series; but in regard to the other organs there is much variation. The chief classes of Arthropoda are as follows:—(1.) Crustacea, including crabs, lobsters, and their allies. (2.) Prototracheata, including only a primitive form known as Peripatus. (3.) Myriapoda: the millipedes and centipedes. (4.) Insecta: the insects. (5.) Arachnoidea: spiders, scorpions, and mites. (6.) Palæostraca: the living king crab and the extinct trilobites and eurypterids.

Arthur, a famous British chieftain who distinguished himself in the wars with the Saxons during the latter part of the 5th and the commencement of the 6th century. Some writers suppose that there were two historic chiefs of that name—one mainly active in the north, the other in the south-west part of the island. We may accept as historical the fact that Arthur fought a series of successful engagements with the invaders, ending in the crushing defeat inflicted upon the Saxons at Mount Badon (according to Zimmer, between 495 and 501); probably he was betrayed by his wife, and met his death in conflict with a near kinsman.

About 1135 Geoffrey of Monmouth wrote his *Historia Regum Britanniæ*, based upon the earlier history of Nennius, amplified by popular tradition. Here the historic Arthur, *dux bellorum*, becomes Arthur, the king of Britain and world-conqueror. Geoffrey's work was translated into French verse, about 1155, by Robert Wace, who himself found a translator in the Anglo-Saxon monk Layamon, each of them adding, from their own knowledge of popular tradition, to the picture drawn by Geoffrey. It is more especially on the version of Wace that the popular conception of Arthur is founded. Here he is the son of Uther Pendragon; king of Britain; conqueror of Scandinavia, Gaul, and Rome; the founder of the Round Table, and the centre of a brilliant circle of heroes. Victim of the joint treachery of his wife and his nephew Modred, he is wounded in battle with the latter, and retires to Avalon to be healed of his wounds.

Mythical Elements.—Many threads meet and mingle in this perplexing legend. Mr. Alfred Nutt has pointed out the resemblance between the popular tales of Arthur and a very widespread heroic and pre-historic tradition, the forms of which were classified by Von der Hagen under the title of *The Aryan Expulsion and Return Formula.* Professor Rhys detects in our hero a certain *Mercurius Artaius*, worshipped by the Gauls as a culture-god, and has dwelt at length on the persistence in the story of certain elements of early Celtic myth. It is probably in his character of culture-hero that Arthur is represented as the slayer of monsters—*e.g.* the demon cat of Lausanne, the giant of Mont St. Michel, and the boar *Twrch Trwyth*—while the prevalence of certain features of early Irish tradition in tales alike of Arthur and his knights cannot be denied. To later mediæval writers the Arthurian story was largely compounded of fairy elements. After his last fight his body was magically transported to the Isle of Avalon, and its wounds healed. Avalon was a land of fairy, of which Arthur was king (*Bataille de Loquifer*); he was heir to the kingdom of Oberon (*Huon de Bordeaux*), and all places haunted by fairies, in whatever land they were situated, belonged to him, and were under his rule (*Brun de la Montaigne*).

Arthurian Romance.—It is now generally recognized that, great as was the influence of Geoffrey of Monmouth and his translator Wace, Arthur as a romantic

(rather than historic or mythic) hero was known before the publication of the *Historia*, and that stories connected with him and his knights were already widely diffused. Professor Rajna has shown that the names of Arthur and Gawain were known in Italy by the end of the 11th century. Modern scholars are divided in opinion as to the source of this romantic tradition, some holding that it was of purely continental growth, the work of the Armorican Britons—their insular compatriots knowing only the historic *dux bellorum;* while others maintain that the romantic tradition was common to both sides of the Channel, and that Anglo-Norman writers played an important part in the transmission of the legend to the Continent. It is certain that during the latter half of the 12th and the first quarter of the 13th century the legends connected with Arthur were the most popular subject for literary treatment. Round the figure of the British king, as represented by the pseudo-chronicles, gathered a group of heroes, many of whom had already an independent and popular story attached to their names. Many of these old stories were retold with a view to bringing them into harmony with Arthurian tradition; new combinations and developments followed; and the resultant body of literature, prose and verse, the work of approximately some seventy years of literary activity, is what was known as the Arthurian cycle. Many of the stories are only superficially connected with Arthur, and all have been remodelled at least six centuries later than that in which the events are supposed to occur. The ignoring of this elementary fact has been the main cause of the mistaken popular conceptions concerning Arthur. A British chieftain of the 5th and 6th centuries could not have been the centre of a court such as the French romances describe, nor could his heroes have been 'knights' in any other sense save that in which the Roman soldiers were such. The main body of Arthurian romance is in French, the principal writers being Chrétien de Troyes, Robert de Borron, Walter Map, Raoul de Houdenc—the names of Hélie de Borron and Luces de Gast, the ostensible compilers of the prose *Tristan*, being fictitious. In Germany the leading writers were Hartmann von der Aue, Wolfram von Eschenbach, and Gottfried von Strassburg; but in every case their work is wholly or in part derived from a French source. This was also most probably the case in England, where, previous to Sir Thomas Malory's 15th century compilation, based upon the later prose romances, Arthurian tradition was represented by a few scattered metrical romances, some of which had certainly French or Anglo-Norman originals, while the source of others is unknown. The original of the Welsh tales is more doubtful; French influence is undoubtedly present, but it seems highly probable that the groundwork of the stories represents genuine insular tradition. See, for history, Nennius's *Historia Brittonum* (1838); Zimmer's *Nennius Vindicatus* (1893); Geoffrey of Monmouth's *Historia Regum Britanniæ* (ed. Schulz, 1854)—translations of Nennius and Geoffrey are included in Bohn's Library; also by Sebastian Evans (1903); Wace's *Li Romans de Brut* (ed. Leroux de Lincy, 1836–8); Layamon's *Brut* (ed. Sir F. Madden, 1847). For mythical elements, Nutt's *Folklore Record* (vol. iv.), *Aryan Expulsion and Return Formula*, and (vol. v.) *Mabinogion Studies;* Rhys's *Arthurian Studies* (1891), and his *Celtic Heathendom*, 1886 (Hibbert Lectures); also *Celtic Folklore*

(1901). For romance, J. L. Weston's *King Arthur and his Knights* ('Popular Studies in Mythology, Romance, and Folklore,' No. 4, Nutt, 1899; new ed., 1904), a summary of the various branches of Arthurian romance, with full bibliography; Ward's *Catalogue of MS. Romances in the British Museum* (1883, vol. i.). For the sources of Arthurian romance, *cf.*, for the arguments in favour of Continental origin, Professor Zimmer, *Göttinger Gelehrten Anzeigen* (1890, Nos. 12 and 20), and *Zeitschrift für Französische Sprache* (vol. xiv.); E. Bruegger, *Zeitschrift für Französische Sprache* (vol. xx.); Professor Foerster, Introduction to vol. iv. of his edition of Chrétien de Troyes (1884, etc.). On the other side, Gaston Paris, Introduction to *Histoire Littéraire de la France* (1888, vol. xxx.); Ferd. Lot, *Nouvelles Etudes sur la Provenance du Cycle Arthurien* (in *Romania*, vols. xxiv. *seq.*); J. Loth, *Les Nouvelles Théories sur l'Origine des Romans Arthuriens* (in *Revue Celtique*, vol. xiii.); J. L. Weston, *The Legend of Sir Lancelot du Lac* (Grimm Library, vol. xii. ch. v., 1901), where Professor Foerster's theories are examined. See also 'Cambridge History of English Literature'—*The Arthurian Legend*, vol. i. (1907).

Arthur, Duke of Connaught. See Connaught.

Arthur, Prince of Brittany (1187–1203), grandson of Henry II. On the death of his uncle, Richard I., Arthur's claim to the English throne as son of Geoffrey, elder brother of John, king of England, was upheld by several French provinces, and, at first, by Philip Augustus of France. John captured Arthur in 1202, and imprisoned him at Falaise and at Rouen, where he disappeared in 1203, murdered, it is said, by the hands of his uncle. See Shakespeare's *King John* and Norgate's *John Lackland* (1902).

Arthur, Prince (1486–1502), eldest son of Henry VII. of England, was married to Catherine of Aragon at the age of fifteen; died in the following year.

Arthur, Chester Alan (1830–86), vice-president, U.S.A., in 1880, born at Fairfield, Vermont; became president on the assassination of General Garfield in 1881, and held office till 1885. Arthur was admitted to the bar in 1854; took part in the civil war, holding the post of quartermaster-general of the New York forces; and after the war became a prominent lawyer and politician on the republican side. He was collector of the port of New York from 1871 to 1878, but was removed by President Hayes on account of his hostility to the latter's policy of civil service reform.

Arthuret, par., Cumberland, England, 8 m. N. of Carlisle; in early times a strategic point commanding the fords on the Esk and the road to Scotland. A battle was fought here (A.D. 573) between the Britons and the Romans. Pop. 2,500.

Arthur's Seat, hill (822 ft.), in the King's Park, Edinburgh. Geologically interesting, the upper part consists of volcanic rocks, which overlie Upper Old Red sandstones and shales, traversed by intrusive sheets of dolerite and basalt, whose formation may be seen in Samson's Ribs and Salisbury Crags. Over the Holyrood end of the Radical Road and elsewhere the remains of the overlying sedimentary rocks can be seen below the basalt. The eastern part of the hill (the Whinny Hill) consists of alternating sheets of lava and beds of volcanic ash. The summit, or 'lion's head,' and also the 'lion's haunch,' are old craters plugged with basalt and agglomerate. The internal structure of the hill and its detailed history have given rise to much discussion. A large

coloured model showing the latest interpretation of its structure can be seen in the Royal Scottish Museum, Edinburgh. The hill figures in Scott's *Heart of Midlothian*.

Artichoke, two different plants of the order Compositæ—the globe artichoke, or *Cynara scolymus*, and the Jerusalem artichoke, or *Helianthus tuberosus*. The globe artichoke, a native of N. Africa, is grown in British gardens for the sake of its large flower-heads, the edible parts being the large fleshy bracts and the fleshy axis from which they grow. In the second plant, the name Jerusalem is a misnomer for the Italian *girasole* (turning to the sun), from the habit of the plant, which belongs to the same genus as the sunflower. Its underground stem-tubers resemble potato tubers, their value as a food depending upon the starch they contain. The plant, introduced into Europe from N. America in 1616, was supposed to be a native of Brazil, but is indigenous to the upper Mississippi and parts of Canada.

Articles, THE SIX, STATUTE OF, 1539, was, in Henry VIII.'s intention, a corrective to the reforming zeal of Protestants in England after the breach with Rome (1529–36, 1539). It reasserted fundamental doctrines and positions in the church—viz. (1) transubstantiation; (2) communion unnecessary; (3) celibacy of priests; (4) vows of chastity to be observed; (5) private masses to be permitted; (6) auricular confession necessary. Those denying the truth of transubstantiation were to be burnt. The penalties for non-compliance with the other articles were forfeiture of property for the first offence, death for the second. The statute was repealed in 1547, after Edward VI.'s accession. See Cambridge, *Modern History*, ii. ch. 13, etc. (1904), and J. F. Bright's *History of England*, vol. ii. (1887).

Articles, THIRTY-NINE. See THIRTY-NINE ARTICLES.

Articles of Association. See COMPANIES.

Articles of War. Before the establishment of a standing army in 1660, when war broke out, 'Articles of War' were issued by the crown to govern the troops when actually engaged in hostilities. The earliest articles of which record remains were those issued by Richard II. and Henry V., on the occasion of wars with France. The punishments awarded for crimes were very severe, death and loss of limb being inflicted for trivial offences. The prerogative power of the crown to issue articles was gradually encroached upon by Parliament, and finally superseded by a corresponding statutory power in 1803. Owing to the completeness of the present military code, Articles of War are no longer necessary; but section 69 of the Army Act reserves the right to make Articles in case of need. See MUTINY ACT.

Articulata (Lat. *articulus*, 'a joint'), a term formerly used instead of Arthropoda to include animals, such as crustaceans and insects, which bear jointed appendages; now obsolete.

Artificer Engineers (British navy). Engine-room artificers, of at least eight years' confirmed service, and of not less than thirty-five years of age, are eligible for warrant rank as artificer engineers. They rank with carpenters, and wear the same uniform, with the addition of a narrow stripe of purple cloth on the cuff.

Artificers, Engine-room, a class of petty officers in the British navy. The age for entering this branch of the service is between twenty-one and twenty-eight, and the candidates must be engine-fitters, boiler-makers, smiths, or coppersmiths. They are divided into four classes,

entering in the fourth class, and rising, after twelve years' service, to the first. After six years' service, an engine-room artificer is eligible for advancement to chief engine-room artificer, and after twelve years' service he may re-engage. Boys are entered between the ages of fifteen and sixteen, and after four years' training are rated E.R.A. 5th class, being subsequently advanced to the classes above.

Artificial Eyes. See EYE.

Artificial Feeding of Infants. See INFANT, FEEDING OF.

Artificial Flowers. See FLOWERS, ARTIFICIAL.

Artificial Limb, a mechanical contrivance taking the place of an absent limb in use and appearance. In the museum of the London College of Surgeons there is an artificial leg, made about 300 B.C., of bronze, wood, and iron. The artificial foot varies in construction, in material, and in price. After what is known as a Hey's or a Chopart's operation, which leaves the heel and part of the sole, the chief intention is to make a presentable appearance with a cork-filled boot. In cases of higher amputation, where an artificial ankle joint is needed it may be in the form of a transverse rod working in a socket, or of two 'rule joints,' one on either side of the stump. The lateral yielding of a foot is sometimes imitated by side springs which yield to lateral pressure. One of the best substitutes for the real foot is a curved sole (Beaufort), where the movement has a natural appearance, though the substitute itself is somewhat unsightly. The simplest artificial foot is a peg at the end of 'a bucket' which holds the stump. The centre of the artificial ankle is sometimes on the principle of the ball-and-socket joint. The artificial foot is sometimes extended by means of catgut strings, fastened at the back of the knee, with flexible bands passing down over the upper surface, or dorsum, of the foot. In amputations below the knee—such as Syme's operation—pressure can be borne upon the extremity of the stump, and the foot can be made to suit the purse and occupation of the patient. If the amputation be across the shafts of the bones, a laced leather sheath is needed—an awkward expedient, but a cheap one, the 'bucket leg' being secured by straps to the thigh. If the amputation is close below the knee, the resulting flap and breadth of bone give a stump that will bear the weight of the body. In amputation above the knee, the weight can be borne either on the extremity or by a leather sheath. The artificial hand made in Nuremberg, in 1504, for the German knight Götz von Berlichingen of the Iron Hand, is well known. The simplest form of artificial hand is a leather sheath, laced to the arm stump, and so fitted that a knife, fork, or spoon can be screwed to it; other hands open and close by hydraulic pressure—the Beaufort being of wood, with a movable thumb. The Beaufort arm and leg are the most natural and useful types of all substitutes, and not expensive. A 'box-leg,' with which the cripple rests on his knee and points the stump backwards, can be had for about 15s., while a jointed leg may cost as much as 30 guineas. See 'Artificial Limbs,' in the *Encyclopædia Medica;* Caird and Cathcart's *Surgical Handbook* (11th ed. 1902); Heather Bigg's *Orthopædy* (1892).

Artificial Respiration. See RESUSCITATION.

Artificial Stone. See STONE, ARTIFICIAL.

Artigas, most northerly dep. of Uruguay, bounded w. by Uruguay R., N. by Cuarcim R., and S. by dep. of Salto. Pop. 26,000. Cap. San Eugenio.

Artillery, in a general sense, includes the theory and practice of the employment of cannon, the guns themselves and their entire equipment, as well as the organization, *personnel*, and transport of that branch of the service which has the handling of ordnance.

The early ordnance of the 14th century was rude in construction, weighty to move, and of little real efficiency. Guns were made of wrought-iron bars bound together like the staves of a cask by the shrinking over them of iron hoops. In the 15th century the 'bombards' were replaced by guns of cast iron or brass. Wheeled carriages of a rough type were framed, and iron projectiles began to supersede those of stone. The necessity of mobility was first realized in the 16th century, and culverins, sakers, and falcons of light make followed an army in the field. The culverin of the 17th century required fifteen horses to drag it, while the loading was slowly effected by putting in powder with a ladle. On the Continent an attempt at real mobility was originated by Gustavus Adolphus with his so-called 'leather' guns, while rapidity of fire was secured by the introduction of cartridges. It was not till 1716 that a permanent force of two companies of artillerymen was organized in England, and formed the nucleus from which was evolved the present Royal Regiment of Artillery. Meantime some progress was made in the casting of light guns in brass, from 3-pounders up to 12-pounders; while cast-iron guns reached a size that threw a 68 lb. shot. The wars of the French revolution led to the abolition of the civilian driver, and a more mobile equipment for field guns. Military drivers were mounted on the draught horses, and 'brigades' of guns formed a unit closely resembling the modern battery. Napoleon, an artilleryman by profession, may be said to have laid the basis of the modern system of artillery tactics. But little progress was made until the middle of the 19th century, when the introduction of rifled guns made of wrought iron forced the artillery arm prominently to the front, notably in the Franco-German war. The quality and power of *matériel* has since been enormously increased by the substitution of steel for iron.

Artillery may be considered under the heads of field, siege, and fortress guns, with their *personnel* and equipment. The artillery of this country is organized into:—

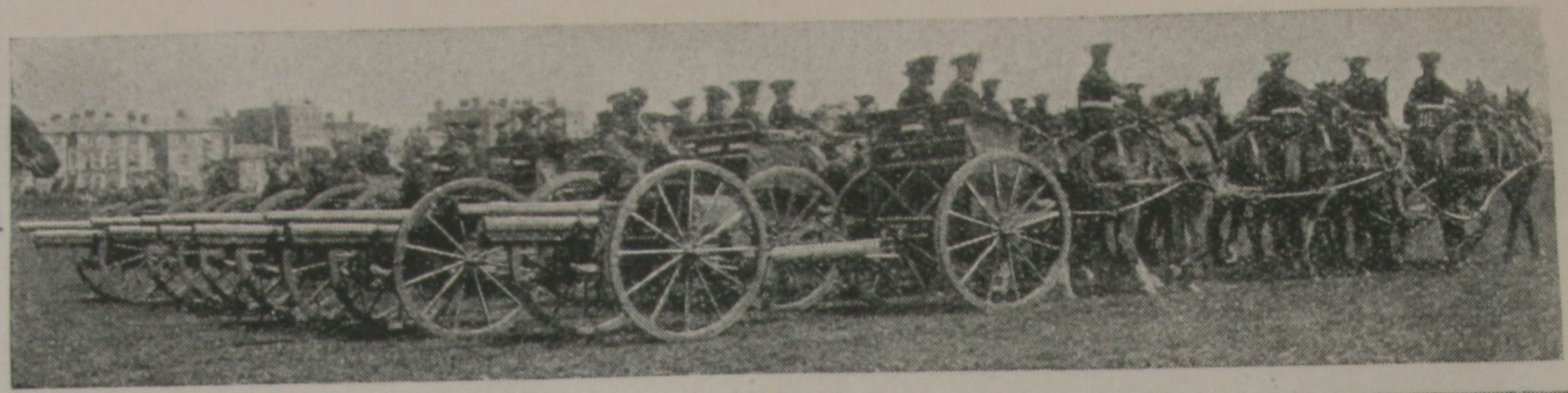
28 horse artillery batteries.
150 field artillery batteries.
87 garrison artillery companies.
8 mountain batteries.
12 heavy batteries.

Horse and field artillery are on one roster for promotion; mountain, garrison, and heavy artillery on another.

The brigade is the tactical unit. It consists of 2 batteries of horse, or 3 batteries of field or heavy artillery. An ammunition column forms part of each brigade. Garrison artillery has no regular brigade formation.

Horse artillery operates almost entirely with cavalry. It must move rapidly, and therefore the gunners are mounted and the equipment is lighter than that of field artillery. As a rule, it marches and operates on a flank, and its first duty is to shatter or disorganize the enemy's cavalry before the actual charge takes place. The hostile guns are only a secondary objective. It also co-operates in cavalry dismounted action (see CAVALRY), and as the front to be covered may be wide, it is often broken up into single batteries, or even sections. Apart from cavalry duties, the power of its weapon (see GUNS) permits of its being used in line with field

1



2

British Artillery.

1. Battery of Field Artillery with 15-pr. guns. 2. Mountain gun—mule equipment.

artillery. It must always be prepared for rapid action, so that it does not, as a rule, employ positions under cover (see FIRE TACTICS).

Field artillery operates with infantry, and rarely moves faster than a trot. The gunners therefore walk, or ride on the carriages. Its main duty is to facilitate the infantry advance by breaking down the hostile fire. It was until recently the ambition of every leader to bring all his guns early into action, and to endeavour to beat down the hostile guns. The present tendency is to commit the artillery of an army only as required, and to employ it against whatever portion of the enemy is doing most damage; this will nearly always be his infantry. Formerly, also, it was considered desirable to bring artillery into action in large groups or masses. This facilitated not only command, but also concentration of fire. To-day the greater power of the Q.F. gun, the longer ranges, and the application of indirect fire (see FIRE TACTICS) call for great dispersion of the batteries, and the greater difficulties in the way of command and concentration are compensated for by better means of inter-communication. Field artillery includes also light howitzers, of which a brigade is allotted to each division. Howitzers, by reason of the steep angle of descent of their shell, are very suitable for the attack of shielded guns, of an enemy under cover, and of entrenchments and buildings. During the final assault, also, they can continue firing over their own infantry longer than can the flat-trajectory field guns. They are at present the only British field guns firing high-explosive shell.

Garrison artillery is employed in coast and other fortresses; and is organized into companies of a strength suitable for the defences allotted to them. It now numbers some 18,500, of whom over 8,000 serve at home, 5,500 in the Colonies, and 5,000 in India. Were it not that it provides the units now to be described, its *personnel* would have little chance of service in the field (see also COAST DEFENCES).

Mountain artillery is employed mainly in the hilly country of the N.W. frontier of India. It is now recognized that, owing to its possibilities of moving through broken and enclosed country without disclosing itself, it can often afford the infantry close support throughout the attack, and may also be useful in wood fighting and in rear and flank guard operations. It is therefore possible that it may figure more largely in European warfare than has hitherto been the case.

Heavy artillery has great shell power, and can fire accurately at long ranges. A battery is attached to each division. It is employed against shielded guns, to search distant localities, and to support the infantry assault by converging fire.

A siege train is necessary against fortresses, and arrangements have been made to mobilize medium and heavy brigades. A medium brigade will consist of 4 batteries, each of four 6-inch howitzers, with 186 of all ranks and 111 horses. A heavy brigade will consist of 2 batteries, each of 4 heavy howitzers or high-angle guns, with 129 of all ranks, and, probably, mechanical transport. See Owen's *Modern Artillery* (1873); Jerram's *Armies of the World* (1889); Lloyd and Hadcock's *Artillery, its Progress and Present Position* (1893).

Artillery Schools. See WOOLWICH and SHOEBURYNESS.

Artiodactyla, the name given to even-toed ungulates, such as the sheep and the cow, as contrasted with odd-toed forms, such as the

horse and the rhinoceros. The artiodactyles have the third and fourth toes of the foot almost equally developed, and so shaped that, while each is unsymmetrical in itself, the whole foot is symmetrical. The femur is without the third trochanter, conspicuous in the horse, and the stomach is generally complex. The sub-order Artiodactyla contains: (1) Suina, including hippopotamus, pigs, and peccaries; (2) Tylopoda, including camels and llamas and their allies; (3) Tragulina, the chevrotains; (4) Pecora, the ruminants, including deer, giraffes, cattle, and sheep.

Artisans' Dwellings. See HOUSING OF THE WORKING CLASSES.

Artlett, RICHARD AUSTIN (1807–73), an engraver of sculpture, whose chief works are: *The Day Dream*, a statue by P. MacDowell; *The Veiled Vestal*, a statue by R. Monti; *Perdita and Florizel*, and *The Siren and the Drowned Leander*, groups by J. Durham. See *Art Journal*, 1873, p. 377.

Artocarpaceæ, an order of plants confined to the tropics, allied to the Urticaceæ, and containing a milky juice. The best-known species are the upas tree of Java, the bread-fruit tree of the Pacific Islands, the cow tree of S. America, and others producing india-rubber and beautifully-marked woods.

Artois, former prov. of France, now forming the greater part of the dep. Pas-de-Calais. The name is derived from Arras, its capital. From the time of Charles the Bald, Artois belonged (863) to Flanders; was French from 1180 to the middle of the 13th century; became then a Burgundian and afterwards (1493) an Austrian possession, finally reverting to the French (1659–1713).

Arts, FACULTY OF, also DEGREES IN. See UNIVERSITIES.

Art Schools. See SCHOOLS OF ART.

Art Union, a voluntary association the object of which is (1) the purchase of works of art for distribution among the members by ballot, etc.; or (2) the collection, by subscriptions, etc., of money to be distributed among the members as prizes for the purchase of pictures. They originated in Germany (Munich) in 1823, and were instituted in England in 1834. Under the Art Unions Act, 1846, such associations, if founded by royal charter or approved by the Privy Council, are exempted from the acts which forbid lotteries.

Artvin, tn., cap. of prov. Kutais, Russian Armenia, 34 m. S.E. of Batum; exports honey, oil, and wax. Pop. 6,000.

Aru or ARRU ISLANDS, small Dutch archipelago, E. Indies; area of group, 2,460 sq. m.; pop. 15,000. Coralline in formation and well wooded, the group produces trepang, sago, cocoa-nuts, rice, maize, mother-of-pearl, edible swallows' nests, betel nuts, sugar, and tobacco. The birds and fauna are of great interest. Chief town, Dobbo.

Aruba, or ORUBA, an isl., Dutch W. Indies, 35 m. E. of Curaçoa, and 20 m. off the Venezuelan coast. Area, 69 sq. m.; pop. 9,000.

Arum is a genus of plants, belonging to the order Aroidaceæ, characterized by their thick rhizomes, beautiful pedate or hastate leaves, and flowers arranged on a club-shaped spadix, naked at the top, enclosed in a convolute sheath. The only species native to Britain is *A. maculatum*, the cuckoo-pint or lords-and-ladies. Numerous species are, however, cultivated in our gardens and greenhouses. Among the hardy arums are the narrow-leaved *A. tenuifolium*, with a white spathe; *A. dracunculus*, with pedate leaves and a brown spathe; *A. italicum*, with a yellow spadix; and *A. proboscideum*, with long proboscis to spathe. *A. Palæs-*

tinum is the best of the greenhouse sorts.

Arundel, munic. bor., W. Sussex, England, 11 m. E. of Chichester. The castle, which stands on a steep hill, suffered in the civil war. It was restored in the 18th century, and again recently, and is now a magnificent pile surrounded by a park of 1,200 acres, the seat of the Duke of Norfolk. The most noticeable ecclesiastical edifices are the parish church, a Roman Catholic church (1873), and an ancient cruciform church (Fitzalan Chapel). Pop. 2,700. See Turney's *History of Antiquities of Arundel* (1834).

Arundel, EARLS OF, a peerage which has descended through several noble families from Roger de Montgomery, a follower of the Conqueror. In 1243 the estates passed to the Fitzalans through John, a descendant of the third earl. The chief members of the Fitzalan family are:—(**1.**) RICHARD FITZALAN, first Earl of Arundel (1267–1302), who was the first of the peerage actually summoned Earl of Arundel by writ (1291). (**2.**) RICHARD FITZALAN, third earl (1346–97), a famous admiral; was involved in Gloucester's fall, and beheaded in 1397. (**3.**) HENRY FITZALAN, twelfth earl (1511?–80), was one of the twelve councillors in the regency during the minority of Edward VI. He was a prominent councillor of Queen Elizabeth, and also a suitor for her hand. He was imprisoned for his connection with the Ridolfi conspiracy. Through failure of male heirs, the earldom passed to Philip, son of the fourth Duke of Norfolk, in right of his mother, Mary Fitzalan, and has since continued in the line of the Fitzalan Howards, dukes of Norfolk. (See HOWARD.)

Arundel, THOMAS (1353–1414), Archbishop of Canterbury, became bishop of Ely when twenty-one, and was chancellor five times under Richard II. and Henry IV. He became Archbishop of York in 1388, Archbishop of Canterbury in 1396; was banished for complicity in the conspiracy against Richard II. (1397); returned with Henry IV., on whose head he placed the crown, in 1399. He vigorously persecuted the Lollards. See Hook's *Lives of the Archbishops*, vol. iv.

Arundel Marbles, the collection of ancient sculptures formed by Thomas Howard, Earl of Arundel, in 1624–7, and preserved in the Ashmolean Museum at Oxford. They include the celebrated 'Parian Chronicle,' a slab recording the outlines of Greek history from 1582 to 263 B.C., though the portion containing the last ninety years is missing.

Arundel Society, a society founded in London in 1848, its object being the furtherance of art by the publication of photographs and facsimiles. It came to an end about 1880.

Arundo. See REED.

Aruns, a name borne by three of the Tarquins, ancient kings of Rome—(1) the younger brother of Tarquinius Priscus; (2) younger brother of Tarquinius Superbus, murdered by his wife; (3) younger son of Tarquinius Superbus, slain in battle by Brutus. The word is Etruscan, and perhaps means a younger son in general.

Aruwimi. (**1.**) River, r. bk. trib. of the Congo, Congo Free State; rises near the W. side of Albert Nyanza; drains the great forest region between the central lakes and the Congo. (See Stanley's *Darkest Africa*, 1890.) (**2.**) A station and the administrative centre of the Congo Free State, near the junction f the Aruwimi R. with the Congo.

Arvad, a famous Phœnician town (Gen. 10:18, etc.) on a small island N. of Gebal, called Arados in Greek (now Er-Rûâd); also known as Amrit and Marathos.

It is mentioned on monuments about 1500 B.C., when the fleet of Arvad assisted the Amorites against Egypt, and attacked Tyre. Phœnician remains, including a temple, amphitheatre, and tombs, have been found on the island.

Arval, an Old English term for a funeral feast; now obsolete, except as a provincialism. It dates back to the days of the Norsemen, whose 'arvel ("heir-ale") feasts, when heirs drank themselves into their fathers' land and goods,' are referred to by Dasent; of these the classic instance in the Saga literature will be found in *Olaf Tryggvason's Saga*. The English arval was more an affair of eating than of drinking; and in later times the word was lengthened to arval dinner or supper. One distinctive feature was the arval-bread, specially baked for the occasion (spiced with nutmeg, cinnamon, sugar, and raisins), and distributed among the poor.

Arval Brethren (*Fratres Arvales*), a kind of priestly college in ancient Rome who in the end of May conducted the *ambarvalia*, or progressions round the ploughed land, chanting as they went hymns of invocation to Dea Dia, probably Ceres, or to the Lares of the fields, praying that they might grant them a rich harvest. This rite, which lasted three days, was accompanied by dancing and singing; the priests, of whom there were generally twelve, holding office for life, wore chaplets of oak leaves and ears of corn; honeycombs, on which wine and milk were poured, were offered to the goddess, and sacrifices of animals were also made. This priesthood was of great antiquity, and survived until at least the 4th century A.D. See *Acta Fratrum Arvalium*, ed. Henzen (1874).

Arverni, Gallic tribe in Aquitania. In early days they were the most powerful people in Gaul, and under Vercingetorix offered a stubborn resistance to Cæsar (52 B.C.), but were subdued in 121 A.D. by the Romans.

Arveyron, outlet of the Mer de Glace, Mont Blanc chain, Haute Savoy, France; trib. of the Arve, which it joins in the valley of Chamouni; issues from the glacier through an ice-cave, 'Ice-gates of Arveyron.'

Arvicola. See VOLE.

Arya, ARYAN, ARYANISM. Arya is a Sanskrit word, the general connotation of which is nobility, historical and personal, 'belonging to good family' (*cf.* Lat. *gentilis*), in opposition to *anarya*, 'unworthy,' 'vile.' In the Rig-Veda, from the language of which classical Sanskrit was derived and formed, it was used as the national designation of the invading tribes from the north-west. Its original meaning was probably 'kinsman,' as one of the same race, and having the same religion. By it was evinced the proud consciousness of superiority and unity or community, in opposition to the aboriginal inhabitants, who were called Dasa or Dasyu, 'fiends.' When ultimately the Dasa were reduced, their name assumed the meaning of 'slave,' and they were incorporated into the Hindu social system as the fourth caste, the Sudra. (See CASTE.) The name Arya then assumed its meaning as in Sanskrit: instead of being tribal and national, it became social and ethical. This gives the keynote of Hindu civilization and culture, in the history of the dominance of the invading Arya.

In the Iranic field the use of this name was more emphatically ethnical and national. Its earliest ethnical use is found in the old Persian inscription on the tomb of Darius (485 B.C.), where he calls himself an Arya and of Aryan descent. In the Avesta it becomes Airya, where it means 'venerable,' and is the name of the people in opposition to the

Anairya; and the land is named Airyana. Among the Greeks, Herodotus records that the Medes were formerly known as Arii; Hellenicus, that Persia was called Aria; and from Eudemus is cited the phrase, 'the Magi and all the Arian race.' Hence the Greek use of Aria and Ariana, and the modern national name of Persia, Iran.

But the more ordinary use of the term Aryan is for the whole family, which is also known as Indo-Germanic and Indo-European. This use of it was introduced chiefly by Max Müller and Pictet; and latterly, when language and race became more strictly discriminated, Max Müller advocated the use of the term solely for the Indo-European family of languages. Its application, however, to race as well as to language has been long established. When it was seen that the chief languages of Europe had affinities with the ancient languages of India and Persia, the problem arose of their historical connection, and their relation to the parent speech; and out of this problem, again, arose that of the original home of the parent race of the peoples. At first, on account of the antiquity of the ancient language of the Hindus, those of Europe were derived from India, as by Friedrich Schlegel (1808); and from a study of the Avesta, Rhode first indicated the highlands of Central Asia, about the upper basin of the Amu Daria, as the original home. By the comparative study of words and names common to all or several of the languages (linguistic palæontology), it was believed possible to locate the original home as indicated by the primitive civilization. And by the work of many scholars this came to be regarded as some part or other of Central Asia, from the Urals to the Hindu-Kush, and from the Pamirs to Armenia. Opposition to this view was first made by Omalius d'Halloy and Latham, who held that the original abode must be looked for in Europe, Latham calling attention to the archaic forms of Lithuanian. In support of Europe, further evidence was adduced by Benfey, who decided for the southern plains of Russia, and was followed by Schrader; by Geiger, who indicated Central and West Germany, and was followed by Hirt on behalf of the Baltic plains, and by Cuno, who claimed the whole of N. and E. Europe from the Urals to the Atlantic. Finally, anthropological evidence was adduced by Pösche on behalf of E. Europe, and by Penka on behalf of Scandinavia. Europe may be said to have gained the day; but Asia has been, nevertheless, upheld by several scholars, such as Max Müller, Van den Gheyn, Ujfalvy, Hehn, and Ihering. Huxley, summing up the Aryan question in 1890, wrote: 'There was and is an Aryan race—that is to say, the characteristic modes of speech termed Aryan were developed among the blond long-heads alone, however much some of them may have been modified by the importation of non-Aryan elements.'

Thus arose the problem of the Aryan race and its origin. Although the Indo-Iranic word *Arya* is probably represented in the Hellenic *Aristos*, in the Teutonic name *Ariovistus*, and in Old Irish *Aire* or *Airech* (*princeps*), there is insufficient evidence to show that Arya was in use as the name of the primordial race or people which used the parent Aryan speech. As the population of Europe consists of two fundamental races, one of which is dolichocephalic and the other brachycephalic, it is necessary to decide which is to be considered the Aryan. But the dolichocephalic race comprises two branches—a brunette in the south and another

in the north. By one school it is held that the Aryans are the tall, blond dolichocephalic race which is best represented by the people of N. Germany and Scandinavia. It is held by another school, the Gallic, that the brachycephalic race is the original Aryan. According to Sergi, the dolichocephalic race, comprising the brunette and blond branches, constitutes a Eurafrican species, since it is found in Europe and N. Africa; and the brachycephalic race (or Alpine race, as it is called by some, after Linnæus), which is found from Auvergne and Savoy to the Hindu-Kush and the Pamirs, constitutes a Eurasian species, which invaded Europe and Aryanized it in speech. Such is the new phase of the Aryan problem. It is worthy of notice that Prichard (1845) noted the Mongoloid affinity of the Celtic skull, and that several scholars, such as Sweet and Taylor, have found many affinities between Aryan speech and the Ugric and Finnic branches of the Ural-Altaic family.

In the study of the Aryan problem it is necessary to discriminate between language, race, and civilization or culture. From the comparative study of the Indo-European languages, several accounts have been given of the primitive Aryan civilization, as by Kuhn, Pictet, Max Müller, Ihering (for law and custom), and most fully by Schrader in all its aspects. The fascinating idyll of the primitive Aryan of Pictet and Max Müller has been dissipated by more exact study. Its civilization was much inferior to that of the neolithic people of Europe. According to this view, the classical civilization of Europe is of Mediterranean origin, but Aryanized in speech. The advocacy of the opposite theory is termed Aryanism—that Europe owes its culture and civilization to the Aryan, a tall, blond dolichocephalic race represented by the modern Germans, Scandinavians, and English. See Schrader's *Prehistoric Antiquities of the Aryan Peoples* (trans. by Jevons 1890); Reinach's *L'Origine des Aryens* (1892); Sergi's *Mediterranean Races* (1901, with a bibliography); Brugmann's *Comparative Grammar of the Indo-Germanic Languages* (1891); Keane's *The World's Peoples* (1908).

Arya Samaj. See BRAHMA SAMAJ.

Arzamas, tn., Nijni Novgorod gov., Russia, 70 m. s.s.w. of Nijni Novgorod. Commercially, it is, after Nijni Novgorod, the chief town of the government. Tanneries, oil works, foundries, etc. Pop. 11,000.

Arzano, comm., Italy, in Campania, prov. of and 5 m. N. of Naples. Pop. 7,500.

Arzeu, seapt. of Algeria, 30 m. by rail N.E. of Oran. Alfa (esparto) and salt are exported. In the neighbourhood are the Kléber quarries of Numidian marble, and the ruins of ancient *Arsenaria*. Pop. 6,000 (Europeans 5,000).

Arzignano, tn., Italy, prov. of and 11 m. w. by s. of Vicenza. Silk, thread, oil, and wine are produced. Pop. (comm.) 10,500.

As, a Roman term from the compound metal *aes*, with three meanings: (1) a weight=libra= a pound of 12 unciæ (ounces); (2) a coin, at first=12 ounces, then gradually reduced to 4, 2, 1, and ½ oz; (3) a measure=(*a*) a foot (linear), and (*b*) an acre (square). (See DENARIUS.)

As, in northern mythology. See AESIR.

As (plural ÅSAR), ridges of gravel and sand in Sweden, formed during the Glacial epoch, and extending often for miles. They generally reach a height of 100 to 200 ft., and are often wooded.

Asa, king of Judah (*c.* 918–877 B.C.), son and successor of Abijah. He showed great energy in purging his kingdom of idolatry. He defeated Zerah, a Cushite invader, and, with the help of Syria, Baasha, king of Israel. See 1 Kings 15 : 9–24 ; 2 Chron. 14–16.

Asaba, tn., Southern Nigeria, on the r. bk. of the Niger, in 6° 10′ N. lat. Pop. 2,000.

Asafœtida (Lat. 'fetid gum'), a gum resin from the living root of various species of *Ferula*, in Tibet, Afghanistan, Persia, and the Punjab. The fresh oil has not an unpleasant smell, but when decomposed it gives off sulphuretted hydrogen. It is one of the aromatics, differing from most of them in its disagreeable characteristics. It is used as a cathartic to expel flatulence, and as a nerve stimulant.

Asakusa, popular Buddhist temple to the 'thousand-armed Kwan-non,' the goddess of mercy, in a suburb of Tokyo, Japan. See Bird's (Bishop's) *Unbeaten Tracks in Japan* (1880), vol. i. p. 62.

Asaky, GEORGE (1788–1869), Roumanian author, one of the leaders in the regeneration of his country. He established in Roumania (Moldavia) the first press for printing books in the Roumanian language ; founded, and edited for thirty years, the first Roumanian paper (*Albina*) ; composed school books, translated classical plays from German and French, and wrote a volume of poetry, *Poesii* (2nd ed. 1854).

Asama-yama, active volcano prov. Shinshu, Japan, 80 m. N.W. of Tokyo ; 8,280 ft. The crater is ¾ m. in circumference. A serious eruption took place in 1783.

Asaph, chief musician in the time of David and Solomon (1 Chron. 16 : 5). His name is prefixed to 12 psalms (Nos. 50 and 73–83), and he seems to have been regarded as the founder or ancestral representative of a guild or family of singers in the second temple. *Cf.* 'sons of KORAH,' and see Driver, *Lit. of O.T.* (p. 348, 2nd ed. ; 6th ed. 1897).

Asarum, a genus of plants of the order Aristolochiaceæ, or birthworts. An American species is the snakeroot or wild ginger. The leaves of the European species, called asarabacca, are emetic, cathartic, and diuretic.

Asben. See AÏR.

Asbestos (Gr. 'inextinguishable'), finely fibrous minerals, varieties of amphibole, usually tremolite or actinolite. It occurs in delicate fibres, usually white, gray, or blue, which can be teased out like wool. Though rather brittle, it has been spun and woven into cloth, which was used by the Romans to envelop corpses on the funeral pyre, and served to retain their ashes. From this property its name is derived. It is both uninflammable and a poor conductor of heat, owing to the large amount of air enclosed between the fibres, and is employed in the manufacture of pipes, lamp-wicks, and cardboard. Chemists use it for filtering fluids which attack ordinary filter-paper, or, in place of platinum wire, for flame tests. But it is more largely used as a heat-retaining medium, as in packing steam pipes, and in the manufacture of fireproof safes and of gas stoves. Fireproof paints, papers, putty, clothes, gloves, felt, curtains, have all been made from it, and have been found of value in certain cases. The principal sources of supply are Canada, the Alpine countries, Russia, Corsica, and New South Wales. It is found chiefly in the older crystalline rocks, and has been obtained in Cornwall, at Portsoy, and in Shetland. See Jones's *Asbestos and Asbestic* (1890), and Röll's *Der A. und seine Verwendung* (1901).

Asbjörnsen, PETER CHRISTIAN (1812–85), Norwegian author, and writer of folk-tales. In 1842 he

and his friend and colleague, J. E. Möe, published the first part of the classic *Norske Folkeeventyr* (new ed. 1896–9), which can be placed by the side of Grimm's *Kinder- und Haus-märchen*. On the development of Norwegian literature the book exercised a far-reaching influence. A second collection of folk-tales, dealing chiefly with fairies, appeared from 1845 to 1848, under the title of *Norske Huldreeventyr og Folkesagn*, standing as literature even higher than the *Folkeeventyr*. A third collection of the tales appeared in 1870. Grants from the state enabled Asbjörnsen to travel on the north Norwegian coast—a journey which led to important geological discoveries. From 1860 to 1876 he was engaged as curator of forests, and in investigating the condition of the national peat-fields. Of his scientific works his account of his Mediterranean expedition (1849–50) in the corvette *Eagle* is the most important. Asbjörnsen is the Norwegian story-teller, *par excellence*, though he wrote in Danish. See *Popular Tales from the Norse*, by Dasent (1859; new ed. 1903); *Tales from the Fjeld* (1874); *Round the Yule Log* (1881); *Fairy Tales from the Far North* (1897). Biography: Sinding-Larsen and Asbjörnsen, *P. C. Asbjörnsen; Fra Asbjörnsens Turistliv* (1884).

Asbury, FRANCIS (1745–1816), bishop, founder of Wesleyanism in the United States; born near Birmingham, England; was sent by Wesley to America in 1771, and was ordained first bishop of the Methodist Episcopal Church in the United States in 1784. The great development of Methodism there is largely due to his untiring labours. He died in Virginia. See *Asbury's Journal* (3 vols. 1852) and Strickland's *Pioneer Bishop* (1858).

Ascalon, or ASHKELON, one of the five chief Philistine cities, N. of Gaza, on the Mediterranean, 39 m. S.W. of Jerusalem (Josh. 13:3, etc.). It is noticed on monuments of 1600, 1500, and 1350 B.C. as subject to Egypt under Philistine princes. It is now represented by the ruined city Askalân, with walls built in the 13th century A.D., to which time it was an important city. Near the town, on Aug. 12, 1099, the Crusaders, under Godfrey of Bouillon, defeated a superior army sent by the sultan of Egypt to recapture Jerusalem. The Crusaders captured the place (1153); it was recaptured by Saladin in 1187, and destroyed in 1270. Ascalon gives its name to the eschalot or shallot, which is grown in the vicinity. See Smith's *Hist. Geog. of the Holy Land* and Thomson's *The Land and the Book*.

Ascania. The name of this ruling house is derived from the castle of Ascania near Aschersleben, the home of Albert the Bear, contemporary of Frederick Barbarossa. Albert, the Ascanian margrave of Brandenburg, and his successors, nearly doubled the margravate between 1170 and 1267. The dynasty was intimately connected with the house of Anhalt.

Ascanius, the son of Æneas and Creusa, who as a boy escaped with his father from the fall of Troy. He distinguished himself in the war against the Italians, and after the death of Æneas founded the town of Alba Longa. He is also called Iulus, and from him the Julian clan at Rome claimed descent. See Virgil's *Æneid*.

Ascapart, a legendary giant, 30 ft. high, who, in Drayton's *Polyolbion*, bk. ii. (1612), carries off Sir Bevis of Southampton, his wife, and steed, but is subdued and made into a footman by the knight.

Ascaris, the name of a genus of round worms or nematodes, including some important intestinal parasites—*e.g. A. lumbricoides*, of man; *A. mystax*, of cats, dogs, etc.; and *A. megalocephala*, of the horse and related animals. Other

species have been found in birds, reptiles, and fishes. There is some obscurity as to the means of infection of man, but it is believed that millipedes—*e.g. Iulus*—may serve as the first host, and may be inadvertently eaten in fallen fruit or unwashed vegetables.

Ascendant. See ASTROLOGY.

Ascension, British isl. in S. Atlantic, 760 m. N.W. of St. Helena, lat. 7° 56′ s., long. 14° 24′ w. (so called because discovered by the Portuguese navigator, Juan de Nova, on Ascension Day, 1501), is composed of extinct volcanic cones, forming part of a submarine longitudinal ridge which divides the S. Atlantic into two basins. The island (38 sq. m. in area) is used as a coaling and victualling station for the African squadron. In the S.E. is Green Mt. (2,820 ft.), which is used as a sanatorium. The only good anchorage is at George Town, in the N.W. Land crabs are plentiful, and green turtles are caught in great numbers. Great Britain took possession of it in 1815. Pop. about 130. The island is fortified, and is entirely under the control and jurisdiction of the Admiralty. See Mrs. D. Gill's *Six Months in Ascension* (1878) and Darwin's *Voyage of H.M.S. Beagle.*

Ascension Day, or HOLY THURSDAY, commemorates, in most of the Christian churches, the ascension of Christ into heaven, held to have taken place forty days after the resurrection, and thus placed in the calendar forty days after Easter. The old custom of 'beating the bounds' used to take place on this day.

Ascension, Right. See RIGHT ASCENSION.

Asceticism, as used by ecclesiastical writers from the 3rd century onwards, means the continual mortification of bodily desires, even of such as are lawful in themselves, in order to attain purity of soul and perfect union with God. But though the word thus understood is of Christian origin, the principle of asceticism is common in varying degrees to most religions. It is especially prominent when the idea prevails that earthly life is evil, or that the body is a hindrance to the soul in its quest of virtue. Hence in Brahminism we meet with an elaborate system of meditation and penance, by which the adept attains union with the divine, and acquires supernatural powers; while Buddhism regards the life of the monk who lives in poverty and celibacy as the means of escape from transmigration into new forms of bodily existence. Even among the Greeks there are traces from early times of this ascetic view. In the 5th century B.C. there was a disposition, for example, to depreciate marriage; and tendencies of this kind were fostered by the Orphic mysteries and the teaching attributed to Empedocles and Pythagoras. After the Christian era, the Roman Stoics, and later still the Neo-Pythagoreans and Neo-Platonists, pursued ascetic modes of life. The Old Testament, with its solitary fast (viz. that on the Day of Atonement) and its exaltation of marriage, gives scant encouragement to asceticism. Still, among the later Jews, the Pharisees fasted twice a week; the Essenes, as a rule, abstained from marriage, and lived in community; and the praise of virginity finds frequent expression in the works of Philo Judæus. It was from the influence of later Greek philosophy that the ascetic life gained entrance into the Christian church. The New Testament requires complete self-surrender to the service of God and man, but prescribes no rules of ascetic discipline.

Early in the 2nd century A.D., Christians kept stated fast days and hours of prayer. It was

thought meritorious to abstain from marriage; watching through the night, endurance of cold, going barefoot, wearing of sackcloth, and other kinds of mortification were in high repute. Gradually a special class of men and women arose, known as ἀσκηταί or ascetics. Such persons were at first bound by no vows, and continued to live in the family circle. But towards the close of the 3rd century, Hieracas of Leontopolis, a disciple of Origen, gathered round him a number of ascetics, whom he trained to study and mortification. He even regarded the ascetic life as the distinguishing novelty of the Christian revelation. It is said that some of these ascetics fled into the desert during the Decian persecution. In any case, the Egyptian Antony (251–356 A.D.) became the father of monasticism, which is the legitimate outcome of the ascetic life.

The ascetic principle is still maintained in the Roman and Eastern Churches, though from the earliest times the Catholic authorities have condemned as heretical the belief that wine, flesh-meat, marriage, etc., are intrinsically evil. The Reformation was unfriendly to asceticism. Still, a moderate asceticism, represented, for example, in Jeremy Taylor's *Holy Living*, has found favour in the Anglican Church. Puritans, too, have often been strict ascetics, though not after the Catholic fashion.

Asch, tn. in N.W. corner of Bohemia, Austria, 17 m. by rail N.W. of Eger. Manufactures dress stuffs and lace. Pop. 20,000.

Aschaffenburg, tn., dist. Lower Franconia, Bavaria, on the r. bk. of the Main, 26 m. S.E. of Frankfort-on-Main. The castle contains a valuable library, a picture gallery, and a collection of engravings. Manufactures paper, papier-mâché, clothing, dyes, wax, and tobacco. Pop. 26,000.

Ascham, ANTONY (d. 1650), English Parliamentarian ambassador. In 1649 he was at Hamburg as agent for the Commonwealth, and in 1650 was dispatched to Madrid as resident minister. The day after his arrival there he and his interpreter were murdered by six English royalists. See *Harleian Miscellany* (iv. 280, ed. Park).

Ascham, ROGER (1515–68), educationist and scholar, one of the earliest masters of English prose, was born at Kirby Wiske, near Northallerton. He went in 1530 to Cambridge. In 1537 he became reader in Greek, and in 1546 was appointed public orator to his university. In 1545 he published *Toxophilus*, a treatise on archery, which gained him the favour of Henry VIII. and the appointment (1548) of tutor to Princess Elizabeth. Three years (1550–3) spent abroad in the suite of the English ambassador at the court of Charles V. led to the publication in 1553 of his *Report on the Affaires of Germany*. Meantime he had been appointed Latin secretary to Edward VI., and was continued in the same position under Mary. Under Elizabeth he was secretary and tutor until his death. In 1570 his widow published his principal work, *The Scholemaster*, in which Ascham advocates the teaching of classical languages by the analysis of choice passages rather than by an elaborate course of grammatical instruction; he also shows that gentleness is more effective than punishment with children. See *Toxophilus* (ed. Arber, 1868); *Scholemaster* (ed. Mayor, 1863, or Arber, 1870); *Works* (ed. Giles, 1865); also Katterfeld's *Roger Ascham* (1879).

Aschersleben, tn., prov. Saxony, Prussia, pleasantly situated, 36 m. N.W. of Halle. Woollens, hardware, sugar, etc., and a saline spring. Pop. 28,000.

Ascidians (Ascidiacea) constitute an order of tunicates or sea-squirts, including all the familiar members of that class. The term is also used in a more restricted sense for tunicates belonging to the genus Ascidia and the related genera. See TUNICATA.

Ascites, an accumulation of fluid in the peritoneal cavity. Ascites is not, properly speaking, a disease, but a sign of one of several diseases. Fluid in excess in the peritoneal cavity may be due to (1) mechanical obstruction to the portal circulation, caused by liver disease; (2) lack of propelling power—heart weakness; or (3) obstruction to circulation. Ascites is usually slow in its onset, and a gradual abdominal enlargement is very likely the first thing noticed by the sufferer. It is diagnosed chiefly by the appearance of the abdomen in different positions, by palpation and percussion, or by the discovery of disease likely to produce it. The treatment consists in dealing with the cause, medically or by surgical operation as may be necessary, and in promoting absorption of the ascitic fluid by free action of the bowels, skin, and kidneys.

Asclepiadaceæ, an order of plants closely related to Apocynaceæ, or Dogbanes. Many possess a milky juice (*latex*) which in certain cases forms an acrid caoutchouc of small value, the best-known species occurring in Penang. Most species occur in Africa, but many are found in India and tropical America—the cow plant of Ceylon and a pitcher plant (*Dischidia*) in the Malay Archipelago belonging to the order. In most of the genera the pollen forms pollinia, as in orchids. Many of the plants are of local repute for the cure of leprosy, elephantiasis, dysentery, etc. Several yield useful fibres—*e.g.* mudar.

Asclepiades. (1.) A Greek poet of Samos (fl. 280 B.C.), who is said to have taught Theocritus. Thirty-nine epigrams in the Greek anthology are ascribed to him. (2.) A native of Bithynia (fl. 1st century B.C.); attained great fame as a physician in Rome, where he founded the 'methodical' school. The salient features of his treatment were such as are approved by modern physicians—viz. a generous diet, the use of alteratives, open-air exercise, bathing, and in general the assistance of nature by freeing the patient from mental or nervous strain.

Asclepiadic, a metre supposed to be so called on account of its connection with the poet Asclepiades. The lesser asclepiad consisted of a spondee, two choriambi, and an iambus (– – | – ∪ ∪ – | – ∪ ∪ – | ∪ –); as, *Mæcenas atavis edite regibus.* The greater asclepiad contained three choriambi (– – | – ∪ ∪ – | – ∪ ∪ – | – ∪ ∪ – | ∪ –); as, *Quis post vina gravem militiam aut pauperiem crepat?*

Asclepios. See ÆSCULAPIUS.

Ascoli, GRAZIADIO ISAIA (1829–1907), Italian philologist, from 1861 to 1902 professor at the Academy of Milan. He did much to promote in Italy the study of comparative philology, Sanskrit, and the Romance languages, and was a leading authority on the science of phonetics. His chief publication was *Fonologia Comparata del Sanscrito, del Greco, e del Latino* (1870). His most noteworthy contributions on dialects are contained in the volumes of the Milan periodical *Archivio Glottologico* (1873, etc.). His *Studii Critici* (1861) and *Lettere Glottologiche* (1886) deal mostly with phonetics.

Ascoli Piceno. (1.) Province, Italy, in the Marches, sloping N.E. from the Central Apennines to the Adriatic, with the Sibylline Mts. (8,130 ft.) on its W.

border. Area, 796 sq. m. Pop. 250,000. (2.) Town and episc. see, cap. of above, 20 m. from the Adriatic coast, and 73 m. by rail s. of Ancona. It represents the ancient *Asculum Picenum*, chief town of the Piceni, which played a leading part in the Social war, and in retaliation was burnt (89 B.C.) by the Roman consul Pompeius Strabo. Various remains of the ancient town—*e.g.* a bridge, portions of the walls, etc. —still survive. The cathedral is said to have been built by Constantine the Great, on the site of a former temple of Hercules. Majolica, glass, paper, etc., are manufactured. Pop. 30,000.

Ascoli Satriano, tn. and episc. see, prov. Foggia, Italy, 19 m. s. of Foggia. It is identified with the ancient *Asculum Apulum*, where Pyrrhus, in 279 B.C., defeated the Romans. It was destroyed in the 12th century by a son of the Norman Robert Guiscard. Pop. 8,000.

Asconius Pedianus (2 B.C.–83 A.D.), Roman grammarian, who wrote a commentary on the speeches of Cicero, of which valuable fragments are extant. The best edition is that of Baiter and Orelli, forming part of their edition of Cicero's works. See also Madvig's *De Asconii Pediani Commentaries* (1828). Now published in Oxford Classical Texts, ed. A. C. Clark (1908).

Ascot and **Ascot Heath,** a famous race-course, nearly 2 m. long, in S.E. Berkshire, and 6 m. S.W. of Windsor. The races, instituted in 1711 by the Duke of Cumberland, third son of George II., are held annually in June, and are usually attended by royalty. The course was altered and improved under the personal supervision of the late King in 1902. The centre of the racecourse is laid out as golf links. See Cawthorne's *Royal Ascot* (1900) and RACE MEETINGS.

Ascot Vale, a suburb of Melbourne, Victoria, Australia, on Saltwater R. Pop. 10,000.

Asculum. See ASCOLI SATRIANS.

Asellio, GASPARO (1581–1626), a celebrated Italian surgeon, native of Cremona. An early advocate of vivisection, and an accomplished anatomist (some time professor of anatomy at Padua), his greatest claim to distinction is his discovery (1623) of the lacteals. He died at Milan.

Asepsis is the neutral condition in which there are neither the germs of putrefaction nor any active antiseptic agents: *e.g.* water boiled for half an hour in a covered vessel is *aseptic*, having no live germs of putrefaction, but is not *antiseptic* until an antiseptic has been added to it. The term aseptic is now used to express a condition of freedom from all bacteria — not merely from those concerned in putrefaction. Asepsis is the surgeon's aim as the ideal condition in a wound, and the less antiseptic required to maintain that condition the better. See ANTISEPTICS.

Asexual. See SEX.

Asgard, home of the Aesir. See AESIR.

Asgill, JOHN (1659–1738), an English barrister and pamphleteer, expelled in 1703 from the Irish and in 1707 from the English House of Commons on account of the blasphemous nature of his book, *An Argument*, holding that men may be translated to heaven without dying. He attributed death to the power of custom, and to the fear of dying, rather than to necessity. From the Fleet prison, where he was imprisoned for debt (and where he died), he issued numerous pamphlets. Coleridge (*Table Talk*) declares there is no 'genuine Saxon English' finer than Asgill's. See Asgill's pamphlet *On Argument*, ed. by Gregg (1875), and Southey's *Doctor*.

Ash, THE (Lat. *Fraxinus excelsior*), of the order Oleaceæ, is a native of the British Isles. In winter the tree has a bold appearance with its gray, compact, grooved bark, and branches which often bend downwards and then upwards towards their extremities, while the twigs are thick and knotted, due to the large lateral and terminal buds, which are protected by black scales. The minute flowers, destitute of calyx and corolla, appear in dense clusters in April and May, before the leaves, and each consists of a pistil and two purple stamens. The leaves are compound, with long, drawn-out leaflets, and a grooved midrib and petiole which are said to absorb rain. The fruit is a two-celled and two-seeded samara. Varieties are the weeping ash; the flowering or manna ash, which exudes a sap in summer; and the mountain ash, or rowan tree. The wood is whitish, tough, and elastic, with a well-marked grain in the spring wood of the annual rings. It is chiefly used for making the handles of spades, hammers, and other tools. The ash tree figures prominently in ancient Scandinavian mythology; see YGGDRASIL.

Ashangos, a tribe of fetish-worshippers of the French Congo. They work iron into weapons. Unlike most neighbouring tribes, they are fully clothed.

Ashanti, down to 1896 a native kingdom of W. Africa, dating from the very beginning of the 18th century, lies inland behind the Prah R., on the Gold Coast. It is an undulating region, covered with dense forest, and traversed by wide, swampy streams. Its people (one of the most important tribes of the Tshi group) were warlike, predatory, and notorious blood-shedders, principally in orgiastic human sacrifices. Owing to their depredations on the Fanti subjects of Britain in the coast regions, they were punished by military expeditions in 1807–11; in 1873–4, when Sir Garnet Wolseley captured and burned Kumassi; in 1895–6, when their king, Prempeh, was exiled; and again in 1900, after which Ashanti was annexed (1901) by Great Britain. It now constitutes a district of the Gold Coast Colony. Chief town, Kumassi (Coomassie). The entire population is estimated at about 1,000,000. The gold export in 1909 was £301,222. Other exports were rubber, kola, and cocoa, to the value of £450,000. A railway runs from Sekondi *viâ* Tarkwa and Obuassi to Kumassi (180 m.). See C. C. Reindorf's *Hist. of Gold Coast and Ashantee* (1895); Bliss's *The Relief of Kumasi* (1901); and Armitage and Montanaro's *The Ashanti Campaign of 1900* (1901).

Ashbee, HENRY SPENCER (1834–1900), bibliographer and author. His library, which contained a splendid collection of Cervantic literature, first editions of Molière, Le Sage, etc., he bequeathed to the British Museum; and his water-colour drawings, by Turner, De Wint, etc., to the Kensington Museum. He published *Notes on Curious and Uncommon Books* (3 vols. 1877–85); *Iconography of Don Quixote, 1605–1895* (1895).

Ashbourne, or ASHBORNE, mrkt. tn., Derbyshire, England, is beautifully situated on the l. bk. of the Dove, 12 m. N.W. of Derby. The cruciform church, with central tower, dates from 1241, and its beautiful spire (212 ft.) is known as the 'Pride of the Peak.' In the Boothby chapel is the remarkably fine sculpture of Banks to the memory of Penelope Boothby, which suggested Chantry's 'Sleeping Children' in Lichfield Cathedral. Two engagements took place here during the civil war, Charles I. being in the town on both occasions. Pop. 4,000.

Ashbourne, THE RT. HON. EDWARD GIBSON, FIRST BARON (1837), born in Dublin. He became M.P. for Dublin University (1875), attorney-general for Ireland (1877–80), and was raised to the peerage in 1885. He has been lord chancellor of Ireland (1885–92 and 1895–1906). His name is associated with the Act of 1885 for facilitating the sale of Irish holdings to tenants.

Ashburnham, JOHN (1603–71), confidential agent to Charles I. He sat in the Long Parliament; assisted, during the civil war, at the treaty of Uxbridge and other peace negotiations, accompanied Charles in his journey to the Scots army, and arranged his flight from Hampton Court to the Isle of Wight. During the Commonwealth he was imprisoned and banished, but regained his old office as groom of the bedchamber at the restoration. See *Narrative* edited by Lord Ashburnham (1830).

Ashburton, mrkt. tn., Devonshire, England, on the Yeo, 19 m. S.W. of Exeter. It received a charter in Edward III.'s time (1328) as a stannary town. It was occupied by the Royalists during the civil war, and was taken by Fairfax in 1646. On Holne Chace, a bold promontory 2 m. to the W., is a curious 'camp of concealment,' surrounded by a fosse, and enclosing an 'agger.' Pop. 2,600.

Ashburton, tn. in co. of same name. South I., New Zealand, on the l. bk. of Ashburton R., 50 m. S.W. of Christchurch. Pop. 2,600; of county, 12,000.

Ashburton River, W. Australia, N.W. of the colony, flows 400 m. N.W. to the Indian Ocean, N.E. of Exmouth.

Ashburton, ALEXANDER BARING, BARON (1774–1848), was the head of the banking firm of Baring Brothers; M.P. for various constituencies (1806–35), and raised to the peerage (1835). As special commissioner to Washington (1842), he concluded the Ashburton Treaty, which dealt with the frontier line between the state of Maine and Canada, the extradition of criminals, and the suppression of the slave trade.

Ashburton, JOHN DUNNING, FIRST BARON (1731–83), English lawyer and politician; born at Ashburton. Called to the bar in 1756, he became recorder of Bristol (1766), and solicitor-general (1767–70); M.P. for Calne (1768–82); opposed the government's American policy; chancellor of the Duchy of Lancaster, a privy councillor, and a peer (1782). See Roscoe's *Lives of Eminent British Lawyers.*

Ashbury. See ASHDOWN.

Ashby-de-la-Zouch, mrkt. tn., Leicestershire, England, 18 m. N.W. by W. of Leicester has collieries, and manufactures of hosiery, hats, and leather. The town is pleasantly situated; the 'Ivanhoe' medicinal baths were erected in 1826. The church contains monuments of the Hastings family, and a curious finger-pillory for the punishment of persons who were disorderly in church. In the time of Edward IV. a strongly-fortified castle was erected here by Sir William, afterwards Lord Hastings. During the civil war it was garrisoned for the king under Lord Loughborough, but surrendered in 1646, and was demolished about 1649. The town and district figure in Scott's *Ivanhoe.* Pop. 4,700. See Mamenatt's *History and Description* (1852).

Ashdod, a great city of the Philistines (Josh. 11:22, etc.), not far from the coast; called Azotus in the Apocrypha and New Testament, now Isdud or Esdûd, a small mud village, 22 m. S. by W. of Joppa, Palestine. It was for long a thorn in the side of the Israelites. When the Philistines captured the ark, they conveyed it to

Ashdod, where stood the temple of Dagon. The town underwent sieges at the hands of Sargon and Psammetichus, and was despoiled by Judas Maccabæus, as also by Jonathan, his brother.

Ashdown, W. Berkshire, England, 3¼ m. N.W. of Lambourn; probably the scene of a sanguinary battle (Æscandune or Assandune) in which Ethelred and Alfred defeated the Danes (871). There are various ancient entrenchments—Alfred's Castle, Uffington Castle, and Hardwell Castle—in the vicinity of Ashbury, a little farther to the N.W. Wayland Smith's Cave or Forge is a cromlech 1½ m. E. of Ashbury. The associated legend plays a part in Scott's *Kenilworth.*

Ashe, SIMEON (d. 1662), nonconformist divine. On the outbreak of the civil war he became chaplain to the Earl of Manchester, and afterwards rector of St. Austin. He wrote, with the object of vindicating the conduct of his patron, *A True Relation of the most Chiefe Occurrences at and since the late Battell at Newbery* (1644). He actively promoted the restoration of 1660. See Calamy's *Nonconformist Memorial*, ed. 1802, i. 94–96.

Ashehoh, AJEHO, or ALCHUKU, trading tn. in N. of prov. Kirin, Manchuria, 30 m. S. of Sungari R. Pop. 30,000.

Asher, Jacob's eighth son, whose mother was Zilpah, the handmaid of Leah. Asher was the ancestor of the tribe of the same name, the territory allotted to which extended from Dor north-eastward to Lebanon.

Asherah, a Hebrew word (pl. *asherim, asheroth*) translated 'grove' in the Authorized Version, which follows the Septuagint and the Vulgate, but simply transliterated by the revisers. Being sometimes associated with Baal (*cf.* Judg. 3:7), like Ashtoreth (Judg. 2 : 13), Asherah has been supposed to be a doublet of the latter name; but the word more probably signified a sacred post or stake, which, though often connected with alien cults, may originally have had a place in the worship of Jehovah. It is unlikely that the *asherah* was a phallic emblem, but it may have been a residuum of tree-worship. See W. R. Smith, *Religion of the Semites* (2nd ed. 1894).

Ashes, the mineral residue obtained by the combustion of animal and vegetable substances. Every organic tissue contains inorganic salts. The study of ashes is thus of great importance in the physiological chemistry of animals and plants, in dietetics, in the detection of certain poisons, in agricultural chemistry and the preparation of manures, in the estimation of the heating power of fuel, and in the discovery of adulteration.

Asheville, city, N. Carolina, U.S.A., the county seat of Buncombe co., in the W. part of the state; alt. 2,350 ft. Its mild climate (mean temp., summer, 72°; winter, 39°) makes it a popular resort for invalids. Tobacco, leather, and cotton goods are manufactured. In the vicinity is Biltmore, the seat of Mr. G. W. Vanderbilt. Pop. 23,000.

Ashfield, tn., New South Wales, 5 m. S. of Sydney. Pop. 15,000.

Ashford, mrkt. tn., Kent, England, near the Stour, 14 m. S.W. of Canterbury, with an ancient church, containing a monument to Thomas ('Customer') Smyth and his wife. The industries include brewing, brick-making, tanning, flour-milling, and manufacture of agricultural implements. At Ashford New Town are the engineering works of the S.E. & C. Ry. Pop. 13,000. See Pearman's *History of Ashford* (1868).

Ashikaga, tn., 72 m. by rail N.W. of Tokyo, Hondo I., Japan, with a large trade in native cotton and silk. An image of Confucius is the only relic of an ancient academy of Chinese learning

which once existed here. It has a large trade in cotton and silk goods. Pop. 22,000.

Ashingdon, par., Essex, England, 6 m. N. of Southend, the reputed scene of Edmund Ironside's defeat (Assandun) by Canute in 1016.

Ashira, a Bantu people living between the Congo and the equator, in the coast region to the west of the French Congo. They are skilful workers in iron and copper, and weave a kind of cloth from palm-leaf fibre. Complexion, coal-black; physique and features, good; religion, fetishism.

Ashkenaz, the name of a tribe descended from one of the sons of Gomer, the son of Japheth (Gen. 10:3), originally inhabiting the part of Asia Minor in the vicinity of Armenia, and associated with Ararat and Minni (a portion of Armenia) in Jer. 51:27; found later in the west and north of Asia Minor, and giving the name Ashkenaz to the Black Sea. They have been identified with the Scandinavians; also with the Polish and German Jews, who are, as a matter of fact, called Ashkenazim, to distinguish them from the Sephardim, or Spanish and Portuguese Jews.

Ashland. (1.) City, Wisconsin, U.S.A., co. seat of Ashland co.; 60 m. E. of Duluth on Chaquamegon Bay, an arm of Lake Superior; a busy lake port, it has large lumber and iron industries. Pop. 15,000. (2.) City, Boyd co., Kentucky, U.S.A., 144 m. E. by S. of Cincinnati; has large trade in coal, iron ore, oil, woollen goods, and furniture. Pop. 7,000. (3.) Bor. Schuylkill, co. Pennsylvania, U.S.A., 120 m. N.W. of Philadelphia; in coal mining district. Pop. 6,500.

Ashlar, squared stone masonry truly dressed, either in courses over 12 inches deep, or random, that is without courses. ASHLAR PIECES, in carpentry, are short uprights from floor to roof in an attic room, cutting off the acute angle of meeting; also pieces in mediæval roofs between the wall blocks and the rafters.

Ashley, ANTHONY. See SHAFTESBURY, LORD.

Ashley, RT. HON. ANTHONY EVELYN MELBOURNE (1836–1907), 4th son of late Earl of Shaftesbury; was secretary to Lord Palmerston, (1858–65), whose life he afterwards (1876) wrote; M.P. for Poole (1874–80), Isle of Wight (1880–5); parliamentary secretary to Board of Trade (1880–2); church estates commissioner (1880–5); and Under-Secretary for the Colonies (1882–5).

Ashley, WILLIAM JAMES (1860), held the chair of political economy and constitutional history at Toronto (1888–92), and of economic history at Harvard (1892–1901); organizing professor of faculty of commerce in Birmingham University (1901); one of the chief academic champions of Mr. Chamberlain's fiscal policy (1903–4); has published *Introd. to Eng. Economic Hist. and Theory* (1888–93); *Surveys, Historic and Economic* (1900); *Adjustment of Wages* (1903); *The Tariff Problem* (new ed. 1904); and *Progress of the German Working Classes* (1904).

Ashmole, ELIAS (1617–92), English antiquary and astrologer, born at Lichfield; became a Royalist soldier in 1642; appointed commissioner of excise at Lichfield, 1644. In 1660 he was made Windsor herald by Charles II., and from that time devoted himself to antiquarian researches. In 1677 he presented his collection of antiquities—including the collection of his friend Tradescant—to Oxford University. He wrote *Institution, Laws, and Ceremonies of the Order of the Garter* (1672), a capital work; *The Antiquities of Berkshire* (1719). Of his works on alchemy, for which he had a passion in the early part of his life, the most important is the *Thea-*

trum Chemicum (1652). See his *Diary* (1717), and Anthony à Wood's *Athenæ Oxon.*

Ashmolean Museum, Oxford, was founded in 1679 by Elias Ashmole, and was housed from its foundation till 1894 in a building in Broad Street, Oxford. The natural history and anthropological exhibits were, some years since, removed to the University Museum, and the remaining portion of the collection was in 1894 transferred to new rooms at the University Galleries in Beaumont Street. The galleries, with the exception of the picture gallery and its dependencies, have now been incorporated in the Ashmolean Museum, which, thus reconstituted, comprises, in addition to the Antiquarium, the university collection of sculpture and casts from the antique, an archæological library, with lecture-rooms, and other accommodation. Among its treasures are the Arundel Marbles and the Selden Marbles.

Ashmun, JEHUDI (1794–1828), prominent for his efforts in developing the negro republic of Liberia, was born at Champlain, New York; was professor in the Bangor Theological Seminary, Maine. He spent the period 1822–8 in Liberia, as agent of the American Colonization Society, being practically governor of the little settlement. See *Life* by Gurley (1839).

Ashraf, or ASHREF, tn. in Mazanderan prov., Persia, near the S.E. corner of the Caspian Sea, and about 50 m. W. of Astrabad; the residence of Shah Abbas the Great in the 16th century. Pop. about 6,000.

Ashta, tn. in Satara dist., Bombay, India, on railway 180 m. S.E. of Bombay. Pop. 12,000.

Ashtabula, city, Ashtabula co., Ohio, U.S.A., situated 3 m. from Lake Erie, 55 m. E. of Cleveland, with a fine harbour. It ships iron ore and coal, and manufactures agricultural implements, leather, and woollen goods, etc. Pop. 13,000.

Ashtaroth. See ASTARTE.

Ashteroth-Karnaim (Gen. 14:5, etc.), a chief city of Bashan, noticed on monuments 1700–1500 B.C.; now the ruin Tell Ashterah in the Hauran, about 60 m. S.S.W. of Damascus.

Ashton, JAMES WILLIAMSON, FIRST BARON (1842), born at Parkfield, Lancashire; was M.P. for Lancaster div. (1886–95): raised to the peerage (1895). He is a large landowner and manufacturer, and practically controls the English linoleum industry.

Ashton, JOHN (1834), antiquarian, born in London; author of *Social Life in the Reign of Queen Anne* (1882), *History of 18th Century Chapbooks* (1882), *Old Times* (1885), *The Dawn of the 19th Century in Eng.* (1885), *Social Eng. under the Regency* (1890), *Hist. of Gambling in Eng.* (1898), *The History of Bread* (1904), and other works.

Ashton-in-Makerfield, tn., Lancashire, England, 4 m. S. of Wigan; manufactures locks, tools, cotton, and pottery; extensive collieries. Pop. 19,000.

Ashton-under-Lyne, parl. and munic. bor., Lancashire, England, 6½ m. E. of Manchester. The ancient church of St. Michael was rebuilt in the 15th century. The public buildings include a technical school, school of art, a free library, and public baths. The public park was mainly the gift of Lord Stamford. Local industries are cotton spinning and weaving, silk spinning and dyeing, and the manufacture of hats, machinery, and beer. There are extensive collieries in the vicinity. Ashton returns one member to the House of Commons. From early times the place has belonged to the Asshetons. Pop. 44,000. See Butterworth's *History* (1827).

Ashurada, isl. and Russian naval stn. at S.E. extremity of Caspian, at entrance of Bay of Astrabad.

Ash-Wednesday (Ger. *Aschermittwoch*; Fr. *Le jour des cendres*), observed by most of the Christian churches, is the first day of Lent, and is said to derive its name from the custom of sprinkling ashes on the heads of penitents on that day—a custom that received papal sanction in 1191, but is believed to be six centuries older.

Ashwell, ARTHUR RAWSON (1824–79), born at Chelsea. He became principal of the Oxford Diocesan Training College at Culham (1853), of the Training College, Durham (1865), and of Theological College, Chichester (1870–9). He wrote *The Schoolmaster's Studies* (1860), *Lectures on the Holy Catholic Church* (1876), and the first volume of a *Life of Bishop Wilberforce* (1880).

Ashworth, HENRY (1794–1880), friend of Cobden, was born at Bolton, Lancashire. He was one of the founders and leaders of the Anti-Corn Law League, and wrote *Recollections of Richard Cobden* (1876; 2nd ed. 1881).

Asia.—*Confines and Dimensions.*—Asia was first distinguished from Europe by Mediterranean peoples. The name originally given to a small region of Asia Minor has been extended to the largest of the continents. So large is it that when the sun at the equinoxes is rising on its W. extremity, Cape Baba, in Asia Minor (26° E.), it is nearly setting on its farthest E. shores, Cape Dezhneff (170° W.), formerly known as East Cape, 6,000 m. away. For some weeks every year continual night reigns at the N. point, Cape Chelyuskin (77½° N.); while day and night are nearly equal at the S. point, Cape Romania (1° N.), 5,400 m. away, and within 90 m. of the equator.

The main feature lines are drawn out, on the whole, from W. to E., but converge towards the W. No physical barrier interrupts their passage westwards from Asia into Europe, and it is natural to expect a continuity of intercourse as well as of physical features between the two continents. Nevertheless, the Mediterranean and Black Seas form natural physical W. limits to the continent; so does the Red Sea, lying between Asia and Africa, which are connected by the isthmus of Suez, 72 m. wide. The modern Suez Canal may here be taken as the boundary. The Ural River and Mountains are the common conventional boundaries with Europe north of the Caspian. The Manych depression and the crest of the Caucasus are both used as the limits of Asia between the Black and Caspian Seas. The former is the better. The low N. coast, with great river estuaries in the W. and great river deltas in the E., borders the Arctic Ocean, into which the Taimyr peninsula projects, and out of which the New Siberian Islands rise. The Bering Strait, 36 m. wide, separates Asia from America; and St. Lawrence and the Aleutian Islands are reckoned with the latter, the Komandorski Islands with the former. The E. coast borders the Pacific. The mainland juts out in peninsulas and recurves in great gulfs, bordered on the outer side by a series of volcanic islands, which form a fringe to the continent; the Japan and Philippine Islands are the chief of these. Farther S. the Malay archipelago links Asia to Australia, and presents another boundary problem. The volcanic chain can be traced through the Moluccas and Sunda Islands, and it may be taken as the limit. Three great peninsulas, which have some analogies with those of S. Europe, project southwards.

Within these limits the continent has an area of over 17,000,000

sq. m.—roughly, one-third of the land of the globe. The coast-line bounding it is some 44,000 m. (three times the minimum possible periphery). The peninsular area amounts to 17 per cent. of the whole, a proportion surpassed only in Europe. Excluding this area, the continent is a compact quadrilateral, whose centre lies over 1,600 m. from any sea.

Physical Divisions.—Over one-fourth of the area lies below 650 ft. (1·3 per cent. being beneath the level of the sea), and one-seventh is over 6,600 ft. The bulk of the lowlands is found in the N., and the highest land lies in the centre. The continent may be divided into four great natural regions: (1) The Great Lowlands, in the N.; (2) the Great Central Mountain System; (3) the Eastern Margin of Fringing Basins and Volcanic Islands; (4) the South and South-west Table-lands of the Deccan and Arabia.

1. *The Great Lowlands* lie N. of a line drawn from the Sea of Okhotsk to the s. of the Caspian, whose surface lies 85 ft. below sea-level. There are three well-marked divisions: (1) The Turanian lowlands, separated by the Kirghiz steppe from (2) Western Siberia beyond the Yenisei, which rises to the more rugged region of (3) Eastern Siberia.

Turan (Western or Russian Turkestan) forms the Aralo-Caspian depression. It is a low, sand-covered plain, with few heights, except the Ust-Urt plateau to the E. of the Caspian, and the Kirghiz steppe to the N. Here all the rivers evaporate or enter lakes without an outlet, of which the chief are the Caspian, Aral, and Balkhash. The Ural flows to the first, the Amu and Syr (Oxus and Jaxartes) to the second, and the Ili to the third.

Western Siberia is a low, flat, marshy region, lying between the Urals and the main stream of the Yenisei. It is lowest in the W., where the Tobol and the Lower Ob flow northwards, and into the same depression the Irtish and the Ob flow from the S.E.

Eastern Siberia is a higher and more uneven land (composed largely of almost horizontally bedded Palæozoic and crystalline rocks, with some recent volcanic outcrops). The W. part is drained by the Upper, Middle, and Lower Tunguska Rivers to the Yenisei. The Lena flows through the central region. The E. is bounded by an arc of mountains which runs, under various names (Verkhoyansk, Stanovoi), from the Lena delta to Cape Dezhneff. The N. is drained by the Indigirka and the Kolyma.

2. *The Central Mountain System*—The central mass of mountains and plateaus gradually widens from W. to E. At two points it is constricted, and the northern and southern lowlands come closely together—(*a*) in Armenia (separating the Caspian and Mesopotamia), and (*b*) in the Pamirs (separating Turan and the Indo-Gangetic plain). Between these mountain nodes are three series of chains—northern, central, and southern. A series of depressions lies between the northern and central sets of chains, and a series of plateaus between the central and southern ones.

West of Armenia the Caucasus and Yaila Mountains (continued westwards as the Balkans) sweep round the Black Sea depression. The plateau of Asia Minor to the S. is separated from this depression by the Pontic chain, and bounded on the S. by the Taurus chain. The E. and W. lines of heights which characterize the plateau project westwards as peninsulas, and the intervening hollows form bays in the Ægean Sea, and may be traced westwards through the archipelago to Europe. Much evidence of recent volcanic disturbances

exists—*e.g.* the volcano Arjish, the ancient *Argæus* (14,000 ft.), surpassed by the twin-peaked Ararat in Armenia (17,000 ft.).

East of Armenia lie the Turan depression and the Iran plateau, separated by the Elburz, Khorassan, and Hindu-Kush Mountains. The N. ranges are not so definite here, but may be traced in the W. spurs of the Tian-Shan and their probable W. continuation in the Mangishlak. The Iranian plateau is largely composed of porous limestone, producing karst landscapes. On the whole it is a desert region, and only a few of the rivers run S.W. to the sea. On all sides it is bounded by narrow folded ridges and furrows, dominated by a massive chain of Cretaceous peaks. These 'retaining mountain walls' may be called the Zagros chain in S.W. Persia, the Makran chain in S. Baluchistan, and the Khirthar or Hala and Sulaiman ranges in the E., rising in terraces above the plains of the Indus.

The Pamir plateau is much loftier. It is bordered on the E. by the lofty Sarikol and Muztagh-ata ranges, and is drained to the W. by parallel streams which are forced to the N. by the Badakshan plateau, forming the Amu or Oxus.

The Tian-Shan forms the N. boundary of the Pamir plateau, from which its ranges strike both to W. and to E. The E. extension is by far the more important, and bounds the depression of Eastern or Chinese Turkestan, with the great Takla-makan desert, round whose margin flow the Tarim and its tributaries, fed by the melting snows of the mountains, and forming rich oases.

The Kwen-lun runs due E. from the Pamirs; has the E. Turkestan depression on the N., and the Tibetan plateau on the S. It extends for 40° of lat. (nearly 2,300 m.), with a mean level higher than that of any other mountain chain.

The Tibetan plateau, like those of Iran and the Pamirs, consists of many bare west to east parallel ranges and troughs. Its average height is over 13,000 ft. It is bounded by lofty mountains, and most of the passes crossing them are over 15,000 ft. high. The Karakoram range, with the greatest glaciers in the world (Biafo, Baltoro, and Hispar), and some of the loftiest peaks (Godwin-Austen, 28,280 ft.), runs south-eastwards from the Pamirs, and forms its western end. On the S. the Himalayas, with even loftier peaks (Mount Everest, 29,000 ft.) and almost as lofty passes, form the 'retaining wall.'

The Himalayas are pierced by the gorges of the Indus, Sutlej, Ganges, Gogra, Gandak, and Brahmaputra, which are said to have gradually eroded their beds as the mountains were upraised, and so to be antecedent to the ranges they pierce. The Himalayas therefore do not form the main divide between the rivers of Tibet, which flow into inland lakes, or the Irawadi, Mekong, or Yang-tse, and other rivers, which reach the sea through deep longitudinal valleys.

These continuations of the folded mountain system form the main lines of S.E. Asia. The W. chain passes by the Khasi and Arakan ranges and the volcanic Andaman and Nicobar Islands to the Malayan volcanic chain. The Irawadi basin and the Andaman sea lie between it and the central chain which forms the Malay peninsula. The plains, hills, and gulf of Siam lie farther to the E., and the E. Annam chain forms the coast of the S. China Sea.

All these mountains from Asia Minor to Malaysia were folded in the Tertiary period, and, like the Alps, are part of the younger mid-world mountain system, whose main feature lines are due to crustal movements, where active denudation has, as yet, affected only the superficial features.

The other mountains of Central Asia are of much older date, and resemble the highlands of Central Europe (drained by the Rhine and Elbe) rather than the Alps. The valleys have been hollowed out of plateaus characterized by foldings of the rock layers of ancient date. The land, however, is partly shaped by fractures, the most remarkable of which are the deep rifts in which the waters of Lake Baikal have accumulated to a depth of over 4,500 ft., so that the floor of the rift is some 3,000 feet below sea-level, while the land surrounding the lake rises to over 6,000 ft. above it. These rifts may be compared with those of similar origin in East Africa, or with Glen More in Scotland.

Round Lake Baikal the highlands can be grouped in four great masses—the Sayan and Altai in the S.W., and the W. Trans-Baikalian highlands to the S.E. and E. South of these lies the plateau of Mongolia. The highlands are much less lofty than the younger folded mountains. The Altai, which forms the loftiest highland (Byelukha, 14,800 ft.), rises N. of the plain of Dzungaria. This important gap in the Asiatic highlands connects the Siberian lowland with the plateau of Mongolia, and has as its southern rampart the Tian-Shan. The Altai Mountains have great glaciers in the upper valleys, and are clad with forests on the wetter northern slopes. They contain many minerals, including gold, whence their other name, the Kin-Shan or Gold Mountains. The Sayan Mountains are of similar character, but somewhat lower. The culminating line of the Trans-Baikal plateaus is commonly known as the Yablonoi (Apple), and more recently as the Malkhan Mountains. It does not, as was formerly supposed, form the main divide between the Arctic and the Pacific river basins, although most of the W. plateau is drained to Lake Baikal, and the E. one to the Amur. The average elevation of these plateaus is between 4,000 and 5,000 ft., the highest point (Sokhondo) rising to 8,200 ft.

The Mongolian plateau averages between 3,000 and 4,000 ft. above the sea, and forms a stony steppe, here and there covered with sand, which gives it its native name of Shamo (Sand Sea), or Gobi, which, with the Taklamakan, comprises the Han-hai, or dried-up sea of the Chinese. The E. limit of this region is the escarpment of the so-called Khingan Mountains (6,000 ft.).

3. *The Eastern Margin of Asia.*—From Cape Dezhneff a series of escarpments can be traced along a great circle beyond the tropic of Cancer in the E. of Yünnan. In plan they are ⌟ shaped, a series of scarps, one of which is parallel to the meridian, the other parallel to the lines of latitude. The Stanovoi Mountains form the most N. pair, the Yablonoi the second, the Khingan the third, the Tai-hang-Shan, forming the E. and S. boundary of Shan-si, the fourth, the eastern to southern limits of Ho-nan the fifth, of Kwei-chou the sixth, and of Yünnan the seventh. This zigzag line is also of climatic and economic significance.

A somewhat similar succession of N. and S. alternating with E. and W. running feature lines can be traced in the coast-line and in the bordering islands and peninsulas of the extreme E.: (1) Along the coast there is the Stanovoi, or N. and W. coasts of the Sea of Okhotsk; (2) the Tungus coast, bordered by the Sikhota-Alin Mountains; (3) the Korea coast, which can be traced to the Saddle Islands in Hang-chou Bay; (4) the China coast, S. of Hang-chou to the Red River delta; and (5) the Annam coast, to the Mekong delta. In the peninsulas and islands there are: (1) the Aleutian

Islands, continuing the Alaskan peninsula; (2) Kamchatka, the Kurile Islands, and W. Yezo (Hokkaido); (3) Sakhalin and the two parts of the main island of Japan, Honshiu; (4) Kiushiu and the Lu-chu Islands; (5) Formosa, the N. of Luzon, Palawan, and Borneo. In the S., beyond this series of islands, a second can be traced (1) through the Bonin and Marianne Islands, and (2) through the S. of Luzon, Mindanao, and the Moluccas.

Between these feature lines lie great depressions. In the W. there is land forming the Anadyr basin, Manchuria, the N. China plain, and the S. China and Tongking basins. In the E. they are covered with water, and form the Bering, Okhotsk, Japan, E. China, and S. China seas. In the extreme S. are the seas between the Marianne Islands and the Philippines, and the Sulu, Celebes, and Moluccas Seas. Only the Sea of Okhotsk extends from the western to the eastern feature line without a break, and the number of successive hollows, each eastern one deeper than its western neighbour, increases in the S. The S. of China contains a series of fracture mountains striking from S.W. to N.E.

Three great rivers and a number of smaller ones rise in the plateaus of Asia, and break across these eastern escarpments to the sea—the Amur, the Hwang-ho, and the Yang-tse-kiang.

The fringing islands are mainly volcanic, and form part of the 'girdle of fire' which encircles the Pacific and rises above the greatest depths of the ocean. The volcanic line is not continued through Palawan and Borneo, but forms a great arc through the Moluccas, and so joins the line already traced by the Andaman and Nicobar Islands, Sumatra, Java, and the Lesser Sunda Islands. Within this arc are the large islands of Borneo and Celebes.

4. *The S.W. Asiatic Table-lands.*—The Deccan and Arabia are geologically a continuation of Africa. The former resembles S. Africa, the latter N. Africa, in composition and structure. In the Deccan crystalline schists and old Palæozoic rocks, lying horizontally, form the framework. Above them the Gondwana rocks — 'sub-aerially formed river deposits,' probably dating from Carboniferous to Jurassic times—lie in the E., and resemble similar rocks in S. Africa. The W. contains a lava outflow of recent origin, the hygroscopic black soil of which is excellent for cotton-growing. This outflow may be associated with the fracturing which shaped the W. coast, which rises above the sea in a succession of terraces known as the W. Ghats or the Sahyadri Mountains. A series of shallows connects the Deccan with the island of Ceylon, which consists of a low northern plain and lofty southern mountains.

The Arabian table-land is bounded on the W. by the great rift valley of the Red Sea, which is prolonged to the N. in the Jordan and the Orontes valley between Lebanon and Anti-Lebanon. The floor of the Dead Sea lies 1,300 ft. below the Mediterranean. The northern part of Arabia is composed of Cretaceous and Tertiary limestone; recent volcanic outpourings pierce the Archæan rocks of the west and centre; Tertiary limestone prevails in the south; while much of the surface of the south and east is covered with sand.

The Mesopotamian and Indo-Gangetic plains are formed of alluvium brought down by the rivers Euphrates and Tigris to the former, the Indus, Ganges, and Brahmaputra to the latter. These rivers all form great deltas.

Climate.—The southern chains of the Central Mountain system N. of the tropic form the climatic divide between the N. and S. of

Asia, between the regions of cold and those of warm winters, between the regions of light summer rains and the monsoon lands, which, except in N. Arabia, receive heavy summer rains.

In winter a region of intense low temperature (under – 40° F.) exists in N.E. Siberia, with Verkhoyansk as its centre; and a high-pressure system extends over the continent, with a pressure of over 30·5 in. (reduced to sea-level) over Mongolia. The winds blow out from the cold continent to the warmer ocean, and deposit rain only on lands to the windward of mountains which deflect the air currents upwards—*e.g.* in W. Japan, in E. Annam and Ceylon, S.E. India, and in the western mountain regions, where winter storm winds penetrate from the western seas. The outflowing winds are cold, and cause cold winter seasons even in the extreme S. of China.

In summer a region with a mean temperature of over 90° F. (reduced to sea-level) exists in the S.W.; a low-pressure system extends over this region, with a pressure under 29·5 in. (reduced to sea-level). Towards the low-pressure axis, which is continued diagonally from S.W. to N.E., the winds blow inwards in the S. and E. from over warm seas, and are consequently laden with moisture, which is deposited on all the southern and eastern marginal lands, and is carried far into the interior. Rain also falls at this season most abundantly in the regions lying to the N. and W. of the low-pressure axis, so that the greater part of Asia receives most of its rain in summer. The lofty central regions, surrounded by mountains, are arid, for the winds blowing over these barriers have *föhn* characteristics.

Asia may be divided into ten climatic regions:—(1.) The region fringing the Arctic Circle, belonging to the cold, dry northern or Arctic climatic region, where the average temperature of the warmest month is not over 50° F. (2.) The Siberian continental region, N. of 50°, with a July temperature of 50° to 70° F., and a January temperature under 0° F. The rainfall is between 10 and 12 in. (3.) The Siberian coastal plain, with a similar summer and a slightly higher winter temperature, and a heavier rainfall. (4.) The Turanian region, with a July temperature between 75° and 90° F., a January temperature between 10° and 40° F., and a rainfall under 10 in. (5.) The Mediterranean region, with cool winters and warm summers, and rain during the winter half-year. (6.) The mountain region, from inner Asia Minor to the Khingan, and from the Altai to the crest of the Himalayas; dry everywhere, with very cold winters, especially on the lofty plateaus, and warm summers, especially in the depressions. Both annual and daily ranges of temperature are very great. The rainfall in this region is usually less than 10 in. (7.) The east monsoon region, including China and Japan, with a uniform July temperature of over 70° in Japan and over 80° F. in China, but with a January temperature that varies from 60° F. in the S. to below freezing-point in the N. The rain falls in summer, and also in winter on the W. coast of Japan, and is over 40 in. except in the N., and even 80 in. on some exposed mountain slopes. (8.) The south monsoon region, including India and Further India, where the temperature is never lower than 60° F., and the rain falls in the summer months, except in the S.E. of both peninsulas, where the maximum is in winter. (9.) The Indian desert region, which differs from the rest of India in having hardly any rain. (10.) The south-western desert region, including Arabia, with warm winters and very hot

summers, and scarcely any rain, and that falling in winter, except in the southern mountains of Arabia.

Hydrography.—The rivers flowing to the Arctic Ocean are ice-bound in winter, and, as their upper waters thaw before the lower, great floods occur in the middle and lower basins every spring. The rivers rising in Tibet are fullest in summer, when the snow melts and the rainfall is abundant, causing heavy floods. The flood waters of the Yang-tse flow into the Tung-ting and Po-yang lakes, and those of the Mekong into the Tonle-sap, which act as regulators, and prevent disastrous floods. The rivers of the Deccan are low in winter, and raging torrents during the rains. The Mesopotamian rivers receive winter rains, and much melted snow in summer. Most of the lakes have no outlet, and are salt and brackish. Lake Baikal is drained by the Angara.

Minerals.—The mineral wealth of Asia is very great. The older mountains, like the Altai, the Khingan, and the Chinese mountains, are rich in many kinds of minerals. The gold-mining in the regions N. and S. of the Amur may one day rival that of the American mountains in similar latitudes on the other side of the Pacific. The precious stones of Ceylon, Burma, and the Yablonoi are famous. The coal and iron of China are among the richest known, and have scarcely yet been touched. Petroleum is abundant in Sumatra, Burma, and the Caucasus.

Vegetation.—The vegetation areas correspond to the climatic ones. The tundras are found N. of the Arctic Circle, and in patches as far S. as 60° N. (See TUNDRA.) The cold temperate forests of larch, spruce, fir, and birch lie between 50° and 60° N. The thin-stemmed trees are covered with lichens and dark-green mosses, and the forest is strewn with wreckage of storm and fire. The Mediterranean flora—plants with thickened leaves, bulbous roots, watery fruits, and other provisions for enduring a hot, dry summer—is found in Asia Minor and Syria. The vine, fig, orange, citron, and pomegranate are among the fruits; the cedar, Aleppo pine, cork, and evergreen oak among the timber trees. The western steppes and deserts cover most of the plateaus of Iran, Arabia, and the heart of Asia Minor. Pistachio and junipers are characteristic bushes of the less arid parts, and date-palms are the trees of the oases. Salt steppes cover much of Iran, and sand-dunes Arabia, whose southern heights are a savanna region yielding important cultivated plants. Wherever water is found, vegetation flourishes. The central steppe and desert, the relatively low-lying Turan, Tarim, and Gobi region, have grasses and composites in the more favoured parts, willows and poplars along the stream courses, and tamarisks, artemisia, lilies, ranunculuses, crucifers, poppies, grasses, and other small-leafed plants in the higher areas. The saksaul is a characteristic shrub. Much of this region is covered with salt wastes or moving sand-dunes. The high mountain and plateau regions of Tibet, the Pamirs, and the great mountain chains are treeless. In N.E. Tibet meadows are found to about 13,000 ft. Above them are stony deserts, with a few saxifrages and pyrethrums; and still higher, from 14,500 ft. on an average, is perpetual snow. In the Pamirs the valleys have a scanty vegetation; stunted trees have been found at 23,000 ft. The S. slopes of the Himalayas have deciduous forests in the wet east, and evergreens in the drier west. The Amur region is a rich steppe land, with many umbellifers and spiræas transitional between the

desert and the woodlands of the E. coast—*e.g.* in Sakhalin. In Japan two regions can be distinguished—the northern, with dense temperate forests of deciduous trees, thick undergrowth, and innumerable lianas, due to the heat and moisture of the vegetation period; and the southern, where evergreen trees abound, such as camphor, camellia, magnolia and other laurels, oaks, etc. Similar vegetation is characteristic of Korea. The savannas of Southern and Eastern Asia are found in the higher and drier regions, and produce the alang-alang grass, between three and five feet high. The wet jungles of heavy monsoon rains are characteristic of the lower flood plains of the S. and S.E. peninsulas and islands. Areca-nut, liquidambar, borassus and phœnix palms, pandanus, and tree-ferns are common, and, at higher levels, bamboos. In the E. of the S.E. islands the vegetation is more Australian in character, and eucalyptus trees predominate. The great central mountain system separates markedly different floras. A mixture of plants takes place and a region of mixed woods exists in Korea and Amuria, a transition between the Sino-Japanese region and the Siberian region, corresponding to the similar transition region in West Central Europe. The species in Arabia are closely related to those of N. Africa.

Animals.—The E. to W. trend of the mountains separates Asia into two great faunal realms, the palæarctic and the oriental, with a transition region in the E. The N. tundras and forests are the home of many fur-bearing animals. The seal, walrus, and other aquatic mammals are found in Arctic waters. The polar bear, reindeer, dog, arctic fox, wolf, ermine, lemming, arctic vole, musk ox, deer, and brown bear are among the characteristic mammals. Some tigers and Kamchatkan sheep are still found in the E. of this region. Ptarmigan, snow owl, and guillemot are among the birds. In the steppe lands S. of the forests a different fauna exists. The horse, ass, and camel are among the animals of this region; and the argali, a large, handsome sheep, lives in the mountains. The jerboa, marmots, some deer and gazelles, and a few tigers are found. The lofty plateau of Tibet, with its severe climate and scanty vegetation, deserves to be reckoned as a special region. The yak, wild ass (kulan), Hodgson's argali, and some rodents are peculiar to it. The Sino-Japanese region is a transition one for animals as well as for plants. Monkeys are found, and tigers exist on the mainland. Many deer, some of which exchange white-spotted coats for brown winter ones, are found. The sea-otter occurs round the coast. The giant salamander is peculiar to Japan. The pheasant and silkworm are of Chinese origin.

Human Geography.—The population is estimated at 850,000,000, or 50 inhabitants per sq. m. Vast areas are almost uninhabited. The densest population is found in the monsoon area, especially in the Ganges, Lower Hwang-ho, and Yang-tse basins, round the coasts of the Deccan and China, in S. Japan, and in Java, where more than 350 people live in each square mile.

Economic Conditions.—In the north the reindeer is domesticated, and hunting and fishing are the main occupations. Among the nomads of the grass lands flocks and herds form the chief wealth. Agriculture has long flourished in the mountain valleys. In the Asia Minor and Iranian plateaus agriculture is carried on along with pastoral occupations; but farther E., in the mountains, the people are mainly herdsmen. Mesopotamia, India, the Indo-Gangetic plain, and the Deccan are agricultural

regions; and the W. slopes of the W. Ghats, and the flood plains of the great rivers, the Ganges, Brahmaputra, Irawadi, and Salwin, the coasts of Indo-China and the south-eastern islands, are regions where plantation cultivation has developed. In the interior of Indo-China and the south-eastern islands hunting, with a slight cultivation of the soil, is carried on. In most of China and Japan the cultivation is so careful that we may distinguish it as spade cultivation. In Korea and round the Yellow Sea, and up the valley of the Amur, agriculture is the chief occupation. The tribes of the forest north of Korea are mainly hunting tribes.

Races.—Asia is the home of the Mongolians. They are divided by Keane into the Northern Mongols, found throughout the lowlands, in parts of Iran, and Asia Minor; the Southern Mongols, in Tibet, Indo-China, Formosa, and some parts of Malaysia; and the Oceanic Mongols, found in Malaysia, the Philippines, Formosa, and the Nicobar Islands. In W. Asia the white man predominates, mainly the central or alpine type, with round heads, pale or swarthy complexion, and brown eyes and hair. In the S.E. are numerous oceanic negroes, mainly Negritos. The Northern Mongols, or Mongolo-Tartars, or, better, Mongolo-Turki, are related by their languages, known as the Finno-Tartar or Ural-Altaic group. They include such different races as the Japanese in the E., the Magyars and the Finns in Europe, the semi-nomadic Mongols and the Khirgiz and Turkomans of the steppes, the agricultural Turks of the Asia Minor and the Balkan (European) peninsulas in the W., and the Manchus and Koreans in the E., while the Northern tribes are nomadic fishers and hunters, with herds of reindeer. The Southern Mongols are darker than the Northern ones, and their speech differs mainly in being monosyllabic. They include such different peoples as the Tibetans, Gurkhas, Burmese, the different tribes of the mountains between Tibet and Burma, the Lao and other tribes of N. Siam, the Annamese, the Cochin-Chinese, and the Chinese themselves. The Oceanic Mongols are less homologous, and are mixed with Negroes in many regions. They are similar in size and of the same colour as the Southern Mongols, but their cheek-bones are not so prominent. They speak languages of the group known as the Oceanic or Malay-Polynesian. They may be divided into Proto-Malays and Historic Malays. The former are found in Sumatra, Java, the Sunda Islands, and Celebes, in the Dyaks of Borneo, Tagals and Bisayans of the Philippines, the natives of Formosa, and those of the Nicobar Islands. The Historic Malays are found in the Malay Peninsula and the coast-lands of Borneo and the Moluccas, in the smaller islands to the south of the peninsula, in Ternate and Amboyna, and in parts of the Sulu archipelago. Many of these are Mohammedans, but the peoples in the interior are fetish worshippers.

In the Asia Minor and Iranian plateaus, as well as in the plains of Hindustan, numerous peoples are found corresponding to the southern or Mediterranean-European type—*e.g.*, some Kurds, most Persians, Afghans, Dards, Kafirs, and Hindus. The Armenians and many inhabitants on the northern slopes of the Hindu-Kush are of the central or mountain type of white men. The Negritos are found in the Andaman Islands and in the Malay Peninsula, and to them belong the Aetas of the Philippines.

Political Divisions.—In the W. the Turkish empire, Persia, and Afghanistan, in the E. the Chinese empire, Japan (which has

annexed Korea), and Siam, have not yet been absorbed by European powers. The northern lowlands are controlled by Russia; the Deccan and the land around it form British India. Ceylon, much of the Malay Peninsula, the N. of Borneo, and numerous smaller possessions, such as Cyprus, Aden, most of the islands in the N. Indian Ocean, Hongkong, and Wei-hai-wei (N. China), are under British control. The French own the eastern part of the Indo-China peninsula, and have several small colonies in India. Portugal possesses three settlements in India, Macao in China, and the eastern half of the island of Timor. The Philippines belong to the United States of America. The other islands of S.E. Asia belong to the Dutch. Germany has a footing in China at Kiao-chou.

Religion.—Asia is the home of the great religions of mankind. In the W. Judaism, then Christianity, then Mohammedanism sprang up on the confines of the Arabian desert. Mohammedanism prevails in Central and S.W. Asia (except Tibet), and in parts of India. It is also the religion of the majority in the Malay Peninsula and many of the south-eastern islands. In India, Brahmanism and its offshoot, Buddhism, arose. Brahmanism still prevails in India, and Buddhism throughout the Chinese empire, Japan, Indo-China, and Ceylon.

Recent Explorations.—The most prominent among recent explorers in Asia has been Sven Hedin, who, between 1894 and 1900, successfully explored a large part of Central Asia, including the region of Lob Nor, where he discovered many lakes, the Gobi desert, and much of Tibet. In 1903 Rawlings and Hargreaves, in an expedition to Tibet, surveyed 38,000 sq. m. of territory hitherto unknown. Dr. and Mrs. Workman, during 1903–5, made many notable journeys among the Himalayan glaciers and the Nun-Nun mountains of Kashmir. In 1904 the political mission to Tibet, led by Colonel Younghusband, added certainty to much hitherto indefinite geographical knowledge concerning that country, as well as yielded much new information. A survey party dispatched by him surveyed the whole region to the N. of the central Himalayas, and proved that in that direction no peaks rivalling Mount Everest exist. In 1905 a Russian expedition explored the Khatanga basin, and showed lake Yessei to be 2° farther S. than marked. Sven Hedin, in Oct. 1905, started on his fifth journey to Central Asia. After exploring the desert regions of eastern Persia he crossed the Himalayas into southern Tibet, to investigate the sources of the Indus and the Brahmaputra, which in 1907 he traced to their ultimate sources in the Himalayan glaciers. E. Huntingdon, in 1905–6, made an examination of the desert region between Khotan and Lob Nor, and found many indications of the drying up of rivers and lakes. In 1906–7 Dr. Stein continued his archæological researches near the Takla Makan desert and Lob Nor, and in the ruins N. and S. of the latter collected a number of Buddhistic wall-pictures, and also documents in over ten languages—one an unknown tongue. He afterwards travelled to the Chinese province of Kansu by a route once taken by Marco Polo, and brought to light an ancient line of frontier defence corresponding to the Great Wall. In his later explorations he discovered the ruins of an ancient town near the Gobi Desert, and proved that the Great Wall had, in the 2nd century B.C., a considerably greater extension westwards than

had been supposed. In 1909 the Duke of the Abruzzi established a record in mountaineering by ascending to a height of 24,600 ft. on a peak close to Mount Godwin-Austen, in the N.W. Himalayas; while farther E., in the same range, Dr. Longstaff discovered an immense glacier—the largest yet recorded in the Himalayas—never before seen by Europeans. The Indian topographical survey map of Nepal by Captain Wood, issued in 1906, shows the true position of Mount Everest—the highest summit of the globe—the group to which it belongs being distinct from the central Himalayas; and he considers that 140 ft. should be added to its height. Captain Wood also thinks that Mount Kanchinjanga yet retains its place as second highest, an honour which is generally claimed for Mount Godwin-Austen. Other regions of the continent, from Arabia to Kamchatka, have not been neglected by explorers, and much accurate surveying work has been accomplished and considerable additions made to topographical and archæological knowledge.

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Asia, WESTERN. By Western Asia is meant all that part of Asia which lies westward of a line drawn from the Caspian Sea to the Persian Gulf. Within this area we must look for most of the races and tribes mentioned in Gen. 10, the oldest ethnographical table that has come down to us. It is watered by two great rivers, the Euphrates and Tigris, which in their lower course enclose the rich alluvial plain of Babylonia. On the S. the Persian Gulf gives access to the Indian Ocean and the products of Arabia and India; to the W. the Mediterranean brings Asia into contact with Egypt and Europe. The peninsula of Asia Minor, with its thick forests and fertile valleys, forms, as it were, a bridge from one continent to the other. With the exception of S. Arabia, W. Asia may be said to belong to the temperate zone. But geographical differences produce within this zone a great variety of climate.

The races of men represented within the region are similarly various, though the prevailing type is the Semitic. The primitive seat of the Semitic race was probably N. Arabia. In Babylonia the Semites were preceded by the Sumerians, who spoke an agglutinative language; their precise racial affinities, however, have not yet been settled. Eastward and northward, in Elam and Armenia, were other races, also non-Semitic. The race which inhabited Elam, where it has left us inscriptions in agglutinative

dialects, is, like the Sumerian, of uncertain relationship; but the older races of Armenia were Caucasian in their origin. It was not until the 7th century B.C. that the highlands of Armenia were occupied by an Indo-European people. These latter came from the northern part of Asia Minor, into which they had migrated from Europe, the southern portion of the peninsula being peopled by a race (or races) who were probably Caucasian. The most important among the latter for many centuries were the Hittites, whose home was in Cappadocia and the Taurus. They are represented on the Egyptian monuments with yellow skins and black hair, beardless faces, and projecting jaws. From the same sources we learn that the Amorites of Syria belonged to the white race. They were blond and light-haired, with blue eyes and abundant beard, and of tall stature. They seem to have been an eastern offshoot of the Libyans, who are similarly depicted.

Babylonian civilization was a continuation of Semitic and Sumerian elements, the Sumerian element being the earlier. It reflected the mixed character of the population of the country, and had a profound effect upon the rest of W. Asia. Already, in B.C. 3800, Babylonian armies made their way to the shores of the Mediterranean, bringing with them the culture of Babylonia, which included its script and language, religion and laws. Two thousand years later, the cuneiform characters and language of the Babylonians had become the medium of literary and diplomatic intercourse throughout W. Asia, and Babylonian and Assyrian colonies had established themselves even in Cappadocia; and the Egyptian Pharaohs carried on their foreign correspondence in the Babylonian language and script. Before the 10th century B.C. the cuneiform syllabary had been superseded in the W. by the so-called Phœnician alphabet; two centuries later, however, it made up for its loss of ground in Syria by penetrating into the highlands of Armenia. But the simpler Phœnician alphabet generally supplanted it, and a new eclectic form of culture, which we may term Phœnician, took the place of the older Babylonian. Meanwhile a religion had arisen in Palestine which was destined to have a profound effect upon the civilized world, and which found its literary instrument in the Phœnician alphabet. The Jewish exile brought it under the immediate influence of Babylonian culture, and so united the two streams of literary thought which were flowing from Palestine and Babylonia. The empire of Asia now passed into the hands of the Indo-European Persians, whose official religion was Zoroastrianism, and who were therefore inclined to look with favour on the adherents of a monotheistic form of faith. The Greek conquest of Asia, however, brought with it once more a revival of polytheism, this time in an artistic form. But the triumph of polytheism was short-lived. Judaism made way for Christianity, which, like Judaism, arose in Western Asia, and from thence spread throughout the world. Henceforth the supremacy of Christianity in the civilized East was disputed only by Mohammedanism, itself also of Western Asiatic origin, but unable to adapt itself to the higher culture of the European peoples. With the rise and decline of Mohammedanism, the influence of Western Asia upon the history of the world has come to an end. It has given us our religion, our alphabet, and the elements of our

civilization; it was the earliest home of the arts and sciences, of organized government and legal codes.

Asia Minor, or ANATOLIA. The name is generally applied to the western projection of Asia, to distinguish it from the huge continent of which it forms a western peninsula. The Greeks called it Anatolia, while the Turkish name, Anadoli, was usually applied to the W. and N. provinces only. Washed on three sides by the sea—the Black Sea and the Sea of Marmora, with its straits, in the N., the Ægean Sea in the W., and the Mediterranean Sea in the S.—it forms a sort of bridge between Europe and Asia. The E. boundary is an arbitrary line which may be drawn from the S.E. side of the Gulf of Alexandretta or Iskanderun in a N.E. direction to the S.E. corner of the Black Sea, a little to the S. of Batum. From Cape Baba, its W. extremity, to the vicinity of the banks of the Euphrates, in the E., is about 700 m.; and from Sinope, on the shores of the Black Sea, in the N., to Cape Anamur, in the S., the distance is over 400 m.

Physically, Asia Minor is a plateau sloping from the great Taurus range in the S. to the mountains bordering on the Black Sea in the N., and westwards towards the shores of the Ægean Sea. Numerous passes through the Taurus and Anti-Taurus allow communication with the eastern portions of the Turkish empire; one of them, 'the Cilician Gates,' between Bulgar Dagh and Ala Dagh, in the Taurus range, has been of great historical importance. The general elevation of the plateau is from 2,000 to 3,000 ft. Transverse ranges intersect the plateau, and these are almost at right angles to the flanking ranges, while numerous isolated peaks rise at intervals. The chief summits are the volcanic mountain Arjish Dagh (12,650 ft.; anc. *Argæus*), lying to the W. of the Anti-Taurus range; Bulgar Dagh (11,400 ft.), in the Taurus range; Mount Olympus (6,500 ft.), near Brusa, in the N.W.; and Mount Ida (5,750 ft.), which overlooks the plains of Troy, towards the Hellespont. The central plateau, an area of Tertiary lacustrine formation, consists of sandy deserts, salt steppe lands, marshes, fertile valleys, and numerous salt lakes, the largest being Tuz-göl, 70 m. N.E. of Konia. Between the western mountains and the Ægean Sea there are plains and valleys of great fertility. The Black Sea coast is rocky, and almost unbroken; the W. coast is deeply indented, and is fringed with numerous islands; the S. coast contains the Gulfs of Adalia and Alexandretta. The rivers draining to the Black Sea are the Yeshil Irmak (Iris), the Kizil Irmak (Halys, over 500 m. long), and the Sakaria (Sangarius).

The minerals of the peninsula have a wide range, but the deposits of gold, silver, lead, antimony, coal, lignite, and chrome have not been worked to any extent. Coal and lignite to the extent of some 400,000 tons are annually mined in Brusa. There is a small production of antimony, and Eskishehr supplies some 150 tons of meerschaum annually.

The islands of the Archipelago, the 'Vilayet' of the White Sea Islands, have a fine climate, and produce great quantities of honey, fruit, wine, and oil. Samothrace, Tenedos, Lemnos, Imbros, Mitylene, Khios, Kos, Nicaria, Patmos, and Rhodes are well known in classical history. The plateau has severe winters, with such heavy snowfalls as to render communication difficult; summers of excessive heat follow. The S. and W. coasts have mild

winters and temperate summers, because of the sea breezes. The rainfall is supplemented by heavy dews. The N. coasts have hot summers and cold winters, with much rain and snow. The central plateau is in general healthy, but some of the higher valleys are not so; and malaria, due to heat and moisture, is prevalent in the coastal plains towards the Black Sea.

Agriculture is in a backward state. The plateau yields wheat, and many of the lower valleys produce wheat and barley, while the lowlands give good crops of millet and rice. The vine, the olive, the orange, the lemon, the apple, and the pear flourish; and rice, cotton, opium, poppies, and madder are cultivated largely. Forests of oak, fir, beech, ash, and plane still clothe the slopes along the Black Sea coast, but have almost disappeared from the mountain lands, which were once densely wooded.

The wild animals include the wolf, the bear, the hyæna, the lynx, and the wild boar. Camels and asses are used for beasts of burden, horses for riding, the buffalo for farm work, and the Angora goat is bred for its characteristic silky hair. Bees are kept in great numbers.

The people are of mixed races, the Turkish being the predominant, and feuds and massacres are not infrequent. Greeks and Armenians are the trading races. Jews, Arabs, and Kurds form the greater portion of the remainder. Turkish is the official language, but different languages prevail in the several districts. Agriculture occupies most of the people. Mining gives employment to many; others engage in the production of silks, in the weaving of carpets, shawls, and mohair cloth, and in the manufacture of wine; the fisheries in the Ægean Sea occupy others.

The principal exports are wheat, cotton, dried fruits (figs and raisins), wine, oil, silk, mohair, carpets, tobacco, valonia (acorn-cups for tanning), meerschaum, honey and beeswax, ores (silver, lead, and antimony). The imports consist chiefly of cotton fabrics, metal ware, sugar, coffee, petroleum, woollen goods, and coal. At least half the trade is carried on with Great Britain. The chief ports are Trebizond, Samsun, Sinope, Smyrna, Adalia, and Mersina.

The roads are in a wretched condition, and internal trade is thus greatly hindered; but some attention is now being paid to them. There are 2,850 m. of railways in operation (1910), and further extensions to Baggad and the Persian Gulf are under construction. The most important of these lines are under German control.

In the 7th century B.C. Lydia was the ruling power in Asia Minor, after which it passed under the rule of Persia, and, later, under that of Alexander the Great. After the latter's death it became partly subject to the Seleucidæ dynasty and partly to the kingdom of Pergamum. During the Roman period the country was well developed, but was again thrown back during the wars of the Byzantine empire. It then passed into Turkish rule, and now forms part of the Ottoman empire, and is divided into the following vilayets:—

Vilayets.	Area in Sq. Miles.	Pop.
Ismid	3,130	222,700
Brusa	25,400	1,626,800
Bigha	2,550	129,500
Archipelago	2,660	322,300
Smyrna	21,580	1,396,500
Kastamuni	19,570	961,200
Angora	27,370	932,800
Konia	39,410	1,069,000
Adana	15,400	422,400
Sivas	23,970	1,037,500
Trebizond	12,500	948,500

In addition to the seaports, the following towns deserve mention: Brusa, Scutari, Angora, Konia, Sivas, Kaisarieh, Tarsus, Adana, Erzerum, and Van.

The Mohammedans are in the majority on the mainland, the Christians in the Ægean Islands. The Mohammedans are estimated at over 7,000,000; Armenians, 600,000; other Christians, 1,000,000; Jews, etc., 200,000. The total population is 9,100,000. See Ramsay's *Historical Geography of Asia Minor* (1890); Tozer's *Eastern Asia Minor* (1881); Sykes's *Through Five Turkish Provinces* (1900); Layard's *Autobiography and Letters* (1903): and *Studies in the History and Art of the Eastern Provinces of the Roman Empire*, ed. by Prof. Wm. Ramsay (1907).

Asiatic Quarterly Review, THE, was founded in 1886 for the discussion of questions relating to the Indian empire and the East. Its scope was extended to Africa and the British colonies in 1891, when the full title of the publication was enlarged to *The Imperial and Asiatic Quarterly Review and Oriental and Colonial Record.* It is published by the Oriental Institute, at Woking.

Asiatic Society, ROYAL, founded in London in 1823 for the furtherance of science, art, and literature in relation to Asia, incorporating the Literary Society of Bombay (1819) and Madras (1827) and the Asiatic Societies of Ceylon and China. Since 1833 it has published the *Journal of the Royal Asiatic Society.* It established the 'Oriental Translation Fund' in 1828, which has published many volumes of Eastern literature. The oldest Asiatic society is the Dutch Colonial, formed at Batavia in Java in 1779, which has issued three important publications — *Verhandelingen* (Proceedings), since its foundation; *Tijdschrift voor Nederlandsch Indië*, since 1842; and *Tijdschrift voor Indische Taal-, Land-, en Volkenkunde*, since 1853. But the Asiatic Society of Bengal is nearly as old, having been founded in 1784; it has issued *Asiatic Researches* (1788–1836) and *Journal of the Asiatic Society* (since 1832). The Americans have the American Oriental Society, founded at Boston in 1842; its *Journal* has appeared since 1850. Several countries on the Continent have societies which devote themselves to the study of Asiatic antiquities, history, etc.—*e.g.* the Société Asiatique (1821) and Société Orientale de France (1842), at Paris; the Deutsche Morgenländische Gesellschaft (1845); Società Asiatica Italiana; and Koninglijk Institut voor de Taal-, Land-, en Volkenkunde van Nederlandsch Indië, at Amsterdam. Outside of Europe the principal Asiatic societies are the Asiatic Society of Japan, at Tokyo, and the Peking Oriental Society.

Asiatic Turkey, the possessions of the Turkish empire in Asia, consists of Asia Minor or Anatolia, Armenia, Kurdistan, Mesopotamia, Syria (Palestine), and Arabia (see these articles), with an area of between 650,000 and 700,000 sq. m., and a pop. of about 18 millions.

Asinius. See POLLIO.

Asirgarh, a fortress in Nimar dist., Central Provinces, India, 87 m. S.S.E. of Indore, standing on a detached spur (850 ft. above the plain) of the Satpura range. It was captured in 1600 by Akbar, and became a British possession in 1819.

Aske, ROBERT (d. 1537), led the Yorkshire Pilgrimage of Grace, an insurrection caused by the suppression of the smaller monasteries and other unpopular measures. On the king's sending promises of pardon, the rebels disbanded. Aske, however, was exe-

cuted at York. See Hall's (1809) and Wriothesley's (1875) *Chronicle*.

Askelöf, JOHAN KRISTOFFER (1787–1848), leading Swedish publicist; first made himself famous as an ardent disciple of the new romantic school, and in 1802 started their chief literary organ, *Polyfem*, which gave its name to the party. He became editor of the conservative organ, *Svenska Minerva* (1830–48).

Askew, ANNE (1521–46), English Protestant martyr, was tried for heresy before the lord mayor, Bonner bishop of London, and others in 1545, but set at liberty. Again accused of heresy, she was sent to the Tower and tortured; but, refusing to recant, was burned at Smithfield. See Bale's two Tracts *On the Examination of Anne Askew* (1546 and 1547); and Foxe's *Acts and Monuments*.

Askhabad, or ASKABAD, tn. and fortress of Transcaspia, capital of the province, at foot of the Kopet Dagh, in oasis of Atek, 830 ft. above sea-level. Before its Russian conquest in 1881 it was a place of 500 tents; now it is an important mercantile and political centre. Pop. 20,000.

Askja, an immense volcano, or rather a crater valley 3,000 ft. deep, in Iceland, occupying an area of 25 sq. m., still sporadically active. All around it stretches the vast lava desert of the Odadahraun, extending over 1,500 sq. m. There was a great eruption in 1875, when some of the ashes ejected were washed ashore at Stockholm.

Asmara, tn., Eritrea, N.E. Africa, 55 m. S.W. of Massowah, with which it is being connected by rail; is the seat of the government in the Italian colony on the coast of the Red Sea.

Asmodeus, a corruption of Æshma Dæva, an evil genius in the ancient Persian religion. He became known among the Jews through the story of Tobit, a Jew who was taken captive to Nineveh, and the scene of whose adventures (in which Æshma Dæva, or Asmodeus, figures prominently) is laid in Media. (See the apocryphal *Book of Tobit*.) Asmodeus is frequently encountered in mediæval literature, and he is the supernatural cicerone in Le Sage's *Le Diable Boiteux*.

Asmoneans, or HASMONEANS, the Greek denomination of the first members of the Jewish dynasty of the Maccabees.

Asnières, tn., France, dep. of Seine; a residential suburb of Paris, to the N.W.; 2 m. from the fortifications, on the l. bk. of the Seine. Pop. 36,500.

Asoca (*Jonesia asoca*), an Indian tree of the order Leguminosæ, named after Sir William Jones. It is common throughout India, where it is associated with poetry and mythology, and is also cultivated in Mauritius.

Asoka, emperor of India from B.C. 272–232, styled in his own edicts 'King Priyadarsin' (*Pâli*, Piyadasi), which signifies 'the Humane,' was alike notable as a great monarch and as a most zealous propagandist of Buddhism. He was the third emperor of the Maurya dynasty. Asoka's empire included all the Indian peninsula except the small portion south of the 12th lat., and extended north to the Himalayas, embracing also part of Kashmir, most of Afghanistan, and the whole of Baluchistan. Pâtuliputra (modern Patna) was his capital. After his conquest of the east coast tribes in 261 B.C., he devoted himself to the spread of the Buddhist religion and culture. Many of Asoka's monuments, some inscribed, still exist. See V. A. Smith's *Asoka* (1901).

Asolo, small fort. tn. in Treviso prov., Italy, 18 m. N.W. of Treviso, at the base of a hill of over 1,000 ft., has ruins of a 13th century castle; a favourite resort of Robert Browning, and possibly

the source of inspiration for parts of *Pippa Passes* and *Sordello*. The old castle was the residence (1489–1515) of Queen Caterina Cornaro, the last queen of Cyprus. Pop. (comm.) 6,000.

Asp (*Vipera aspis*), a poisonous snake belonging to the family Viperidæ, about two feet in length, exceedingly common in Italy and in the wooded elevated regions of S. Europe generally. It is also found on the opposite shores of the Mediterranean — *e.g.* in Algeria. The name asp is, however, frequently used in a loose sense to indicate any poisonous serpent, as the serpent by means of which Cleopatra of Egypt caused her own death.

Aspalathos, Dalmatia. See SPALATO.

Asparagine, amido-succinamic acid, $NH_2CO.CH_2CH(NH_2)CO.OH$, occurs in asparagus, peas, and many other plants. It can be prepared synthetically, and forms transparent, colourless crystals (sp. gr. 1·52), which are soluble in water.

Asparagus, COMMON (*Asparagus officinalis*), belongs to the order Liliaceæ, is found throughout Europe, and grows wild on the south and south-western coasts of England. It is cultivated in gardens as a vegetable, and in spring produces from its perennial underground stems (rhizomes) numerous fleshy, aerial stems bearing small scale-leaves. The plant flowers in August, and produces small scarlet berries, with black seeds. The seed of asparagus should be sown thinly on ground that has been well dug but not manured, any time from March to June. The drills should be about a foot apart and an inch deep. When the seeds are placed, the ground should be pressed and raked over. The plants make more root than top the first year; but if they are kept clear of weeds, and the ground stirred often between them, they will grow vigorously the second year, and be fit to plant out the following spring. Beds of asparagus may be made as late as September. Established beds of asparagus require top-dressing every spring.

Asparagus Stone, certain varieties of apatite.

Aspasia. (**1.**) Of Miletus, the most famous of Greek courtesans. She came to Athens, and Pericles lived with her until his death. Though an Athenian could not legally marry an alien, their son was legitimized by a decree of the people. Aspasia shared to the full the highest culture of the day; popular gossip gave her the credit of much of Pericles's statesmanship. When she was prosecuted for impiety, only his personal influence procured her acquittal. The best intellects of Athens, including Socrates, seem to have met in her house. After the death of Pericles she was connected with Lysicles, a demagogue. See Suidas's *Aspasia*, Landor's *Pericles and Aspasia* (1836), and Becq de Fouquières's *Aspasie de Milet* (1875). (**2.**) The younger, a Phocæan, the favourite mistress of Cyrus the younger. After his death she became the mistress of his brother Artaxerxes, king of Persia, who, when his son Darius fell in love with her, made her priestess of a temple in Ecbatana, in which strict celibacy was essential.

Aspatria and Brayton, tn., Cumberland, 8 m. N.E. by E. of Maryport; has coal mines, and an agricultural college, established in 1874, rebuilt in 1892–3. Pop. 3,000.

Aspe, tn., Spain, 16 m. W. of Alicante; has marble quarries. Pop. (comm.) 8,000.

Aspe, VALLÉE D', a beautiful valley on the French slope of the Pyrenees, dep. Basses-Pyrénées; traversed by the Gave d'Aspe, a torrent 30 m. long, which rises on the Col de Somport (5,380 ft.) and

flows north to Oloron. A Roman road crossing the Col de Somport connects this valley with Aragon, Spain. The Vallée d'Aspe was formerly a republic under the protection of the princes of Béarn.

Aspect in astronomy refers to the relative positions of two planets as seen from the earth. Five principal aspects were originally recognized, but only two are now in use—conjunction and opposition. A planet is in conjunction when it is seen in the same direction as the sun, and in opposition when 180° away from the sun. The aspects now obsolete were: the sextile, applied to two bodies distant 60° from each other; the quartile or quadrate, when they were 90° apart; and the trine, when they were 120° distant.

Aspen (*Populus tremula*), a British tree found in moist soils, and known as the trembling poplar. It belongs to the order Salicaceæ. Even in calm weather the leaves tremble in upward currents of air which are not strong enough to stir the leaves of other trees. The petiole of the leaf, at its junction with the blade, is flattened at right angles to the plane of the blade; the junction is thus weaker than in other leaves, so that the faintest breath is enough to move it. During the Tudor period its wood was highly valued for making into arrows. There is an old tradition in Scotland that the leaves are never at rest because the cross was made of aspen wood.

Asperges, in the Roman Catholic Church, is an antiphone taken from the *Miserere*, and sung by the choir before a high mass, during which the priest sprinkles holy water by means of a rod called an aspersorium or aspergillus.

Aspergillum, a genus of bivalve molluscs found in the warmer parts of the globe. The shells are placed at the lower end of an elongated shelly tube. They are sometimes called 'watering-pot shells,' from the shape.

Aspergillus, a genus of hyphomycetous fungi. See MOULD.

Aspern, vil., l. bk. of Danube, nearly opposite Vienna, Austria, on a plain containing also the village of Essling, the scene of a sanguinary battle in which Napoleon was defeated by the Austrians under the Archduke Charles (May 21 and 22, 1809). Pop. 1,000.

Asperula. See WOODRUFF.

Asphalt, or MINERAL PITCH, is a mixture of a number of hydrocarbons and their derivatives, containing oxygen, nitrogen, and sulphur, together with more or less mineral matter or ash. Those of Val de Travers, Trinidad, and California are among the most important. Asphalts are of two main varieties—*rock asphalts*, in which the bituminous matter saturates limestone or sandstone; and *soft asphalts*, in which it is merely mixed with more or less earthy matter. Rock asphalts are dark-brown or black hard solids, containing about 90 per cent. of mineral matter; while soft asphalts are of a dark-brown resinous appearance, and contain much less ash, do not flow like pitch, and only melt at about 150° C. Rock asphalts are employed largely for paving, after mixture with soft asphalt, pitch, petroleum residue, stone dust, etc.; while soft asphalts, besides the above application, are used in the preparation of varnish and japan.

Asphalter's Work (in BUILDING) includes the laying of a 'damp course' on the top of brick or masonry walls, just above the ground-level, and at least ½-in. thick. The asphalter covers the whole surface under the building, to prevent ground air from rising into it; and in cases of a platform roof, he may cover the latter with two layers laid on canvas nailed to the roof. All this is measured by the superficial yard. See BUILDING.

Asphodel, a plant of the order Liliaceæ and the section Anthericeæ. Eight species are cultivated in English gardens. Medicinally it has been used as a substitute for squill. The asphodel, being sacred to Proserpine, was in the days of the Romans used in funeral ceremonies. In the *Odyssey*, Minos sits in judgment in the asphodel meadows.

Asphodel, Bog (*Narthecium ossifragum*), also called 'Lancashire asphodel,' is a small plant of the order Liliaceæ, whose blossom gives an orange tint to many peat bogs in Britain during July and August. The specific name, meaning 'bone-breaking,' is derived from the unfounded belief that when sheep eat the leaves their bones become fragile.

Asphyxia is commonly used to denote the condition following upon total deprivation of oxygen for respiration, from whatever cause. Drowning, strangling, irrespirable gases, and mechanical obstruction of any kind to the entrance of oxygen to the lungs, are common examples. The creature deprived of oxygen shows discomfort in a few seconds by restlessness. In warm-blooded animals a few seconds more under such conditions will bring about exaggerated respiratory movements, quickly followed by convulsions, the effect of poisoned blood (unoxygenated, and saturated with carbon dioxide) upon the great nerve-centres. Insensibility and cessation of movement now rapidly supervene, and death is possible within about three minutes from the beginning, though the time will vary with the strength of the sufferer and with the manner of asphyxiation. Respiratory efforts cease before the heart stops, which it ultimately does in diastole. Recovery is possible while the heart beats, and may even be hoped for a little later still, in some cases, if the heart's work be made easier by bleeding. Since both respiratory and cardiac movements may be present, though undetected by the untrained, it is of the first importance that help to the asphyxiated should be given at once, and all efforts continued until a fully competent person can take the case in hand. The cause of asphyxia must be removed, fresh air must be ensured, and crowding around must be guarded against. If respiration has not ceased, these steps, with the use of smelling-salts or dashing cold water on the chest, may be enough. But no time should be lost before proceeding to artificial respiration. See Resuscitation.

Aspidistra, a Chinese genus of the order Liliaceæ, introduced into Britain in 1822, and now much cultivated in houses. Three species are grown, but *A. lurida* is the one commonly seen in rooms. The branching stems are entirely underground; they soon fill the pot with cord-like roots, and send up robust leaves, which when young appear as lengthened conical growths protected by scale-leaves. A variety shows creamy white streaks or bands running lengthwise through the blade, but the whole leaf becomes green when the soil is enriched. Small purple flowers appear in early summer, and they should be removed if vigorous foliage is desired. The plant is popularly known as 'parlour palm.'

Aspidium. See Male Fern.

Aspinwall. See Colon.

Aspinwall, William H. (1807-75), a New York merchant who obtained a concession in 1850 to construct a railway across the isthmus of Panama. It was completed in February 1855, and the eastern terminus was named after him.

Aspirate (Lat. *ad*, 'to;' *spirare*, 'to breathe'), in phonetics, is the strong breathing of a letter, approximating the guttural sound.

From very early times there appears to have been a difference of opinion as to when and where the aspirate ought to be used. Catullus (*Ep.* lxxxiii.) ridicules a contemporary because he said '*h*insidias' and '*H*ionios' instead of 'insidias' and 'Ionios.' A similar tendency has been noticed in Sanskrit and Greek. In Gaelic it is a recognized law that a euphonic *h* shall be intruded between the final vowel of one word and the initial vowel of another; thus, 'na *h*-iasgan' (the fishes). Systematic aspiration, in certain connections, is indeed a notable characteristic both of Gaelic and Cymric. The habit of 'dropping the *h*' when (according to modern usage) it ought to be retained is prevalent in the English lower class, and this is accompanied by the contrary habit of prefixing an *h* where it is not wanted. An Englishman of this class, therefore, will say '*h*ash' for 'ash,' and ''ash' for 'hash.' Nowadays a mark of inferior breeding, this heterodox practice was once orthodox. In the 13th century, *eye*, *earl*, *old*, and *English* were written *heie*, *herle*, *hold*, and *Henglishe*; while in recent times the use of 'an' before many words, such as *hundred*, *habit*, and *household*, seems to indicate that the *h* was almost, if not altogether, silent. In the English of the cultivated class of to-day there is a tendency to restore the aspirate in some words and to drop it in others. See *The Aspirate*, by G. Hill (1902).

Aspirator, an apparatus used to draw air or gases through pipes or other apparatus connected with it. In its simplest form it consists of a vessel of glass or metal fitted with inlet and outlet cocks at the top and bottom. It is filled with water, and, by allowing the water to escape through the lower tap, air or any gas may be drawn through the upper tap, and, if necessary, through a series of tubes or bottles. The filter-pump is another form of aspirator much used in laboratories. It consists of a tube with constricted bore, through which water is passed under pressure; a small opening in the side of the tube communicates with the vessel from which air is to be withdrawn. As the water passes through the constricted tube it draws air in with it, and a partial vacuum is soon produced in the vessel.

The name is also given to a surgical instrument, introduced by Dieulafoy in 1869, for removing fluids from body cavities, as in pleurisy, ascites, abscesses, retention of urine, etc. A fine hollow needle, connected by a rubber tube with a syringe or bottle from which the air is partially exhausted, is passed through the skin; and the fluid is driven into the bottle by atmospheric pressure.

Aspland, Robert (1782–1845), Unitarian divine, born at Wicken, Cambridgeshire. He was for forty years minister of Gravel Pit Chapel, Hackney, London, and founded in 1813 the Hackney Academy at Durham House, for the training of Unitarian ministers. He was the editor of the *Monthly Repository*, which he founded, from 1806 to 1826, and of the *Christian Reformer* (1815–45). See *Memoirs* by R. Brook Aspland (1850).

Asplenium. See Spleenwort.

Aspromonte, a wooded mountainous district in the extreme south of Italy, rising above the Strait of Messina to 6,425 ft. in Mt. Montalto. Here Garibaldi was wounded and taken prisoner (1862).

Asquith, The Right Hon. Herbert Henry (1852), lawyer and statesman, was born at Morley, Yorkshire. He was educated at the City of London School and Balliol College, Oxford, where he

carried off the Craven Scholarship. Called to the bar at Lincoln's Inn in 1876, his marked legal ability rapidly brought him into prominence (notably during the Parnell Commission), and he was appointed a Q.C. in 1890. Of strong Liberal proclivities, Mr. Asquith has been member for East Fife since 1886, and took a prominent part in the Home Rule debates. In 1892 he moved the amendment to the Queen's Speech which resulted in the fall of the Salisbury government of that date; and during the succeeding Gladstone-Rosebery ministry of 1892-5, he held the office of Home Secretary. In 1893 he introduced an Employers' Liability Bill, which passed the Commons, but was subsequently abandoned, as the Lords refused to give way on Lord Dudley's amendment. The tact and judgment displayed by Mr. Asquith in connection with the labour disputes of 1893 and the London cab strike of 1894 have everywhere been recognized. In 1894 also his name was pre-eminently associated with the bill for the disestablishment of the Church of Wales, which, however, was ultimately rejected.

Prior to the hostilities in South Africa Mr. Asquith dissociated himself from the anti-war section of his party, and in a speech at the Reform Club in 1901, while supporting the vote of confidence in Sir H. Campbell-Bannerman, claimed for himself and others full liberty of action on South African questions without incurring the imputation of party disloyalty. In 1902 he became vice-president of the Liberal League. During 1903 he was one of the most effective Liberal speakers in opposition to the Education Bill and in denunciation of the conduct of the war as revealed by the War Commission report. He was generally recognized as the leading protagonist of free trade in opposition to Mr. Chamberlain's fiscal policy. On the formation of Sir H. Campbell-Bannerman's administration (Dec. 1905) Mr. Asquith was appointed Chancellor of the Exchequer. On the resignation of Sir H. Campbell-Bannerman in 1908 Mr. Asquith became Prime Minister and First Lord of the Treasury. He returned to power in Jan. 1910, and again in Dec. 1910. For the work of the Asquith administration, see under INCOME TAX, LAND VALUES, OLD AGE PENSIONS, SOUTH AFRICA. See Ellis's *The Right Hon. H. H. Asquith* (1909).

Ass, a name given to a group of species of the genus Equus, including the domestic ass (*E. asinus*), probably identical with the wild ass of Africa and the Asiatic wild asses, which seem to belong to one species, *E. hemionus*. From the horse the ass differs in its long ears, the absence of long hairs at the base of the tail, and of callosities on the inner side of the hind leg above the hock, in the erect mane, and the well-marked dorsal stripe. There is also a stripe across the shoulders, and the limbs are often banded. The domestic ass of N. Europe cannot be regarded as representative of the asses in general, for it has markedly degenerated owing to the absence of selective breeding and of careful nurture. Where, as in many parts of the East, the ass is treated as the horse is treated, it proves itself little inferior to the latter as regards the valued qualities, and has the great advantages of being less liable to disease, and much less particular as to diet. Of the Asiatic wild asses there are three varieties—the kiang (kulan), the onager, and the Syrian wild ass. The first is very horselike in appearance, and exceedingly swift in movement; it roams over the Tibetan plateau in troops, and is very wary. Its flesh is eaten by the

Mohammedans of E. Turkestan. The Abyssinian wild ass is a desert animal, and seems to resemble the domestic ass in its mental characteristics as well as in appearance. From time immemorial the ass and the horse have been crossed together, the hybrid offspring being known as mules or hinnies, according as the male parent is an ass or a horse.

Assab, bay and tn. on Red Sea, Eritrea, N.E. Africa, 40 m. N.W. of Str. of Bab-el-Mandeb. It is one of the best ports of the colony, and is strongly fortified. Pop. 5,000.

Assai Palm (*Euterpe oleracea*), a tree of tropical America, much cultivated for its pulpy fruit, *assai*, from which a beverage and a food are prepared.

Assal, or ASAL, large salt lake in volcanic basin of Adel, E. Africa, 25 m. S.W. of Tajurra, on the Red Sea.

Assam, British India. See EASTERN BENGAL AND ASSAM.

Assandune. See ASHDOWN.

Assassination, a term sometimes applied to any murder, but usually restricted to the killing of some prominent person from fanatical or political or religious motives. The following is a list of the most famous assassinations:—Julius Cæsar, Mar. 15, 44 B.C.; Thomas à Becket, Dec. 29, 1170 A.D.; Albert I., emperor of Germany, May 1, 1308; James I. (Scotland), Feb. 21, 1437; Alessandro de Medici, Jan. 5, 1537; Cardinal Beaton, May 29, 1546; David Rizzio, Mar. 9, 1566; Lord Darnley, Feb. 10, 1567; James, Earl of Murray, Regent of Scotland, Jan. 23, 1570; William of Orange, July 10, 1584; Henry III. of France, by Jacques Clément, Aug. 2, 1589; Henry IV. of France, by Ravaillac, May 14, 1610; Villiers, Duke of Buckingham, by Lieut. Felton, Aug. 23, 1628; Wallenstein, by Butler, Leslie, and Gordon, Feb. 25, 1634; Archbishop Sharp, May 3, 1679; Gustavus III. of Sweden, Mar. 16, 1792; Marat, by Charlotte Corday, July 13, 1793; General Kléber, June 14, 1800; Czar Paul, Mar. 24, 1801; Selim III., Sultan of Turkey, June 1808; Spencer Perceval, English premier, by Bellingham, May 11, 1812; Kotzebue, German dramatist, Mar. 23, 1819; Abraham Lincoln, by Booth, Apr. 14–15, 1865; Milosh, prince of Servia, June 10, 1868; Marshal Prim, Spain, Dec. 28, 1870; Georges Darboy, archbishop of Paris, May 24, 1871; Earl of Mayo, viceroy of India, Feb. 8, 1872; Abdul-Aziz, Sultan of Turkey, June 4, 1876; Czar Alexander II., Mar. 13, 1881; President Garfield, U.S.A., by Guiteau, July 2–Sept. 19, 1881; Lord Frederick Cavendish and Mr. Burke, May 6, 1882; President Carnot, France, by Caserio (*anarchist*), June 24, 1894; Stefan Stambulov, Bulgarian statesman, July 15, 1895; Shah Nazr ed-Din of Persia, by Mirza Reza, on May 1, 1896; Empress Elizabeth of Austria, by Lucchini (*anarchist*), Sept. 10, 1898; King Humbert of Italy, by Bresci (*anarchist*), July 28, 1900; President M'Kinley, U.S.A., by Czolgosz (*anarchist*), Sept. 6, 1901; Alexander I. and Draga, king and queen of Servia, June 11, 1903; Grand-Duke Sergius, uncle of the Czar, Feb. 17, 1905; King Carlos I. of Portugal and the Crown Prince, Feb. 1908.

Assassins, a powerful fanatical sect which sprang from the secret order Ismailis and flourished in Persia and Syria from the 11th to the 13th century. It was founded by Hassan-ibn-Sabbah, a Shiite of Khorassan, who seized, in 1090, the fortress of Alamut in Persia, where he established his society, consisting of a supreme ruler, the Sheikh el-Jebel, or 'Old Man of the Mountain' of European historians, and the *fedavis*, the assassins proper, who,

when selected for the commission of a murder, were first intoxicated with *hashish* (hemp), whence perhaps the name assassin, from *hashishin* (hemp-eaters). The last of their rulers was Rukhn ed-Din, who murdered his father, Mohammed III., in 1255. In 1266 their power in Persia was completely broken by the Mongols under Hulaku, 12,000 of the Assassins being massacred. A Syrian section, which had asserted its political independence in 1169, was subjugated by the Mameluk Sultan Bibars in 1270–3. The crusading chiefs Raymond of Tripoli and Conrad of Montserrat both fell under their daggers. See Von Hammer-Purgstall, *Geschichte der Assassinen* (1818); F. Walpole, *The Ansayrii, or Assassins* (1851); Guyard, *Fragments relatifs à la Doctrine des Ismaelis* (1874), and *Un Grand Maître des Assassins au Temps de Saladin* (1877). See also Maurice Hewlett's novel *Richard Yea and Nay* (1900).

Assault, an offer of personal violence to another. Thus, to threaten to strike a person within striking distance, or to shake one's fist in his face, or to present a gun at him when within range, to pull a rosette off his coat, or to incite a dog to attack him, or to attempt to kiss a woman, or to do any act accompanied by circumstances which denote both intention and ability at the time to molest or do violence to the person, is an assault. If a blow is struck or violence actually used, it is a battery; but the word assault is frequently used in the sense of a battery. Verbal abuse does not amount to an assault. A person actually struck is justified in striking back in self-defence, but not in revenge. His retaliation must, therefore, not be greater than is necessary to put an end to the assault. A person assaulted may either bring an action for damages, or prosecute the assailant criminally, or both. For the purposes of criminal proceedings, assaults may be divided into (1) common assaults, and (2) aggravated assaults. A common assault is punishable, on summary conviction, by a fine of £5, or two months' imprisonment; but if the case goes for trial, the punishment may be one year's imprisonment. If an aggravated assault is committed on a boy under fourteen, or on a woman, it is punishable, on summary conviction, by a fine of £20, or six months' imprisonment. An assault on a police constable in the execution of his duty may also be similarly punished. There are a large number of offences, principally statutory, which are punishable upon indictment with various terms of imprisonment or penal servitude, and which are all forms of aggravated assault. Such are assaults causing actual bodily harm; indecent assaults; malicious wounding; wounding or shooting at a person with intent to maim, disfigure, or disable, or to resist apprehension; assaults with intent to rob, or to commit any felony; attempting to choke, suffocate, or strangle, or to render any person insensible, with intent to commit an indictable offence; poisoning so as to endanger life, or with intent to injure; using or sending explosives with intent to injure; assaulting clergymen in performance of their office, or gamekeepers protecting game; assaults within royal palaces or in the High Court of Justice.

The common law of Scotland with regard to assault is very similar to the law of England. The remedy is both civil and criminal, and assaults are regarded as aggravated (1) by the intent, as to kill, to rob, to ravish, or to rescue prisoners; (2) by the mode, as by using firearms, stabbing, cutting, or throwing acids; (3) by the ex-

tent of the injury; (4) by the place, as the presence of the sovereign, or in a court of justice; (5) by the quality of the persons assaulted, as parents or young children. See Russell, *On Crimes* (16th ed. 1896); Macdonald's *Crim. Law of Scotland* (3rd ed. 1894).

Assaye (*Asái*), vil., Haidarabad (Deccan), India, 46 m. N.E. of Aurungabad. Here the British under Wellesley defeated the Mahrattas (Sept. 23, 1803).

Assaying. This term, formerly restricted to the estimation of a metal in its ore or alloy, is now often used as synonymous with analysis; but it is better to confine it to the determination of certain constituents of a substance, particularly in the 'dry' way, and to reserve the word 'analysis' for the estimation of every constituent of a body. Assaying is 'wet' or 'dry' according as to whether the operation is carried out in solution or by the action of fire. The first process in either method is the selection of a typical sample, on which much of the value of the examination depends. Dry assays are carried out in muffle furnaces, in which the substance is heated in a small fireclay oven, or in wind furnaces, where the combustion is urged by blast or draught. The actions vary much in particular cases, of which the following are examples.

Copper.—Take a yellow ore, for example. Twenty-five grammes of ore, 20 grammes of borax, 20 grammes of glass, 25 grammes each of lime and fluor-spar, and 6 grammes of nitre. The first fusion will produce regulus and slag. The regulus is crushed fine, roasted sweet, and fused with 4 grammes of sodium carbonate, 5 grammes of tartar, and 3 grammes of borax. The slag is cleaned by fusing with 2 grammes each of sodium carbonate and tartar and half a gramme of carbon. The copper is refined by heating in a crucible till bright, then adding 6 grammes of refining flux. In two minutes the contents are poured into a mould, the slag cleaned, and all the copper weighed.

Lead.—Galena is generally fused in an iron crucible which gives the lead direct; but fluxes are often necessary, and a clay pot may be used—ore, 25 grammes; sodium carbonate, 25 grammes; tartar, 3 grammes. After breaking off the slag the metal is weighed and the percentage calculated.

Silver.—(1.) Bullion, coin, and plate. By the cupellation method three-quarters of a gramme is wrapped in 10 grammes of lead, and heated in a cupel in the molten state in a muffle until the base metals are oxidized and absorbed into the cupel. The silver is then detached, cleaned, and weighed. (2.) Ores and compounds. Twelve grammes of ore, 30 grammes of red lead, 2 grammes of charcoal, 18 grammes each of sodium carbonate and borax. The mixture is fused in a clay crucible until all action ceases. If sulphides are present, a little iron must be added. The contents are poured into a mould, cooled, the lead detached from the slag and cupelled.

Gold.—Bullion assay is the same as for silver. Ore assay is also much the same as in the silver-ore assay, but much larger quantities are used—viz. 60 grammes of ore, 80 grammes of sodium carbonate, 30 grammes of red lead, and 2 grammes of carbon. Fuse as for silver assay. Cupel the button of lead and weigh the gold. If much base metal is present, it must be partly removed by scorification, and then the remaining lead cupelled. If silver is present, the alloy must be so proportioned as to contain two and a half times as much silver as gold. By digesting in nitric acid the silver is dissolved, the gold remains unaltered, and after ignition may be weighed.

Tin.—Take 60 grammes of tin-

stone, mix with excess of anthracite, and reduce in a plumbago crucible. After pouring off the tin the residue is ground fine, the excess of carbon washed away, and the residue fused with a little sodium carbonate to collect the remaining tin. Or the ore may be reduced in a clay pot with five times its weight of common potassium cyanide and a little charcoal.

Antimony.—Sulphide of antimony is reduced by iron, like galena, or it may be reduced by fusing with an excess of common potassium cyanide. Loss by volatilization introduces an error, and must be allowed for.

Mercury.—The chief ore is cinnabar (HgS). It is assayed by distillation in a glass tube. Three to five grammes are well mixed with excess of lime, and heated with bunsen burners until all the mercury is reduced. It collects in the cool end of the tube. The residue is washed, to extract the small entangled globules. After drying the metal is weighed.

The ores of metals other than the above are best determined by wet methods, as follows:—

Iron.—The estimation of iron in ores is generally effected by a volumetric method, and in alloys by a gravimetric method. There are two chief volumetric methods —*viz.* the 'bichromate' and the 'permanganate' methods. (1.) In the bichromate method, which is most used, a standard solution is made to contain about 8 grammes of the salt per litre; 0·25 gramme of pure iron is then dissolved in hydrochloric acid, and when this is colourless, the standard solution is run in from a burette until the ferrous salt is just oxidized to the ferric condition. To determine this point an indicator is used, which consists of about 1 gramme of potassium ferricyanide in 100 c.c. of water. When a drop of this solution just ceases to be coloured blue by the iron solution, the oxidation is complete. By observing how many cubic centimetres of the standard solution have been run off, its value per c.c. is obtained. To estimate iron in ores, they must be crushed very fine, and about ½ gramme to 1 gramme dissolved in HCl. As the ore is probably in the state of the higher oxide, it must be reduced to the ferrous state by means of zinc or sodium sulphite. The standard solution is run in as before, and the number of cubic centimetres required gives the amount of iron present. In alloys, iron is usually precipitated from solution as hydrated oxide by means of ammonia, if manganese, chromium, and aluminium are absent. The precipitate is washed, dried, ignited, and weighed as Fe_2O_3, from which the percentage of iron is computed.

(2.) The permanganate method is as follows:—A solution of potassium permanganate has a purple colour, which is discharged as long as any ferrous salt remains unoxidized; but immediately it is all oxidized a single drop of the permanganate will give a rose tint to the solution. A standard solution of the permanganate is made and standardized by a known weight of pure iron dissolved in H_2SO4. Iron in ores, etc., is dissolved as before, decolourized by zinc or sodium sulphite, and the iron estimated from the solution required for complete oxidation. In presence of HCL titration must be carried out at a temperature below 70° C.

Copper may be estimated (1) by potassium cyanide in ores and slags free from manganese, nickel, cobalt, silver, mercury, and zinc. The reaction is based on the fact that when potassium cyanide is added to a copper solution which has been rendered blue by ammonia it gradually loses its colour. By ascertaining the amount of standard solution required to

decolourize a known weight of copper in solution, the value of each cubic centimetre of the standard solution is found. A standard solution may be made to contain 60 grammes of potassium cyanide per litre of water. The pure copper for standardizing is dissolved in a measured quantity of nitric acid, and when cold the solution is just made blue by the addition of ammonia. Ores may be digested with HCl and a little nitric acid added. When dissolved, cooled, and the requisite ammonia added, the standard solution is run in, and the copper estimated. Sulphur ores are first moistened with sulphuric acid, then digested with strong nitric acid for an hour. If much iron is present, it may be precipitated with ammonia and filtered off. If this precipitate is redissolved, the iron may be estimated by potassium bichromate.

(2.) Coloration method. Copper in slags and products may be approximately estimated by comparing the colour produced in the solution of potassium ferrocyanide or hydrogen sulphide as compared with a series of copper solutions of known strength.

(3.) The sodium thiosulphate method is valuable for alloys in which lead and iron are not present in large quantities. The process is based on the reaction between iodine and thiosulphuric acid, and the completion is determined by the bleaching effect that is produced upon a solution of starch added during the experiment. A standard solution may contain 40 grammes of pure crystallized thiosulphate per litre. Pure copper is dissolved in dilute nitric acid, 3 oz. of water being added, neutralized with sodium carbonate, acetic acid being added in slight excess, then crystals of potassium iodide. The standard solution is run in until the solution is yellow, about 3 c.c. of starch solution are introduced, and the standard solution added drop by drop until the liquid is completely bleached. The solution being standardized, ores and copper alloys may be dissolved and the copper estimated as above.

(4.) Electrolytic method. Copper in commercial ores and in alloys may be very accurately determined by dissolving half a gramme in about 3 c.c. of nitric acid, evaporating partly to dryness, then adding 1 c.c. sulphuric acid, and diluting with water to 200 c.c. in a beaker in which are placed a platinum cone and a spiral of platinum wire. The cone is connected with the zinc and the spiral with the carbon of a bunsen cell. By weighing the cone before and after the experiment the amount of copper is obtained.

Lead.—By the wet method, lead is generally determined by precipitation as sulphate. In ores the dry method is sufficiently accurate. In alloys, about one gramme is dissolved in dilute nitric acid; and if the solution is clear, dilute sulphuric acid is added, then twice its volume of alcohol, and the solution allowed to stand several hours. The $PbSO_4$ is then filtered off, washed with alcohol, dried, ignited, and weighed. The precipitate contains 0·683 of its weight of lead.

Silver.—The ordinary volumetric assay is based on the affinity of silver for chlorine, by which an insoluble chloride is precipitated (Gay-Lussac method). (1.) Standard solution. Pure NaCl is dissolved in water in sufficient quantity to precipitate one gramme of silver—*i.e.* 0·542 gramme of salt is dissolved in 500 c.c. water. A solution is also made to contain one-tenth of the above: one gramme of silver is dissolved in nitric acid and diluted to one litre, so that each cubic centimetre contains 0·001 gramme of silver. After testing the standard by a known

weight of pure silver, it may then be used for estimating silver in alloys. One-half to three-quarter gramme of alloy is dissolved in nitric acid, diluted, 50 c.c. of the stronger solution run in, and the liquid well shaken; when the solution is practically clear, add the weak solution until the silver just ceases to yield a precipitate. The amounts of strong and weak solutions added, having definite values, indicate the amount of silver in the alloy.

(2.) Volhard method. Silver may be volumetrically estimated by means of a standard solution of potassium sulphocyanide, using iron alum as an indicator (*Eng. and Min. Jour.*, Jan. 1883). Knorr recommends a normal solution of common salt and a deci-normal solution of sulphocyanide, which obviates the tedious shaking of the Gay-Lussac method.

Tin.—Tinstone is decomposed by fusing with four times its weight of potassium fluoride. The fluorine is then expelled with sulphuric acid. On diluting with water, filtering, and boiling, the tin is precipitated as hydrated oxide.

Tin oxide may be fused with eight times its bulk of sodium hydrate dissolved in hot water, and the tin precipitated by SH_2 forming the sulphide, which may be roasted to oxide and estimated as SnO_2.

Zinc.—(1.) By a standard solution of sodium sulphide. When a zinc solution containing oxide of iron has been made alkaline with ammonia and the standard solution run in, the zinc is first precipitated as a white sulphide, then the iron, which is recognized by the dark colour. (2.) By a standard solution of potassium bichromate. When zinc sulphide is mixed with ferric chloride and hydrochloric acid, the iron is converted into the ferrous state. The amount of $FeCl_2$ may then be estimated by the bichromate method.

Antimony.—The metal in stibnite (Sb_2S_3) may be estimated by means of gallic acid (Crookes's *Select Methods*, p. 400). The ore is heated with HCl until sulphuretted hydrogen ceases to be expelled. The residue is filtered off, and the solution concentrated by evaporation. Gallic acid solution is then added, and the precipitate, after settling, is collected on a weighed paper, dried at 100° C., and weighed. The dry precipitate contains 40·85 per cent. of antimony.

Sulphur.—(1.) Pyrites, purple ore, etc. Three grammes are digested for an hour in three parts nitric to one part hydrochloric acid, then HCl added until nitrous fumes are expelled, evaporated to dryness, redissolved in HCl and water, and barium chloride added. The precipitate formed is $BaSO_4$, which is washed, dried, ignited, and weighed, and the sulphur computed. (2.) Estimation of sulphur in coal. Mix one gramme of coal with one gramme MgO and half a gramme Na_2CO_3, and ignite over a spirit lamp; boil with bromine water, digest with HCl, filter, and add barium chloride to the filtrate to precipitate $BaSO_4$.

See Crookes's *Select Methods of Chemical Analysis* (3rd ed. 1894); Sutton's *Volumetric Analysis* (8th ed. 1900); Rhead and Sexton's *Assaying and Metallurgical Analysis* (1902); Hiorns's *Practical Metallurgy and Assaying* (1888); Aaron's *A Practical Treatise on Testing and Working Silver Ores* (1876); Beringer's *Text-book of Assaying* (1902).

Assche, tn., Belgium, in Brabant prov., 7 m. N.W. of Brussels. Pop. 8,500.

Assegai, the Zulu spear, of which there are two varieties—the long javelin, or throwing-spear; and the shorter 'stabbing' assegai, for use at close quarters.

Assemani, Joseph Simon (1687–1768), Orientalist; born at Tripoli

in Syria, but studied in Rome. In 1715 he was sent to the Levant to collect Oriental MSS. for the Vatican Library, of which he was appointed keeper. He wrote *Bibliotheca Orientalis Clementino-Vaticana* (1719–28), *Opera Ephraemi Syri* (1732–46), etc.

Assembly. See GENERAL ASSEMBLY.

Assembly, NATIONAL. See FRANCE—*History.*

Assembly, UNLAWFUL, an assembly of three or more persons with intent to commit a crime, or with intent to carry out in common any purpose, lawful or unlawful, which is likely to lead to a breach of the peace. An unlawful assembly may be dispersed by force, and all parties to it are guilty of a common law misdemeanour punishable by fine and imprisonment. See RIOT, PRIZE FIGHT.

Assembly of Divines at Westminster. See WESTMINSTER.

Assen, tn., cap. of prov. Drenthe, Netherlands, 16 m. by rail s. of Groningen. Pop. 11,000.

Asser, JOHN (d. 909 ?), bishop of Sherborne, was reader to King Alfred from about 885. He is author of *De Rebus Gestis Ælfredi Magni*, first published in 1572. Best edition by W. H. Stevenson (1904).

Assessment. See RATING.

Assessors are experts who sit with and assist a judge in matters requiring special technical knowledge, but they have no part in the judgment. By s. 56 of the Judicature Act, 1873, they may be employed in all cases in the High Court. By s. 14 of the Appellate Jurisdiction Act, 1876, the archbishops and bishops may be appointed assessors to the Judicial Committee of the Privy Council when trying ecclesiastical matters. By the Supreme Court of Judicature Act, 1891, the House of Lords may employ assessors in Admiralty appeals. By the Patents, Designs, and Trade Marks Act, 1883, either party in a patent action may require that a case be heard with an assessor. By the Merchant Shipping Act, 1894, courts of survey are constituted consisting of a judge and two assessors. In the Admiralty Court assessors are generally Trinity Brethren. Assessors may also be employed in county court cases. See also CLERGY DISCIPLINE ACT, 1892.

Assets. This term signifies, in law, property available for distribution among creditors. It is derived from the French *assez*—*i.e.* enough to make the administrator chargeable to a creditor. Assets are 'legal' or 'equitable;' but the distinction is too technical to be more than referred to here. Formerly, in administering legal assets, 'specialty' creditors, or those whose debts arose by virtue of a bond or other instrument under seal, were entitled to payment in priority to simple contract creditors; but now both classes of debts are payable *pari passu* as was always the case with equitable assets. In distributing assets of a deceased person, funeral and testamentary expenses are always payable before anything else; then the order of payment out of 'legal' assets is—subject to crown debts by specialty or record, and debts having statutory priority—(1) judgments against the deceased if registered; (2) judgments against the executor or administrator according to priority of date; (3) recognizances and statutes; (4) specialty and simple contract debts, and unregistered judgments against the deceased; (5) voluntary obligations. But in distributing 'equitable' assets, all debts stand on the same footing. The right of an executor to prefer one creditor to another, and to retain a debt due to himself in preference to other creditors of equal degree, exists only with regard to legal assets.

In applying assets in payment of debts, the rule is that the general personal estate is to be first exhausted, then the real estate; and if both these are insufficient, recourse must be had to the legacies, and to property appointed under a general power of appointment. The marshalling of assets is the process by which, where a claimant may resort to either of two funds, a person having an interest in only one of them can compel him to satisfy his claim out of the other.

If assets are distributed before the debts are paid, creditors may follow them into the hands of the persons who have taken them. As to administration of assets of a bankrupt or deceased insolvent, see BANKRUPTCY.

Assiento (Span. 'treaty'), a contract made between Spain and other powers, by which the monopoly of importing slaves into Spanish America was conferred upon the latter. It was first held by a Flemish company from 1517; then by the Genoese, from 1580; by the French Guinea Company, from 1702; but the treaty of Utrecht (1713) gave it to Britain, along with the right of sending yearly a ship carrying 500 tons merchandise to the Spanish colonies—a privilege exercised for twenty-six years by the South Sea Company. Britain relinquished that right in 1750 for £100,000 and certain other concessions. See *Political History of England*, vol. ix. *passim* (1909).

Assignation, the term applied by Scots law to any deed of conveyance by which rights of either a permanent or a temporary nature to movable property are transferred. The maker of the assignation is called the cedent, the receiver the assignee; and if the subject assigned be a debt, the debtor is called the common debtor. An assignation is not complete without intimation of it to the debtor or debtors. Forms of intimation are provided by statute; and it is sufficient proof of intimation that the debtor has written acknowledging the receipt of a certified copy of the assignation. Indorsations of bills of exchange, assignations in favour of trustees on sequestrated estates, and assignations operating by marriage in favour of a husband, do not require intimation. The general effect of an assignation is to vest the assignee with the whole right of the cedent; but a mere assignation of corporeal movables without possession is nothing but a personal obligation, and confers no preference on the assignee in a question with the cedent's creditors. An assignation of a debt from an assignee to another person is called a translation; and if the assignee reconvey the debt to the cedent, the deed of reconveyance is called a retrocession.

Assignats. During the period immediately preceding the French revolution, the National Assembly declared the church lands to be national property, and offered them for sale to the various municipalities throughout the country; accepting, in lieu of cash payment, paper notes or bonds of equivalent value, consequently styled *assignats*. Later, assignats were issued against the property of the *emigrés* and the crown. But the simplicity of the system led to a continued issue of assignats (amounting to a total face value of 45,500 million livres), which ultimately became so depreciated as to be almost valueless. Assignats were in circulation in France from 1790 to 1796, being exchangeable in the latter year for *mandats*, which were called in in 1797, at the value of $\frac{1}{1000}$ of the original assignats. See Mignet's *History of the French Revolution;* Thier's *Revolution Française; Cambridge Modern History*, vol. viii., ch. 23, etc. (1907).

Assignment, a legal term denoting a transfer of property from one person to another. It takes place (1) by operation of law—*e.g.* on bankruptcy; or (2) by the voluntary act of a person—as on a sale or other disposition. Generally speaking, any kind of property may be assigned. But the assignment of pensions and salaries of public officers is void, as contrary to public policy; while assignments which are fraudulent or for illegal purposes are also invalid. The effect of an assignment of property is generally to put the assignee in the same position as the assignor, with all the rights, and subject to all the obligations, attaching to the property assigned. When the property consists of a debt or other chose in action, notice of the assignment should be given to the debtor; otherwise, if the latter should pay the assignor without notice, he could not be compelled to pay over again to the assignee. As to the special incidents of an assignment of leaseholds, see LANDLORD AND TENANT. By an act of 1571, all transfers of real or personal property intended to defeat creditors are void, unless they are for good consideration, and the purchaser has no notice of the fraud.

Assimilation, the process by which organisms take up and transform foreign substances into their own tissues, as in digestion and respiration.

Assiniboia, a region of Canada now forming the south part of the province of Saskatchewan (since July 1, 1905). It lay between the 49th and 52nd parallels of N. lat., with Manitoba on the E. and Alberta on the W. Its area was 90,340 sq. m.

Assiniboine. (1.) ('River of the Stony Sioux'), a river of Canada, rising in E. of Saskatchewan, flows S.E. through that prov. and part of Manitoba, then E. to Red R., which it joins at Winnipeg, after a course of about 600 m. It is navigable for vessels of 100 tons to Fort Ellice, at its junction with the Qu'appelle. (2.) A summit of the Rocky Mts., Canada, about 20 m. S. of Banff, near the boundary between Alberta and British Columbia. Alt. est. at 12,000 ft.

Assiniboines, an Indian tribe of Canada belonging to the Siouxan stock, and akin to the Crows and Dakotas. They are mostly gathered in reservations, but conduct an extensive fur trade with the Hudson's Bay Company.

Assisi (the ancient *Asisium*), tn. and episc. see, prov. Perugia, Italy, 15 m. by rail S.E. of Perugia, the birthplace (1182) of St. Francis Bernardone, founder of the Franciscan order (1209); his bones (since about 1822) have been interred in a crypt underneath the double church of the Franciscan order. These two edifices, both built between 1228 and 1253, stand one above the other, and are adorned with frescoes by Giotto, Cimabue, Memmi, and others. Assisi contains also a church built out of a temple of Minerva, a cathedral (12th to 13th century), the tomb of St. Clara, founder of an order of nuns, and below the town the grandiose church of Sta. Maria degli Angeli, built (1569) over the oratory of St. Francis. Here were born the Latin poet Propertius (middle of 1st century B.C.) and the Italian poet Metastasio (1698). Pop. 17,000. See Cruikshank's *The Umbrian Towns* (1901) and Gordon's *The Story of Assisi* (1900).

Assisi, ST. FRANCIS OF. See FRANCIS.

Assiut, ASSIOUT, or SIUT. (1.) Province of Upper Egypt; area, 770 sq. m.; pop. 905,000, 24,000 of them being nomads. (2.) Capital of above prov., between l. bk. of Nile and Bahr Yusuf; 27° 10′ N.; is the site of a Nile barrage and lock. Pop. 40,000.

Assize of Clarendon (1166), Henry II.'s first measure of judicial reform, remarkable by its institution, in criminal trials, of the germ of the jury system—the justices and local sheriffs trying accused persons by grand juries of the county. With the *Assize of Northampton* (1176) it was effectual in removing the administrative machinery from the power of the barons. See Stubbs's *Select Charters*, 140–146 (8th ed. 1895), and *Political History of England*, vol. ii. c. 15 (1905).

Assizes, the sittings of the judges of the High Court at the various towns which they visit periodically on their circuits for the trial of civil and criminal cases—the whole of England and Wales, outside the district of the Central Criminal Court, being for this purpose divided into circuits. All questions of law as well as of fact can be disposed of as fully as in the High Court. The names of all the judges are included in the commissions, but in practice only the judges of the King's Bench Division go on circuit. The King has power to appoint any King's counsel, or serjeant-at-law, or county court judge a commissioner of assize, with all the powers of a judge of the High Court. The word *assisa* originally meant a session of the king's council, or an ordinance made there. The Assize of Clarendon in 1166 introduced a new form of procedure for settling disputes about the possession of land, and the principal writs issued for this purpose came to be known as the assizes of novel disseisin and of mort d'ancestor, which were not abolished till 1835. Commissions were issued to justices of assize to try these suits in the county in which they arose, and in 1285 the statute of Westminster II. extended the jurisdiction of these justices of assize to all actions arising in the county to which they were sent. Judges now go on circuit under the four commissions of the peace, of assize, of oyer and terminer, and of general gaol delivery, the second of which gives them civil, and the two last criminal jurisdiction.

Associated Counties, those counties in the east of England which united in 1642 to raise a parliamentary army, and to keep the war outside their boundaries. The association included Essex, Cambridge, Norfolk, Suffolk, and Hertford, and, at a later date, Lincoln and Huntingdon. The force was first commanded by Lord Grey of Wark, and later by Cromwell.

Associated Press. See PRESS ASSOCIATION.

Associates (so-called because they were formerly associated with the judges and clerks of assize in the commissions of assize) are clerks of the Crown Office, and, as such, officials of the King's Bench Division of the High Court, whose duties are mainly concerned with the trial stage of legal proceedings. They prepare the cause lists, attend the judge in court, note the judgment, enter the verdict, and deliver the 'record' to the proper party. They also keep the records of the court. They must be barristers or solicitors.

Association, THE, in William III.'s reign, was formed in 1696 for the security of William's person and government, as a result of a plot—the Assassination Plot—to kill the king. The Association was popular; its badge an orange ribbon, with the words 'National Association for King William' in letters of gold. *Political History of England*, vol. viii. c. 17 (1910).

Association Football. See FOOTBALL.

Association of Ideas, the manner in which, or principle according to which, ideas or images succeed each other in the mind when their succession is not inter-

rupted from without, or determined by logical thinking. By Hume and Hartley the conception was given a fundamental importance in psychological and philosophical theory, and their general view has been maintained since their time by a line of thinkers to which the name of the Associationist School has been given, and of which the most prominent later representatives have been the Mills and Professor Bain. The philosophical application of the conception has all along been a matter of dispute, while within recent years the purely psychological significance and range of the conception have also been the subject of much critical discussion. Various laws of association have been formulated from the time of Aristotle onwards, but the two most generally accepted are those of Contiguity (ideas that have once been presented together tend to suggest each other) and Similarity (ideas presented at different times, but resembling each other, tend to suggest each other). It is a disputed question whether one of these two laws is more fundamental than the other, and, if so, which. Those who hold contiguity to be more fundamental, argue that the explicit consciousness of similarity involves comparison—*i.e.* already implies the presence of *both* similars before the mind. So that, if we represent the similar ideas by XY and XZ (resembling each other in respect of the common element X), the really operative principle of revival is the contiguous association of the common X, now present in XY, with Z, its former associate in XZ; and the consciousness of the similarity of XY and XZ can only exist when XZ has thus been reinstated alongside of XY. But since XZ is not, to begin with, before the mind, but exists only as a memory trace or residuum, the above analysis implies a process, not in consciousness, by which the present X operates the trace or residuum x in the residual whole xz. This process is called by Ward 'Assimilation;' and he points out that such a process is implied in all association, contiguous and similar alike. For in every case the present idea can operate only through the corresponding memory trace, apart from which it would be a new idea, and awaken no memories at all. And it is a process distinct from that of association, because X and x are not, as X and Z are, distinct ideas before the mind. Thus contiguity remains the only law of association proper, but implies the action of a prior law of mental process—prior, because assimilation is implied in perception as well as in memory. From this point of view, a lower limit has been assigned to the action of association, which cannot come into play until after a considerable development of perception, since traces of impressions serve at first only for the perceptual recognition of objects without constituting a distinct memory of them. From the other or higher side, it has been shown that the action of mere association is continually being modified by the thinking process whose material it supplies. See Stout's *Analytic Psychology* (1896), vol. ii. bk. ii. ch. 5 and 6. For a general view of the place of association in mental life, see PSYCHOLOGY. For more special criticism of the psychological doctrine of association, see Bradley's *Principles of Logic* (1883), bk. ii. pt. ii. ch. 1; Külpe's *Outlines of Psychology* (trans.), sec. 27–33 (1859); and articles in *Mind*, July 1893 and Oct. 1894, by Ward. For the philosophical doctrine of associationism, see HUME and MILL.

Assoilzie, a term used in Scots law signifying 'to acquit' or absolve from the charge made.

Assonance, a kind of imperfect rhyme consisting in the recurrence of the same vowel sounds. It differs from rhyme proper in paying no regard to the accompanying consonants. (See RHYME.) *Pain* and *care*, *waver* and *fairest*, are examples of perfect assonants. The oldest romances of the French *trouvères* are generally assonantal, one vowel sound being often carried through the whole composition; but French poets early rejected assonance and restricted themselves to rhyme. Nevertheless, some of the younger contemporary French poets, especially the Decadent School, in their attempt to widen the range of their lyric poetry, have recently essayed the reintroduction of assonance. In Spain it has more than held its own against the more highly developed forms of rhyme imported from Italy, and has retained its position in the romance (or ballad) metres, in the dramas of Calderon and Lope de Vega, in popular songs, and in lyric poetry generally. Its most striking development, however, is to be found in Celtic poetry, which compensates for its almost total absence of perfect rhyme by the establishment of a highly artificial and intricate system of assonantal harmonies, which includes not only the usual terminal correspondence of one line with another, but also a further assonance between the terminal word of one line and a medial word in the line following, together with the regular employment of internal 'chiming' within the bounds of the line itself. Assonance is only suitable to languages in which the vowel sounds predominate over the consonants. Hence, while rejected in English, it is tolerated in Scottish poetry.

Assos (now BEHRAM), ruined city at the entrance to Gulf of Adramyti, Asia Minor, opposite the island of Mitylene or Lesbos, and 12 m. E. of Cape Baba. See *Investigations at Assos*, ed. F. H. Bacon (1903, etc.) and Sterrett's *Inscriptions of Assos* (1885).

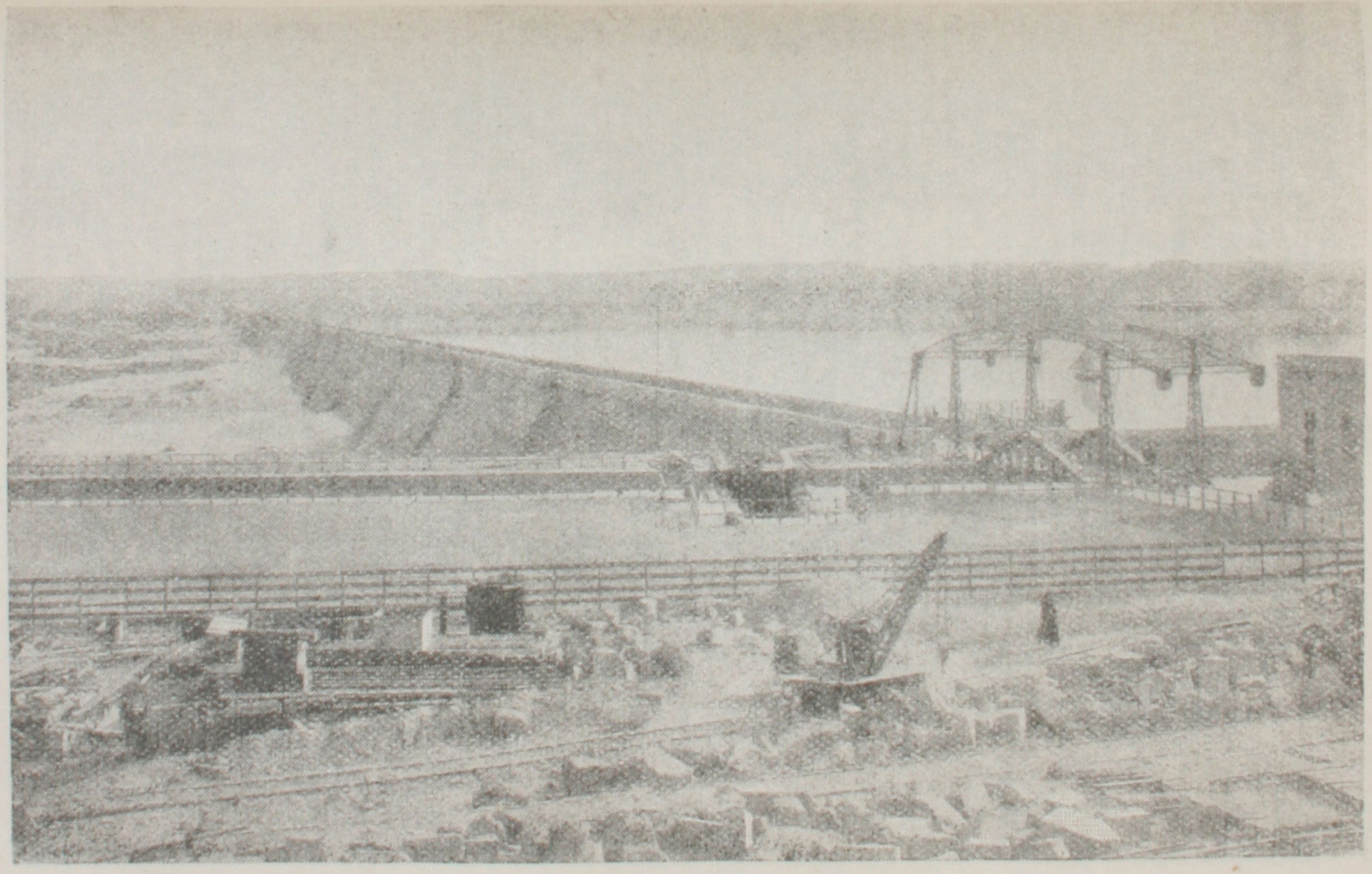
Assouan, or ASWAN, in Upper Egypt, at the first cataract of the Nile, the site of a great *barrage* or dam built (1899–1902) by the Egyptian government to form a reservoir regulating the flow of the Nile for irrigation purposes. It is 2,187 yards long, and is built of solid masonry, weighing a million tons, with a sloping buttress throughout its length, but having 180 under-sluices, which when opened will allow free passage to the early floods—the later annual inundation being, of course, conserved. At its original level the dam held up no less than 35 milliards of cubic feet of water; but the height is being raised another 24 ft. and it will then be capable of impounding double that volume of water, thereby, it is estimated, providing for the irrigation of 600,000 acres of sugar-cane and cotton land. Navigation is provided for by a 'ladder' of four locks. See Willcock's *The Assouan Reservoir* (1904).

Assumpsit, a form of action abolished by the Common Law Procedure and Judicature Acts. The action was for damages in respect of the breach of a simple contract, and was so called because in the pleadings it was always stated that the defendant undertook (*assumpsit*) to perform the contract.

Assumption of the Virgin, a day observed by the Eastern and Western Churches, but ignored by Protestants, which commemorates the ascent of the Virgin Mary into heaven. The belief in this miracle cannot be traced before the 6th century.

Assur, ASUR, or ASSHUR, the ancient national god of Assyria.

Assurance, LIFE. Life assurance (or insurance) may be defined as a system or business the object of which is to provide a capital



The Nile Reservoir and Assouan Dam.

sum as compensation against loss by premature death, in return for a comparatively small sum, called the *premium*. The business originated from marine insurance; for merchants sending goods by sea in early times usually accompanied the ship themselves, and were liable to capture by Moorish or Turkish pirates. With a view to providing the ransom necessary to secure their release, it became customary for them before embarking to pay an agreed premium to certain individuals, called underwriters, who were willing to guarantee payment of the ransom in the event of the merchant being captured. From this beginning the practice was gradually extended to insuring the lives, first of mariners, and then of other persons, the underwriters agreeing, in return for a certain premium, to pay a fixed amount (called the *sum assured*) if the person insured should die within a year. The document embodying the contract was called the *policy*, and the same term is applied to all the widely different forms of insurance contract which have since been invented. The premium charged appears to have been not less than 5 per cent. of the sum assured, irrespective of the age of the life insured—probably because that was the rate usually charged for insurance of ships at the time. It has been suggested that this rate was fixed because the annual rate of mortality in London was about one in every twenty persons; but, as a matter of fact, the mortality was never so heavy, even during the visitations of the plague. In 1574 Queen Elizabeth granted a patent to Richard Chandler, under which he established a Chamber of Insurance in London, with the object of regulating all contracts of insurance; but this chamber, with probably all its records, was destroyed by the great fire of 1666. The earliest recorded life policy was issued on June 18, 1583, and provided that if a certain William Gybbons should die within twelve months, the underwriters would pay £383, 6s. 8d., the premium being at the rate of 8 per cent. He died on May 29, 1584, and the underwriters refused to pay, on the ground that he had not died within twelve months of twenty-eight days each; but the court decided that the twelve months mentioned in the policy meant a complete year, and therefore ordered payment to be made. The object of these early insurances was undoubtedly to protect creditors, no mention of life insurance as a provision for wife and children being made until 1622. It was customary to buy appointments in those days; and if the purchaser, as frequently happened, had not sufficient money of his own to pay the purchase price, he borrowed it on security of the salary attached to the appointment. As the salary would cease at death, the lender might lose his money if the borrower died soon after purchase, and a policy of assurance therefore became an essential feature of such transactions. An 'Office of Assurances' succeeded the Chamber of Insurance above mentioned, and exercised much the same functions. All policies of assurance could be registered there *verbatim*, and commissioners were appointed to hear and decide disputes; but probably this office related chiefly to marine insurance. Up till 1699 all life insurances appear to have been underwritten by individuals, and the first scheme for granting assurances by an association, 'The Society of Assurance for Widows and Orphans,' was established in that year. It was to consist, 'when full,' of 2,000 members, who were to contribute 5s. each on entry to pay for the first claim, and 5s. on every subsequent death

that occurred among the members, thus providing a sum of £500 for the widow and children. The number of members did not amount to 1,000 until nearly eight years had elapsed, and at that time the sum paid at each death was about £220. The association seems to have come to an end by 1712. 'The Amicable Society for a Perpetual Assurance' was established in 1705, and obtained a charter in the following year. It was to consist of 2,000 members, each of whom paid 10s. as an entry fee, and an annual subscription of £6, 4s. One-sixth of the contributions was to be divided amongst those who died in the first year, one-third in the second year, and so on until, in the fifth and all subsequent years, five-sixths of the contributions were to be divided—the remainder, with all profit made by the sale of annuities, being accumulated as a *reserve*. Thus the amount of each claim depended on the number of deaths in the year it occurred, as well as on the number of members, and in consequence it varied very considerably, increasing from about £30 the first year to about £90 a few years later. Its average amount up to 1749 was about £93, and after that date it increased to as much as £260 in 1760, falling again to £125 the following year. It will be noted that all the members paid the same contribution irrespective of their ages; but the precaution was taken of admitting no person under the age of twelve years or over fifty-five (afterwards altered to forty-five). Not until 1807 was the contribution made to vary with the age at entry; and thus the older entrants had an advantage over those who were younger. This society continued to transact business for about one hundred and sixty years, and was finally amalgamated with the 'Norwich Union' in 1864. The main distinction between these two societies lies in the fact that one set aside part of the contributions to form a reserve (albeit on no scientific basis), and the other did not; and they are a striking illustration of the principle that no assurance society can be permanent unless it establishes a sufficient reserve. Attempts have been made over and over again to establish companies on what is called the *assessment* principle, which is to form no reserve, but make calls upon the members each year of sufficient amount to pay the claims of that year. In the early years of such a company the mortality is light and the calls are small, because the average age is small, and most of the lives are in good health, as the entrants are usually examined by a doctor, and all the unhealthy or diseased are rejected; but with the lapse of time, unless a *constantly-increasing* number of new entrants is obtained, the average age increases and the proportion of healthy lives decreases, so that the rate of mortality increases rapidly. The amount of the annual call must, therefore, be raised, and this not only renders it more difficult to obtain new entrants, but increases the number of those who drop their policies and withdraw from the scheme, necessitating still further increases in the calls made upon those who remain. The result is that those who are still young and in good health can obtain insurance more cheaply in offices established upon sound principles, and therefore withdraw in large numbers. The bulk of those who remain are of advanced age or in bad health, and the death-rate therefore becomes so high that the annual calls are prohibitive, the scheme at last collapses, and nothing is left for the unfortunate remnant of members. Since no association can obtain a *continually-increasing* number of new entrants, every

such scheme must inevitably end in disaster, and the experience of scores of such companies has proved the unsoundness of the assessment principle over and over again. Not a single company now transacts business on this plan in the United Kingdom.

Up to 1720 about fifty assurance societies were started (most of them on unsound principles), but the bursting of the South Sea Bubble in that year swept away every one of them except the Amicable. At this period it was practically impossible for any association to obtain a charter of incorporation to enable it to carry on the business of life assurance. Any such association was, therefore, a mere partnership, and every member was individually liable for the whole debts of the association. There were many other drawbacks to unincorporated associations, among which may be mentioned the difficulty in the way of taking legal proceedings or holding property; and these led to a series of attempts to secure incorporation by purchase of existing charters, which had been granted for other purposes. For example, a charter had been granted in 1690 to 'The Governor and Company of the Undertakers for Raising House Water in York Buildings,' empowering them (among other things) to purchase lands; and the company having got into difficulties, sold their charter in 1719. Now an act passed in that year, in order to facilitate the sale of the estates which had been forfeited to the government in the Jacobite rebellion of 1715, empowered any corporation which purchased any of those estates to grant annuities; and the purchasers of the charter therefore proceeded to buy certain of the estates, and to transact annuity and assurance business. A practice of insuring lives as a pure speculation grew up about the middle of the century, and spread to an extraordinary extent. For example, when any well-known person was said to be ill, large sums were insured on his life, the premium varying with every rumour as to his state of health; and the evils of this gambling on lives became so apparent that the celebrated Gambling Act was passed in 1774, rendering it illegal to effect any insurance on a life unless the person effecting the insurance had a pecuniary interest in the life.

The first office to transact life-assurance business on scientific principles was the Equitable, founded in 1760, owing chiefly to the exertions of one Dodson who wished to get his life insured, but was refused admittance to the Amicable, as his age was over forty-five. The plan adopted by the Equitable was to fix both the sum assured and the premium at the time of making the assurance, so that by payment of a fixed annual premium a definite and a certain sum was secured at death whenever it might happen. The rate of premium was regulated by the age at entry, and the scale adopted was derived from the Northampton table of mortality, which overstates the mortality throughout the greater part of life. The great majority of the premiums were, therefore, too high, and after payment of all claims and expenses, and making the necessary reserves for future claims, a surplus was gradually accumulated. This was divided among the members from time to time, thus originating the modern system of bonus-giving. Thesame table was adopted by most other insurance companies from this time onward, and was not entirely discarded until more than a century later. Had the errors of this table been in the other direction, making the premiums too small,

there can be little doubt that the early insurance companies would have become involved in difficulties, and the growth of the business would probably have been checked for a generation. As it was, the number of companies increased rapidly, and in 1870 there were 113 offices, insuring a total sum of £329,000,000 under about 638,000 policies, against which liabilities they held funds of about £92,000,000, and an annual premium income of about £9,500,000. Shortly before this date the number of companies was larger; but a rage for amalgamations set in, and many companies were amalgamated in the most reckless manner. Two well-known companies, the Albert and the European, failed from this cause, having respectively absorbed no less than 26 and 40 others; and these disasters threw much undeserved discredit upon the principle of amalgamation. The amalgamation of small companies on well-considered terms is generally advantageous, the union resulting in a company which is stronger than either of the original companies, owing to the risks being spread over a larger area, thus adding to stability; and the fusion of the two organizations furnishes an opportunity of reducing the expenses of management. The amalgamations effected by the Albert and European, however, were not of this nature, having been conducted on the most extravagant or even dishonest terms. The Life Assurance Companies Act of 1870 was framed with the object of preventing the repetition of such scandals, and protecting the public against unsound companies—not by exercising any control over the management of the companies, but simply by making them publish sufficient information regarding their transactions to enable any competent person to understand their true financial position. The chief provisions of the act were that every company transacting life assurance business in the United Kingdom must publish an annual balance sheet and revenue account in a prescribed form, and periodical valuations of liabilities and assets; the terms of every amalgamation must be made public, and receive the sanction of the court; and no new company could commence business until it had deposited £20,000 with the Board of Trade as a guarantee to the policy-holders. The spirit of the act has been tersely expressed in the phrase 'freedom and pub-

Comparative Table of Ordinary and Industrial Companies.
(*Blue Book issued in* 1910.)

	Ordinary Companies.	Industrial Companies.	Total.
	£	£	£
Assurances in force	767,644,459	285,807,599	1,053,452,058
Life and annnity funds . .	325,885,514	39,603,705	365,489,219
Annual premiums received .	27,937,702	13,336,561	41,274,263
Annual interest received . .	12,341,281	1,306,701	13,647,982
Annual claims paid	22,113,564	5,300,300	27,413,864
Annual surrenders paid . .	2,195,323	212,524	2,407,847
Annual cash bonuses and reductions of premium paid.	1,309,653	733	1,310,386
Annual commission and expenses paid	3,915,864	5,772,234	9,688,098
Percentage of expenses to premiums	14·3	43·3	..

licity,' and its object has been attained with remarkable success. The force of public opinion has compelled most companies to adopt more and more stringent methods of valuation, thus strengthening their position; and the well-deserved confidence inspired by this movement has helped to foster a large increase in the business. The deposit of £20,000 has proved a considerable check on the formation of new companies, and the tendency is for the number of companies to diminish while their size increases rapidly. Excluding American and foreign companies, there are 85 offices transacting ordinary life-assurance business and 10 transacting industrial business in the United Kingdom, the extent of their operations being indicated by the figures in the preceding table. The assets are increasing by about £11,000,000 each year, and new ordinary assurances to the amount of about £45,000,000 are effected annually. The law relating to life insurance is now consolidated in the Assurance Companies Act, 1909. As regards the insurance of babies at nurse, see the Children Act, 1908.

Ordinary insurance companies are those which transact business among the upper and middle classes, the policies issued by them being seldom for less than £100 each, and the premiums being payable yearly, half-yearly, or quarterly. Industrial companies, on the other hand, confine their operations to the working classes, their policies usually being for sums of about £10 each or even less, and the premiums being collected by weekly instalments. As each premium is generally only a few pence, and its collection involves the visit of a paid collector to the house of the assured, the expense of conducting the business is necessarily very great. The British workman, however, prefers this system to the cheaper but (to him) highly inconvenient method of paying his premiums to the office in a lump sum once or twice a year.

In 1864 the government adopted a scheme for enabling assurances to be effected through the Post Office. The amount which can be assured is not less than £5, nor more than £100, on a life of either sex between the ages of fourteen and sixty-five, and not more than £5 on a child between the ages of eight and fourteen. Although the security offered is without parallel, and the government may be said to have an agent to push the business in every post office in the kingdom, and the premiums can be paid in instalments of 1s. through the medium of the post-office savings bank, the scheme has not been a success, probably because the government pays no commission to agents for the introduction of business. The total number of policies in force is only about 12,000, insuring a sum of about £720,000; and the number of new policies issued each year is about 800, for the sum of £43,000.

As a further encouragement to assurance, the government allows every income-tax payer to deduct from his income the amount of any premiums paid to any British office for assurances, or for deferred annuities, on the life of himself or his wife, to the extent of one-sixth of his total income.

Ordinary insurance companies may be divided into two classes—(1) Mutual Companies, which have no shareholders, so that all the profits of the business belong to the policyholders; and (2) Proprietary Companies, which belong to a body of shareholders, who receive a share of the profits in return for the additional security furnished by their capital. As in most cases the dividends paid to the shareholders are only a small part of the total profits, this distinction is of very little impor-

tance to the policyholder. Most companies issue two classes of policies—viz. those which share in the profits and those which do not, the latter being subject to smaller premiums, as they have not the chance of being increased by the addition of bonuses. It is usually considered more advantageous to insure under the 'with profit' class, as in a well-managed office the bonuses to be received will, on the average, be more than the equivalent of the difference in the premiums. Some offices issue a third class of policy, under which future bonuses are anticipated and applied in reduction of the premium, which is thereby made lower than the 'without profit' rate. Such policies are, however, liable to be reduced in amount, or to have their premiums increased, should the bonus fall below the anticipated rate. The most common form of contract is a 'whole life' policy. This provides that if a fixed premium (annual or otherwise) be regularly paid to the office during the whole life of the assured, the office will, on his death, pay a fixed sum (with or without bonus as the case may be). Varieties of this are policies where the premium is either a single payment or ceases after a fixed number of years. Another form of almost equal popularity is endowment assurance. This kind of policy provides that the sum assured shall be payable on the life assured attaining a specified age, or at his death, if that occurs before the agreed age is attained, thus furnishing a provision for his own old age, in addition to a provision for his dependants in the event of his premature death. The Married Women's Property Acts of 1870 and 1882, and the Married Women's Policies of Assurance (Scotland) Act, 1880, provide that policies may be effected so as to form trusts for the benefit of the assured's wife and children, and thus be protected against his creditors should he become bankrupt.

When a policyholder desires to stop payment of the premium and give up his policy, the office will generally return him a part of the premiums he has already paid. This return, which is called the surrender value, usually varies from one-third to one-half of the premiums paid in ordinary cases, but may be as much as, or even more than, the whole of the premiums, if the policy has been in force for many years, and the life assured is of advanced age. Most companies will grant loans on security of their policies, to an extent closely approaching the surrender value.

The calculation of premiums for life insurance is based upon the theory of compound interest, combined with the probabilities of human life; and an estimate of these probabilities is, therefore, a necessary preliminary to the calculation. Many tables have been formed which show the rate of mortality prevailing at different places or among different classes of the population, among which may be mentioned the Carlisle Table, which was for many years the standard table employed by most offices; and the Institute of Actuaries Tables, published in 1869, which, with the Select Tables deduced therefrom by Dr. Sprague and published in 1882, have gradually supplanted the Carlisle Table, and are now generally regarded as the standards. Applicants for insurance are almost invariably put through a searching examination by a doctor, and many inquiries are made with a view to ascertaining their state of health; and, as a rule, none are admitted unless this is found to be satisfactory. In consequence, practically all new entrants are in excellent health, and the rate of mortality among them is very

low. In the course of time some of them fall into bad health, and the rate of mortality gradually rises, so that the mortality among a body of men who have been insured, say, ten years is much heavier than the mortality among a similar body of the same age who have been recently admitted. The rate of mortality, therefore, depends not only on the age, but also upon the length of time the lives have been insured; and as this peculiarity is due to the office selecting the good lives and rejecting the inferior ones, tables which allow for it go by the name Select Life Tables. In constructing every standard table used prior to 1882, all lives of the same age were grouped together irrespective of the length of time they had been insured, thus forming what is known as an *aggregate* mortality table; and although such tables are convenient for many purposes, especially for making a periodical valuation, their employment in the calculation of premiums results in the rates being too low for young entrants and too high for entrants of advanced age. The above-mentioned Select Tables are, therefore, generally adopted as the basis for the calculation of premiums. In the calculation provision has to be made for the expense of conducting the business, and a margin allowed to cover any unforeseen contingencies; the addition made on these accounts being called the *loading*, and the final result the *office premium*. The *net premium* is the figure arrived at before any allowance has been made for expenses or contingencies. The following table shows the 'expectation of life' (1) of newly-entered male lives; (2) of male lives who have been insured for ten years; (3) of assured male lives according to the aggregate method; and (4) of the general population. The figures in column (1) are all greater than the corresponding figures in column (2), thus showing the superior longevity of newly-entered lives over those who have been insured for a number of years. A comparison of columns (1) and (3) shows that the aggregate method overestimates the longevity of young entrants, and underestimates it in the case of those entering at age forty and upwards; and a comparison of column (4) with the other three columns shows that assured male lives as a class live considerably longer than the general male population.

Age.	Expectation of Life			
	Of newly-entered Males.	Of Males insured for more than 10 years.	Of Males, by the aggregate method.	Of the general Male population.
	(1)	(2)	(3)	(4)
20	43·3 years	42·4 years	43·7 years	39·5 years
30	35·6 ,,	34·9 ,,	35·6 ,,	32·8 ,,
40	28·2 ,,	27·6 ,,	27·9 ,,	26·1 ,,
50	20·9 ,,	20·5 ,,	20·6 ,,	19·5 ,,
60	14·8 ,,	14·0 ,,	14·1 ,,	13·5 ,,
70	10·3 ,,	8·7 ,,	8·7 ,,	8·5 ,,

The rate of mortality also varies in the different classes of assurance—policyholders in the endowment assurance class having greater longevity than those in the 'whole life with profits' class, who in turn are superior to the holders of whole life policies without profits. Although female *annuitants* are, on the average, longer lived than male annuitants, *insured*