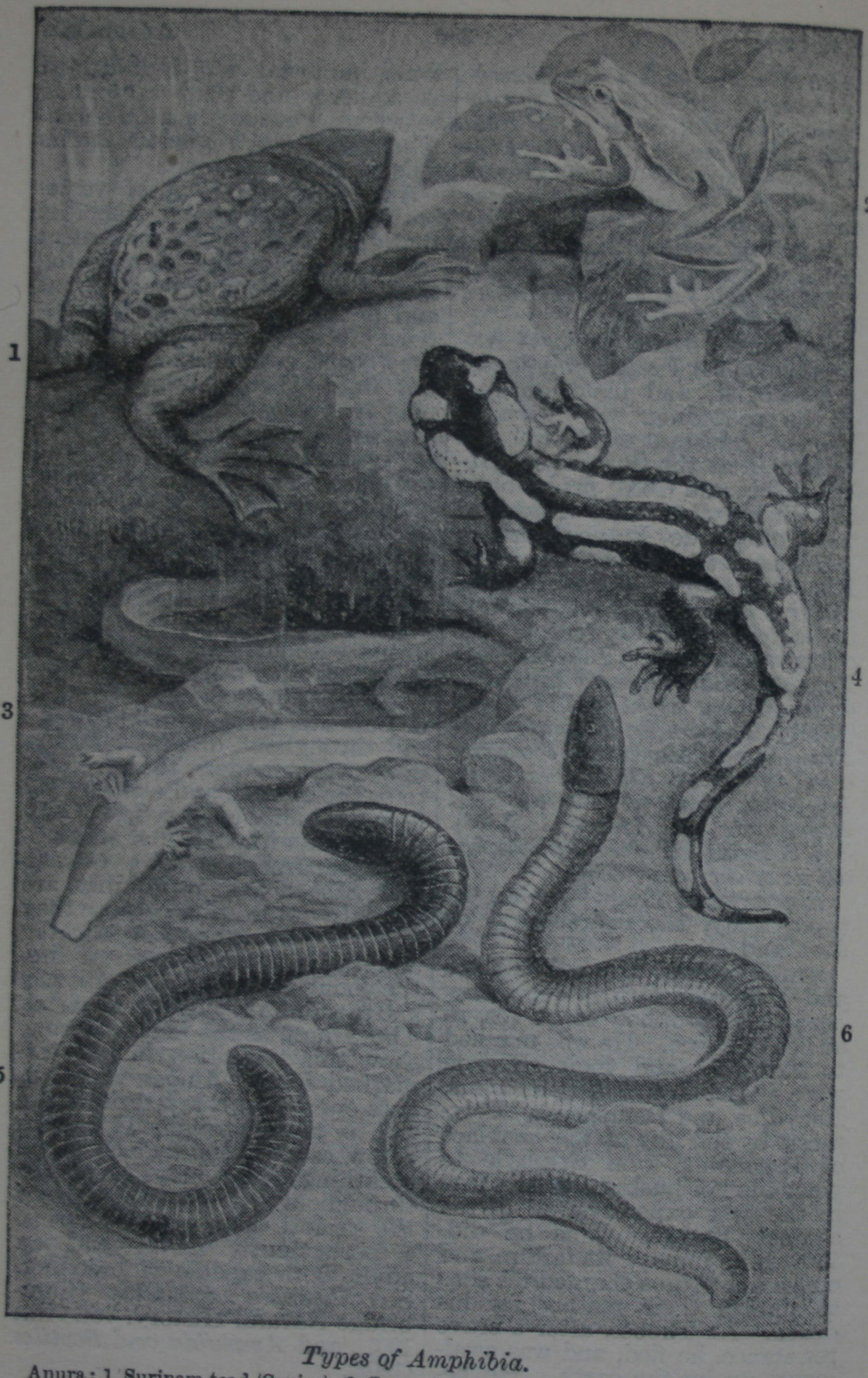
Théorie des Phénomènes électro-dynamiques (1830); *Essai sur la Philosophie des Sciences* (2 vols. 1834, 1843). See his *Journal et Correspondance* (1872); *André Marie Ampère et Jean Jacques Ampère; Correspondance et Souvenirs 1805–1864* (1875); Saint-Hilaire's *Philosophie des deux Ampères* (1866); Valson's *La Vie et les Travaux d'A. M. Ampère* (1886).

Ampère, Jean Jacques Antoine (1800–64), French philologer, archæologist, and historian, son of the preceding, was born at Lyons. Assistant of Fauriel and Villemain at the Sorbonne (1831–32), he became (1833) professor of French literature and history at the Collège de France, and in 1847 was elected to the Academy. His chief work, *L'Histoire Romaine à Rome* (1858) first appeared in the *Revue des Deux Mondes*. His other works include *Littérature et Voyages* (1834); *Histoire Littéraire de la France avant le XII^e^ Siècle* (1840); *Histoire de la Littérature Française au Moyen Age comparée aux Littératures Etrangères* (1841); *La Grèce, Rome et Dante* (1848); *Promenade en Amérique* (1855). See B. Saint-Hilaire's *Philosophie des deux Ampère* (1866).

Ampersand ('and' *per se*), in typography, the character & or & = 'and.'

Amphiaraus, son of Œcleus and Hypermnestra, a legendary hero and prophet of Argos in ancient Greece. He was married to Eriphyle, and their children were Alcmæon, Amphilochus, Eurydice, and Demonassa. Polynices, by the gift of the necklace of Harmonia, won Eriphyle to persuade her husband to join him in the first expedition of Seven against Thebes. This he did, though he foresaw its failure, and on leaving Argos charged his sons to punish their mother for his death. At Thebes, after a brave resistance, he fled, and was swallowed up by the earth. He became immortal, was worshipped as a hero, and had an oracle between Potniæ and Thebes. Æschylus's *Seven against Thebes* tells much of the story.

Amphibia, a group of vertebrates characterized by the fact that gills are typically present at some period of life, though the adults possess functional lungs and breathe air through the nostrils. When limbs are present, they bear fingers and toes, and are not fins. Though unpaired fins may be present, they never have supporting fin-rays, and the skin is typically smooth, soft, and scaleless. The heart is three-chambered, and the blood is cold. Development nearly always takes place in water, and the young usually pass through a metamorphosis. The following is an outline classification:—(1.) Anura, forms without tails when adult, including the frogs, toads, tree-frogs, and others. (2.) Urodela or Caudata, forms which keep the tail throughout life, such as the newts, salamanders, the cave proteus, the axolotl, and others. (3.) Gymnophiona or Apoda, worm-like forms without limbs, and subterranean in habit, such as *Cœcilia* and *Siphonops*. Amphibia are specially interesting because they mark the transition between the aquatic and the terrestrial life, the young being typically aquatic, and the adults typically terrestrial. The Anura, as the highest forms, show this transition in its best-marked form. Among the Caudata one larval characteristic, the tail, is always retained; and in a few cases the gills, the larval breathing organs, may also persist throughout life. In the case of the axolotl there are two forms, a permanently larval and an adult, both capable of breeding. See Gadow's *Amphibia* (Cambridge Natural History, vol. viii.; 1901), and *Amphibia and Reptiles* (1902).



Types of Amphibia.

Anura: 1. Surinam toad (Cuvier); 2. Green frog (life). Urodela or Caudata: 3. Proteus (Cuvier); 4. Salamander (life). Gymnophiona or Apoda: 5. Liphonops (D'Orbigny); 6. Cæcilia (Cuvier).

Amphiboles, a large group of minerals, the silicates of many different bases, the commonest being alumina, iron oxide, lime, magnesia, and the alkalis. They are constituents of many crystalline igneous rocks and of metamorphic schists. In many of their properties they closely resemble the pyroxenes, of which they are probably only a dimorphous form. They occur generally in black or dark green crystals, usually long, narrow, and bladelike; and, owing to their perfect cleavages, their surfaces are smooth and bright. The commoner varieties are hornblende (black), actinolite (dark green), tremolite (pale gray to white). The tendency to elongated fibrous forms is best seen in asbestos and crocodilite.

Amphibrach, a metrical foot of three syllables, the first and the last short or unaccented (˘), and the middle one long or accented (–). The Greek *ameinon* is a quantitative amphibrach. Compare the following accentual amphibrachic measure:—

There cáme to | the shóre a | poor éxile | of Érin;
The déw on | his thín robe | was heávy | and chíll.

Amphictyonic Council. An amphictyony was an assemblage of deputies of tribes (not cities) dwelling around any important temple, gathered together to manage the affairs of that sanctuary. Of numerous examples throughout Greece, the most celebrated was that which took its name first from the temple of Demeter at Anthela, near Pylæ, and afterwards from the temple of the Pythian Apollo at Delphi. Twelve tribes, with their colonies, composed the amphictyony of Delphi —Malians, Phthians, Œtæans (Ænianes), Dolopes, Magnetians, Perrhæbians, Thessalians, Locrians, Dorians, Phocians, Bœotians, Ionians. To the two annual meetings, in spring and autumn, each tribe sent two 'wardens' with voting powers, and several 'deputies' who might speak but could not vote. They bound themselves to observe certain intertribal principles of right, and thus the amphictyony became a political force. They agreed not to destroy any city of the league, nor wholly cut off its supply of running water, during war; but they would unite to punish those who had broken the compact, or had injured the temple of Delphi. These rules were, however, not fully realized in action. The first sacred war was declared against the Phocian city of Crissa (594 B.C.); in the second (346 B.C.) the Phocians were temporarily expelled from the league; and from the third (339 B.C.), against Amphissa, followed the destruction of Greek liberty by Philip of Macedon. The amphictyonic council continued, with limited powers, under Roman sway, the last mention of it occurring in the 2nd century A.D.

Amphilestes, one of the primitive mammals of the Jurassic epoch. Little is known of its anatomy, the remains which have been found being only lower jaws with teeth; it was probably related to the existing monotremes.

Amphimacer, a metrical foot consisting of three syllables, the first and last long (–), and the middle one short (˘)—*e.g.* Oīdĭpoūs.

Amphion, son of Zeus and Antiope, and twin-brother of Zethus. Their family was connected with Thebes. Lycus, Antiope's husband, maltreated her on finding her with child by Zeus; and the children, Amphion and Zethus, were exposed, but were brought up by shepherds. When they grew up their mother escaped to them, and told them her wrongs; whereupon they killed Lycus and Dirce, his second wife, torturing her by fastening her to a bull (represented by the famous Farnese bull in the

Naples Museum), and took possession of Thebes. They then fortified it—the stones uniting of their own accord to form the wall, moved by the strains of a lyre given to Amphion by Hermes. Amphion married Niobe, and after the death of his children slew himself. His story is told in Ovid, *Metamorphoses*, bk. vi., and in Apollodorus, bk. iii.

Amphioxus, or LANCELET (*Amphioxus lanceolatus*), is a small, pointed creature (length, 1½–2 in.), interesting as being one of the most primitive of vertebrates. It is a marine animal, widely distributed in shallow water off sandy shores, and differing in many striking ways from fishes. Thus, it has no limbs, no skull, no distinct brain, no jaws, no heart, no ears, no eyes; but it has down the back that important supporting structure, the notochord, which occurs at some period of life in all vertebrates. In most vertebrates this notochord is replaced at a very early stage by the vertebral column, a structure which is absent in amphioxus. Though exceedingly simple in structure as compared with higher vertebrates, amphioxus is in some respects specialized, possessing characters not represented in higher forms. It appears to be most nearly related to the degenerate tunicates or sea-squirts; but it is interesting to note that this fact is not of great assistance in bridging the gulf between vertebrates and invertebrates, for the relation of the tunicates to the invertebrates is still obscure. See Willey's *Amphioxus and the Ancestry of the Vertebrates* (1894).

Amphipoda, an order of Crustacea characterized by the fact that, of the six pairs of legs borne by the abdomen, the anterior three are used in swimming, and the posterior three are directed backwards and are used in jumping. Many species are known, but naturalists are not agreed as to their relationship. The order includes the sandhopper and the beach flea (*Talitrus* and *Orchestia*), and many other forms abundant in fresh and salt water. A few, such as *Cyamus*, the whale louse, are parasitic.

Amphipolis, anc. city, Macedonia, on the E. bk. of the river Strymon, near to its port Eion. The Athenians founded a colony here in B.C. 437. It is mentioned (Acts 17 : 1) as a stage in St. Paul's second missionary journey. The site is now occupied by the Turkish vil. of Neohorio. See Leake's *Travels in Northern Greece* (1835).

Amphisbænidæ, a family of aberrant lizards, found for the most part in America. They are from 18 in. to 2 ft. long, with a body of equal thickness throughout, head and eyes small, tail very short, limbs absent. The animals live underground, and feed on insects and worms.

Amphissa (formerly *Salona*), tn., Greece, to the W. of Mount Lyakura (Parnassus), 31 m. N.E. of Lepanto. It is connected with Itea, which serves as its port. In antiquity it was the capital of the Locrides Ozoles. In 339 B.C. the town was captured and destroyed by Philip of Macedon.

Amphitheatre, the structure, usually oval in its ground-plan, surrounding the arena which, in ancient Rome, was the scene of gladiatorial and other combats. The term is often held to include the arena also, but the amphitheatre proper was occupied solely by the spectators. Like the arena, it was roofless, and the seats were ranged in long tiers rising in successive gradation. Ruins of these ancient amphitheatres are found all over the area of the Roman empire, the finest specimen being the Flavian amphitheatre or Colosseum at Rome. Next in size is the amphitheatre at Capua, 558 ft. by 460 ft.; while that at

1

2

Roman Amphitheatres.

1. Verona. 2. Nîmes.

Nîmes is next in age. Verona possesses a beautiful example of the amphitheatre, which is in admirable preservation owing to the care bestowed on it during the middle ages. The amphitheatre at Pola, in Istria, had an arena of wood, which has disappeared, while the walls stand. Arles, in France; Italica, near Seville, in Spain; Cirencester and Silchester, in England; Alt-Ofen or Buda (*Aquincum*), in Hungary, are some of the many sites of Roman amphitheatres. The first of the buildings erected in stone dates from about 31 B.C., in the reign of Augustus; and they ceased to be built only with the decadence of the empire. But visitors to the modern Spanish bull-ring never fail to be struck with the fact that this is, in all essentials, the lineal descendant of the Roman amphitheatre; and the preliminary salute given by the performers to the 'president' recalls at once the emperor and the '*Ave, Cæsar!*' of the gladiators. See Lanciani's *Pagan and Christian Rome* (1893), and *Ancient Rome in the Light of Recent Discovery* (1889); J. H. Parker's *Historical Photographs of the Colosseum* (1878); and S. Dill's *Roman Society from Nero to Marcus Aurelius* (1905).

Amphitherium, a primitive mammal, remains of which are found in the Stonesfield slate (Jurassic) of England. Four imperfect jaw-bones have been obtained, and they indicate a small animal allied to the marsupials.

Amphitrite, a sea-goddess, wife of Poseidon or Neptune, and mother of Triton. In Homer the name is used simply of the sea.

Amphitryon, a Theban general, son of Alcæus and Hipponome, husband of Alcmena, and nominal father of Hercules. His name is commonly used as a synonym for a generous host. He gives title to comedies by Plautus, Molière (1668), and Dryden (1690).

Amphiuma, a genus of American amphibians, including long, eel-like forms, with weak, widely-separated limbs. Though gills are absent in the adult, the branchial aperture persists throughout life.

Amphora, a large, double-handled Roman vessel, of reddish-yellow coarse clay, for holding liquids. Two forms were common—(*a*) nearly spherical and short-necked, pointed at the base for setting in the earth; (*b*) semi-oval and long-necked. Very similar vessels were used to contain the ashes of the dead.

Amplepius, tn., Rhone dep., France, 30 m. N.W. of Lyons; manufactures textiles. Pop. 7,000.

Amplitude, the horizontal distance of a heavenly body from the east or west point. Its measure is the angle intercepted between the prime vertical and the vertical circle passing through the object, and it is thus complementary to the azimuth, which is measured from the north or south point.

Ampthill, par. and tn., England, co. of and 8 m. s. of Bedford. Pop. 2,200.

Ampthill, ODO WILLIAM LEOPOLD RUSSELL, FIRST BARON (1829–84), British diplomatist, born at Florence. From 1850–2 he was employed at the Foreign Office, whence he passed successively to the embassies at Paris, Vienna, Constantinople, and Washington. From 1858–70 he was secretary of legation at Florence, and at the same time the official representative of Britain at the Vatican. In 1871 he was sent as ambassador to Berlin, where he remained until his death, at Potsdam, in 1884. He took part in the Congress of Berlin (1878), and was raised to the peerage in 1881.—His son, ARTHUR OLIVER VILLIERS RUSSELL, SECOND LORD AMPTHILL (b. 1869), acted as private secretary to Mr. Chamberlain when Colonial Secretary, and was governor of Madras (1899–

1906). He was acting governor-general of India during Lord Curzon's absence in 1904. Since his return he has played an important part on the Conservative side of the House of Lords.

Ampulla, an ancient Roman vessel made of glass or earthenware, with wide body and narrow mouth, used for holding oil and other liquids. An ampulla, shaped like an eagle, is used in the British coronation ceremony.

Amputation is the operation of cutting away a limb, or a portion of a limb, either because of a hopelessly crushed or shattered condition, or to prevent the spread of disease. The aim is to remove all diseased, dead, or useless tissue, at the same time saving as much as possible, and leaving a useful stump, which will be serviceable alone, or which can have an artificial limb fitted to it. Amputations are broadly divided into the 'flap' and the 'circular' operation, modified as far as necessary to meet the necessities of the case. Bloodlessness, painlessness, and cleanliness — *i.e.* antisepsis — are the outstanding features of a modern operation, due respectively to the tourniquet or its equivalent, to anæsthetics, and to antiseptic treatment. See ARTIFICIAL LIMBS.

Amraoti, tn., cap. of the dist. of the same name, Berar, India, 90 m. S.W. of Nagpur, is an important centre of the cotton trade, both raw and manufactured. It is celebrated for its temples, one of them—the temple of Bhawani—built a thousand years ago. Pop. of dist. 630,000; of tn. 35,000.

Amravati, or AMARAVATI (*Amara Ishwara*), tn. in Kistna dist., Madras, India, is 20 m. N.W. of Guntur, and was one of the centres of the Buddhist kingdom of Vengi. It is of interest to the antiquarian; portions of its Buddhist tope, once of great magnificence, have been removed to the British Museum.

Amrilcais, or IMRU AL-KAIS, Arabian poet, son of Hodshr, chief of the Benu-Asad tribe, was a contemporary of Mohammed, against whom he wrote satiric verses. His *Moallaka* is rich in imagination, and seems to have served as a model for the Arabian poets of the following centuries. Editions have been published by Müller (1869), Frenkel (1876), Ahlwardt (Eng. trans. in *Six Ancient Arabic Poets*, 1870).

Amrili, or UMRILI, tn., Gujarat, India, on the Kathiawar pen., 140 m. S.W. of Ahmedabad. Pop. 14,000.

Amritsar, or UMRITSAR. (1.) An important commercial city, cap. of the dist. of the same name, in the Punjab, India, 32 m. E. of Lahore; the religious capital of the Sikhs; founded (1574) by Guru Ram Das, who excavated a sacred tank, which gives the city its name (lit. 'pool of immortality'), and in the midst of which is the chief temple of the Sikhs. Noted for its cashmere shawls and silks. Amritsar suffered severely from earthquake in April 1905. Pop. 163,000. (2.) District; area, 1,601 sq. m.; pop. 1,024,000.

Amru, Ibn-el-Aas (?600–663 A.D.), an Arab general, who at first opposed Mohammed, but later became a convert, joining the prophet in his refuge at Medina. Under Abu-Bekr he conquered Syria (634), and in the caliphate of Omar served in Palestine, capturing Cæsarea in 638. In 639 he invaded Egypt, took Misrah (the ancient Memphis), and Alexandria (641). He is credited with having projected a canal between the Mediterranean and Red Seas; and with causing the destruction of the famous library of Alexandria, but this charge is probably unfounded.

Amrua, or UMROHAH, tn., United Provs., India, 80 m. E.N.E. of Delhi. Pop. 40,000.

Amsler, SAMUEL (1791–1849), engraver, born at Schinznach, Swit-

zerland. In 1829 he became professor of engraving at the Academy of Fine Arts, Munich, where he died. His works are best represented by the *Triumphal March of Alexander the Great*, after Thorwaldsen; the *Triumph of Religion in the Arts*, after Overbeck; and several *Virgins*, after Raphael.

Amsteg, vil., Canton Uri, Switzerland, in the Reuss valley, on the St. Gothard Ry., 7 m. S.E. of Altdorf, is a tourist resort.

Amstelodamum, the Latin name of Amsterdam, used in all Latin books issued from the Amsterdam press.

Amsterdam. (1.) Seapt. and largest city, Netherlands, prov. N. Holland, stands at the mouth of the Amstel, on the Ij bay at the S.W. corner of the Zuider Zee, and is connected with the North Sea, 15 m. to the W., by the North Sea Canal, which gives access to the largest vessels. Although its shipping trade is less than that of Rotterdam, Amsterdam is the commercial capital of the Netherlands. It is the headquarters of Dutch finance and of the shipowning interest, and the principal market for the produce of the Dutch E. Indies, especially rice, coffee, sugar, tobacco, tin, and spices. The city is intersected in every direction by canals. In the older central parts of the town the more conspicuous buildings are constructed of brick, in the Dutch style of the 16th and 17th centuries. On the S. bank of the Ij are the docks and quays, and in the midst of these the central railway station (1889). Southwards from the central harbour are the church of St. Nicholas (1885–6); the old church (*c.* 1300); the new exchange (1900); the new church, a cruciform basilica in the Late Gothic style; the royal palace (1648–55), the university (1754), attended by about 1,000 students; the Royal Academy of Sciences; and the arsenal. Further south are three large museums. One of these, the National Museum, erected 1877–85, is the most important art depository in the Netherlands. The others are the Museum Fodor (1860) and the Museum Suasso (1892–5), both containing paintings by modern Dutch artists. In the same quarter is the Vondel Park, and the Palace for National Industry (1855–64), used principally as a 'people's palace.' Amsterdam also possesses zoological and botanical gardens. Prominent industries are diamond cutting and polishing, sugar-refining, the manufacture of tobacco and cigars, rice-husking, saw-milling, shipbuilding, brewing, engineering, the preparation of cobalt, borax, and camphor, and the manufacture of chocolate, glass, porcelain, jewellery, cottons, woollens, leather, liqueurs, etc. In addition to the E. Indian goods already mentioned, Amsterdam imports tea, indigo, cocoa, hides and skins, cereals, timber, petroleum, rapeseed, linseed and other oil seeds, and coal; and exports butter, cheese, margarine, paper, and hides. Pop. 570,000. In the 13th century Amsterdam was merely a fishing village, but rapidly grew in importance, especially after the middle of the 16th century, when the United Provinces shook off the Spanish yoke. Its commercial supremacy is in great part owing to the foundation of the Dutch E. India Company in 1602, and the Bank of Amsterdam (1609–1796). In 1808 the city was chosen as the capital of the Netherlands by Louis Bonaparte. The present epoch of prosperity dates from the opening of the North Sea Canal (1876). Distinguished natives are Spinoza (1632), Swammerdam (1637), and the poet Bilderdijk (1750). See Bredin's *Amsterdam* (1897–1904) and Kroon's *Amsterdam* (1888). **2.** City, Montgomery co., New York,

U.S.A., situated on the Mohawk R. and Erie Canal, 33 m. N.W. of Albany. It manufactures carpets, woollens, hosiery, steel springs, brooms, etc. Pop. 32,000.

Amu Daria, OXUS, or JIHUN, riv., Russian Central Asia, formed by two streams which rise on the Little Pamir near the Indian frontier—(1) the Ak-su ('white water'), from which, perhaps, the ancient name Oxus is derived, which issues from the Gaz Kul, and is called lower down the Ak-tash and then the Murghab; and (2) the Panj, the sources of which flow from the glaciers of the Hindu-Kush, N.W. of the Kitik Pass. After the confluence of these, the river emerges into the Aralo-Caspian plain. It then flows N.W. Having skirted the N. boundary of the Khiva khanate, it enters the Sea of Aral by a large delta 327 ft. above sea-level, after a course of some 1,400 m. Steam navigation extends from Charjui up to Faizabad-kala (370 m.), and down to Kungrad in the delta (350 m.).

Amulet. (1.) Any object worn suspended or attached to the person, as a charm against disease, or as the medium of good fortune. The ancient Chaldæans and Egyptians wore these charms in divers forms. The Jews' phylactery was essentially an amulet. Curative amulets, often consisting of texts from the Koran written on strips of paper, are worn by Mussulmans. The old Norsemen were fond of wearing an image of Thor as an amulet. In ancient Etruria special heed was given to waxen *phalli*. Italian peasants carry amulets in the form of pigs, mice, bulls, and crosses of oak twigs (see C. G. Leland's *Etruscan-Roman Remains*, 1892). Lamaists carry an image of Buddha (*burkhan*), generally made of terra-cotta, and worn in a case (*gavo*) round the neck. Sometimes more than one is worn by the same person, and they are worn on the back as well as on the chest. The serpent amulet is all but universal; nails symbolically inscribed were widely used (see Elworthy's *The Evil Eye*, 1895); while pebbles, certain seeds, and crystal balls were common in Britain (see Black's 'Scottish Charms,' *Proc. Soc. Antiq. Scot.*, vol. xxvii.). Compare the 'luck of Edenhall,' a painted glass goblet preserved as a magic heirloom by the Musgrave family in Cumberland, and the story of *The Talisman* which Sir Walter Scott wove about it. See J. C. Lawson's *Modern Greek Folklore and Ancient Greek Religion* (1910), and W. H. S. Jones's *Malaria and Greek History* (1909). (2.) A term applied in architecture to a ringlike moulding on a column. (3.) In decorative art, a band painted in relief round a vase or similar object. (4.) In heraldry, a ring borne as a charge, being a mark of cadency.

Amun. See AMMON.

Amundsen, ROALD (1870), Norwegian navigator, born in Christiania, became a sailor at an early age, and was a member of the *Belgica* Antarctic expedition in 1897–9. On his return he planned an expedition for the discovery of the North-West Passage, and fitting out a 60-ton schooner, the *Gjoa*, he sailed from Christiania on June 1, 1903. He was the first to make the passage from Europe to Alaska, and reached Fort Egbert, Alaska, on Dec. 5, 1905. See his narrative, *The North-West Passage* (1908).

Amur, a province of E. Siberia lying between the Amur R. and the Stanovoi range on the N. The greater part is mountainous and covered with forest, especially in the W., and the broader valleys are marshy. The wet summer and cold winter, without snow, are unfavourable to farming. The mean winter temperature is −9° F., and the summer 66° F. Gold is extracted, chiefly by convicts, on the Jalinda and other rivers. The

conquest of the Amur was commenced in 1650 by the Cossack Khabarov; but the country was ceded by China to Russia only in 1858, by the treaty of Aigun. Area, 172,800 sq. m. Pop. 160,000. See works cited under CHINA and MANCHURIA.

Amurath, or MURAD, name of several Sultans of Turkey.

Amurnath, or HAMARNATH, a cave in the mountains of N.E. Kashmir, is the reputed abode of the god Siva, and a resort of Hindu pilgrims.

Amur Petroglyphs. Unknown to science until a few years ago, these curious and apparently very ancient sculptures are traced on a series of boulders at the mouth of the river Orda, a tributary of the Amur. They represent conventionalized drawings of the human face and of animals, in wavy and spiral lines, with faint suggestions of Chinese affinities. These petroglyphs were first discovered by the officers of the United States Jesup North Pacific Expedition.

Amur River, one of the most important rivers of Asia; also named the He-lung-Kiang, or Black Dragon R., by the Chinese, and the Sakhalinula, or Black Water, by the Manchus. It is formed by the union of the Shilka and the Argun, the former rising on the N. flank, and the latter on the S. side, of the Khan-ula range. The total length is about 2,760 m. On its course the Amur breaks through the Great Khingan and Little Khingan ranges, and from the mouth of the Usuri is forced northwards by the Sikhota-alin Mts., entering the sea at Nikolaievsk, not far from the N. end of Sakhalin I. The fall is slight and the current moderate. Steamers ply regularly during the season of navigation, May to October, up to Strietensk on the Shilka. The great tributary, the Sungari, affords navigable waterways 1,300 m. in length. The Usuri gives access also by the Sungacha to Lake Khanka, 3,070 sq. m. in area; and other tributaries of the Amur, the Zeya, Bureya, and Amgun, are navigable for short distances. The total length of navigable waterways is nearly 8,400 m. See Vend's *La Conquête du Fleuve Amour* (1894), and Holmes's *Down the Amur* (1901).

Amyclæ, anc. tn., 2½ m. S.E. of Sparta, chief town of the Achæans; it remained unsubdued long after the Dorian conquest. It was said to be the birthplace of Castor and Pollux. Its early prosperity has been proved by the discovery of a splendid tomb belonging to its princes, which contained, among other treasures, two magnificent gold cups, the finest specimens of Mycenæan art.

Amygdaleæ, a sub-order of the Rosaceæ, including many trees with stone fruits—*e.g.* almond, peach, cherry, laurel.

Amygdalin ($C_{20}H_{27}NO_{11}$), a glucoside occurring in the bitter almond, in laurel leaves, and in the kernels of the peach, apple, and pear. Bitter almonds are crushed, the pressed cake is boiled with alcohol, and the clear liquid concentrated; ether is then added, and amygdalin is precipitated in the form of white crystalline scales. Amygdalin is decomposed by emulsin (also present in almonds) or by dilute acids, into benzaldehyde, glucose, and prussic acid.

Amygdaloidal, a name given to igneous rocks, usually old lava flows, full of almond-shaped cavities which have been filled up with secondary minerals, such as calcite, agate, or the zeolites. These cavities vary in size up to several inches across, and were formed while the rock was still fluid and in motion.

Amyl (C_5H_{11}), an alkyl radical in a number of organic compounds. Of these, amyl alcohol

occurs in fusel oil; amyl nitrite is a powerful poison, with a specific action on heart and blood-vessels, and is inhaled in small doses in certain diseases of the heart and in asthma; amyl acetate is used as a flavour and solvent etc.

Amyloid. See WAXY DISEASE.

Amylopsin, the diastatic ferment in the pancreatic secretion. See PANCREAS; DIGESTION.

Amyntor, GERHARDT VON, pseudonym of Dagobert von Gerhardt.

Amyot, JACQUES (1513–93), translator of Plutarch (his version has become one of the classical works of French literature), grand almoner of France, bishop of Auxerre, was born at Melun, of humble origin; made by Marguerite of Navarre professor of Greek and Latin at Bourges University. There he translated the *Æthiopica* (1547) of Heliodorus and some of Plutarch's *Lives*. He attended the Council of Trent, and on his return became tutor to Charles and Henry, the sons of Henry II. It is to the latter that the *Vies de Plutarque* (1559) are dedicated. In 1570 he was created bishop of Auxerre. The *Œuvres Morales de Plutarque* appeared in 1572. His other works include versions of Diodorus Siculus (1554), and of *Daphnis and Chloe* (1559). Reprints of his *Plutarch:* 1783–7 (22 vols.); 1801–6 (25 vols.); 1818–21 (25 vols.). See A. de Blignières' *Essais sur Amyot* (1851); Sainte-Beuve's *Causeries du Lundi*, vol. iv.

Amyraut, or AMYRALDUS, MOSES (1596–1664), Protestant theologian. A pupil of Calvin, he wrote *Traité de la Prédestination* (1634), *Traité des Religions* (1631), and many other books. He made the University of Saumur the principal school of Protestantism in France. See Fraissinet's *Essai sur la Morale d'Amyraut* (1889).

Amyris, a genus of tropical plants with fragrant resinous juice—*e.g.* myrrh, frankincense.

Anabaptists, a Christian sect which appeared in Germany at the time of the reformation. They denied the validity of infant baptism, and preached a new social organization with absolute equality and community of goods—doctrines which they also extended to their domestic relations as well. The history of this sect was brief but eventful. They first came prominently forward in 1521 at Zwickau, in Saxony, under Thomas Münzer and others, who styled themselves the Prophets of Zwickau. Luther spoke strongly against them, urging the princes in whose states they appeared to suppress them. Münzer travelled through Bohemia, Thuringia, Switzerland, etc., preaching his theories with great success. In 1525 he adroitly fomented the deep dissatisfaction of the peasants of the south and middle of Germany, who were in revolt against their lords in what is known as the Peasants' war. The peasants were completely defeated at Frankenhausen (May 15, 1525), and Münzer and other leaders were executed; but the movement was continued by propagandists throughout Germany, Switzerland, and the Netherlands. The sect gained considerable power in Münster, Westphalia, where, under the leadership of Johann Bockhold, a tailor of Leyden, better known as John of Leyden, they secured possession of the town in 1533, and founded a new theocratic state. John of Leyden, who called himself prophet and king of the New Zion, ruled here absolutely, and made preparations for the conquest of the world. The town was besieged by several princes, and after an obstinate resistance was taken on June 24, 1535. John of Leyden, Knipperdolling, and other leaders were executed, and the movement gradually died out. The name was, however, applied

generally to the extreme party which revolted against the abuses of the Roman Catholic Church, but which is not to be exclusively identified with the fanatic sect dishonoured by the excesses of Münzer and John of Leyden. In this more moderate form Anabaptism was the precursor of the later Baptist movement. See PEASANTS' WAR; also Hase's *Neue Propheten* (3rd ed. 1893); Cornelius's *Geschichte des Münsterschen Aufruhrs* (2 vols. 1855–60); Mackinnon's *History of Modern Liberty*, vol. ii. (1906); Beard's *The Reformation;* Lindsay's *History of the Reformation*, vol. i.; Heath's *Anabaptism* (1895).

Anabasis of Cyrus, a historical account by Xenophon of the campaign of the younger Cyrus against Artaxerxes, and of his own famous retreat with the Ten Thousand. — The ANABASIS OF ALEXANDER, the story of Alexander the Great by Arrian.

Anabolism, as opposed to katabolism, the constructive or synthetic changes in protoplasm. See METABOLISM.

Anacharis. See CANADIAN PONDWEED.

Anacharsis, a noble Scythian who visited Greece about 590 B.C., and gained much admiration by his manner of life and acute observations on Greek society. He was acquainted with Solon. Letters attributed to him, but certainly forgeries, are extant. See Herodotus, bk. iv.; and compare Barthélemy's sociological novel, *Voyage du Jeune Anacharsis en Grèce* (1788).

Anachronism (Gr. *ana*, 'back;' *chronos*, 'time'), the reference of a circumstance, custom, or mode of speech to a wrong date. The exact significance of an anachronism depends on the intention of the writer in whom it is found. The English and Spanish dramatists are full of anachronisms, but as they make no pretence of preserving local colour or historic truth, these errors can scarcely be counted as artistic faults. Calderon, in his *Virgen del Sagrario*, introduces a bishop who is supposed to live three hundred years before the discovery of the New World, yet who quotes Herodotus as an authority on America; while it is not uncommon in Spanish religious plays to find Adam, the prophets, and Christ all on the stage at once. Shakespeare's own liberties in the same direction are well known. He transports all our modern customs and usages, the observance of May day, and the institution of nunneries, to the court of Duke Theseus (*Midsummer-Night's Dream*). So, too, in *Julius Cæsar* we have a reference to clocks striking the hour. These slips are of little consequence, however, for the avoidance of them is no part of the author's artistic theory. But when Agamemnon, in *Troilus and Cressida*, quotes Aristotle, the anachronism becomes a positive fault, because the poet is evidently trying to produce an effect by an appeal to the historic sense. In the case of historical novelists it is almost impossible to avoid an occasional transposition of events—as where Scott, for example, quotes in *Kenilworth* from the *Midsummer-Night's Dream*, in a scene dated several years before the writing of that drama. Such an error as this, however, is immaterial so long as the general effect is true to the spirit of the age, and is much less serious than the procedure of the modern French romantic dramatists, with Victor Hugo at their head, who have elevated historic truth of fact into an absolute law of the drama, but who do not scruple to commit the graver anachronism of attributing to their characters sentiments and ideas utterly foreign to the age

they lived in. Anachronisms have in almost all ages been perpetrated by painters of sacred Christian subjects—Dutch, German, etc., peasants being depicted as disciples of Jesus.

Anacoluthon (Gr. *an*, 'not;' *akolouthos*, 'following'), a want of grammatical sequence, produced by a sudden change of construction in the middle of a sentence: *e.g.* 'Whoso desireth to live happily—let him make virtue his friend.'

Anaconda, a very large boa of aquatic habits. See BOA.

Anaconda, tn. and co. seat of Deer Lodge co., Montana, U.S.A., 30 m. N.W. of Butte (where the well-known Anaconda copper mine is situated). Its principal industry is mining copper, and it possesses some of the largest smelting works in the world. Pop. 13,000.

Anacreon of Teos (*c.* 560–478 B.C.), celebrated lyric poet; removed to Abdera in Thrace about 544 B.C.; afterwards lived with Polycrates, despot of Samos, until his death (522), and then with Hipparchus at Athens. He was a poet of pleasure, love, and wine. There are few genuine fragments; though a great body of poems, most of which are of much later date, bear his name. Moore's imitations give an idea of their spirit. Both they and the genuine fragments are included in Bergk's *Poetæ Lyrici Græci*, vol. iii. (1843). Short lyrical poems in praise of love or wine are called ANACREONTIC—*e.g.* the Anacreontic and Bacchanalian division of Herrick's *Hesperides* (1648). See H. W. Smyth's *Greek Melic Poets* (1900).

Anadiplosis (Gr.), the rhetorical figure of simple repetition—*e.g.* 'O earth, earth, earth,' etc.

Anadyomene, an epithet of APHRODITE.

Anadyr, riv. in E. Siberia, rises in Stanovoi Mts., flows through an uninhabited region, and after a course of 460 m. falls into the Gulf of Anadyr, in Bering Sea.

Anæmia (Gr. 'want of blood'), a deficiency or poverty of blood, mainly due to changes in the red blood corpuscles. (See BLOOD.) Symptoms are: pallor of skin and mucous membranes, weakness and lassitude, breathlessness, headache, dizziness, neuralgia, dyspepsia. The conjunctivæ are white, and there is often œdema of the lower eyelids and the feet and ankles. The heart is often dilated, with systolic murmurs, and a humming may be heard in the veins of the neck. There is generally little loss of weight; the patient is often plump. Anæmia often ensues on hæmophilia, scurvy, nose-bleeding, purpura, hæmorrhoids, menorrhagia, hæmoptysis, hæmatemesis, etc. Insufficient or indigestible food, internal parasites, the strain of lactation, bad hygienic conditions, cardiac diseases, and lung disease commonly cause secondary anæmia. Two of the commonest causes in young girls are constipation and insanitary or overcrowded bedrooms. But there are also anæmias called primary, probably due to disease of the blood-forming organs. Since secondary anæmia is only a symptom, its treatment depends on the disease which causes it. In its worst forms, anæmia, then called *pernicious*, is supposed to be primary. In all cases, treatment consists in physical and mental rest, healthy and cheerful surroundings, attention to the state of the mouth and teeth, regulation of the bowels, and careful attention to diet. Transfusion of blood is resorted to in dangerous cases. Arsenic and iron are the most reliable drugs. Intestinal antiseptics, such as salol, naphthol, and salicylate of bismuth, are useful. See CHLOROSIS; also Bramwell's *Anæmia* (1899), W. Hunter's *Pernicious Anæmia* (1901).

Anæsthesia (Gr. 'want of sensation'), the local or general absence of sensation, whether due to disease (morbid anæsthesia) or to artificial means (anæsthetics). For the morbid condition, see SENSATION. General anæsthetics act on the central nervous system; local anæsthetics act on nerve-endings, leaving the central system usually unaffected. For the former, see CHLOROFORM, ETHER, NITROUS OXIDE ('laughing gas'), and ETHYL CHLORIDE; HYPNOTISM also is important in this respect. For local anæsthetics, see COCAINE, EUCAINE, and HOLOCAINE. Laudanum and similar anodynes are not properly anæsthetics. The hypodermic injection of water produces a certain amount of local anæsthesia; and a tight ligature has the same effect. Suprarenal extract has lately been recommended as a local anæsthetic, hypodermically injected, or applied to mucous membranes.

NEW LOCAL ANÆSTHETICS. An increasing number of major operations are now performed under local anæsthesia. For example, an amputation, or exploratory incision into the abdomen, or the removal of cysts or tumours in various situations are frequently carried out under local anæsthesia; for many years past cocaine has been largely substituted for chloroform for operations on the eye and interior of the nose. Various cocaine substitutes have been lately introduced; of these one of the best is novocaine. Its local anæsthetic power is about equal to that of cocaine, and its toxidity, as determined in frogs, mice, and rabbits, only about one half that of cocaine. Various combinations of novocaine with suprarenin are largely used for dental purposes, and for spinal anæsthesia. Stovaine, eucaine, and tropacocaine are other valuable preparations, also largely used often in conjunction with adrenalin. (See ADRENALIN and ANÆSTHESIA SPINAL.)

ANÆSTHESIA BY ELECTRICITY. Electric Narcosis. In 1907 Leduc described a condition which he termed electric narcosis, a state which he induced by the application of electric currents to the brain, and during which the subject is without voluntary movement, makes no reply to stimulation, and exhibits only some reflex movements—the beating of the heart and respiration. This state can be maintained for several consecutive hours, and ceases immediately with the stoppage of the current. As in chloroform or ether narcosis there is at first excitement; but by first raising the current very slowly this is followed, without a movement or sign of pain, by a state of cerebral inhibition analogous to chemical narcosis. The animal reacts to no stimulus, any operation can be done on it, and the limbs if moved seem to be under no influence except that of gravity. Several operations, both of a minor and major character, have been carried out on the human subject under electric narcosis with complete success. This subject may in the near future influence medicine and surgery to an extent little suspected by the medical profession as a whole.

ANÆSTHESIA SPINAL. The idea of producing anæsthesia by making injections into the spinal subarachnoid space was originally suggested by the American neurologist, Corning, but was first put into practice by Bier. He used cocaine on eight occasions on the human subject, but discontinued the method owing to its dangers. In the last five years, however, improvement in technique and the use of drugs similar in effect to cocaine, but without some of its toxic properties, have led many surgeons to test anew the value

of the method; and there is now a very large amount of recorded experience, for the most part favourable in character. The drugs employed are stovaine, tropacocaine, or novocaine, a small amount of adrenalin (see ADRENALIN) being frequently added. About 1 c.c. of anæsthetic solution, previously carefully sterilized, is used for the injection. For the operation the patient is placed either in the sitting posture and leaning forwards, or lying on the side with the limbs and head forward. The spine of the fourth lumbar spinal vertebra is then defined, corresponding in line with the highest points of the iliac crests. The space above this spine is the one usually chosen. After sterilization of the skin, the needle in its canula is introduced into the middle line and pushed forwards and upwards for about one and a half inches. At this point the stiletto is withdrawn, and the canula is pushed slowly onwards until cerebro-spinal fluid begins to flow. This flow is permitted to continue until about 8 to 10 c.c. have escaped, and the syringe now contains 1 c.c. of anæsthetic mixture diluted with cerebro-spinal fluid. This is then slowly injected into the cavity of the cord. In from ten to fifteen minutes there is an absolute anæsthesia of the abdomen, trunk, and limbs below the seat of the injection, and any major operation on these parts can be carried out as painlessly as in chloroform anæsthesia. The patient may be chatting and taking an intelligent interest in the operation. In a few cases severe headache, vomiting, rise of temperature, and collapse are a sequel to this form of anæsthesia, and a few deaths have been recorded. Many thousands of major operations have been done in the course of the last few years under special anæsthesia, and without a doubt it is an important adjunct to treatment. Care is, however, necessary in the selection of cases. It is not suitable for patients under 15 years of age; diseases of the central nervous system, either of an organic or functional kind, are contra-indication to its use, and it should not be used in cases of fever or septic infection of any kind.

Anagni, tn., prov. Rome, Italy, 46 m. by rail S.E. of Rome, has been an episcopal see since the 5th century. Large portions of the ancient walls remain. The cathedral dates from the 11th century. Pop. 10,000.

Anagoge, or ANAGOGY (Gr. 'a leaping up'), a raising of the mind to celestial things; a mystical interpretation of the plain narrative of Scripture, as when Gregory the Great, in his *Commentary on Job*, explains the apostle Peter's warming himself at a fire of coals during Christ's trial as being typical of the coldness of heart which would lead him presently to deny Christ. See ALLEGORY.

Anagram (Gr. *ana*, 'back;' *gramma*, 'a letter'), a new word or phrase formed from an old one by the transposition of its letters. In the middle ages a mysterious power of divination was supposed to reside in the anagram; and thus, from the letters of Pilate's question, *Quid est veritas?* (What is truth?), the monkish anagrammatists produced the answer, *Est vir qui adest* (It is the man before you). The anagram is often employed in the manufacture of pseudonyms. The name Voltaire, for example, is formed from the letters of 'Arouet l(e) j(eune);' and Barry Cornwall is an imperfect anagram formed from Bryan Waller Proctor. Out of Horatio Nelson Dr. Burney fashioned *Honor est a Nilo.* Addison classes the anagram and the acrostic together as species of 'false wit,' adding trenchantly,

'It is impossible to decide whether the inventor of the one or the other were the greater blockhead' (*Spectator*, No. 60). In more recent times it has shared the fate of the "Limerick" as a theme for prize competitions in cheap periodicals. See Wheatley's *On Anagrams* (1862), and Dobson's *Literary Frivolities* (1880).

Anahuac, the great central table-land of Mexico extending from the valley of Mexico to El Paso, on the Rio Grande del Norte. The name ('amid the waters') referred originally to the coast-lands of Mexico; but since the end of the 16th century has been applied to the central table-land, because of the numerous lakes in the valley of Mexico. With a uniform elevation of 7,500 ft., the plateau has an absolute incline from the capital to El Paso (1,225 m.) of only 3,632 ft. The plateau is cut by *barrancas* or cañons formed by streams.

Anakapalle, tn., Madras, India, 20 m. w. of Vizagapatam; produces sugar and cotton. Pop. 18,000.

Anakim, or SONS OF ANAK, a race of giants mentioned in Scripture (Josh. 11 : 21 *f.*; Num. 13 : 33) who occupied the mountains about Hebron, and were also found to the north, near the Mediterranean. They were conquered by Joshua and Caleb.

Analecta, or ANALECT (Gr. 'things gathered'), a literary collection or anthology.

Analgesics. See ANODYNES.

Analogy. (1.) In logic, a form of proof and instrument of investigation. If two objects, X and Y, resemble each other in a number of characteristics *abcd*, and X has the further characteristic *e*, then it is a matter of more or less probable inference that Y has this characteristic also: such an inference is called inference by analogy. The presence of *e* in Y is inferred from the presumed connection of *e* with the common characters, or common structure, *abcd*. But inasmuch as this connection is not shown to be necessary, but only presumed on the strength of its actual occurrence in X, the analogical inference is only probable, and, if the conjunction of *e* with *abcd* be only accidental, may be mistaken. If, for example, I hear one Liberal candidate supporting a certain measure, and infer that the Liberal candidate in another constituency will support the same measure, I may be mistaken, if the measure in question is one upon which the Liberal party are not agreed. I was arguing from the common character of Liberalism predicated of both candidates; but the connection between Liberalism and the particular measure in question was not made out, but only presumed. It is sometimes said that the value of an analogical inference depends on the proportion of the known resemblances between X and Y to the known differences between them, and, again, to the total number of their respective qualities. But any such quasi-numerical statements are misleading. The real point is the degree of probability attaching to the connection of *e* with *abcd*. Thus, if in the above illustration it could be shown that the political measure in question was logically connected with other measures in the Liberal programme, the force of the analogy would be greatly strengthened; though even then the argument would be only probable, since politics is not ruled exclusively by logic. In a sphere of abstract necessity, such as mathematics, analogical proof has no place. See J. S. Mill's *System of Logic*, bk. iii. ch. 20; and Bosanquet's *Logic*, bk. ii. ch. 3 (1888). (2.) In biology, analogy is morphological conception, distinguished from homology. When two organs fulfil the

same function, they are said to be analogous, whether they are or are not structurally similar. For example, the wings of butterfly and bird are analogous organs; but they are not homologous, for their development and structure are strikingly different.

Analysis. (1.) In logic. A clear distinction must be kept between the analysis which consists in resolving a datum into its elements, and the analysis which is a logical method for finding the premises by which a conclusion can be established. Examples of the former kind are the chemical analysis of a given substance into its elements, the grammatical analysis of a sentence into its several parts, and the logical analysis of an inference into premises and conclusion. Analysis as a logical method is most easily illustrated from geometry. If we are required to prove a theorem A, we may begin by supposing it true, and try to deduce some consequence B which, if true, implies in turn the truth of A, and similarly proceed from B to C. When we have thus arrived at some proposition (say D) which we know to be true, the analytic process is complete, and we can then deduce the truth of A *synthetically* from the known truth of D, through the intermediate steps C and B. The logical process of induction by hypothesis (see INDUCTION) is essentially similar.

(2.) In MATHEMATICS, analysis denotes the algebraical as contrasted with the geometrical treatment of the properties of figures.

(3.) In CHEMISTRY, analysis is the process of separating a compound body into its constituents. Proximate analysis is the separation of one or more compounds from a mixture. Milk contains water, fat, sugar, casein, and mineral salts: a separation of these from each other is a proximate analysis. Ultimate analysis is the further separation of these compounds into their elements. Analysis may be *qualitative* or *quantitative*. In the former we determine the various ingredients or elements, in the latter their exact proportions. The qualitative analysis of inorganic substances is based on the fact that every element will, under suitable conditions, give a reaction which is characteristic. Quantitative methods are based on the laws of definite proportions (see ATOMIC THEORY), and on the fact that all chemical compounds, however produced, have a fixed and definite composition. In qualitative analysis there are *dry* reactions, performed on the solid at a high temperature, and *wet* reactions, where the substance is in solution. Compounds which have reactions in common are grouped together, and by systematic methods all the ingredients of a complex mixture can be detected. Quantitative analysis is divided into many branches. Gravimetric methods are those in which the reaction forms an insoluble compound. By filtration, washing, and ignition these compounds are obtained pure, and are weighed. In volumetric methods solutions of known strength are used, the end of the reaction being made known by the use of an indicator, such as litmus, etc. In commercial analysis only those substances which give value to the product are determined: in manures, the phosphoric acid, nitrogen, and potash; in bleaching powder, the available chlorine; in coal, its calorific value. The microscope, spectroscope, and polariscope are used in special cases; and some substances are decomposed, and one or more of the ingredients estimated, by the use of the electric current. Assaying, gas anal-

ysis, water analysis, and organic analysis are all branches of the same subject, and involve special theoretical and practical training. See ASSAYING; and Fresenius's *Qualitative Analysis* (1897), also his *Quantitative Analysis* (1876); Sutton's *Volumetric Analysis* (1896); Hempel's *Gas Analysis* (1902); Blyth's *Foods: Composition and Analysis* (4th ed. 1896); Allen's *Commercial Organic Analysis* (2 vols. 1896–1901); Phillip's *Manual of Assaying and Metallurgy;* Lewkowitsch's *Chemical Analysis of Oils, Fats, and Waxes.*

Analyst, PUBLIC, an official appointed by the local authority of a borough or county to analyze samples of food and drugs under the conditions of the Food and Drugs Acts, 1875 and 1899. After appointment by the local authority, the analyst has to satisfy the Local Government Board as to his qualifications; they confirm the appointment, and the analyst can only be dismissed from office by the same authority. The qualification now generally accepted is the Fellowship of the Institute of Chemistry (F.I.C.), which must include the extra certificate in therapeutics, pharmacology, and microscopy. For his duties under the act, see ADULTERATION. The analyst has to send in a quarterly report to the local authority as to the work he has performed during the quarter, and once a year a summarized report has to be transmitted to the Local Government Board. A special provision of the act allows the analyst's certificate to be taken as evidence without his presence in court, but the defence may call him as a witness.

Analytical and SYNTHETICAL JUDGMENTS, in logic, a Kantian distinction which has been the subject of much controversy. The analytical or explicative judgment is one in which the predicate merely states explicitly some attribute already contained in the definition or notion of the subject—*e.g.* 'All bodies are extended;' whereas the synthetical or ampliative judgment adds an attribute not so contained—*e.g.* 'All bodies are heavy.'

Anam. See ANNAM.

Anamalai, or ANNAMALLY ('Elephant Mts.'), is the part of the Sahyadri range, or Western Ghâts, which lies in the Coimbatore dist., Madras Presidency, and the Travancore State, India. The lower range (2,000 ft.) is well wooded with teak, blackwood, and bamboo. The higher range (6,000 to 8,000 ft.) consists of open grassy hills. Here is the peak Anamudi (8,850 ft.), the highest in S. India. The climate is healthy and the scenery grand. Tea and coffee plantations are scattered over the hills. The elephant, bison, and ibex are numerous. The hill tribes are keen hunters, and are called Kaders ('lords of the hills') and Malassers.

Anambas Islands, a group of small islands in the Dutch E. Indies, between Borneo and the Malay Peninsula, with an area of 200 sq. m. and 3,000 inhabitants. They belong to the residency of Riouw, and include the harbour of Clermont-Tonnerre.

Ananas. See PINE-APPLE.

Ananchytes (*Echinuscorys*), 'irregular' or heart-shaped sea urchin, a common and characteristic fossil of the Upper Chalk. Its upper surface is strongly convex; its under side is flattened, with the mouth near the anterior edge.

Ananias. (1.) The husband of Sapphira (Acts 5 : 1–10). The pair, while pretending to surrender to the church treasury the *whole* proceeds of a possession which they had sold, retained a part—*i.e.* were guilty of falsehood and hypocrisy. Being rebuked by Peter, both fell down dead. See Neander's *Planting*

of Christianity, i. p. 27 *ff.* (2.) A disciple at Damascus, who baptized Saul, and introduced him to the church (Acts 9 : 10–18). He is said to have been one of the Seventy, and to have died a martyr. (3.) The high priest before whom Paul was brought by Claudius Lysias, and to whom the apostle applied the term, 'thou whited wall.' He was the son of Nebedaios, and was murdered at the siege of Jerusalem. See Schürer's *Hist. of the Jewish People in the Time of Christ*, I. ii. 188 *f.*, II. i. 200 *ff.*

Ananyev, or ANANIEV, tn., Kherson gov., Russia, on the Black Sea, 95 m. N.N.W. of Odessa. Grain is cultivated. Pop. 17,000.

Anapa, a Russian port in the N. Caucasus, on the Black Sea, 45 m. S.E. of the entrance to the Sea of Azor. Originally a Turkish fortress, it was three times (1791, 1807, 1828) captured by the Russians, who destroyed its works in 1855. Pop. 6,700.

Anapæst, a reversed dactyl; a metrical foot consisting of two short or unaccented (˘) syllables, followed by one long or accented (–) syllable. Tyrtæus used the anapæstic measure in his war songs; in later Greek the term became almost synonymous with satire. Swinburne employed the anapæst very extensively and with excellent effect in English—*e.g.* 'Ye are góds, and, behóld, ye shall díe, and the wáves be upón you at lást' (*Hymn to Proserpine*).

Anarchism, a political theory and propaganda demanding or awaiting the abolition of all institutions and instruments of government. Theoretically, it is diametrically opposed to socialism, and it is to be equally distinguished from communism; but the development of their theory shows that anarchists are 'really more socialist than are socialists themselves, because they are disposed to want not only common property and common production, but common enjoyment of products as well.' Anarchism aims at the unfettered self-government of the individual. Although William Godwin was the first in modern times to preach subversive doctrines—*An Enquiry concerning Political Justice* (1793)—the first articulate teacher of anarchism was Proudhon. Founding his argument upon the Scriptures and the writings of Adam Smith and Hegel, he desired that the political function should be reabsorbed in the industrial, and anticipated that in that case 'social order would ensue spontaneously out of the simple operation of transactions and exchanges'—*Du Principe Fédératif* (1863), p. 29. Anarchists are generally antitheist, and condemn power and authority of every kind—landlords, employers, functionaries, even the law itself. 'The best government,' they say, 'is the worst.' Russian thinkers, such as Bakunin and Kropotkin, urged by the poverty and oppression of the workers, and applying the economic quasi-communism and the social anarchy of the Russian *mir* to more complex societies, have been fervent apostles of the movement. The leading American exponent of theoretical anarchism has been Benjamin R. Tucker. The doctrine is chiefly known, however, as the source of the execrable 'propaganda of deed,' by which frequent murders have been done, now upon a crowned head, and again, at random, upon the only less hated *bourgeoisie*. Most European countries have since 1883 passed severe repressive measures, but Britain, the refuge of foreign anarchists, has hitherto depended upon ordinary law and the police supervision of suspects. In Paris, Ravachol (1892), Vailiant (1893), and Henry (1894) have been exe-

cuted for bomb outrages against unoffending citizens; and there has been a series of assassinations of rulers: (1) of President Carnot, by Caserio, at Lyons, on June 24, 1894; (2) Canovas del Castillo, on Aug. 8, 1897; (3) Empress Elizabeth of Austria, by Luccheni, at Geneva, on Sept. 10, 1898; (4) King Humbert of Italy, by Bresci, at Monza, on July 29, 1900; (5) President M'Kinley, by Czolgosz, at Buffalo, on Sept. 6, 1901. The most recent bomb outrage was the attempt on the lives of the king and queen of Spain on their marriage day, May 31, 1906. The murder of the King and Crown Prince of Portugal, on Feb. 1, 1908, has not been traced to anarchism. See Rae's *Contemporary Socialism*, cap. 8 (1891); Garin's *L'Anarchie* (1885); Lombroso's *Anarchists: a Study in Criminal Psychology and Sociology* (Turin, 1894); Spencer's *The Individual and the State* (1885); Zenker's *Anarchism* (trans. 1898); Kropotkin's *Anarchy* (1897) and *Memoirs of a Revolutionist* (1900).

Anas, anc. name of the Guadiana.

Anasarca, a general diffusion of serous fluid into the subcutaneous connective tissues. See DROPSY.

Anastasius I. (d. 401), Pope, held the supreme office from 398. He was a strenuous opponent of the Manichæan heresy and of the doctrines of Origen.

Anastasius I. (430–518 A.D.), Emperor of Constantinople. His reign was troubled with Hun and Slav invasions. He was an active and enlightened prince, but provoked papal censure by his patronage of Eutychian and Manichæan heresies.

Anastasius II., Emperor of Constantinople, was raised to the throne on the deposition of Philippicus (713), but deposed (715) in favour of Theodosius. With the assistance of Bulgaria he attempted to regain the empire, but was taken by the Emperor Leo and put to death (719).

Anastasius, ST., or ASTRIC (954–1044), the 'Apostle of the Hungarians,' a monk of Rouen who was made bishop of Coloeza by Duke Stephen of Hungary, for whom he obtained from the Pope the title of king.

Anastasius Grün, pen-name of the German poet, Count von Auersperg.

Anastomosis, the communication or inosculation of blood-vessels. When one such is tied, the circulation is kept up by others, forming what is described as a 'collateral' circulation. Anastomosis is particularly free round joints.

Anata (anc. *Anathoth*), vil., Palestine, 3 m. N.E. of Jerusalem. In Bible times one of the cities of refuge, in the tribe of Benjamin; birthplace of Jehu (1 Chron. 12:3) and of Jeremiah (Jer. 1:1; 11:21–23, etc.).

Anathema (Gr. 'that which is set up'), at first an offering hung up in a temple to a god; later it implied the devotion of a sacrificial victim, or, by analogy, of a person, to destruction (Rom. 9:3; Gal. 1:8, 9). For its ecclesiastical sense, see EXCOMMUNICATION.

Anatolia. See ASIA MINOR.

Anatolian Railway, the chief railway in Asia Minor. It starts at Haidar Pasha, on the Bosporus over against Constantinople, and extends through Ismid and Angora to Kaisarieh. The first section, Haidar Pasha to Ismid (58 m.), was opened in 1870; the second section, from Ismid to Angora (301 m.), in 1892; the third section, from Angora to Kaisarieh (264 m.), was sanctioned in 1893; and a further concession, to Bagdad and Basra, was granted in 1899. A branch line was opened from Eskishehr (between Ismid and Angora) to Konieh (276 m.) in 1896. See BAGDAD RAILWAY.

Anatomical Preparations. The various methods of preserving skins and of reproducing external anatomical features are dealt with in the article TAXIDERMY. As regards the deeper parts, it is often desirable, for teaching and other purposes, to have a more permanent preparation than an ordinary dissection. In the case of the skeleton this may easily be secured. Boiling bones will remove nearly all their organic material, leaving only the earthy constituents. The bones may then be riveted or jointed with wire in their relative positions. The soft parts may be preserved in glass jars containing spirit of wine, weak formalin solution, or other transparent preservative fluid; or they may be dried, sterilized, and varnished. Both methods are open to objection. In the former, specimens become decolourized, and lose their characteristic fresh appearance. They cannot be handled, and they fail to impress the student so vividly as a recent dissection. Dried specimens soon decay, unless kept in glass cases sealed against air and moisture. Plaster of Paris casts (see PLASTER CASTING) may be taken; but it cannot be said that plaster lends itself to the representation of soft tissues, no matter how well it be painted. Much more useful and realistic is the result of casting in glycero-gelatin. In this process a mixture of 'No. 1' gelatin and clear glycerin, in the proportion of 1 oz. by weight of gelatin to 1 oz. by measure of glycerin, is employed. The gelatin is soaked in water till soft. It is then slowly dried until just pliable, and melted in a water bath along with the glycerin. While still hot, it may be made opaque by the addition of a thick paint of oxide of zinc rubbed up with glycerin. Other pigments, such as calamine or vermilion, may be added to colour it as desired. All the ingredients must be thoroughly mixed. The cost is about 1s. 6d. per lb.

A plaster mould of the specimen is first taken. After this has been thoroughly dried by slow heat, hot glycero-gelatin is poured into it, the mould meanwhile being gently rocked to get rid of air bubbles. The fluid runs into the concavities, and must be ladled up over the higher parts, to which it gradually adheres as it cools, so that the whole surface is almost evenly coated over. While still in the mould it should be covered with lint or cotton-wool, and plaster of Paris is then spread over the lint. The plaster must fit the hollows and elevations of the back of the cast, and must be smoothed down on the surface which is uppermost during the casting. When it has set it is temporarily removed, and the glycero-gelatin is stripped gently out of the mould. This is now an elastic cast of the original, and when fitted to its plaster backing is ready for paint. When it is desired to represent a moist surface, oil-colours should be used; when a dry appearance is wished for, several coats of water-colour must be applied. Finally, an edging of velveteen or similar material hides the ragged edges, and throws the cast into relief. With a little practice and but slight artistic skill this method produces results almost startling in their fidelity to nature.

Anatomy (Gr. 'cutting up'), the knowledge of animal structure obtained by dissection. The science of structure, both in the animal and in the vegetable kingdom, is properly called morphology, and the word anatomy is usually restricted to the more special investigations, particularly of the human subject. *Comparative* anatomy is the morphological comparison of different classes of animals, revealing points of dif-

ference in structure, homologies of apparently different organs, and the supposed phylogenetic relationships of the various groups. *Descriptive* anatomy is the minute account, for purposes of surgical and medical practice, of the organs of the body and their physical relations. *Morbid* anatomy is the study of the structural changes consequent on disease. *Teratology* is the investigation of monstrosities and lesser abnormalities in the individual. *Physiological* anatomy relates to the structure of organs in respect of their several functions or uses. *Regional* or *surgical* anatomy refers to the relative positions of parts from the operative point of view. *Microscopic* anatomy is an inconvenient name for histology, or the science of the minute structure of tissues. *Surface* anatomy is the location of internal parts by means of external landmarks.

Anatomy is the first special subject entered upon by the modern medical student, after he has been grounded in biology, physics, and chemistry. He is occupied with it for two years, and does well to dissect every part of the body twice. For that purpose the body is divided into (1) arm, (2) leg, (3) head and neck, (4) thorax, and (5) abdomen. The arteries are injected with a red paste containing a powerful antiseptic. Morbid anatomy is demonstrated in the post-mortem rooms of infirmaries, and surgical anatomy is taught by operations on living patients and the recent subject. The instruments used in dissection are scalpel and forceps. There are many good text-books on anatomy: see especially Quain's (new ed. 1896), and for the dissecting room Cunningham's; also Symington's *Topographical Anatomy of the Child* (1887). Well-organized statistical work is now carried on with reference to the occurrence of abnormal deviations in human structure. The Anatomy Acts, 1832 and 1871, require that schools of anatomy and teachers of the subject should be licensed. The acts are administered by the Home Office and four inspectors—*viz.* for London, England, Scotland, and Ireland. The unclaimed bodies of persons dying in hospitals and workhouses are secured for the purposes of tuition and research. For the parts of the body see special articles.

Anaxagoras (500–428 B.C.), one of the greatest early Greek philosophers; was born at Clazomenæ, went to Athens in 480, where he became intimate with Pericles; was fined five talents and banished for impiety (*c.* 430)—he asserted that 'the sun was a red-hot mass larger than the Peloponnesus;' retired to Lampsacus, where he died. His predecessors had sought to derive all the world from some one material substance; but Anaxagoras postulated a creative Intelligence (*Nous*), before whose operation the world was chaos. See Zeller's *Presocratic Philos.* (Eng. trans.); Burnet's *Early Greek Philos.* (1892).

Anaxarchus (4th century B.C.), a Greek philosopher of the Eleatic school; born in Abdera; was the favourite of Alexander the Great, whom he accompanied on his Asiatic expedition.

Anaximander OF MILETUS (610–547 B.C.), successor of Thales, the earliest Greek philosopher. He described the original element (*archē*) from which the phenomenal world developed as 'the infinite' (*apeiron*). His theories were materialistic in form. He introduced the gnomon, and was the first map-maker among the Greeks. See Zeller's *Presocratic Philos.* (Eng. trans.); Burnet's *Early Greek Philos.* (1892).

Anaximenes (*c.* 570–480 B.C.), third of the Ionic school of Greek

philosophy, pupil of Anaximander and master of Anaxagoras; found the *archē*, or eternal and original element of the world, in air, of which all substances were formed by compression or expansion—even the soul, he said, was composed of air. See Zeller's *Presocratic Philos.*; Burnet's *Early Greek Philos.* (1892).

Anaximenes OF LAMPSACUS, Greek historian and rhetorician, tutor of Alexander the Great; wrote a history of Philip and of Alexander, and a history of Greece.

Ancachs, a Peruvian dep. on the Pacific slope to the N. of Lima dep. Valuable mineral deposits. Cap. Huaraz. Area, 16,560 sq. m. Pop. 400,000.

Ancelot, JACQUES ARSÈNE POLYCARPE FRANÇOIS (1794–1854), French dramatist and academician; wrote *Louis IX.* (1819), for which he was pensioned by Louis XVIII.; *Fiesque* (1824), adapted from Schiller's *Fiesco; Elisabeth d'Angleterre* (1829); and *Maria Padilla* (1838). His non-dramatic works include *Les Familières: Epîtres* (1842) and *Poésies* (1853).

Ancenis, tn., dep. Loire-Inférieure, France, 24 m. N.E. of Nantes, on the riv. Loire. Trade in cattle, spirits, and timber. Pop. 5,000.

Ancestor-Worship, which is still the basis of the Chinese and Annamese religions, and with which totemism is in some measure allied, is of very ancient origin, and so widespread that it may be traced throughout the world. 'The most special representatives of ancestor-worship in Europe,' observes Professor Tylor, 'were perhaps the ancient Romans, whose word *manes* has become the recognized name for ancestral deities in modern civilized language. They embodied them as images, set them up as household patrons, gratified them with offerings and solemn homage, and, counting them as or among the infernal gods, inscribed on tombs D.M., *Diis Manibus.*' See W. Warde Fowler's *Gifford Lectures*, Edinburgh University 1909–1910. The 'ancestral tablets' which are found in the family room in modern Chinese houses are also supposed to contain the spirits of the family ancestors; and on every solemn occasion incense and candles are burned in front of the tablets, before which the worshippers kneel. Among many races, the soul of an ancestor has been held to become incarnated in a certain animal, which animal is accordingly set apart as sacred, although the reverence ostensibly accorded to it is actually due to the indwelling ancestral spirit. (See ANIMAL-WORSHIP.) To distinguish between the worship of a long-dead ancestor and the reverence paid to a supernatural deity is sometimes a difficult matter; and, indeed, according to the school of Euhemerus, all the gods of the classic Pantheon are nothing more than deified ancestors. Herbert Spencer regards ancestor-worship as the most primitive form of religion. See his *Principles of Sociology* (1877–96).

Anchises, king of Dardanus on Mount Ida, to whom Aphrodite bore the illustrious Æneas. He was blinded by Zeus for revealing the child's maternity. After the fall of Troy his son took him on his wanderings, until the old man died in Sicily. Homer's *Iliad*, the Homeric *Hymn to Aphrodite*, and Virgil's *Æneid* give his story.

Anchitherium, a small extinct ungulate, supposed to be one of the primitive ancestors of the horse; inhabited Europe and N. America in the Miocene period. It had three toes on each foot; each toe reached the ground; the lateral metacarpals, represented in the horse by splint bones, were well developed.

Anchor, the iron or steel instrument by which ships hold fast to

the bottom of the sea. A common anchor has a 'shank,' 'stock,' 'ring,' and two 'arms,' at the extremities of which are 'flukes' or 'palms.' A ship 'rides' at anchor when it is secured at its moorings. To 'weigh' anchor is to heave it up, in order to get the ship under way. To 'cat' the anchor is to hoist it up to the cathead. To 'fish' an anchor means to draw up its flukes to the top of the bows by a machine called a fish, in order to stow it after it has been 'catted.' All large ships carry several anchors. A first-class battleship usually has eight. In 1852 an Admiralty committee examined several new types of anchor, and among those most favourably reported upon were Honiball's (or Porter's), Lenox's, Mitcheson's, Rodger's, and Trotman's. Later developments have been introduced by Rodger, Martin, Smith, Inglefield, Hall, and many others. Many of the patent anchors have movable instead of rigid arms; others are stockless, and so constructed that the ring and shank can be drawn right into a ship's hawse-hole, thus doing away with the necessity for catting and fishing. Anchors of various forms are also used for keeping buoys and moorings in position. Of these the mushroom and the screw anchor are well-known types.

Anchorage. (1.) A sheltered position in which vessels may anchor. In its legal sense the word denotes the duty levied upon ships for coming to or lying in certain roads or anchoring grounds. Such payment is due, in the first instance, to the crown only, no subject having any rights below and beyond high-water mark. It is admitted as a general principle that vessels driven in by stress of weather are exempt from anchorage dues. Similar to anchorage are shore dues, which, under a special grant, are in the hands of a subject who has rights over a particular port or haven. (2.) Also applied to the terminal structure (natural rock or heavy masonry) to which the cables of a suspension bridge are made fast.

Anchor Ice, or Ground Ice, ice formed (rarely) at the bottom of rivers. The current is too great for the formation of ice at the surface, but the water, retarded in the bed of the river, is congealed. When much ice has been formed round a stone, it lifts it to the surface; in the Baltic even iron chains and anchors have floated in this way. See *Symons's Meteorol. Mag.*, vol. xxiv. p. 40; *Report of Thames Commissioners* (1866).

Anchorite, a recluse or hermit; one who seeks to live in solitude, and with as little intercourse as possible with his fellowmen. The term is specifically applied to the Christian ascetics of the 3rd century, who established themselves in caves and lonely places in Egypt and in the adjacent deserts. St. Antony was the most illustrious.

Anchor Line, a steamship line founded (1852) by Messrs. Handyside and Henderson, now Anchor Line (Henderson Bros.) Ltd., of Glasgow and Liverpool. Its chief trade is between Glasgow and New York (since 1856); and it maintains in addition a service between the United Kingdom and Bombay and Calcutta, and between Mediterranean ports and New York. It owns a fleet of eighteen steamers, amounting to 102,203 tons. In 1899 the line was made a joint-stock company. London offices: 4 St. Mary Axe, E.C.

Anchovy (*Engraulis encrasicholus*), a small fish belonging to the same family as the herring (Clupeidæ), found in abundance in the Mediterranean. It is there the object of an important fishery, and, after preservation in salt, is exported to all parts of the world. The species is widely distributed,

and numerous other anchovies occur in different parts of the world, both in temperate and in tropical seas. The adult fish measures from five to seven inches. There is usually a broad silvery band at the sides of the body, by which it can be easily recognized. Anchovies are taken in drift-nets and seines. See PILCHARD.

Anchovy Pear, the fruit of a tree of the myrtle order, native of the W. Indies. The leaves, from two to four feet long and about one foot broad, are the largest of all dicotyledonous leaves. The fruit is edible, with a flavour like that of mango; it is often pickled.

Ancient Demesne. English manors which are mentioned in Domesday as belonging to Edward the Confessor or William I. were considered to belong in a peculiar way to the royal inheritance, and were known as ancient demesne. Tenure in ancient demesne has many peculiarities, the chief of which was that before 1852 actions relating to such land could only be brought in the Lord's court. It exists either (*a*) by the custom of the manor, a sort of customary freehold, or (*b*) freehold. See Challis's *Law of Real Property*.

Ancient Lights. See LIGHT AND AIR.

Ancient Mariner, poem by S. T. Coleridge, published in *Lyrical Ballads* (1798). The idea appears to have been taken from Captain G. Shelvocke's *Voyage Round the World* (1757).

Ancients and Moderns, the name given to a dispute at the end of the 17th century and beginning of the 18th as to the comparative merits of classical and modern literature. It is said to have arisen in Italy out of the debate on the pre-eminence of Tasso or Ariosto. It was, however, only an inevitable result of the renaissance. The plea that undue regard is paid to the classics is one of perpetual recurrence; but in the 17th century it ranged the leading literary men of France in two main parties, and occasioned a lively controversy in England. François Ogier has some claim to be considered the first 'modern' in France; but the honour belongs properly to Boisrobert, who in February 1635 attacked the ancients in an address delivered to the newly-founded French Academy. The real quarrel did not begin, however, till about thirty-five years later. In 1670 Desmarets de Saint-Sorlin brought out a *Traité pour juger des Poètes Grecs, Latins, et Français*, in which he censures severely both Homer and Virgil. He also urged in it the use of French in the inscription on a triumphal arch to be erected to Louis XIV. In 1673 he defended, in a *Discours pour prouver que les Sujets Chrétiens sont les seuls propres à la Poésie Héroïque*, his rejection, in his epic *Clovis*, of the gods of classical mythology. Both the *Traité* and the *Discours* won him satirical allusions in Boileau's *Art Poétique* (1674). He replied in a *Défense du Poème Héroïque* (1674), and in the following year wrote a *Défense de la Poésie et de la Langue Française*. On the death of Desmarets, in 1676, the defence of the moderns was left to the three brothers Perrault — Pierre, Claude, and Charles. The first to enter the lists was Pierre, who, in a defence of Quinault's *Alceste* against the epigrams of Boileau, made a blundering attack on Euripides, to which Racine replied in his preface to *Iphigénie* (1674). Claude was satirized by Boileau, in a somewhat inartistic excursus in the *Art Poétique*, for having spoken against the satirist's treatment of Quinault. To this Claude replied in *Le Corbeau guéri par la Cigogne, ou l'Envieux Parfait*. In 1678 Pierre

published *Le Seau Enlevé*, a translation of Tassoni's *Secchia Rapita*, and asserted that the reputation of the ancients was due to their having written in rude and unlearned times. There was then a lull in the quarrel. On January 27, 1687, when the Academy was assembled to celebrate the convalescence of the king (Louis XIV.), Charles Perrault recited a poem entitled *Le Siècle de Louis le Grand*, in which he asserted the superiority of modern France to Greece and Rome in every art. The theme was pursued again in the prose *Parallèles des Anciens et des Modernes* (4 vols. 1688–97). The general argument is that antiquity was but the youth of the world, and that modern times are its maturity, and that progress has been made in everything, for the attainments of the ancients were a foundation for further improvement. The fallacy in Perrault's argument was the application to art of principles which hold good only in science. In a comedy entitled *L'Oublieux* (1691) he pokes fun at those who have so great a regard for antiquity that they cannot live the life of their time and appreciate its advantages. The chief champion of the ancients was Boileau, who, besides writing numerous epigrams, replied to the *Parallèle* in his *Discours sur l'Ode* (1693), and in the first nine *Réflexions Critiques sur Longin* (1694). Boileau, however, neglected the general question, and confined himself mostly to Perrault's faulty knowledge of Greek. Perrault's chief supporter was Fontenelle, who early in 1688, and thus before the appearance of the *Parallèle*, published with his *Discours sur la Nature de l'Eglogue* a *Digression sur les Anciens et les Modernes*. In point of literary merit the *Digression* is the chief contribution to the quarrel in France. Perrault had also on his side the society of the time and most of the journals, conspicuously *Le Mercure Galant*. The supporters of the ancients included Racine, La Fontaine, La Bruyère, Huet, and Ménage. In time Boileau came to recognize his mistake in omitting to deal, as he himself admitted, with the sentiment of Perrault's *Parallèle*. A truce was patched up by the intervention of Arnauld in 1694, and six years later Boileau sealed the reconciliation by sending Perrault a letter, in which, though declaring his objection to the disdainful manner in which the ancients had been treated, he admitted that the age of Louis XIV. was superior, not to the ancients generally, but to any one century of Greece or Rome. There is much in the quarrel that now appears childish; but it has the importance of marking the introduction of the idea of progress and of relativity in literary matters. And in expressing the idea of progress, and in tending to neglect art for the worship of reason, the moderns manifest one phase of the Cartesian principles of the 17th century, and herald the philosophy of the 18th.

The quarrel soon passed into England. As early as 1668 Dryden had discussed in his *Essay of Dramatic Poesy* the merits of the ancients and moderns; but the quarrel proper began with Sir William Temple's *Essay upon the Ancient and Modern Learning* (1692), which was prompted by Fontenelle's *Digression*. William Wotton replied in his *Reflections upon Ancient and Modern Learning* (1694), which, though favouring the moderns, endeavours to hold the balance evenly. Temple answered in *Some Thoughts upon Reviewing the Essay of Ancient and Modern Learning* (published by Swift,

1701). Thomas Rymer reviewed the dispute in *An Essay concerning Critical and Curious Learning* (1698), and this called forth an *Answer* (1698) and a *Vindication* (1698) by Wotton, in his second edition of the *Reflections*. Dryden favoured the ancients in his *Dedication of the Æneid* (1697), but in his *Discourse concerning Satire* (1692) and *Dedication of Examen Poeticum* (1693) he is for the moderns; and those and certain earlier utterances justify Swift in classing him with the moderns in the *Battle of the Books* (1704). In 1697 the quarrel began to be fought out on a side issue. Temple's praise of the *Letters of Phalaris* in his *Essay* had given them a sudden popularity, and a new edition had been published by Charles Boyle in 1695. Bentley asserted the spuriousness of the *Letters* in a *Dissertation upon the Epistles of Phalaris*, added to the second edition of Wotton's *Reflections* (1697). Boyle replied in *Dr. Bentley's Dissertation on the Epistles of Phalaris Examined* (1698), and this called forth Bentley's triumphant proof of their spuriousness in 1699. The chief result of the quarrel in England was thus the production of a book which marks an epoch in classical criticism. By a strange coincidence the man who knew the ancients best was ranged on the side of the moderns, and, what is as strange, the public in England were for the ancients. The popular opinion was expressed in Swift's *Battle of the Books* (1704, said to have been suggested by Courtay's *Histoire Poetique de la Guerre Nouvellement declarée entre les Anciens et les Modernes*), in which Bentley and Wotton are transfixed by Boyle. In 1705 Wotton published a *Defense of the Reflections*. But the main question had not been fought out as it had been in France.

The quarrel again broke out in France in 1714, when La Motte published a translation of the *Iliad* conforming to the taste of the 18th century. It was preceded by a *Discours*, in which Homer's faults were pointed out. This brought Madame Dacier (whose translation of Homer La Motte had used) to write *Des Causes de la Corruption du Goût* (1715). La Motte replied in *Réflexions sur la Critique* (1715). Unlike Dacier's book, it was politely dignified and witty, and won him the public favour. A *Homère Vengé*, by Gacon, and an *Apologie d'Homère*, by Hardouin, appeared about the same time; and the latter called Madame Dacier into the field again to defend Homer against his imprudent friends. Her *Homère défendu contre l'Apologie du R. P. Hardouin ou suite des Causes de la Corruption du Goût* appeared in 1716. Among others who took part in the quarrel were Boivin, who also defended Homer, and the Abbé Terrasson and the Abbé de Pons, both of whom fought for the moderns. In 1715 Fénélon entered into the dispute in his *Lettre à l'Académie*. He declared for neither party, but on the whole favoured the ancients. The quarrel then subsided somewhat, but as late as 1734 there appeared an enlarged edition of one of the most popular contributions to the controversy, Saint-Hyacinthe's *Chef-d'œuvre d'un Inconnu* (1714). In France the quarrel had the important result of popularizing criticism.

See Rigault's *Histoire de la Querelle des Anciens et des Modernes* (1856), *Querelles Littéraires* (1761), Brunetière's *L'Evolution des Genres* (1890), Monk's *Life of Bentley* (1830), and Professor Jebb's *Bentley* (1882).

Ancillon, CHARLES (1659–1715), diplomatist and historian; born at Metz, where he practised law.

Settling in Berlin, he was appointed a judge of the French refugees (1699), and superintendent of the French school. His works include *Histoire de l'Etablissement des Français Réfugiés dans le Brandebourg* (1690), which determined many Protestants to settle in Brandenburg; *L'Irrévocabilité de l'Edit de Nantes* (1688); *La France intéressée à rétablir l'Edit de Nantes* (1690); and *Histoire de Soliman II.* (1706).

Ancillon, JOHANN PETER FRIEDRICH (1767–1837), Prussian statesman and author; born at Berlin; filled (1792) the chair of history in the military academy at Berlin; was elected (1803) a member of the Academy of Sciences, and appointed historiographer royal; rose to be (1832) Minister of Foreign Affairs. In 1810 the education of the Crown Prince (afterwards King Friedrich Wilhelm IV.) was entrusted to him. He wrote on philosophy, history, and politics—*e.g. Révolutions du Système politique de l'Europe depuis le XV^e Siècle* (4 vols. 1803).

Ancona. (1.) Province, Italy, in the Marches, between the Central Apennines and the Adriatic, with an area of 750 sq. m.; pop. 315,000. The people grow grain and fruit, breed silkworms, manufacture silk, paper, iron, sugar, flour, lime, bricks, and leather, and mine sulphur. Chief towns, Ancona, Jesi, and Senigallia. The railway from Bologna to Brindisi skirts the shore. (2.) Town and episc. see, cap. of above province, situated on the Adriatic, is the only good port between Venice and Brindisi. The harbour is enclosed by two fine piers, one of which was built by Trajan in 115 A.D. Extensions to the moles were agreed upon in 1903. The town is strongly fortified, and has a naval arsenal. Tartar, hides, asphalt, and silk are exported. Iron and other mineral works, and factories of sugar, soap, and tallow, represent the chief industries. Pop. 60,000. Founded by Greeks from Syracuse (380 B.C.), Ancona was destroyed successively by the Goths and the Longobards; later, it asserted its position as an independent republic, until it fell into the hands of Pope Clement VII. in 1532. In 1849 the Austrians captured it; and again in 1860 its papal defender, General Lamoricière, was compelled to capitulate to the Piedmontese.

Ancona, ALESSANDRO D' (1835), Italian man of letters and philologist; born at Pisa. He became one of the chief intermediaries between the Tuscan Liberals and Cavour. In 1859 he edited the newly-founded journal, *La Nazione;* but having in the following year been elected to the chair of Italian literature in the University of Pisa, he devoted himself until 1900 to academic teaching and literary work. He has edited a number of early and rare Italian texts—Dante's *Vita Nuova* (2nd ed. 1884); the *Antiche Rime Volgari* (1875–88), together with Comparetti; a *Manuale della Lett. Ital.* (1892–5), together with Bacci; edition of Campanella (1854); has written studies on the Italian drama—*Sacre Rappresentazioni dei Secoli XIV., XV., e XVI.* (1872); *Origini del Teatro in Italia* (2nd ed. 1891); and has treated of several subjects connected with Italian literature—*I Precursori di Dante* (1874); *La Poesia Popolare Italiana* (1878). Two collections of *Studii* appeared in 1880 and 1884.

Ancre, BARON DE LUSSIGNY, MARQUIS D' (d. 1617), whose real name was CONCINO CONCINI, a Florentine adventurer, accompanied Maria de' Medici to France in 1600, and rose to be marshal and chief minister of state, and acquired vast wealth. He was assassinated in April 1617 at the instigation of Louis XIII. His corpse

was treated with great indignity, and his wife was afterwards burned at the stake as a sorceress.

Ancren Riwle, or THE RULE OF NUNS, a manual of religious instruction written about 1210 for a small society of three pious ladies and their lay sisters, established at Tarente (Tarrant-Kaines or Kingston) in Dorsetshire. The book treats of devotional services, of the regulation of outward behaviour, of avoiding temptation, of confession, penance, and charity, and of social and domestic duties. The authorship has been attributed to Richard Poor, a native of Tarente, who was successively bishop of Chichester, Salisbury, and Durham, and who rebuilt the monastery of nuns founded by Ralph de Kahaines, son of one of William the First's barons. Bishop Poor died at Tarente in 1237, and was buried in the cathedral church of Salisbury. See *Ancren Riwle*, ed. Morton (Camden Society, 1853; new ed. 1905), Neilson's monograph in *The Athenæum* (1904), and Gasquet's translation (1905).

Ancrum, vil. and par., Roxburghshire, Scotland, 3½ m. N.N.W. of Jedburgh; 2 m. from Ancrum Moor, where (Feb. 17, 1545) 5,000 English were defeated by the Scots.

Ancus Marcius, fourth king of Rome, said to have reigned 640–616 B.C., and to have conquered many Latin towns and transplanted their inhabitants to Rome. He is also the reputed founder of Ostia.

Ancyra, anc. city of Galatia, Asia Minor; remembered chiefly for the fact that, when Augustus set up a record of the chief events of his life at Rome, its citizens had a copy of the inscription made, which still exists. The inscription (*Monumentum Ancyranum*) is in Greek and Latin, and has been edited by Mommsen (1883). See (modern) ANGORA.

Andagoya, PASCUAL DE (1495–1548), Spanish colonial administrator and geographer, was the first to obtain information with regard to the empire of the Incas. He became governor of New Castile in 1540, and founded the city of Buenaventura. His account of his travels (trans. by Sir C. Markham) was published by the Hakluyt Society (1865).

Andalusia, or ANDALUCIA (corruption of *Vandalusia*, so called from the Vandal invasion), the largest of the ancient divisions of the s. of Spain, comprises the provinces of Almeria, Cadiz, Cordova, Granada, Huelva, Jaën, Malaga, and Seville, and is physically divided into Upper and Lower Andalusia. Its chief towns are Cordova, Seville, and Cadiz. It is one of the most fertile portions of Spain. It is drained by the Guadalquivir. There are numerous gypsies (*gitanos*) scattered throughout the province, and a few descendants of the Moors still survive. The attire of the people is very picturesque, and the women are renowned for their grace and beauty. This province was visited in antiquity by the Phœnicians, who founded the colonies of Hispalis (Seville), Gades (Cadiz), etc.; afterwards by the Carthaginians; and after the second Punic war it became a Roman province. Here were born the poet Lucan, the emperor Trajan, the philosopher Seneca. In the 5th century it was invaded by the Alans, Vandals, and Visigoths, who conquered the whole of Spain. In 711 it was subdued by the Moors, after the battle of Xeres de la Frontera. Here they founded the caliphate of Cordova, which reached the height of its power under the Ommiades. During this period Andalusia was a flourishing and thickly-populated province. Cordova was one of the chief centres in Europe for the

arts and sciences. But after the extinction of the Ommiades (1031) Andalusia was divided between Seville, Cordova, and Jaën, which were conquered (1238–48) by Ferdinand III. of Castile. See Murray's *Cities and Wilds of Andalusia* (1853), Thomas's *Tour in the Andalusian Highlands* (1903), Maugham's *The Land of the Blessed Virgin* (1906).

Andalusite, a mineral consisting of silicate of alumina, crystallizing in gray or pink rhombic prisms. It is a characteristic ingredient of metamorphic rocks, and is often found in argillaceous slates into which a granite has been injected in a greatly-heated condition, altering the surrounding masses, and developing new minerals in them. Andalusite is rarely transparent and well coloured, but fine specimens come from Brazil, and are polished and used as gems.

Andaman Islands, a group in the Indian Ocean, forming, together with the Nicobar Islands, a dependency of the government of India. They are situated some 650 m. from the mouth of the river Hugli and 150 m. from Cape Negrais in Burma. The principal islands of the Andaman group are N., Mid., S., and Little Andaman. Their total area is 2,508 sq. m. They are hilly, reaching 2,400 ft. in Saddle Peak, densely wooded, and indented by several harbours —*e.g.* Port Blair, Port Cornwallis, and Stewart Sound. The aborigines, savages of a low Negrito type, number about 1800. Tea, timber, cocoanuts, coffee, sugar, betel nuts, Manila hemp, and aloes are the principal products. These islands have been used since 1858 as a convict settlement by the government of India. Total population of group about 18,000. Chief tn., Port Blair. Pop. 17,000. Here Lord Mayo, viceroy of India, was assassinated by a Mussulman convict in 1872. See E. H. Man's *Aborigines of the Andaman Islands* (1885); Mouatt's *Andaman Islanders* (1863); Kloss's *In the Andamans and Nicobars* (1903). Compare also NICOBAR ISLANDS.

Andante (It. 'going'), in musical score, the name of an individual composition or of a movement; also used as a time indication signifying a slow degree of *tempo*, but not so slow as *larghetto*. ANDANTINO, being a diminutive of andante, ought to indicate a slower degree of *tempo;* but the term is sometimes used to signify a degree of movement less slow than andante.

Andaqui, a confederacy of Indian tribes in S. Colombia, of which a warlike remnant still survives. Their ruined temples and rock sculpture attest a former high degree of civilization.

Andenne, tn., prov. Namur, on the river Meuse, Belgium. Coal mines; manufactures of paper, pottery, and spirits. Pop. 8,000.

Anderlecht, tn., Belgium, s.w. suburb of Brussels. Large cotton mills and dye works. Pop. 55,000.

Anderlues, tn., Belgium, prov. Hainault, 8 m. w. of Charleroi. Has coal mining. Pop. 10,000.

Andermatt, vil. in upper valley of the Reuss, canton Uri, Switzerland; alt. 4,738 ft.; on road over Furka, Oberalp, and St. Gothard passes; 3½ m. from Goeschenen. Pop. 800.

Andernach (anc. *Antunnacum*), tn., prov. Rhineland, Prussia, on l. bk. of the Rhine, 11 m. N.W. of Coblenz; has Roman and mediæval remains. Cigars and malt manufactured; trade in emery and lava. Pop. 8,800.

Andersen, HANS CHRISTIAN (1805–75), Danish author, son of a shoemaker at Odense, was sent to school and university by generous patrons. He then undertook, at the expense of the state, several continental tours, resulting in his brilliant travel-books—viz. *Skygge-*

bilder (1831); *En Digters Bazar* (1842), after a tour to Greece; *I Sverrig* (1849), after his visit to Sweden; *I Spanien* (1863), a book about Spain. His first novels, all of which have been translated into English, were *Improvisatoren* (1835), *O.T.* (1835), and *Kun en Spillemand* (1837). The first portion of the immortal *Fairy Tales* (*Eventyr*) came out in 1835, the second series appeared in 1838-42, the third in 1845; and so they continued to appear, at irregular intervals, until the last *Eventyr* were published in 1871-2, by which time they had won a world-wide reputation. Andersen's numerous plays and poems are inferior to his *Tales*. His autobiography, *Mit Livs Eventyr* (1855-77), is of great interest, and perhaps the most naïve and subjective biography ever written. Other works are *Billedbog uden Billeder* (1840); *Ahasuerus* (1847); *De to Baronesser* (1847); *At vaere eller ikke vaere* (1857). Numerous English editions of the *Fairy Tales* have been published. See R. N. Bain's *H. C. Andersen: a Biography* (1895).

Anderson, city, Madison co., Indiana, U.S.A., on White R., about 40 m. N.E. of Indianapolis. Manufactures iron, steel, and brass goods, machinery, paper, glass, etc. The historic mounds of the "mound builders" are near the city. Pop. 20,000.

Anderson, ADAM (?1692-1765), Scottish political economist, for over forty years clerk in the South Sea House; published *Hist. and Chron. Deduction of the Origin of Commerce, containing a Hist. of the Great Commercial Interests of the Brit. Empire* (1762). See *Gent. Mag.*, liii. 41-2.

Anderson, ALEXANDER (1775-1870), American wood engraver. His illustrations to Bell's *Anatomy* (70 plates) and to Shakespeare's works (80 plates) are his principal works. See *Life* by Burr (1893).

Anderson, ALEXANDER, "Surfaceman" (1845-1909), Scottish poet, was born at Kirkconnel, Dumfriesshire. For many years he wrought as a railway surfaceman. He became a librarian in Edinburgh in 1883, and after 1905 was librarian to the University of Edinburgh. His principal works are *A Song of Labour, and other Poems* (1873), *The Two Angels, and other Poems* (1875), *Songs of the Rail* (3rd ed., 1881), and *Ballads and Sonnets* (1879).

Anderson, ELIZABETH GARRETT (1836), physician, wife of J. G. S. Anderson of the Orient S.S. Line; was born in London; studied medicine at the Middlesex Hospital (1860), but was refused admission to the examinations of the Colleges of Physicians and Surgeons; licensed to practise by the Society of Apothecaries (1865); received the degree of M.D. from the University of Paris (1870). She has held numerous important professional appointments and laboured indefatigably to open the medical profession to women; she was the first woman elected as mayor in England.

Anderson, SIR GEORGE WILLIAM (1791-1857), Indian official and administrator; governor of Mauritius (1849), but transferred to Ceylon (1850). He was the author of important judicial and other reforms in both places.

Anderson, JAMES (1662-1728), Scottish genealogist and antiquary, an Edinburgh lawyer, who wrote (1705) *An Historical Essay showing that the Crown and Kingdom of Scotland is Imperial and Independent*, and edited the public records of Scotland, published by Ruddiman in 1739 under the title of *Diplomatum et Numismatum Scotiæ Thesaurus*.

Anderson, JAMES (1739-1808), farmer and political economist; born near Edinburgh; was the inventor of the 'Scottish plough.' In his *Recreations in Agriculture*

(a paper in monthly parts from 1797–1802) and his *Inquiry into the Nature of the Corn Laws* (1777) he anticipated Ricardo's theory of rent.

Anderson, JOHN (1726–96), founder of Anderson's College, Glasgow (1797), was professor of Oriental languages (1756) and of natural philosophy (1760) at Glasgow University, where he taught a class of physics for working men. His invention of an air-brake gun, refused by the British government, was presented to the National Convention, Paris. His *Institutes of Physics* (1786) was for some time a standard text-book.

Anderson, JOHN (1805-55), Scottish missionary, born in Galloway; was sent by the Church of Scotland as its first missionary to Madras (1837), but at the 'disruption' joined the Free Church. His first mission school became the nucleus of the institution now known as the Madras Christian College. He died at Madras. See Braidwood's *True Yokefellows in the Mission Field* (1862).

Anderson, JOSEPH, LL.D. (1832), keeper (since 1870) of the National Museum of Antiquities, Edinburgh, and hon. professor of antiquities to the Royal Scottish Academy. He edited the *Orkneyinga Saga* (1873). His other works include *The Oliphants in Scotland* (1879), *Drummond's Ancient Scottish Weapons* (1881), and papers in the *Proc. of the Soc. of Antiq., Scotland*. Rhind lecturer in 1879–82 (*Scotland in Early Christian and in Pagan Times*, 4 vols. 1881–6), and again in 1892 (*Early Christian Monuments in Scotland*).

Anderson, MISS MARY (1859), American actress, of English origin on her father's side and of German on her mother's, was born at Sacramento in California. In 1875 she made her first appearance as Juliet at Louisville. Her success led to a regular engagement. Julia in *The Hunchback* (a favourite rôle) and Pauline in *The Lady of Lyons* were among her parts. In 1882, after she had become famous in New York, Miss Anderson began her English career at the Lyceum. Her most notable impersonations were Perdita and Hermione, Galatea, Pauline, and Juliet. Her statuesque beauty and her exquisite voice gave her for some years an almost unique position on the English stage. In 1889 she retired from the stage, to marry Mr. Antonio F. de Navarro. In 1896 she published a volume of reminiscences, entitled *A Few Memories*.

Anderson, ROBERT (1770–1833), Cumbrian poet, whose works are valuable for their picture of old country customs. His best poems are, *The Impatient Lass*, *King Roger*, *Will and Kate*, and *Lucy Gray*. See *Works*, with Life prefixed (1820); *Songs and Ballads of Cumberland*, ed. by Sidney Gilpin (1874).

Anderson, SIR ROBERT (1841), civil servant and author, was born in Dublin. In 1868 he became adviser to the Home Office in matters relating to political crime. Subsequently he was appointed assistant-commissioner of police of the metropolis, and from 1888 to 1901 was head of the Criminal Investigation Department. In 1910 he came prominently before the public in connection with a statement made by him in a magazine article that while at the Home Office he wrote the famous articles entitled "Parnellism and Crime," which appeared in the *Times* in 1887. Sir Robert is the author of two books arising out of his official duties—*Sidelights on the Home Rule Movement* (1906) and *Criminals and Crime* (1907). He has also written *The Lighter Side of my Official Life* (1910). He is best known in literature, however, by his trenchant writings on behalf of orthodox Bible religion. His

Daniel in the Critics' Den, *The Bible and Modern Criticism*, and *In Defence: a Plea for the Faith*, have had a wide influence among a certain class of the religious public.

Anderson, WILLIAM (1842–1900), surgeon, professor of anatomy and surgery at Tokyo (1873–1880), formed a large collection of Chinese and Japanese paintings and engravings, afterwards bequeathed to the British Museum. He was the author of *The Pictorial Arts of Japan* (1886); *Japanese Wood Engraving* (1895); *Catalogue of Collection of Japanese and Chinese Pictures in the British Museum* (1886).

Anderson, SIR WILLIAM (1835–98), engineer; born in St. Petersburg; director-general of ordnance factories in Britain. Author of *Conversion of Heat into Work* (1887).

Anderson's College, Glasgow, was founded as Anderson's University in 1797 by Professor John Anderson, and is devoted chiefly to the teaching of medicine. In 1886 the non-medical sections were merged in the Glasgow and West of Scotland Technical College; and in 1887 the Medical School was re-incorporated.

Anderssen, ADOLF (1818–79), famous chess-player, born in Breslau, where he became (1847) master at the Lyceum. In 1851 he won the first prize at the international chess tournament held in London during the first International Exhibition. He won other international contests in London (1862) and Baden (1870). He published many valuable books about chess.

Andersson, KARL JOHAN (1827–67), Swedish African explorer, who investigated the land of the Damaras and Ovampos (1850–4), and the Okavango R. (1859). He died while on an expedition to the Kunene R. See his *Lake Ngami, or Discoveries in S. Africa* (1856), and *The Okavango R.* (1861). Life in his *Notes of Travel in S. Africa* (1875), ed. by Lloyd.

Andes, a mountain system stretching along the W. side of the continent of S. America, from the mountains and plateaus of Costa Rica to Tierra del Fuego, and perhaps connected by the Burdwood Bank with the volcanoes of Graham Land. In its middle section it is divided into two main chains — that on the E. being known generally as the Andes, and that on the W. as the Cordillera. Its total length is considerably over 4,000 m., and its greatest development in Peru and Bolivia, where, between the transverse ridges of Vilcanota (lat. 14° 30′ S.) and of Lipez (lat. 22° 30′ S.), it expands to a breadth of 500 m., enclosing between its E. and W. Cordilleras plateaus 12,000 to 14,000 ft. above sea-level. North of the Vilcanota range the E. Cordillera has been eroded by affluents of the Ucayali, and to the W. of this great basin is a confused group of ranges, among which runs the Alto Marañon, or Upper Amazon. The W. Cordillera, between lat. 23° and 7° 45′ S., descends in a bold escarpment to the Pacific littoral, but it gradually decreases in height northwards. On entering Ecuador the Andes consist of a single broad chain, which bifurcates in the province of Loja; and thence to the borders of Colombia the system is again composed of two cordilleras, united by transverse ridges, and including lofty basins 8,000 to 10,000 ft. above sea-level. These cordilleras are continued in the Western and Central Cordilleras of Colombia, which include between them the great longitudinal valley of the Cauca R. The last-named range is the loftier, containing many peaks over 16,000 ft. in altitude. The long valley of the Atrato separates the W. Cordillera from a coast range, the Sierra de Baudo, with an average elevation of 3,000 ft., which is continued across the Isthmus of Panama. The E. Cordillera of Colombia, or

Cordillera of Bogotá, a third division, branches off near the frontier of Ecuador. At first only a low watershed between the basin of the Magdalena and those of the Amazon and Orinoco, it rises to over 15,000 ft. in the peak Suma Paz, and runs N.W. to Pamplona, whence it is continued by the Cordillera de Merida in Venezuela.

Near Santa Cruz de la Sierra, in Bolivia, the Eastern Cordillera makes a great bend to the S.S.W.: crossing the Upper Pilcomayo, and appearing as the Sierra de la Huerta in the Argentine province of San Juan, it terminates in the hills of Pencoso in San Luis. In the Famatina peak (Argentine province of Rioja) it rises to a height of 20,680 ft. Another (central) range of isolated peaks and volcanic cones rises in lat. 17° 30′, E. of Oruro in Bolivia, and divides the great plateau of Titicaca and Poopo into two sections. The Andes preserve their plateau character down to Aconcagua (about 32° 30′ S.), enclosing the great dreary Puna (high plain) of Atacama; thence to 41° 30′ S. lat. they consist of a single chain. South of Lake Nahuel-huapi they no longer constitute the watershed, but are crossed by numerous rivers rising from an elevation to the E., from which in some cases the water runs to both oceans; and finally they pass through the islands of the Tierra del Fuego archipelago to Cape Horn.

The Andes are built up of Archæan, Palæozoic, and Cretaceous rocks, with some Jurassic strata and porphyritic rocks in the W. range. They appear to have been folded in Tertiary times, the Cretaceous rocks being involved in the folds. Probably the W. Cordillera is more recent than the E. Cordillera. Many volcanoes are still active. Andesite lavas fill the basins of Ecuador, where the grandest group of volcanoes in the whole chain is found, among which are Cotopaxi (19,613 ft.), Sangay (17,460 ft.), and others; these lavas also compose the large mass of Aconcagua, which rises to 23,080 ft., the highest point of the S. American continent. Many of the highest peaks are covered with perpetual snow, and glaciers are still found in the S.

In Peru the W. Cordillera forms a formidable barrier to traffic, while farther S., between lat. 23° and 32° S., there is no pass lower than 12,000 ft. In lat. 32° 33′ is the Uspallata Pass, or La Cumbre (11,500 ft.), crossed by the railway from Buenos Ayres, in Argentina, to Valparaiso by means of a tunnel 2 m. long, the first to pierce the Andes (opened April 1910); and at 36° the Planchon (10,000 ft.). In Ecuador and S. Colombia the passes are of about the same height. The Guayaquil and Quito Railway crosses the Andes at an altitude of 10,800 ft. at 2° S. lat. This railroad connects the Port of Guayaquil with Quito, the capital of Ecuador, and after climbing the Andes extends on the plateau for about 200 m., tapping the agricultural and mineral wealth of Ecuador and S. Colombia. Besides the peaks already mentioned, Illimani (22,200 ft.) and Illampu, or Sorata, E. of Lake Titicaca, are among the most prominent—the latter, according to Sir Martin Conway's estimate, exceeding 23,000 ft., and therefore rivalling Aconcagua. Chimborazo, in Ecuador, rises to 20,475 ft. above sea-level, and Tupungato, S. of Aconcagua, to 21,550 ft. Other railways across the Andes are the line (highest alt. 15,660 ft.) which connects Oruro in Bolivia with Antofagasta in Chile; another, farther S., connects La Concepcion in Chile with various places in Argentina, crossing in about 37° S. lat.; another climbs up (alt. 14,660 ft.) from Mollendo to Lake Titicaca;

yet another in Peru, from Lima up towards Ayacucho.

The first ascent of the Andes peaks was that of Chimborazo (to 19,300 ft.) by A. von Humboldt in 1802, and this mountain has since been climbed by Boussingault and Hall (to 19,700 ft.) in 1831, and twice by Whymper in 1880. Whymper also first ascended Cotopaxi, Antisana, and Cayambe, each over 19,000 ft., the same year. Aconcagua was first ascended in 1897 by Zurbriggen (Jan.) and Stuart Vines (Feb.), by Conway in 1898 and again in 1900, and by Rankin in 1902. See Whymper's *Travels amongst the Great Andes of the Equator* (1892); Conway's *The Bolivian Andes* (1901); Fitzgerald's *The Highest Andes* (1899); Moreno's 'Explorations in Patagonia' (*Geog. Jour.*, July–Dec. 1899); Church's 'S. America: an Outline of its Physical Geog.' (*Geog. Jour.*, Jan.–June 1901); Petrocockino's *Along the Andes* (1903) and *Across the Andes* (1904).

Andesite, a crystalline igneous rock, occurring mostly in lava flows, but sometimes in dykes and veins. It consists principally of plagioclase felspar, and is often porphyritic, showing large crystals of felspar scattered through a fine-grained ground mass, usually of small felspar crystals, but often containing much glassy matter. In addition to felspar other minerals are present, as mica (biotite), hornblende, augite, and hypersthene; these give their names to the four principal varieties of andesite. The augite and hypersthene varieties especially are dark brown or black, and often become brown or red on weathering, from oxidation of the iron they contain. Andesite rocks are perhaps the commonest lavas in the world. In Scotland they compose most of the Cheviots, Ochils, Pentlands, and Sidlaws; in England they form much of the Lake District. They are common in Wales and Ireland, Hungary, and N. America, and include most of the recent volcanic rocks of the Andes, whence their name.

Andijan, tn., prov. Fergana, Russian Central Asia, on the l. bk. of the Syr Daria, 160 m. E. of Tashkend; alt. 1,500 ft.; terminus of branch of the Transcaspian Ry. (completed 1899); was the scene of a Mohammedan outbreak (1898). It is famous for its gardens, and grows and manufactures cotton. Pop. 47,000.

Andira, a genus of papilionaceous plants, mostly tropical American trees. The bark of *A. inermis* and *A. retusa* contains purgative and emetic substances; the pith of *A. araroba* provides the 'Goa powder,' or chrysarobinum, used as a remedy for certain skin diseases.

Andirons, or FIRE-DOGS, the supports on which are laid the logs of wood burned in open hearths.

Andkhui, or ANDKHOI, tn., Afghanistan, about 80 m. W. of Balkh, on trade route between Afghanistan and Bokhara. Pop. about 15,000. Its climate is such that the Persians call it 'hell on earth.'

Andocides (439–389 B.C.), one of the ten Attic orators; a man of influential position at Athens, and of oligarchical sympathies. In 415 B.C. he was accused of being concerned in the mutilation of the Hermæ; he turned informer, but had to leave Athens. He was banished three times afterwards, and died in exile. Three genuine speeches of great historical importance are extant: the best editions are (text only) Blass (1881) and Lipsius (1890); (with notes) Hickie's *De Mysteriis* (1885), and Marchant's *De Reditu* (1889). See Jebb's *Attic Orators* (1876).

Andorra (Ar. *Al Darra*, 'a wooded place'), a small independent republic on the Spanish side of the Pyrenees, between the French dep. of Ariège and the

Spanish prov. of Lerida, with an area of 175 sq. m. When Louis le Débonnaire besieged Urgel, the inhabitants of Andorra assisted him against the Saracens (805 A.D.); Louis, therefore, gave them self-government, reserving certain rights, which were subsequently transferred to the Counts of Foix, and passed by inheritance to the Bourbons. The tithes and other dues were granted to the bishop of Urgel. On the N. side bridle-paths lead into France, by which the valley of the Ariège and the town of Ax-les-Thermes are reached. The country lies high, from 3,000 ft. to peaks of 10,000 ft. There is still a large quantity of timber, which is an important source of revenue to the inhabitants. The arable land is rich, but limited in extent. Cultivation is pushed up the mountain sides; rye and barley, tobacco, vines, and vegetables are grown. Pines, firs, oaks, poplars, and beeches, scented boxwood, the rose, anemone, narcissus, clematis, crocus, and cowslip are among the flora. The country is rich in iron and lead, but the mines are very little worked, and the cost of transport would be a great hindrance to their development, for there is no carriage road into the republic. There are hot mineral springs at Las Escaldas and elsewhere. The chief wealth consists of herds of cattle, mules, sheep, goats, and pigs. Horse-breeding is an important industry, and an extensive contraband trade is carried on with France and Spain. The Andorrans, about 6,000 in number, are of Spanish race, Catholics in religion, and speak a dialect of Catalan. They are poor, orderly, and industrious. They are governed by a council of 24 members, elected by the six parishes. Each of the suzerains is represented by a *viguier* (vicar). The bishop's *viguier* holds office for three years, and the French *viguier* for life. The *viguiers* and the judge of appeals constitute the supreme court. The only tax is the *quistia*, an annual tribute of £38 to the French government, and about half that sum, together with certain tithes in kind, to the bishop of Urgel. The capital is Andorra la Vella (Old Andorra), a small town of 800 inhabitants, 11 m. from Urgel. See Deverell's *Valley of Andorra* (1886); Smith's 'Andorra' (*S.G.M.*, 1895); Osona's *La Republica d'Andorra* (1896); Spender's *Through the High Pyrenees* (1898); and Belloc's *Pyrenees* (1909).

Andover. (1.) Munic. bor. and mrkt. tn., Hampshire, England, 27 m. N.W. of Southampton; has iron works and manufacture of agricultural implements. There are traces of ancient earthworks in the vicinity. Pop. 6,500. (2.) Town, Essex co., Mass., U.S.A., 22 m. N. of Boston; here is situated an important Congregational divinity college—the Andover Theological Seminary.

Andrada e Sylva, BONIFACIO JOSÉ DE (1763–1838), one of the founders of Brazilian independence, was born at Santos, near Rio Janeiro. In 1819, he took a prominent part in the declaration of independence, and held the portfolios of the interior and of foreign affairs. His democratic tendencies led to his exile to France (1823–9). On the abdication of Pedro I. (1831) he undertook the education of the Prince Imperial (Pedro II.). He was the author of *Poesias d'America Elysea* (1825).

Andrassy, GYULA, COUNT (1823–90), Hungarian statesman; born at Zemplin, which he represented in the Presburg Diet (1847–8). During the 'year of revolution' he espoused the popular cause, and was exiled, spending the years 1849–57 in France and England. Under the amnesty of 1857 he returned to his native

land, and was elected a member of the Diet in 1860, where he supported the policy of Deák, and became (1867) premier and minister of national defence. The civil and political emancipation of the Jews, and the reorganization of the Honved or national militia, were the principal acts of his administration. In November 1871 he became foreign minister for Austria and chancellor of Austria-Hungary. In the diplomatic transactions which preceded the Russo-Turkish war, and in the negotiations which led to the Berlin Conference, he took a prominent part; and the 'Andrassy Note' of 1876 was one of numerous efforts made to avoid war. At the Berlin Congress (June 1878) he succeeded in obtaining, for Austria, the occupation of Bosnia and Herzegovina. After the conclusion of the Austro-German treaty of alliance, he resigned, and remained in retirement for the rest of his life. See Kakay's *Count Julius Andrassy* (1879).

André, or ANDREAS, BERNARD (*c.* 1500), poet and historian, born at Toulouse; came to England with Henry VII., by whom he was made poet laureate. He wrote a life of the king in Latin and some poems in French. See Gairdner's *Memorials of Henry VII.*

André, JOHN (1751–80), major in the British army, was born in London, where his father, a Swiss, had settled as a merchant. In 1771 he joined the British army, and went in 1774 to America. In 1780, when the American general, Benedict Arnold, in command of the works at West Point, made overtures to surrender to the British, André was chosen to negotiate with him; but he was apprehended as a spy, and after being tried by a military board convoked by Washington, was hanged at Tappan, Oct. 2, 1780. The British army went into mourning for him, and in 1821 his remains were brought to England and deposited in Westminster Abbey, where a monument was raised to his memory. See the *Life* by Sargent (1861), and Lossing's *Two Spies* (1886).

André, LOUIS JOSEPH NICOLAS (1838), French soldier and politician, born at Nuits (Côte d'Or); distinguished himself in the Franco-German war; became head of the Polytechnic (military) School, and minister of war in the Combes cabinet (1902). An energetic republican, he resolutely opposed the clerical and so-called nationalist intrigues which for the past twenty-five years had made headway in the army, and in November 1904 was the subject of bitter attacks in the French Chamber. The charge against him was that of countenancing delation in the military academies, and in reference to the promotion of officers, republicans being preferred and clericals kept back. On November 4, André defended himself in a speech of two hours' length, and feeling rose high. He resigned on November 15, and was succeeded by Berteaux.

Andrea d'Agnolo (1487–1531), called ANDREA DEL SARTO, 'the tailor,' from his father's trade (his monogram of two inverted A's led to the misnomer Vannucchi), also ANDREA SENZA ERRORI, 'the faultless,' an Italian painter, was the chief Florentine colourist of the 16th century. His delicate colouring is conspicuous in the *Madonna di San Francesco* in the Uffizzi Gallery at Florence (1517). His pupil, Vasari, relates that Andrea was a pupil of Piero di Cosimo, the housemate of Francia Bigio; that he studied the frescoes of Masaccio and Ghirlandaio, the frescoes of Michael Angelo and Leonardo da Vinci; and that he learned light and shade from Fra Bartolommeo. In 1518 he went to France to paint the fine *Charity* (Louvre) and the

Pietà (Vienna) for Francis I. The following year, his wife—the beautiful model for his Madonnas—induced him to return to Florence and break his engagement to the king; but the story of the embezzlement of money given him by Francis to purchase pictures is questioned since the discovery of the king's accounts. His wife's influence on his art was baneful. When her extravagance had reduced him to indigence she deserted him, and finally he died of the plague. A full conception of his power can be obtained only by a study of the fine series of frescoes in Florence, in Santissima Annunziata, in the convent of St. Salvi, and especially the monochrome series in the cloister of the Scalzo, painted in 1514. His pictures are in the large European galleries; the National Gallery, London, has two examples. See Crowe and Cavalcaselle's *Painting in Italy* (1864–66); Guinness's *Andrea del Sarto* (1899); Swinburne's *Essays and Studies* (1875); Browning's poem 'Andrea del Sarto' in *Men and Women* (1855).

Andrea, Johann Valentin (1586–1654), poet and theological writer, was born at Herrenberg in Würtemberg. He travelled through Germany, Italy, and France as tutor to certain young noblemen, and became one of the most learned men of his age. His numerous writings in Latin and German are directed against the hair-splitting pedantry of the erudite and the clergy (*Turbo*, 1616). He pictured a state based on Christian principles (*Christianopolis*, 1619), after satirizing the present condition of society (*Menippus*, 1618; *Geistliche Kurzweil*, 1619, a collection of poems). See Herder's *A.'s Dichtungen* (1786); his own *Autobiography* (1849); and Glökler's *Life* of him (1886).

Andreæ, Laurentius (1480–1552), Swedish reformer, lived for some time at Rome and at Leipzig. As archdeacon of Strengnäs, he won Gustavus I. to the principles of the reformation. He subsequently became chancellor, and superintended the translation of the Scriptures into Swedish, published in 1526. Having enraged the king by resisting the secularization of the church, he was charged with failing to disclose his knowledge of a conspiracy against him, and was condemned to death (1540), but was reprieved, and sentenced instead to pay a heavy fine.

Andreas, an old English poem, ascribed by some to Cynewulf. The poem describes the delivery of St. Matthew out of the hands of the Mermedonian cannibals by St. Andrew, who is first martyred, then miraculously healed, and finally converts his murderers. It is based ultimately on a Greek 'Acts of Andrew and Matthew.' Its sea-pieces are unsurpassed even in Old English poetry. See text with glossary (Arnold); also Stopford Brooke's *Eng. Lit. to the Norman Conquest* (1898).

Andrée, Salomon August (1854–97), Swedish aeronaut and explorer, born at Grenna; was for some time head engineer at the Swedish patent office. After making several balloon journeys, he decided to attempt to reach the North Pole by such means. On July 11, 1897, he started from Dane's Island, Spitzbergen, with two companions, Strindberg and Fraenkel, in a balloon of 5,000 cubic metres. Several of the buoys which were carried have since been found, two with dispatches dated July 11; but a message sent by carrier-pigeon, and dated two days later, was the last authentic news of the explorers. See Lachambre's *Andrée and his Balloon* (1898), and *Century Mag.*, New Series, vol. xxxiii.

Andreini, Giovanni Battista (1578–1650), Italian poet of the

early 17th century, from whose drama of *Adamo* (Milan, 1613) Milton seems to have taken suggestions for *Paradise Lost*.

Andréossy, Antoine François, Comte d' (1761–1828), French general and diplomatist; born at Castelnaudary in Languedoc; served with Bonaparte in Egypt as chief of brigade; returned with him to France, and supported him at the revolution of 18th Brumaire; was successively ambassador at London, Vienna, and Constantinople; was elected to the Academy in 1826; became deputy for Aude in 1827. He published military memoirs and scientific works, including *Hist. du Canal du Midi* (1800), *Constantinople et le Bosphore de Thrace pendant 1812–14 et 1826* (1828).

Andrew, the first called of Christ's disciples, was the brother of Peter. He belonged to Bethsaida, and had been a follower of John the Baptist. Tradition has it that he preached in Scythia, Macedonia, etc., and that he was crucified at Patræ, in Achaia, on an X-shaped cross. The festival of St. Andrew falls on Nov. 30. He is the patron saint of Scotland, and is held in high regard in Russia as having evangelized that country. See Malan's *Conflicts of the Holy Apostles* (1871).

The St. Andrew's Cross is a diagonal cross of saltire, white on a blue ground, which formed the Scottish national flag from an early date, the relics of St. Andrew being supposed to have been brought to St. Andrews (Kilrimont) in the seventh century. After the accession of James VI. of Scotland to the English throne (1603), it was incorporated with the cross of St. George. In the Treaty of Union between England and Scotland in 1707 it was enacted that the crosses of St. Andrew and St. George should be conjoined as the flag of the United Kingdom (Mackinnon's *The Union of England and Scotland*, p. 235, 1896); on the union with Ireland (1801), with the cross of St. Patrick. (See Flag.)

The Russian Order of St. Andrew was founded (1698) by Peter the Great. The badge consists of the Russian double eagle in black enamel, bearing on its breast a St. Andrew's cross, and surmounted by an imperial crown. It has a blue ribbon, and is worn suspended from a collar of shields and ovals. It is one of the highest orders in the Russian empire, and is bestowed only on members of the imperial family, on princes, and on generals who already hold other important orders. The Scottish Order of the Thistle is also called St. Andrew.

Andrew, kings of Hungary. (1.) Andrew I. (1046–58), succeeded Peter the German, and engaged in war with Germany till 1052. He attempted to introduce Christianity into his kingdom, but was dethroned and killed by his brother Bela in 1058. (2.) Andrew II., reigned 1205–36, conducted a crusade to the Holy Land at the instigation of the Pope in 1217. On his return in 1222, he issued his Golden Bull, which became the basis of the rights of the Hungarian nobles. (3.) Andrew III. (1290–1301) succeeded to the throne after the murder of Ladislaus III., but was opposed by the Duke of Austria and by the Pope, who claimed Hungary as a fief of the church, and put forward Charles Martel, son of Charles II., king of Naples, as his nominee. Andrew defeated them both in 1291. The son of Charles Martel later seized a portion of Hungary, and held it till the death of Andrew in 1301.

Andrew, John Albion (1818–67), American statesman; practised law in Boston; became a prominent anti-slavery advocate,

and was elected to the Massachusetts legislature (1858); two years later was appointed delegate to the Republican National Convention at Chicago. He was republican governor of Massachusetts (1861–6), and one of the most active 'war governors.'

Andrewes, LANCELOT (1555–1626), English scholar and divine; born at Barking; became master of Pembroke Hall, Cambridge; appointed dean of Westminster (1601); took part in the Hampton Court Conference and in the preparation of the Authorized Version of the Bible; and was successively bishop of Chichester (1605), Ely (1609), and Winchester (1618). His writings are preserved in the *Library of Anglo-Catholic Theology*, 1841–54. See Isaacson's *Exact Narrative of the Life and Death of Bishop Andrewes* (1650); A. T. Russell's *Life and Works of Lancelot Andrewes* (1863); R. W. Church's Essay in *Masters in English Theology* (1877); Alex. Whyte's *Lancelot Andrewes and his Private Devotions* (1896); and D. Macleane's *Lancelot Andrewes and the Reaction* (1910).

Andrews, ELISHA BENJAMIN (1844), American educator, born at Hinsdale, New Hampshire; has been president of Denison University, Granville, Ohio (1875–79); professor of homiletics and pastoral theology at Newton Theological Seminary (1879–82); professor of political economy in Brown University till 1888, and president there (1889–98); superintendent of schools, Chicago (1898–1900); and chancellor of the University of Nebraska (since 1900). He represented the United States on the Monetary Conference at Brussels (1892), being a strong advocate of international bimetallism. He has published *Brief Institutes of Constitutional History, English and American* (1884); *Institutes of Economics* (1889); *History of the United States* (1894); *History of the Last Quarter Century of the United States* (1896; new ed., 1903); and *The United States in our own Times* (1904).

Andrews, JAMES PETTIT (1737–97), English antiquary and historian; wrote a *History of Great Britain, connected with the Chronology of Europe* (1794–5), and a continuation of Henry's *Hist. of Great Britain* (1796).

Andrews, THOMAS (1813–85), chemist; born at Belfast; appointed president of the Northern College (1845), professor of chemistry in Queen's College (1845–79); published important researches into the heat evolved and absorbed in chemical combinations, and in connection with the liquefaction of gases. See his *Scientific Papers, with a Memoir*, by Tait and Crum Brown (1889).

Andrews, THOMAS (1847–1907), English engineer and metallurgical chemist, proprietor of Wortley Iron Works and Wortley Silkstone Colliery; made researches in metallurgy and physics, and on the influence of climatic and other conditions upon metals.

Andria, tn. and episc. see, prov. Bari, Italy, 34 m. by rail w. of Bari. Manufactures of majolica and olive oil. Pop. 50,000.

Andrieux, FRANÇOIS GUILLAUME JEAN STANISLAS (1759–1833), French author of the first empire, professor (1814) in the Collège de France, and perpetual secretary (1829) of the Academy. He wrote graceful and witty comedies—*e.g. Les Etourdis* (1788), *La Soirée d'Auteuil* (1804), and *La Comédienne* (1816). His place among the minor poets of his day is secured by his *contes—Le Meunier de Sans Souci* (1797), *La Promenade de Fénélon*, etc. See Taillandier's *Notice sur la Vie et les Ouvrages d'Andrieux* (1850); Sainte-Beuve's *Portraits Littéraires*, vol. i.; Legouvé's *Souvenirs* (1886).

Andro, or ANDROS, most northerly isl. of the Cyclades, Grecian archipelago, s. of Eubœa. Cap. Andro, on E. coast. Silks and carpets. Area, 156 sq. m.; pop. 20,000.

Androclus, or ANDROCLES, a Roman slave who, according to Aulus Gellius, was thrown into the arena, where a lion, let loose upon him, appeared to recognize him, and licked his hands. Inquiry showed that Androclus had run away from his master in Africa, and when he had taken refuge in a cave, a lion entered in great pain and held out his paw to him. Androclus drew out the thorn which caused the pain, and for some time lived with the lion, but was captured and brought to Rome. He was set free, and used to lead his lion about Rome.

Andromache, daughter of Eetion, king of Cilician Thebes, and wife of Hector, to whom she bore Astyanax. No modern description of conjugal affection excels the picture given by Homer of the relations existing between her and her husband; and the passages in the *Iliad* which describe her parting with him, her grief at the sight of his fate, and her lament over his funeral, are unequalled for pathos in all literature. After the fall of Troy her son was cast from the walls and killed, and she became the captive of Neoptolemus, son of Achilles, and accompanied him to Greece. She afterwards married Helenus, brother of Hector, who ruled over Chaonia. The *Iliad* of Homer and the *Andromache* of Euripides give her story.

Andromeda, daughter of Cepheus, king of Æthiopia, and Cassiopeia. As her mother boasted that in beauty Andromeda excelled the Nereids, Poseidon sent a sea monster to ravage the country. The oracle of Ammon prescribed that Andromeda should be given up to the monster to save her country; but Perseus turned it to stone with the Gorgon's head, and saved her, and afterwards married her. After death she was placed among the stars. The story is told in Ovid's *Metamorphoses.* See also C. Kingsley's *Heroes* (1856).

Andromeda, one of the Ptolemaic constellations, forming, with Cepheus, Cassiopeia, and Perseus, a group known from prehistoric antiquity. Three stars of about the second magnitude — Alpheratz, Mirach, and Almaach—mark the head, the girdle, and the foot of the mythical heroine. Alpheratz, or α Andromedæ, β Cassiopeiæ, and γ Pegasi (Algenib), being aligned on the equinoctial colure, are called the 'Three Guides,' and is a spectroscopic binary revolving in a highly eccentric orbit in a period of 97 days. Almaach, or γ Andromedæ, is a triple star, composed of an orange primary, attended by a revolving pair tinted emerald and azure. In its vicinity is situated the radiant point of the Andromeda meteors, the last conspicuous shower of which occurred Nov. 23, 1892. The great nebula near ν Andromedæ was familiar to Al Sûfi in the 10th century, but the first telescopic view of it was obtained Dec. 15, 1612, by Simon Marius, who compared it to a candle shining through horn. A photograph taken by Dr. Roberts in 1888 disclosed it as a vast spiral structure. Close to its nucleus a temporary star rose to 6·5 magnitude in August 1885, then in six months faded to extinction. The nebula emits white light, giving a continuous spectrum, thought to be interrupted by bright and dark lines of undetermined origin. The spectrum, on the other hand, of the biannular nebula (N.G.C. 7662) is almost purely gaseous. Professor Keeler determined for this singular object in 1890 a motion of approach to the earth at the rate of seven miles a second, and Böhlin

found a parallax of 0″·17 corresponding to a distance of 19 light years.

Andromeda, a genus of the heath order; mostly shrubby plants. The only British species is *A. polifolia* (marsh Andromeda), found in peat bogs in Scotland and in the north of England but rare. The pink flowers are pendulous, large, and heathlike. The whole plant is poisonous, and dangerous near pasturage.

Andronicus I., COMNENUS (? 1112–85), Emperor of Constantinople; son of Isaac, and grandson of Alexius I. He was regent during the minority of Alexius II., whom he assassinated. He seized the throne, but was killed in a popular insurrection, and Isaac Angelus was made emperor.

Andronicus II., PALÆOLOGUS THE ELDER, Emperor of Constantinople (1283–1328), whose antagonism to the Roman Church brought about his excommunication in 1307 by Pope Clement V. He tried in vain to stop the advance of the Turks in Asia, and was dethroned by his nephew, Andronicus III., in 1328. He died in 1332, in a monastery near Adrianople.

Andronicus III., PALÆOLOGUS THE YOUNGER, Emperor of Constantinople (1328–41). During his reign the Turks conquered all his territories in Asia to the Bosporus; and in Europe, Stephen III. (Urosh, king of Servia), and Stephen IV. (Dushan), his successor, conquered Bulgaria and the greater part of Macedonia.

Andronicus IV., PALÆOLOGUS, Emperor of Constantinople (1377–9), eldest son of John V., Palæologus, dethroned his father in 1377, who, however, recovered the throne in 1379 with the aid of the Turks. He died in 1385.

Andronicus OF RHODES, a peripatetic philosopher, who lived at Rome about 58 B.C. He made known to the Romans the works of Aristotle; none of his own writings are extant.

Andronicus, LIVIUS, the earliest Roman poet, was of Greek birth. He was the author of tragedies, comedies, and hymns, of which only fragments are extant; he also translated the *Odyssey* into Latin Saturnian verse.

Andronicus Cyrrhestes, the builder of the famous octagonal tower at Athens generally known as the Temple of the Winds.

Andros, SIR EDMUND (1637–1714), governor of New York from 1674–81. In 1686 he was appointed governor of New England, and, on the revocation of the colonial charters, made himself very unpopular by his attempt (1687) to seize the charter of Connecticut. In 1689 the people of Boston sent him to England, where he was acquitted without formal trial. He was governor of Virginia (1692–8), and of Guernsey (1704–6). See Whitmore's *Memoir* (1868–74), and *Andros Tracts* (1869–72).

Androscoggin, a riv. in Maine and New Hampshire, U.S.A., rising in the White Mts., and flowing S.E. for 155 m. to its junction with the Kennebec a few miles above its mouth.

Andros Island, the largest of the Bahama group, W. Indies; length, 100 m.; breadth, 10 to 40 m. Exports wool and sponges. Pop. 6,500.

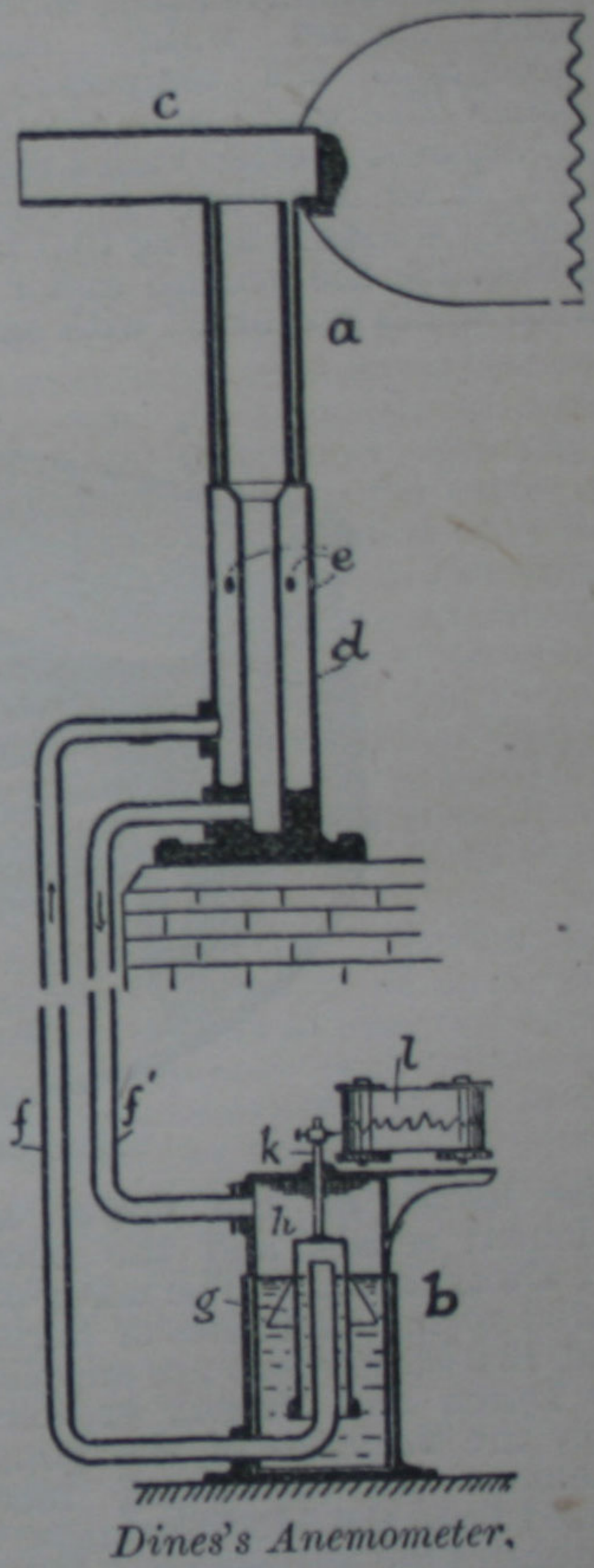
Androsphinx, a sphinx with a male instead of a female head—*e.g.* the great sphinx of Gizeh.

Andujar, tn., prov. Jaën, Spain, on the r. bk. of the Guadalquivir; stn. on ry. between Cordova and Madrid. Flour, oil, wax candles, and porous jars for cooling water are manufactured. Six miles distant are the mineral baths of Marmolejo. Pop. 16,500.

Anelectrotonus, the changes in the region of the anode while a constant electric current is passing through a nerve; irritability in that region is diminished.

Anemochord, a stringed instrument, invented by Schnell in 1789, in which the strings were made to vibrate by currents of air directed upon them. It was found suitable only for the slowest music. The same principle was developed by Herz in his *piano éolien* (1851).

Anemometer, an instrument for measuring the pressure or velocity of the wind. The best-known form is the hemispherical cup anemometer invented (1846) by Robinson, consisting of four hemispherical cups which rotate horizontally with the wind, and a combination of wheels which record the number of revolutions in a given time. Robinson supposed that the cups revolved with about a third of the wind's velocity, and the instruments were scaled on that assumption; but it has been found that the ratio between the speed of the cups and that of the wind is as 1:2·3 (not as 1:3), and varies with the dimensions of the cups and arms, so that velocities hitherto published must be reduced by nearly thirty per cent. The Royal Meteorological Society appointed a committee to consider the subject of wind-force; and an anemometer was invented by W. H. Dines, which has superseded its predecessors. It consists of two separate portions—the head (*a*), which is exposed to the wind; and the recording apparatus (*b*), which may be placed in any convenient situation. The head consists of a vane (*c*), formed of a piece of tube with an open end, which is kept facing the wind; underneath the vane is another and larger tube (*d*), perforated by several holes (*e*) arranged in rings; and the action of the wind in blowing across these is to suck out the air from the inside. The two tubes are separately connected with pipes (*f*, *f'*) which communicate with the recording apparatus. The recorder consists of a float (*g*), which is placed in a closed vessel (*h*) containing water. A pipe (*f*) connects the vane with the inside of this float, so that every variation in wind-pressure at the mouth of the vane is transmitted, causing the float to rise or fall in the water. To the top of the float is attached a rod (*k*) which carries a pen, so



Dines's Anemometer.

that every oscillation is recorded graphically on a moving sheet of paper (*l*) uniformly unrolled by a clock. Osler's pressure anemometer consists of a plate, usually of 1 sq. ft. area, which is kept facing the wind, and is by it driven back

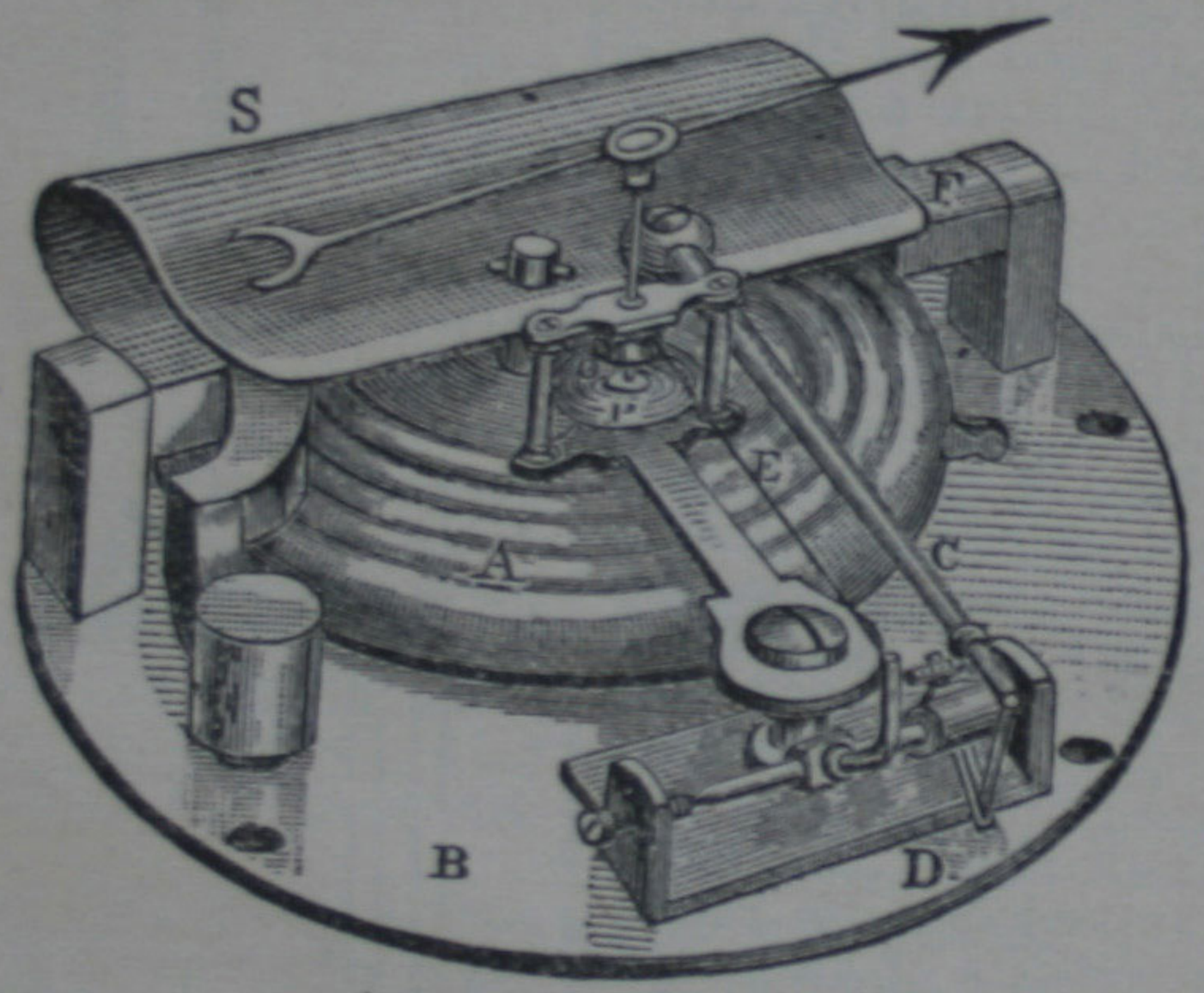
upon a spring whose resistance is the measure of the wind's force. See *Quar. Jour. Met. Soc.*, vol. xv. p. 183, xvi. pp. 26, 205, 208, xviii. p. 165, xix. p. 16, xx. p. 180, and xxii. p. 237; and Marvin's *Anemometry* (1900).

Anemone, the 'wind-flower' genus of Ranunculaceæ, includes many species widely spread throughout the temperate regions. The white wood anemone (*A. nemorosa*), often with a purple tint, is so abundant in certain marshy woods in spring that from a distance the ground under the trees seems sprinkled with snow. The leaves of the flower are coloured sepals, and the petals are always absent. The many-coloured spring anemones of florists and British gardens are supplied by Dutch and French growers; they are varieties of the poppy anemone (*P. coronaria*), introduced from the Mediterranean at the end of the 16th century. There are nearly one hundred distinct species of the anemone; the autumn-flowering species is the *A. japonica*. The hepatica, which appears with the snowdrop and crocus, is another species of anemone from N. America.

Anemone, Sea. See Sea Anemone.

Anemophilous Flowers. See Pollination.

Aneroid (Gr. 'non-liquid'), the barometer invented by Vidi of Paris (1843), consists of a metal box from which the air is exhausted, or 'vacuum chamber,' and a steel spring in the form of a doubled leaf. Alterations in atmospheric pressure bring about changes in the shape of this metal box, which are magnified by a system of levers turning a hand on a dial to indicate a higher or lower barometric pressure. The dial is graduated by comparison with a mercurial barometer, both instruments being placed under an air-pump for the purpose. The vacuum chamber, A, is made of two discs of corrugated German silver soldered together, and attached to the base plate, B; a strong spring, S, supported by the frame, F, and attached to the vacuum chamber, acts in opposition to the motion of the box, preventing its sides giving way under reduced atmospheric pressure. The lever, C, of iron and brass, is attached to the spring, and compensates for alterations in tem-



Aneroid Barometer.

perature. The bent lever at D connects it to a chain, E, which is wound round the arbor, O. The spiral spring, P, keeps the chain, which is coiled round the barrel, free from slackness while the pressure is diminishing, and the hand turns to the left over the graduated dial. When the pressure is increasing, the lever pulls upon the chain, and the hand moves to the right over the dial. The index is fixed to the arbor.

As these instruments are graduated experimentally, they have frequently to be compared with a mercurial barometer. Although very sensitive, they are liable to get out of order owing to rusting, or to alterations in the force of the springs, so that if an instrument has been long in use its scale alters. It is thus rarely used for accurate meteorological observations, but, owing to its lightness, is a handy instrument for the traveller. After subjection to a low pressure, as in a mountain ascent, an aneroid does not at once recover its readings for normal pressures. Whymper made a series of experiments on aneroids in the field and workshop under varying conditions, which are recorded in *How to Use the Aneroid Barometer* (1891). He finds that all aneroids lose upon the mercurial barometer when submitted to diminished pressure, and that when pressure is restored a portion of this loss is recovered. Even at a fixed station an aneroid, after having experienced diminished pressure, will not follow natural diurnal or hourly variations with reasonable accuracy. As regards the use of the instrument for the measurement of altitudes, he has found that large reductions will have to be made in the height of many positions which have been determined by the aneroid. As the indications do not depend on the force of gravity, but on the elasticity of a metallic spring, the readings do not need a correction for latitude. See BAROMETER.

Aneurin, a Welsh poet, who flourished during the 6th century, generally supposed to be the son of Caw ap Geraint, chief of the tribe of Gododin (Otadini), who inhabited the land between the walls of Septimius Severus and Antoninus Pius. The Gododins were routed by the Saxons at Cattraeth, on the Northumbrian coast (540), and of 360 chiefs present at the battle only three escaped, of whom Aneurin was one. He took refuge at the court of King Arthur, and wrote the *Gododin*, an epic poem, descriptive of the wars which terminated in the battle of Cattraeth. Of the poem only 900 lines are extant. It has been translated by E. Davies in his *Mythology and Rites of the Brit. Druids* (1809). See J. H. Parry's *Cambrian Plutarch* (1824); Sharon Turner's *Vindication of the Genuineness of the Ancient Brit. Poems* (1803); Stephens's ed. of the *Gododin* (1885).

Aneurism (Gr. 'a widening'), the local dilatation of an artery, varying greatly in size, and affecting the whole or part of the vessel's circumference. If the artery is dilated in a considerable part or the whole of its circumference, a spindle-shaped or fusiform aneurism is formed. Sometimes the dilatation forms a pouch, and is said to be sacculated; at other times the blood does not lie in a distinct sac, but between the coats of the artery, in what is called a dissecting aneurism. It sometimes arises from an injury (traumatic aneurism), but more frequently occurs spontaneously, and is often multiple. Minute aneurisms (miliary: *milium*, 'millet seed') are, by their rupture, frequently the cause of cerebral hæmorrhage. A cure of aneurism is rarely effected. By acupunc-

ture the internal surface of the artery may be so roughened as to promote the formation of thrombosis or clot. Occlusion of the artery, which may be brought about by ligaturing the vessel, encourages this. But the majority of aneurisms are beyond the reach of surgical interference, and usually they enlarge and end fatally. This may result from pressure on neighbouring parts, such as the heart, so that death may result from hyperæmia and œdema of the lungs, from venous engorgement, and so on. The aneurism sometimes ruptures. It sometimes presses on nerves, causing, first, irritation, and then loss of function. When an aneurism meets with a firm structure, such as bone, it erodes it. Drugs have little effect, but iodide of potassium has sometimes proved beneficial. Duncan of Edinburgh advocated electrolysis. The subcutaneous injection of a one per cent. solution of gelatin is now advocated, to encourage clot formation; but this treatment is still *sub judice*. Meanwhile the general aim is to lessen strain by lowering blood-pressure, moderate dieting, and a quiet life.

Angamos Point, Chile, 50 m. N. of Antifogasta. Off here, on Oct. 8, 1879, occurred the naval battle between the Peruvian ironclad *Huascar* and the Chilean ironclads *Blanco Encalada* and *Almirante Cochrane*. The Peruvians were forced to surrender.

Angara, riv., Siberia, rises in Transbaikalia, enters Lake Baikal on the N. side, issues from it on its W. side (from this point it is also called the Upper Tunguska), flows N. through the town of Irkutsk, and then W., and after a course of 1,300 m. joins the Yenisei above the town of Yeniseisk.

Angel. The word angel is formed from the Greek *aggelos* (pronounced *angelos*), which represents the Hebrew *mal'ak*, and though now restricted to superhuman beings, had originally the general meaning of 'messenger.' We find in Scripture quite a number of terms implying the existence of other supernatural beings besides God—*e.g.* 'sons of the gods' or 'sons of God' (Gen. 6:2), 'sons of the mighty' (Ps. 29:1), 'seraphim' (Isa. 6), 'watchers' (Dan. 4:13 *ff.*), 'host of Jehovah' (Josh. 5:14). But in the oldest parts of the early books of the Bible the name angel is applied neither to a mere messenger of the Deity nor to these superhuman beings, but rather to manifestations of God himself ('angel of God,' or 'of the Lord,' Gen. 31:11; Ex. 3:2) —*i.e.* actual theophanies; though, again, a distinction is sometimes made between the Supreme and His messenger (Gen. 16:11). As the conception of the Divine supremacy (over other gods) and transcendence (above the world) grew more definite, the angels came to be looked upon as beings intermediate between God and man—His servants who carry His messages and otherwise do His pleasure (Gen. 32:1; 2 Sam. 24:16; Ps. 34:7; Dan. 9:21). Next emerges the idea of rank among the angels: there are archangels, chief princes (Dan. 10:13; 12:1; Tobit 12:15), the seven spirits of God (Rev. 4:5); while the 'thrones, dominions, principalities, powers' of Col. 1:16 probably refer to this hierarchy. Further, a moral distinction among the angels becomes increasingly prominent. At first the ethical character of the divine messengers does not come into consideration, and the term 'evil' as applied to them in Ps. 78:49 and Judg. 9:23 does not refer to their character, but to the penal functions committed to them. Even Satan is reckoned among the sons of God (Job 1:6). But as the idea of Satan develops

he becomes positively wicked in himself, the adversary not only of men but of God, the existence of moral and physical evil being frequently traced to him (1 Chr. 21 : 1 : *cf.* 2 Sam. 24 : 1; Luke 13 : 16), and to the hierarchy of demons of which he is the head. In the apocalyptic literature we find the doctrine of a fall of angels, which seems to have left traces in the New Testament (Jude, ver. 6; 2 Pet. 2 : 4). By the early years of the Christian era belief in a good and an evil hierarchy of superhuman beings had become quite distinct. True, the Sadducees rejected the popular notions regarding them; but the common belief in their existence is countenanced by Jesus, though He does not appear to favour the view that they interfere with human life (see Matt. 18 : 10 : *cf.* 16 : 27). Paul not only accepts the Old Testament statements regarding angels, but speaks of them as having to do with the present life of man (1 Cor. 4 : 9; 6 : 3; 11 : 10). In the Book of Revelation they are associated with elemental or cosmical forces (ch. 14 : 18; 16 : 3). The notion of a 'guardian angel' is found not only in the 'princes' of the nations spoken of in Daniel, but may also be justified by such statements of Jesus as Matt. 18 : 10; Luke 15 : 7, 10 : *cf.* Acts 12 : 15. The 'angels of the churches' in Rev. 1 : 20 *ff.* are possibly bishops. Worship of angels is forbidden by Paul in Col. 2 : 18; the second Nicene Council decreed that though *latreia* (worship) was wrong, yet *douleia* (service) was permissible. It may not be out of place to warn the reader against a tendency to identify the 'angelophanies' in the Old Testament with the second Person of the Trinity; we must guard against foisting upon the early Hebrew consciousness ideas which emerged only in sub-apostolic times. See ARCHANGEL, CHERUBIM, SERAPHIM; 'Excursus on Angelology,' etc., by Fuller, in the Speaker's *Apocrypha*, i. p. 171 *f.*; H. Schultz's *O.T. Theology*, ii. p. 214 *ff.* (1892).

In the Catholic Apostolic Church an angel, or bishop—the two offices being held to mean the same thing—presides over each congregation.

Angel, or ANGEL-NOBLE, a gold coin struck in England in 1465. A new issue of the angel took the added name of noble from the figure of Michael and the dragon borne on its obverse. The value varied from 6s. 8d. to 10s. The issue ceased in the reign of Charles I. See ANGELOT.

Angel-Fish, or MONK-FISH (*Rhina Squatina*), a shark which, in its depressed body and its habits, approaches the ray. It reaches a length of five feet, and is viviparous, producing some twenty young at a birth. It is found in both the E. and W. Hemispheres.

Angeli, HEINRICH VON (1840), Hungarian painter, born in Oedenburg; studied in Vienna and Düsseldorf. In 1862 he settled in Vienna, where he soon gained a great reputation as a portrait painter. In 1870 he painted the portraits of the Emperor Francis Joseph and the German Crown Prince. He came also to England and painted the portrait of Queen Victoria, members of the royal family, and many members of the aristocracy. Among his historical pictures are, *Mary Stuart on her Way to the Scaffold* (1857) and *Louis XI. of France before St. Francis of Paola* (1859); and among his genre pictures, *Youthful Love* (1870) and *The Avenger of his Honour* (1869). Since 1877 he has been professor at the Vienna Academy.

Angelica Archangelica is a British plant of the Umbelliferæ, growing to a height of three or four feet, and sometimes cultivated in

kitchen gardens. The leaf-stalks are candied and used for decorating creams, jellies, and trifles. The name is said to have been given to the plant from its supposed high medicinal qualities. It was formerly blanched and eaten like celery.

Angelica Tree, an Aralia belonging to the United States. The crushed bark smells like angelica, and is used as an emetic and a purgative.

Angelic Brothers, a sect of Dutch mystics founded by Johann George Gichtel (1638–1710), who professed to have attained perfection and abolished all carnal desires, like the angels in heaven.

Angelico, GIOVANNI (1387–1455), 'Il beato Fra Giovanni Angelico da Fiesole,' a celebrated Florentine painter, entered the Dominican order in 1408; in later life, through humility, he refused an archbishopric; after death he was beatified for his saintly life. He painted many frescoes and altar-pieces in Fiesole, Cortona, Orvieto, Rome, and Florence. One series of Vatican frescoes was destroyed, but in that in the chapel of Nicholas V., representing the lives of St. Sebastian and St. Lawrence, Angelico's powers attained their maturity of freedom and strength. His most notable work is the remarkable series of frescoes he executed in the cells, cloisters, and chapel of San Marco, Florence (now a national museum), during his sojourn there (1436–45). These paintings have an extraordinary purity of feeling and devotional repose; rapt ecstasy is expressed in the slight figures, graceful in form and gesture, draped in simple folds, and painted with delicate transparent colours, highly ornamented with burnished gold, and shadowless. He believed in the inspiration of his work, prayed when he painted, and rarely retouched—a method that resulted in many technical weaknesses, but conserved the freshness of spontaneity. Among his chief works are, *The Adoration of the Magi*; *The Crucifixion*, in San Marco; *The Coronation of the Virgin*, in the Louvre; and *The Resurrection*, in the National Gallery, London. See L. Douglas's *Fra Angelico* (2nd ed. 1902); Crowe and Cavalcaselle's *Hist. of Painting in Italy from the 2nd to the 16th Century* (1864); and S. Beissel's *Fra G. Angelico da Fiesole* (2nd ed. 1905).

Angelic Salutation. See AVE MARIA.

Angeln, dist., prov. Schleswig-Holstein, Prussia, between the Schlei, Flensburg Fjord, and the Baltic, is the original seat of the Angles.

Angelo, MICHAEL. See MICHELANGELO.

Angelot, a French gold coin struck by Philip VI. in 1340. Its weight was from 97·22 to 87·96 grains. Henry VI. of England also issued a gold coin with this name, for use in his French dominions. It weighed about 35 grains. See ANGEL (coin).

Angelus à Sancto Francisco, the name assumed by RICHARD MASON (1601–78), a Franciscan of the Strict Observance. Born in England; joined the order (1624), and was successively definitor or consultor, guardian of the house of English Recollet friars at Douay (1628), professor of divinity there, confessor to the nuns of the order of St. Francis, missionary, president, and provincial of his brethren (1659–62). In 1675 he retired to St. Bonaventure's convent at Douay, where he died. His works, some of which are very rare, include *Regula et Testamentum S. Francisci* (1643); *The Rule of Penance of the Seraphical F. St. Francis, as approved and confirmed by Leo X.* (1644); *Apologia pro Scoto Anglo* (1656). See Wadding's *Scriptores Ord. Minorum* (1806).

Angelus Bell, a bell rung thrice daily in Catholic countries, at the sound of which, by an ordinance of Pope John XXII. (1326), the faithful repeat three aves. It takes its name from the words, *Angelus Domini*, which preface the 'angelic salutation' to the Virgin Mary (Luke 1:28). Millet painted a picture with the title of *The Angelus* (1859), which has since become widely popular.

Angelus Silesius, JOHANNES (1624–77), whose real name was JOHANN SCHEFFLER, studied medicine and philosophy at Strassburg, Leyden, and Padua. In 1653 the writings of Jacob Boehme and other mystics led him to join the Roman Catholic Church. His *Cherubinischer Wandersmann* and his *Heilige Seelenlust oder geistliche Hirtenlieder der in ihren Jesus verliebten Psyche* appeared in 1657. The mysticism of Angelus Silesius has much in common with the philosophy of Schopenhauer. See Mahn's dissertation, *Die Mystik des Angelus Silesius* (1893); also the Biography by C. Oeltmann (1896). Some of his hymns (*Mir nach! spricht Christus, unser Held; Liebe, die du mich zum Bilde*) even find a place in Protestant hymn books.

Anger, a fundamental emotion arising in pain, characterized by aversion to the object causing pain, and by a tendency to destruction. In all its modes—instinctive aversion, resentment to injury or pain, rage, retaliation, aggressive infliction of pain on the offending sentient object, revenge, righteous indignation, pleasure of malevolence—anger is accompanied by excitement more or less diffused according as the feeling attitude, the conative attitude, or the intellectual attitude predominates. The excitement reaches a climax in rage, which, for the time, is indistinguishable from acute mania. Perhaps the most constant feature is the tendency to destruction; in the higher forms of anger the desire to inflict pain on a sentient object cannot be excluded. The indulgence of anger is more or less pleasurable. In righteous indignation injuries of others or of justice are accepted as personal, sympathy being thus involved. On the physical side anger is marked by sudden change of attitude and aspect, increase of pulse-rate, quickening or arrest of respiration, raising of eyebrows (in animals), frowning, contraction of pupils, blushing, increase of muscular tension, certain organic changes resulting in deranged functions of the viscera, including the glands, such as liver, mammæ, sweat glands, salivary glands, and the like. Monkeys and turkeys redden with passion; dogs snarl, showing canine teeth; young infants scream, struggle, and blush over the face and scalp. Tears of rage may be distinguished from tears due to pain. The circulation may be suddenly interfered with, the face becoming livid, the individual sometimes dying of syncope, due to the sudden increase of blood-pressure. In so-called cold rage the face becomes temporarily pallid, owing to sudden stimulation of the vaso-constrictors. In aggressive anger the nervous discharge to muscles, and consequently the muscular output, are much above normal. In biological evolution anger is probably an emotional adaptation to defence against aggression (individual or tribal), and to securing of prey. Anger may be contrasted with fear, which is a depressing emotion. (See FEAR.) Biologically the physical manifestations of anger —*e.g.* growling, pouting, snarling —may be a means of instilling fear in others, or of masking fear in self. For detailed analysis of anger, see Bain's *The Emotions and the Will* (1875; 4th ed. 1899),

The Angelus. By Jean François Millet.

p. 72 and ch. ix.; for physical manifestations, see Darwin's *Expression of the Emotions in Men and Animals*, ch. x. (1873); for critical analysis, see G. F. Stout's *Manual of Psychology*, vol. ii. pp. 284–310 (1899); for anger as illustrating theory of emotion, and evolutionary aspects, see W. James's *Principles of Psychology*, vol. ii. pp. 409, 460, 478 (1890); also H. M. Stanley's *Evolutionary Psychology of Feeling*, ch. x. (1895). See EMOTIONS.

Angermanland, dist. of Sweden, forming part of prov. of Vesternorrland; is situated about the lower course of the Angerman R. (240 m. long), which enters the Gulf of Bothnia at Hernösand.

Angermünde, tn., dist. Potsdam, prov. Brandenburg, Prussia, 44 m. by rail N.E. of Berlin; an important railway junction, with distilleries, iron works, and manufactures of woollen and linen goods. Pop. 7,600.

Angers (anc. *Andegavum*), tn. and episc. see, France, formerly cap. of Anjou, now of dep. Maine-et-Loire, on l. bk. of the river Maine. The commercial centre for the white wines of Anjou, Angers has considerable trade also in corn, beans, wool, hides, oil, horses, and cattle. The chief industries are textile manufactures, iron and copper wares, boots and shoes, and market-gardening. It is the seat of a university. Its Gothic cathedral was begun in the 12th century. A pre-Roman town, Angers was the capital of the Andegavi, and later received the name Juliomagus. It was united to the French crown in 1474. Pop. 83,000.

Angers, AUGUSTE REAL (1838), Canadian politician, born at Quebec City, Lower Canada; was member of the Quebec legislature from 1874 to 1879, the last three years as premier. Called to the Senate, and entering the Thompson ministry in 1892, he withdrew three years later on account of differences regarding the Manitoba school question. Joining the reconstructed cabinet of 1896, he was defeated at the general elections of that year. He improved the election laws of Quebec, the quarantine regulations of the Dominion, and completed the N. Shore Railway.

Angevine Line, the dynasty of English kings which began with Henry II. (1154) and ended with Richard III. (1485). It thus coincided with the Plantagenet, Lancaster, and Yorkist kings. The name comes from Anjou in France, Henry II. having been the son of the Count of Anjou. See Norgate's *England under the Angevine Kings* (1887), and *Polit. Hist. of Eng.*, vols. ii.–iv. (1906).

Anghiari, tn., Italy, dep. of and 12 m. N.E. of Arezzo. Pop. 8,200. Here in 1440 the Florentines defeated the Milanese.

Angilbert, St. (d. 814), poet, historian, and diplomatist; secretary and friend of Charlemagne, whose daughter, Bertha, he married. He filled high offices of state; was made abbot of Centula in Picardy (790); and assisted at the coronation of Charlemagne at Rome (800). He has been called the Homer of his time. See *Vita S. Angilberti* (Mabillon, *Acta Sanctorum Ord. Sancti Benedicti*, iv. 123); Ceillier's *Histoire des Auteurs sacrés*, vol. xviii. (1729–58).

Angina, a medical term for tonsilitis or quinsy. — ANGINA PECTORIS, or 'breast-pang,' is a most distressing symptom of disease rather than a disease itself. It is a spasmodic pain, starting over the heart, and often spreading even to the finger-tips. The subject is generally over forty, a male, of gouty or neurotic tendency, often with obvious cardiac or arterial disease. The immediate or exciting cause is usually something that interferes

with the heart's regular action—excitement, physical exertion, flatulence, or cold. At the onset of an attack the sufferer is held motionless, and afraid even to breathe. In true angina the tendency is for attacks to recur, and to become more violent. *Treatment.*—Constitutional weaknesses must be treated between the attacks, and exciting causes—*i.e.* anything which puts additional strain upon the heart—must be avoided. During an attack nitrite of amyl and nitro-glycerin are the most powerful remedies, both acting by dilatation of the small blood-vessels, thus lessening blood-pressure, and therefore relieving the heart. Nitrite of amyl can be kept in glass capsules holding five minims or so, and a capsule crushed in a handkerchief will often give immediate relief if the vapour be inhaled. Nitro-glycerin can be used in tablet form, containing $\frac{1}{100}$th gr.—*False angina* is the term used for occasional slight attacks of a similar nature, not increasing in severity, and where there is no reason to suspect organic mischief.

Angiolieri, Cecco, Italian poet, of Siena (*c.* 1260–1315), a Bohemian poet who tells us that 'women, the tavern, and dice' are the only things that attract him. This statement is borne out by his sonnets, 120 of which have come down to us. The most remarkable feature of Cecco's poems is their boundless humour. See D'Ancona's *Studii di Critica e di Storia Letteraria* (1880), p. 105 *ff.*

Angioma, or Nævus, a tumour consisting of blood-vessels and connective tissue. There are two kinds:—(1.) *Capillary*, of capillary vessels, much dilated, and with little connective tissue to bind them; most common on the face, neck, and chest, where they appear as flat, very slightly raised, dark red patches. (2.) *Cavernous* angioma, or venous nævus, consists of a number of spaces filled with dark venous blood, and communicating with both arteries and veins. These are always congenital, generally subcutaneous, and appear as soft, compressible, bluish swellings. It may cause dangerous hæmorrhage. Treatment is (1) by the injection of a coagulating fluid, such as carbolic acid or perchloride of iron; (2) by a seton; (3) by ligature, (4) excision, or (5) electrolysis. The last is generally the preferable method.

Angiosperms, a sub-group of flowering plants, distinguished from gymnosperms by having the seeds developed within closed carpels which form ovaries, as in the pea-pod or poppy capsule. The majority of flowering plants are angiosperms.

Angkor, a ruined city of S.E. Asia, in Cambodia, of which it was once the capital, 10 m. N. of Tonle Sap. Its true name is Nagara Thom, corrupted into Angkor, and also into Nakhon Thom. Its walls, 30 ft. in height, enclose an area 2 m. square, and are pierced by five gates wrought with barbaric splendour. About 5 m. S. are the ruins, similarly enclosed, of an equally grandiose temple, Nakhon Wat (Angkor Wat), one of the greatest architectural curiosities in the world. See Delaporte's *Voyage au Camboge* (1880); Fournereau's *Les Ruines d'Angkor* (1890); and Tissandier's *Cambodje-Java* (1896).

Angle (Lat. *angulus*, 'a corner') is, in geometry, the difference in direction of any two lines. This definition includes all cases; for when curved lines meet, the so-called curvilinear angle at the meeting-point is really the rectilinear angle between the tangents of the curves—*i.e.* their directions at the meeting-point. Angles are measured in degrees, or in grades, or in circular measure. The circumference of a circle is divided into 360 degrees, one-quarter of

which, or 90°, subtends at the centre a right angle. An angle less than a right angle is acute, one greater is obtuse. If an angle be such as to make a portion of a plane figure concave to the outside instead of convex, it is called a re-entrant angle. The angle between two planes is called a dihedral angle. When three or more planes meet at a point a solid angle is formed. The measure of a solid angle is the area cut off by the planes on a sphere of unit radius described about the point. The complement of an angle is 90°, less the angle. The supplement is 180°, less the angle. The unit in circular measure, which is the only scientific measure, is the angle subtended at its centre by the arc of a circle equal to its radius. It is called the radian: 180° is equal to 3·14159 . . . radians, or π radians. See CIRCLE.

Angle-iron, a rolled iron beam with an L-shaped cross-section.

Angler, or FISHING-FROG (*Lophius piscatorius*), a clumsy, flattened fish, not uncommon round the British coast, and in the European seas generally. It owes its popular names—which embrace the sea-devil, the wide gab, etc.—to its method of obtaining food, which consists in concealing the body in sand, or among weeds, etc., and causing the 'lure'—a threadlike structure on the head, with an expanded plate at the tip—to tremble gently in the water. Attracted, it is believed, by this movement, small fishes approach, and are snapped up by the huge mouth with its recurved teeth. The anglers are excessively voracious, and as they may reach a length of seven feet, are very destructive to fish.

Angles, a tribe of Low Germans whose territory extended W. to the North Sea, from whence about the 5th century they passed in large numbers over to England, and settled in East Anglia, Mercia, and Northumbria. From them the name England is derived.

Anglesey, an island and co. of Wales, lies N.W. of the mainland, from which it is separated by the Menai Strait. Its length is 23 m., its breadth 21 m. West of Anglesey, and forming an integral part of the county, is the island of Holyhead. The greater part of the surface consists of a low plateau, with slight undulations, monotonous and bare of trees. Minerals include copper and zinc, coal (not now worked), stone and marbie (including the beautiful green serpentine of Holyhead, known as Mona marble), ochre, fuller's earth, and potter's clay. The soil is generally fertile. The county is served by the N.W.R., which runs through to Holyhead, whence steamers ply to Dublin. It returns one member to Parliament, and has one municipal borough, Beaumaris. The island was a stronghold of the Druids previous to its subjugation by the Romans. Harassed in turn by English, Irish, and Danes, the conquest by Edward I. (1272) brought more settled times. See Llwyd's *Hist. of the Isle of Mona* (1833); Griffith's *Portfolio of the Cromlechs of Anglesey and Carnarvonshire* (1900); and his *Anglesey Flora* (1895). Area, 189 sq. m. Pop. 36,000.

Anglesey, HENRY WILLIAM PAGET, FIRST MARQUIS OF (1768–1854), K.G. (1818); eldest son of the Earl of Uxbridge; born in London; distinguished himself in Flanders (1794), in Holland (1799); and at Corunna, after Sir John Moore had been mortally wounded, he completely routed the enemy. For his brilliant leadership of the cavalry at Waterloo (1815), where he lost a leg, he was made Marquis of Anglesey. Under the administration of Wellington he was appointed (1828)

lord-lieutenant of Ireland, but recalled because of his advocacy of Catholic emancipation. After the formation of Earl Grey's administration he entered on a second tenure of the same office (1830–3); but the O'Connell disturbances drove Anglesey to adopt coercive measures, which forced the government to resign. Ireland owes to him her Board of Education. He was appointed field-marshal (1846).—HENRY CYRIL, fifth marquis (1875–1905), succeeded to the title in 1898, and attained notoriety by his indulgence in amateur theatricals and by his bankruptcy.

Angleur, vil., Belgium, 2 m. S.E. of Liège. Pop. 10,000.

Anglia, EAST, a settlement of the Angles, comprising the North Folk and the South Folk (Norfolk and Suffolk). The first historical king of the East Angles was Redwald (593–617). The realm afterwards became dependent on Mercia, until the supremacy of Wessex. For the Danish kingdom of E. Anglia see ENGLAND—*History*.

Anglican Church and **Anglican Orders.** See CHURCH, ANGLICAN.

Angling, in modern English, is a term restricted to the capture of fish by rod, line, and hook, but in its original application denoted simply the use of the hook, for which the obsolete English term is 'angle,' from the Anglo-Saxon *angel*. The hook must be attached to a line, and rendered attractive to predatory fish, either by concealing it in a natural bait, such as a worm, a small fish, or some other edible object, or by attaching to it a deceptive imitation of one of these objects made of feathers, silk, glittering metal, india-rubber, etc. In fresh water a rod has become an indispensable part of the angler's equipment, whereby the hook can be cast to such a distance from the angler as may prevent the fish taking alarm at his presence. There is abundant evidence to prove that fish in waters much frequented by anglers acquire extreme suspicion of the hook. Colonel Hawker, in a diary compiled in 1815–20, records the capture of prodigious numbers of trout, in the clear chalk streams of Hampshire, with flies and tackle which nobody would dream of exhibiting there now. Such fish have also the power of discriminating between living objects moving on the banks. Trout will feed freely among cattle; horses may gallop alongside the stream without disturbing them; but let a child show himself, and every fish will fly to shelter. Prehistoric fish-hooks made of boars' teeth, deer-horn, bone, wood, thorns, shell, copper, and bronze have been found in abundance in almost all parts of the world. Mr. C. Ran deals fully with these in an interesting publication by the Smithsonian Institute, *Prehistoric Fishing in Europe and N. America*. Ancient, however, as angling undoubtedly is, both as an industry and as a pastime, the 19th century had more than half run its course before the craft, in its higher branches, obtained favour from the wealthy as a high-class sport, and, in its humbler forms, began to rival the popularity of football and cricket among the industrial classes. The first-named result was brought about, no doubt, by such attractive writers as William Scrope, 'Christopher North' (Professor John Wilson), Sir Humphry Davy, Captain Lloyd, and Charles St. John. The rent of good angling for salmon and trout has attained a figure which would have seemed fabulous to a former generation. Upwards of £12,000 is paid in rent for salmon angling in the Aberdeenshire Dee alone. In *The Cost of Sport* (1899) the cost of salmon waters rented in Scotland during the season 1898 is calculated at £5 for each salmon taken, to

which must be added living expenses, travelling, wages, and outfit. In Norway every good or moderately good stretch of salmon river is rented by British anglers. The finest sport used to be had in that country for little more than the cost of travel, living, and wages; but at the present day rent alone amounts, in some instances, to £200 a mile of river. Fly-fishing for trout ranks second only to salmon fishing (some anglers assign it the first place), and the cost of the sport has gone up in proportion to its estimation. Streams within 80 or 100 miles of London command very high rents, £100 a mile being no unusual figure paid for beats on such famous rivers as the Test and Itchen of Hampshire. In America both salmon and trout fishing have suffered great deterioration—the former by the erection of dams in the rivers which arrest the passage of migratory fish from the sea, and the latter by indiscriminate fishing. But in both Canada and the United States efforts are being made to restore the productiveness of the fisheries; and in some districts, notably in the state of New York, the state legislature has assumed strict control over the modes and seasons of fishing, and has spent very large sums in artificially rearing fish and replenishing exhausted waters. In Great Britain and Ireland Parliament has enacted appropriate close times—in England, applying to all sporting fish; in Ireland, to all fish of the salmon kind (including fresh-water trout); in Scotland, to salmon and trout only. The sporting fish of British and Irish fresh waters are roughly distributed by anglers into two classes. The first class consists entirely of fish of the salmon family—*viz.* salmon, salmon or sea trout, common or fresh-water trout, char, and grayling. The second class includes what are termed 'coarse' fish—*viz.* pike, perch, ruff or pope, barbel, chub, dace, roach, rudd, bream, carp, tench, bleak, gudgeon, and eels. Attempts have been made, not very successfully, to supplement the first class by introducing into British waters the American brook trout (*Salvelinus fontinalis*), which is a char, and the Californian trout (*Salmo irideus*); and the second class by introducing the American black bass (*Micropterus dolomieu* and *salmoides*), and the European zander or pike-perch (*Lucioperca sandra*), all of which are fish of high excellence for the table, and afford excellent sport on the rod and line. Coal, iron, and manufacturing industries have proved utterly destructive to many British rivers; but great efforts are being made by local authorities to control and remedy pollution from these sources, and have already attained good results, especially in the Thames and the Clyde. The anglers of Nottingham, Sheffield, Leeds, Galashiels, Glasgow, and other busy places, must be numbered literally by tens of thousands, of whom the majority are members of angling clubs. Coarse fish, except pike and perch, exist in few Scottish waters; in these, trout form the natural quarry of the humblest anglers. Until 1902 the legislature had provided no seasonal protection for these fine sporting fish, but the Fresh-water Fish (Scotland) Act, 1902, now provides an annual close time from October 15 to February 28.

Fly-fishing.—The most esteemed branch of angling is that with the artificial fly, which has been brought of late to a high degree of refinement. The salmon fly varies in size from half an inch to four inches in length, and has become a fabric of wonderful complexity. Much importance is attached by some experienced anglers to niceties of shade of colour, shape, and material; but

the method of presenting the lure and lifelike motion are all-important conditions. The salmon fly is not an imitation of any definite creature, but in fly-fishing for trout and grayling the closest imitation of special insects is desirable. Especially is this so in the modern art of dry fly-fishing, wherein, instead of casting two or three flies at random, and drawing them along below the surface, the angler selects a particular trout which he observes on the feed, and casts over it a single fly dressed to resemble the flies prevailing on the water at the time. The lure is thrown with extreme delicacy a few feet higher up the stream than the fish, and is then allowed to float down dry over its head. This mode of fishing, which had its origin in the crystal clear rivers rising in the chalk downs of S. England, is esteemed by sportsmen as the *ne plus ultra* of their craft. Among the most trustworthy of the numerous modern treatises upon fly-fishing may be noted the following: — Francis Francis's *Book on Angling* (6th ed. 1885); Maxwell's *Salmon and Sea Trout* (the Angler's Library, 1899); *Salmon and Trout* (Badminton Library); Dewar's *Book of the Dry Fly* (1897); Gathorne Hardy's *The Salmon* (Fur, Fin, and Feather Series, 1893); Sir E. Grey's *Fly-fishing* (Haddon Hall Library, 1899); etc.

Spinning ranks next in repute to fly-fishing, and may be practised with either natural or artificial baits. Of artificial spinners the variety is almost infinite, ranging from artistic imitations of fish, such as the well-known 'phantom,' down to the equally well-known 'spoon.' Anything which fulfils the conditions of glitter and movement proves attractive to predatory fish. Of these artificial lures the 'Devon minnow' is probably the most killing; the best results, however, especially where fish are accustomed to see many lures, are usually obtained from natural baits, such as dace, gudgeon, sprats, or minnows. These can now be had from any good tackle-maker at a very reasonable price, preserved in a solution of formaldehyde. One of these, fitted upon the admirable tackle known as the Archer flight, will spin for hours, unless torn by the attacks of fish, owing to the hardening effect of the preservative. Whatever the reason may be, the spinning movement certainly increases the attraction of the lure. The British fish usually caught with the spinning bait are salmon and sea trout, trout, pike, perch, and several kinds of sea fish. It is the only known means of taking the great trout in the deep Highland lochs. These fish, formerly classed as a distinct species under the title of *Salmo ferox*, are now regarded as the common *S. fario*, abnormally developed by abundant space and feeding to as much as 25 or 30 lbs. in weight. If it be intended to catch pike, gimp must be substituted for gut in the attachment of the flight of hooks to the line, for the teeth of the pike will sever what suffices for the capture of other fish. Trolling is another mode of angling for pike with a dead fish, which the pike is allowed time to swallow before he is struck.

In *live-baiting* — a very deadly means of taking large pike and Thames trout—a live fish, generally a roach, dace, minnow, or bleak, is attached to hooks arranged as 'snap-tackle.' A float is used or dispensed with according to the nature of the water and its bottom. Special information may be found in Pennell's *Book of the Pike* (1866), Jardine's *Pike and Perch* (1898), and John Bickerdyke's *Pike and Perch* (the Angler's Library, 1900), etc.

Bottom-fishing is usually practised only for coarse fish. It is

true that many salmon are taken with the worm, and also with the boiled prawn; but fastidious sportsmen regard these baits as unworthy of the king of fishes, not to be resorted to except in water so deep as to be unsuitable for fly-fishing. Worm-fishing for trout in water discoloured by floods is reckoned sheer killing, not true sport; but in clear water it is a delicate, difficult, yet withal a deadly method. Bottom-fishing proper is practised with a float, and some of its exponents on the Thames or Trent attain a wonderful pitch of dexterity. In the system known as 'long-corking,' the float, by means of a light-running reel and special line, is allowed to carry the bait to a distance of sixty or seventy yards from the angler. Useful directions about modes, seasons, and places will be found in Francis's *Book on Angling*, and in John Bickerdyke's *Book of the All-round Angler* (1888).

Tackle.—The salmon fisher's outfit is far more costly than the trout fisher's; the latter is about the same in expense as the pike fisher's; that of the bottom-fisher requires only a very moderate outlay. The rod for salmon fly-fishing varies from 15 to 18 ft. or more in length, and is now usually made of greenheart, in three joints. Anglers of the old school maintained that a greenheart should be spliced, but of late years tackle-makers have so improved the system of jointing that the difference is negligible. A more expensive but not more effective article is composed of 'split cane'—strips of the outer skin of certain kinds of bamboo glued together round a steel core. The Castle-Connell rods, used on the Shannon, are in two pieces spliced together. They cast a powerful line, but are cumbrous to travel with. Fly-rods for trout are similar to those used for salmon, but usually run from 9 to 12 ft. in length. Spinning-rods are much stiffer than fly-rods, and ought not to be longer than 11 or 12 ft. The bottom-fisher from the bank generally favours a light bamboo 18 or 20 ft. long, but the punt-fisher uses a much shorter rod. While the bank-fisher for roach and dace may dispense with a reel altogether, he who fishes for salmon in the heavy rivers of Norway or Canada ought not to go forth with less than 200 yds. of line upon a winch of trustworthy make and material. Gut, a translucent thread drawn from the entrails of the silkworm when it is on the point of spinning, is the most precarious article on which the angler, especially the fly-fisher, has to rely. It is perishable, very susceptible to disintegration under sunlight, and far from uniform in manufacture from season to season. More fish are lost from the hook by fracture of the gut than from all other misadventures whatsoever.

Foreign Angling.—In America, besides the Atlantic salmon so well known in Europe, there is a great variety of salmonoid fish which afford sport to anglers. The place of the European pike is taken by his congeners, the pickerel and muskellunge; while a percoid fish, the black bass, of which there are two chief species, takes fly, minnow, and bait, and affords excellent sport, being pronounced by those who fish for him to be the gamest fish that swims in proportion to his size. Several species of very large fish are angled for off certain parts of the American coast, whereof the tarpon (*Megalops thrissoides*), a giant of the herring family, has become best known. It frequents the Gulf of Mexico, and is frequently taken, with rod and line, of the weight of 200 lbs. 'Roughly speaking,' says Mr. Otis Mygatt, 'the average size caught by sportsmen is about 6 ft. in length and 100 lbs.

in weight.' The chief drawbacks to the sport are, first, the bony nature of the mouth—tarpon are usually fished for with a gorge bait; and, second, the flesh of this magnificent fish is worthless. In India the most notable sporting fish is the mahseer (*Barbus tor*), a member of the carp family, which is found in many rivers in India, China, and Burma. Small mahseer rise readily to a salmon fly, but large ones, running from 50 to 150 lbs., must be angled for with spinning tackle, a large spoon being the favourite bait. This fish is very powerful on the line, but is worthless on the table. The rohn (*Labeo rohita*) has been caught in N. India, on the rod, up to 54 lbs. in weight. It is taken by bottom-fishing, and is excellent when cooked. Among the other sporting fish of India are kalbans (*Labeo calbasa*), running up to 20 lbs.; mirgha (*Cirrhina mirgala*), of similar size; white carp (*Cirrhina cirrhosa*), of half the size; catla (*Catla Buchanani*), good eating, and taken with the rod up to 100 lbs.; Carnatic carp (*Barbus carnaticus*), attaining a weight of 25 lbs., and rising well to the artificial fly; and chital (*Notopterus chitala*), which takes a spinning bait, and runs to 80 lbs. in weight. Norway used to be the salmon angler's paradise, and still affords first-class sport. Large trout are taken with the minnow in Iceland and within the Arctic Circle. On the other side of the world the New Zealand rivers are full of trout of great size, which afford excellent sport. In tropical Africa the tiger-fish takes a spoon, and is an excellent fighter. In temperate S. Africa trout have been successfully naturalized.

Literature.—Among the earliest of English printed books was Dame Juliana Berners' or Barnes's *Treatyses pertenynge to Hawkynge, Huntynge, and Fysshynge with an Angle*, which issued from the press of Wynkyn de Worde in 1486. It is doubtful whether Dame Juliana wrote the chapters on angling; whoever did so displays in the following passage an exemplary devotion to the craft: 'The angler maye have no colde nor no dysease nor angre, but yf he be causer himself. For he maye not use at the moost but a lyne or an hoke, of whyche he maye have store plentee of his owne makynge.....Soo thenne his losse is not grevous, and other greyffes maye he not have, savynge but yf ony fisshe breke away after that he is take on the hoke, or elles that he catche nought: whyche ben not grevous..... And yf the angler take fysshe, surely thenne is there noo man merier than he is in his spyryte.' A hundred years later, in 1590, *A Booke of Fishing with Hook and Line, and of all Instruments thereto belonging*, was brought out by Leonard Mascall; followed in 1613 by John Denny's *Secrets of Angling* in verse. Barker's *Art of Angling* (1651) preceded by two years the most famous work on fishing ever published, *The Compleat Angler* of Izaak Walton, which established its author for all time as *vates sacer* of the craft. The sixth edition appeared in 1676, with added treatises by Venables and Cotton; the hundredth edition—a sumptuous affair in 2 vols. quarto, ably edited by R. B. Marston—was published in 1888. As an all-round angler Izaak Walton might easily be put to shame; he was an effective bottom-fisher, but it is doubtful whether he ever practised the higher art of fly-fishing, and he had never seen a reel. Many of his precepts are drawn from earlier writers, from Dame Juliana Berners to his contemporary Barker. The merit and undying charm of his *Compleat Angler* must be sought in the simple reflections of riverside, meadow,

and leafy woods, of tempting taverns and embowered farm-porches. Through all his pages echoes the tinkle of gentle streams, the music of summer birds, the hum of sunlit flies. The only unkindly critic whom Walton has ever encountered was a contemporary of his own, a Cromwellian trooper named Richard Francks, who, under the pseudonym of Philanthropus, wrote *Northern Memoirs calculated for the Meridian of Scotland, to which is added the Contemplative and Practical Angler*. The manuscript was finished in 1658, but Francks found no publisher till 1694. He was an infinitely better angler and naturalist than Walton, whom he girded at as a plagiarist. He was, however, far inferior to the other in literary charm. Nevertheless, his work, of which a second edition was published in 1821, with a prefatory note by Sir Walter Scott, is exceedingly entertaining, and full of interest to anglers. Thirty years after Walton published the *Compleat Angler*, Robert Nobbes issued an excellent treatise on pike fishing—*The Compleat Troller* (1682). In 1883, Westwood and Satchell, in their *Bibliotheca Piscatoria*, enumerated 3,158 editions and reprints of 2,148 works on fish and fishing. Since that time the output has shown no symptom of slackening. Among the more notable contributions to literature by anglers may be mentioned Colonel T. Thornton's *Sporting Tour through the Northern Parts of England and Great Part of the Highlands of Scotland* (1804; new ed. 1896). Sir Humphry Davy spoiled a good book in his *Salmonia, or Days of Fly-fishing* (1828), by casting it into Waltonian dialogue: Professor John Wilson (Christopher North) infused much angling lore into his *Noctes Ambrosianæ*, which ran in *Blackwood's Magazine*, 1822–35. William Scrope's *Days and Nights of Salmon Fishing* (1843–85–97) ranks as a classic, and may be bracketed with Captain Lloyd's *Field Sports of the North* (1830–1885) and *Scandinavian Adventures* (1854). Thomas T. Stoddart was one of Christopher North's *alumni*; his *Angler's Companion to the Rivers and Lochs of Scotland* (1847–53–92) may still be studied with profit, while some of his *Angling Songs* (1889) are spirited and popular. In 1857 a prophet and reformer appeared on the banks of the Tweed in the person of W. C. Stewart, whose doctrines, as expounded in the *Practical Angler* (6th ed. 1874), gave rise to keen and prolonged controversy, and eventually prevailed over the older systems. A *Book on Angling*, by Francis Francis (1867; 6th ed. 1885), is a happy combination of gossip and instruction. Among living writers, the works of 'John Bickerdyke,' J. J. Manley, Abel Chapman, Sir Edward Grey, G. M. Kelson, C. Pennell, W. Senior, Sir Herbert Maxwell, Hon. Alfred Gathorne Hardy, G. B. Dewar, Major Trahern, F. M. Halford, H. G. Hutchinson, A. Grimble, F. G. Shaw, and E. M. Todd may be named as among the best.

Anglo-Israelitish Theory. See Lost Tribes.

Anglo-Japanese Treaty, signed by Great Britain and Japan, Jan. 30, 1902, by which the two powers agree to safeguard their common interests in China and Korea. In the event of one of them being at war with a foreign power, the other shall maintain a strict neutrality, but shall assist her ally if a second foreign power shall join the first; neither power shall enter into agreements without consent of the other, and each shall confide fully in the other if common interests are endangered. The treaty was in force for five years, and in 1907 it was renewed.

Anglomania, the fancy of Germans, French, or other foreigners for imitating English social customs, dress, etc. There was a craze for English literature in Germany in the second half of the 18th century; a mild Anglomania arose in France just before the revolution; and a similar affectation, which may be seen to-day in certain classes in the United States, is frequently satirized. Conversely, ANGLOPHOBIA is fear, or rather hatred, of Britain. There were outbursts in France after the Fashoda incident (1898), and in Germany and Holland at the time of the Boer war of 1899–1902. Russian hatred of Great Britain was very marked during the Russo-Japanese war, many Russians believing that Japan was the mere cat's-paw of Britain. See J. E. C. Bodley's *L'Anglomanie* (1899).

Anglo-Saxon Chronicle. See CHRONICLE.

Anglo-Saxon Language, Literature, and Race. See ENGLAND and ENGLISH LANGUAGE, LITERATURE, and HISTORY.

Angmagsalik, the most northerly important Eskimo settlement on E. coast of Greenland (67° N. lat.).

Angol, tn., Chile, cap. of Malleco prov., 75 m. S.E. of La Concepcion. Pop. 7,000.

Angola is the general name for the whole Portuguese territory between the Congo State on the N.E., the Barotse kingdom in British Central Africa on the E., and German S.W. Africa on the S. Angola, including Cabinda, N. of the Congo, has an area of 484,000 sq. m., and a coast-line of fully 1,000 m. The principal rivers are the Coanza (520 m. long, and navigable for 200 m. up), Kunene, and Kubango. The surface is mountainous in the W., where some of the peaks reach an altitude of 8,000 ft. The climate varies much: near the coast the damp soil and mangrove swamps render it unhealthy; inland the plateaus have a much cooler and drier atmosphere. The rainfall varies much, but is generally very small. The most healthy season is the *cacimbo*—June, July, and August. The natural resources of Angola are chiefly vegetable. Iron was once worked, malachite abounds, and auriferous deposits have been observed. The flora is that common to the tropical zone of Africa. India-rubber, coffee, cotton, sugar, tobacco, copal gum, ground-nuts, and a small quantity of ivory, are exported. In 1910 there were over 500 m. of railways open for traffic. A line extends from Loanda to Malange (300 m.), and other lines from Lobito to Katanga and the Tanganyika Co.'s concessions (1,200 m.), and from Mossamedes to Lubango (136 m.) are under construction. The annual value of the imports exceeds £1,000,000; exports (70 per cent. rubber), £850,000. Pop. estimated at over 4,000,000, including about 11,000 whites. The capital is Loanda, or São Paolo de Loanda. Besides it, Benguela and Mossamedes are the chief ports. Angola sends two deputies to the Portuguese Parliament, the colonies being considered an integral part of the mother country. See Vasconcellos's *As Colonias Portuguezas* (1896); Monteiro's *Angola and the River Congo* (1875).

Angoniland, a plateau, of an average elevation of 4,000 ft., between Lake Nyasa, Zambezi R., and Loangwa R., in Barotseland, N.E. Rhodesia. The Angoni are said to have a Zulu origin, and to be descendants of a tribe which crossed the Zambezi about 1825. Their chief wealth consists in cattle, sheep, and goats. Physically they are a fine race.

Angora, vilayet, Turkey in Asia, hilly, but with many fertile valleys; exports mohair, wool, and opium. Area, 30,000 sq. m. Pop. about 950,000.

Angora, or ENGURI, tn. and archiepisc. see on Angora R., Asia Minor, 215 m. E.S.E. of Constantinople; is the market for Angora goat hair (mohair). It is the ancient *Ancyra*. Near Angora the Ottoman sultan Bayazid I. was defeated and captured by Tamerlane in 1402. Pop. over 30,000.

Angora Wool, the silky produce of the Angora goat, is woven into shawls, serges, and so forth at Angora, in Asia Minor. It is known in commerce as mohair. See GOAT.

Angostura. See CIUDAD BOLIVAR.

Angostura Bark, the bark of *Galipea cusparia* of S. America, is one of the aromatic bitters. It contains an alkaloid and a volatile oil. Angostura bitters contain angostura, canella, cinchona, lemon, and other aromatics. See BITTERS.

Angoulême, tn. and episc. see, cap. of dep. Charente, formerly cap. of Angoumois, on the l. bk. of the Charente, France, 277 m. S.S.W. of Paris, on Paris-Bordeaux Ry. The restored cathedral is a fine example of the Romanesque Byzantine style (12th century). Angoulême is the centre for the cognac trade, and there are many paper-mills and stone quarries. Birthplace of Marguerite of Navarre (1492), of Ravaillac (1578), and of Guez de Balzac (1597). Pop. 37,500. See Juglart's *Angoulême* (1889), and Lièvre's *Angoulême* (1885).

Angoulême, CHARLES DE VALOIS, DUC D' (1573–1650), illegitimate son of Charles IX. and Marie Touchet; made grand prior of France (1590); known as Comte d'Auvergne from 1590 to 1619. For intrigues with the Marquise de Verneuil he was condemned to death (1604), but was imprisoned, and liberated (1616). He distinguished himself at Arques and Ivry, was present at the sieges of Soissons (1617) and La Rochelle (1628), and fought in Languedoc, Germany, and Flanders. Created Duc d'Angoulême (1619).

Angoulême, LOUIS ANTOINE DE BOURBON, DUC D' (1775–1844), eldest son of Charles X. of France; retired with his father to Turin at the outbreak of the revolution (1789). After conducting unsuccessful military operations in Germany, he rejoined the other exiles at Holyrood, Scotland. At Mitau he married (1799) his cousin Marie Thérèse, only daughter of Louis XVI. and Marie Antoinette. He then withdrew with Louis XVIII. to England; but on the reinstatement of Louis he returned to France, and was made general-lieutenant of the army. In 1823 he led the French expedition into Spain and stormed Cadiz. With his father he signed (1830) an abdication of the throne in favour of the Duc de Bordeaux.

Angoxa, or ANGOCHE, tn. and maritime dist. of Portuguese E. Africa; exports ground-nuts and rubber. The Angoxa R. is navigable for 150 m. up from the town, which stands on the estuary.

Angra do Heroismo, fortified port and cap. of both Azores and Terceira Is., Azores; harbour unsafe in s. gales. Exports wine and grain. Pop. 11,000: of the district of same name, 34,000.

Angra Pequena, or LUDERITZ LAND, a bay with good anchorage and a small settlement on the coast of German S.W. Africa, nearly midway between the mouth of the Orange R. and Walfish Bay. It was the first colony acquired by Germany (June 1883).

Angri, tn., Salerno, Italy, 19 m. S.E. of Naples. Manufactures cotton and silk. Pop. 11,500.

Angström, ANDERS JONAS (1814–74), Swedish physicist, who made valuable researches on heat, magnetism, and spectroscopy. His principal work, *Recherches sur le Spectre Solaire* (1869), formed

an important supplement to the theory of Kirchhoff.

Anguilla or SNAKE I., one of the most northerly of the Lesser Antilles, British W. Indies; produces cattle, ponies, and phosphates. Area, 35 sq. m. Pop. 4,000.

Anguisciola, SOFONISBA (1535–1625), Italian painter, was born in Cremona, and early acquired renown as a good portrait painter. In 1559 she went to Madrid to paint the royal family. Some of her portraits, which are now rare, are in private hands in Florence, Genoa, and in the collection of the Earl of Yarborough. Her own portrait (1554) is in the Uffizzi Gallery at Florence, as also in the museum at Vienna; and the portrait of her three sisters (1555), one of her masterpieces, is in the National Gallery in Berlin. Van Dyck says he learned more from her than from any other painter.

Angul, a hilly dist. in Orissa, Bengal, India; contains large coalfields and iron mines. Area, 881 sq. m. Pop., Angul and Khondmals, 192,000.

Angular Curvature of Spine. See SPINE.

Angular Motion is the motion of a line, fixed at one end, in one plane, relatively to a stationary line passing through the centre of rotation—*e.g.* the movement of the hand of a clock relatively to any fixed line on the face of the clock. Thus we are able also to speak of *angular velocity* and *angular acceleration*. See DYNAMICS.

Angus, an ancient district of Scotland nearly coincident with the present Forfarshire.

Anhalt, a sovereign duchy of the German empire, consisting of two portions, separated and nearly surrounded by the Prussian province of Saxony. The larger (E.) portion is crossed by the Elbe and Saale, and belongs to the N. German Plain; the smaller (W.) portion runs up among the N. foothills (2,020 ft.) of the Harz Mts. Total area, 888 sq. m. Pop. 328,000, most of whom are Protestants. Agriculture is the principal occupation, 61½ per cent. of the surface being cultivated. Chief industries are the manufacture of sugar, and brewing and distilling. Cap. Dessau. The duchy has one vote in the Imperial Federal Council, and sends two representatives to the Imperial Diet.

Anharmonic Ratio, or CROSS RATIO. If a line AB is divided at two points C and D, the ratio of the two ratios AC : CB and AD : DB is called an anharmonic ratio. When the ratio is unity, AC : CB = AD : DB, and the line is divided harmonically. The anharmonic ratio is of fundamental importance in projective geometry. See GEOMETRY, PROJECTIVE.

An-hui. See NGAN-HUI.

Anhydride, an oxide of an element or organic radical, capable of combining with water to form an acid. Nearly all the non-metallic elements, as well as several of the metallic elements, form anhydrides. Thus, sulphuric anhydride, SO_3, with water, H_2O, forms sulphuric acid, H_2SO_4.

Anhydrite, a mineral consisting of sulphate of lime, and differing from gypsum in that the latter contains two molecules of combined water. It crystallizes in the rhombic system with a hardness of 3½, and a perfect cleavage yielding cuboidal fragments. Its colour is white, gray, or pale blue.

Anhydrous means not containing water, either combined as water of crystallization or hydration, or free. Hydrates are dry and apparently free from water, while substances containing uncombined water are moist.

Ani, the ruins of the ancient Armenian capital, in Erivan, Transcaucasia. Ashat III. transferred his capital from Bagrad in 961, and under his son Zampad and grandson Kashka I. Ani became a great city of 100,000 in-

habitants and about a thousand churches and monasteries. In later times it fell into the hands of the Seljuk Turks and of the Georgians (1125–1209); in 1240 it was deserted; and an earthquake in 1319 completed its destruction. See Brosset's *Les Ruines d'Ani* (1860).

Aniche, tn., dep. Nord, France, 10 m. E. of Douay. Coal-mining. Pop. 8,300.

Anie, Pic d', sacred mt. of the Basques, in W. Pyrenees; 8,215 ft.

Anil, a leguminous plant found in the W. Indies, from which indigo is made.

Aniline (amino-benzene, $C_6H_5NH_2$) is an aromatic base occurring in coal tar and similar products of the distillation of nitrogenous bodies. It was first obtained in this way from indigo, but is now prepared exclusively from the benzene of coal tar. The benzene is treated with sulphuric and nitric acids, and the resulting nitro-benzene reduced to aniline by distillation with iron borings and steam in the presence of ferrous chloride. The oil obtained is separated and rectified, and consists of aniline itself along with higher homologues, chiefly toluidines. Aniline is an oily liquid (sp. gr. 1·024 at 16° C.) that is colourless when pure, but turns brown on keeping. It has a peculiar smell, is slightly soluble in water, though more so in alcohol and benzene (m.p. − 8° C. and b.p. 183° C.). Aniline burns with a smoky flame; and though neutral to litmus, acts as a powerful base, uniting with acids to form well-crystallized salts—*e.g.* the 'aniline salt' of commerce is aniline hydrochloride, $C_6H_5NH_2$ HCl. Bleaching powder gives a purple colour when added to aniline solution, and potassium bichromate and sulphuric acid a red followed by blue. Aniline is poisonous, causing collapse if absorbed through the skin, as on saturation of the clothes with it, and workmen engaged in its manufacture suffer from headache and nausea if they inhale its vapour. 'Aniline dyes' are not simple derivatives of aniline, and in many cases are not prepared from it at all; the name arising from the fact that one of the earlier and commonest of these compounds, magenta, or rosaniline hydrochloride, $(C_6H_4NH_2)_2C.C_6H_3(CH_3)NH.HCl$, is obtained by the oxidation of a mixture of aniline and toluidine, and that other colours result by the introduction of different alkyls in the amido groups. (See Dyeing.) The rapid increase in the manufacture of these dyes, especially in Germany, where chemists of the highest standing and scientific skill are engaged in the factories, is as significant as are their beautiful shades in almost endless variety, their low price, and the ease with which they may be used. In many cases they cannot, however, be recommended, because under the influence of sunlight they rapidly fade. They are much used as staining reagents in microscopy. See Benedikt's *Chemistry of Coal-tar Colours*, and Bloxam and Blount's *Chemistry for Manufacturers*.

Animalcules, a term popularly applied to all minute forms of animal life—*e.g.* Protozoa, Rotifera, and Tardigrada.

Animal Heat, the heat constantly being generated in the body, the ultimate source of which is the oxygen consumed in the food and inhaled in breathing. The normal temperature varies throughout the animal kingdom, and bears a fairly close relationship to the activity or sluggishness of the animal, and also to surrounding conditions and circumstances of the individual. In man the normal temperature is 98·4° F., in birds, 100°–112° F., while in fish and reptiles it differs little from the air or water they inhabit. In

some diseases (*e.g.* fevers) the temperature of the human body may rise to 110° or 112° F., while in others (*e.g.* cholera) it may fall to 90° F.; but such extremes continued for any length of time prove fatal to the organism.

Animal Kingdom, one of the three great divisions—the other two being plants and minerals—into which natural objects were at one time classified. Modern research has shown the close connection between simple plants and simple animals, and thus destroyed the basis of this primitive classification.

The prime difference between animal and plant is the difference of diet. A green plant can in sunshine form its own carbohydrates (starch, sugar, etc.), and, if supplied with water and salts, can build up protoplasm under these conditions. An animal must have its carbohydrates ready made, and is incapable of existing unless also supplied with proteids in some form—*i.e.* while a plant requires only simple food which it absorbs in solution, an animal requires complex food, usually taken in solid form. But some simple forms contain the green colouring matter chlorophyll, and are capable of feeding like plants.

Again: most animals get rid of nitrogenous waste products, which plants do not. They are usually more definite in form than plants; and their component cells are not surrounded by cellulose, as those of plants are. Cellulose does, however, occur in tunicates, or sea-squirts. As a rule, animals exhibit much greater histological differentiation than do plants. The older statement that animals move about and plants do not, can no longer be accepted in view of the fact that some animals are sedentary, and that certain microscopic plants and the swarm-spores of some higher plants move about as freely as animals do.

Animals, like plants, are composed of protoplasm, or living matter, and, like them, exhibit the five prime organic functions. They are contractile, or capable of movement; they are sensitive; they nourish themselves; they breathe; they excrete. In addition, they are periodically capable of growth and reproduction. From inorganic substances—the minerals of the old classification—both animals and plants differ in their power of growing at the expense of substances different from themselves, and in the fact that, although they are undergoing constant change, they remain apparently the same for long periods.

The following are the chief groups of the animal kingdom:—

A. Vertebrata: animals with (*a*) a dorsal tubular nervous system; (*b*) a dorsal axis, known as the notochord, which in the higher forms is replaced at an early stage by the backbone; (*c*) gill slits, or their equivalents, the visceral clefts, which are openings from the mouth cavity to the exterior:—(1) Mammals; (2) Birds; (3) Reptiles; (4) Amphibia; (5) Fishes; (6) Cyclostomata, or round-mouths; (7) Protochordata, including the lancelet and sea-squirt.

B. Invertebrata: animals with ventral nervous system, with no backbone or notochord, and no gill slits:—(1) Molluscs, or shell-fish; (2) Arthropods (crustacea, insects, arachnids, etc.); (3) Echinoderms (star-fish, sea urchins, etc.); (4) Annelids, or segmented worms; (5) Unsegmented worms; (6) Cœlentera, or hollow-bodied animals; (7) Sponges; (8) Protozoa. For bibliography, see Biology.

Animal Magnetism. See Hypnotism.

Animal-Power, the amount of work done in traction, or in working a machine, by animals or men. The standard horse-power (H.P.),