

cused to claim that he did not know her age or that he believed she was older. Abduction can be committed by a woman as well as by a man. See KIDNAPING.

ABDUL AZIZ IBN SAUD. See **IBN SAUD, ABDUL AZIZ.**

ABDUL-HAMID II, 1842-1918, sultan of Turkey, second son of **ABDUL-MEDJID**, succeeded his brother, **MURAD V**, in 1876. His long reign was marked by reactionary measures, misgovernment, and foreign interference. The following events marked his reign: Serbian War and Bulgarian atrocities (1876); Russo-Turkish War (1877-78); Treaty of Berlin (1878); union of Bulgaria and east Roumelia (1885); Armenian atrocities (1895-96); Graeco-Turkish War (1897); and the rise of the Young Turk Party, the declaration of independence by Bulgaria, and the completion of Austrian control over Bosnia and Herzegovina (1908). Compelled to grant a constitution and an amnesty to exiles in 1908, he opened the first Turkish Parliament in the same year, but next year was forced to abdicate in favor of his brother, Reshid Effendi, known as **MOHAMMED V**.

ABDUL-MEDJID, 1823-61, sultan of Turkey, succeeded his father, Mahmud II (1839), and in 1841 concluded peace with Mehemet Ali of Egypt. He followed up the reforms of his father by the organic statute of Gulhane (Nov. 3, 1839), securing the rights of person and property to all his subjects without distinction of religion; and he introduced many reforms, which form part of the Treaty of Paris (1856). In 1853 he resisted those claims of Russia to a protectorate over his orthodox subjects, which led to the Crimean War.

ABDULLAH IBN-HUSEIN, 1882-1951, king of Jordan, born in Mecca, Arabia. Having aided Britain in World Wars I and II, he was made emir (1921) and king (1946) of Trans-Jordan by the British, incurring the enmity of Ibn Saud of Saudi Arabia, King Farouk of Egypt, and the Mufti of Jerusalem. He invaded and annexed parts of Palestine in 1948. In 1951, he was assassinated in Jerusalem.

ABDUR-RAHMAN III, 891-961, eighth and the greatest ruler of the Arab Omniad dynasty in Spain, ascended the throne in 912. His wars against the Christian princes Alfonso III of Leon and Sancho of Navarre culminated in the defeat of their combined forces in 918. He was defeated by Ramiro II of Leon at Aljandega (939); but on Ramiro's death assisted the deposed Sancho I to regain his throne. He did much to promote Mohammedan unity in Spain.

ABE MARTIN crossroads philosopher created by cartoonist "Kin" Hubbard (Frank McKinney Hubbard) in 1904. His aphorisms appeared in newspapers until Hubbard's death in 1930. Among the 26 volumes containing Abe's cracker box sayings are *Abe Martin, Brown County, Indiana* (1906), *Abe Martin's Wiscrackers* (1930).

ABECEDARIANS, a small sect among the Anabaptists in Germany in the 16th century, noted for their dislike of learning. They thought it best not even to learn to read, as a knowledge of the Scriptures was all that was necessary, and this was communicated by the Holy Spirit direct to the believer without the medium of the written word.

A BECKET, THOMAS. See **BECKET.**

A BECKETT, GILBERT ABBOTT, 1811-56, English humorist. He founded *Figaro in London*, the forerunner of *Punch*, and also wrote the comic *Blackstone* and the comic histories of England and Rome, the first illustrated by Cruikshank, the last two by Leech.

Gilbert Arthur A Beckett, 1837-91, his son, was the author of several plays and libretti, including *The Happy Land*, in collaboration with W. S. Gilbert, *Savonarola*, *The Canterbury Pilgrims*, and *La Cigale*.

ABEL. See **BIBLE, Principal Persons.**

ABEL, Sir FREDERICK AUGUSTUS, 1827-1902, English chemist for the British war department,

was born in Woolwich and studied at the Royal College of Chemistry. An authority on explosives and pioneer in "smokeless powders," he improved the manufacture of guncotton, invented cordite (with James Dewar), and also the close-test apparatus for determining the flash point of petroleum. His publications include: *Guncotton* (1866); *Modern History of Gunpowder* (1866); *Researches in Explosives* (1875).

ABEL, JOHN JACOB, 1857-1938, American pharmacologist, was born in Cleveland, Ohio. He was educated at the University of Michigan, Johns Hopkins University, and the European universities of Leipzig, Strasbourg, Heidelberg, and Vienna. After teaching materia medica and therapeutics at the University of Michigan (1891-93) he became professor of pharmacology at Johns Hopkins University.

Abel was active in many fields of biological research. From extracts of the adrenal glands he isolated a pure salt of the active principle (a sulfate of **ADRENALINE**, or epinephrine). This was the first product of an endocrine gland to be purified. He discovered the diagnostic usefulness of injecting phenol red as a test of the efficiency of the kidneys. Soon after Banting discovered a method for preparing a pancreatic extract for the treatment of diabetes, Abel isolated pure crystals of **INSULIN** (1927). He also isolated amino acids from the blood. From 1902 to 1932 he edited the *Journal of Pharmacology and Experimental Therapeutics* and from 1932 to 1938 he directed the Laboratory for Endocrine Research at Johns Hopkins.

ABEL, NIELS HENRIK, 1802-29, Norwegian mathematician, was born in Findö and studied at the University of Christiania. While traveling in France and Germany (1825-27) he met the publisher August Leopold Crelle, and several of his mathematical discoveries were published in Crelle's *Journal für die reine und angewandte Mathematik*. Abel distinguished himself by his development of the theory of elliptic functions and the formulation of what is known as Abel's theorem. In his treatise *On the Algebraic Resolution of Equations* he proved the impossibility of solving the quintic, the general equation of the fifth degree. He laid the foundation for a new branch of analysis in the memoir entitled *On a General Property of a Very Extensive Class of Transcendental Functions*. His name has been given to the Abelian equation, Abelian functions, and Abelian integral.

ABELARD, PIERRE, 1079-1142, the most brilliant and daring philosopher and theologian of the twelfth century, was born in the village of Pallet (Palais), near Nantes. His father was of the minor nobility and Pierre, as eldest son, was expected to follow a military career. He chose a life of scholarship instead. One of Abélard's early teachers was Roscelin; another was William of Champeaux, master of the Cathedral School on the Bishop's Island (in the Seine River), at Paris. Abélard soon discovered that the savants were split into two camps, disputing over "universals."

This dispute had to do with the reality quality of general terms in language: is the word "humanity" a mere abstraction—an arbitrary term—or is it fundamentally real in itself? William of Champeaux said that such a word was real and necessary. Roscelin said that the word was an abstraction only—that it had nothing to do with reality. When the discussion concerned words such as "God" and "Trinity" it became crucial indeed for men of the church, as all those in the schools were.

While Abélard would not accept the extreme nominalism of Roscelin, neither could he accept the ultra-realism of Champeaux. Almost from the day of his arrival in Paris to study on the Bishop's Island, Abélard was in trouble with the authorities. Several times he endeavored to get a teaching post at the Bishop's school, but was always refused. He taught anyway, and was immensely popular with the students. Abélard was ordered to leave "the land of Paris," so he lectured to his students from a tree. The

authorities pulled him from the tree. He took a boat out into the Seine and conducted class in the middle of the river. The authorities put a stop to this too. Finally, he left the Bishop's Island and went to the left bank to the school of Ste Geneviève where, no longer under the authority of the Bishop of Paris, he taught after 1108 with great success. In 1113-18, Abélard was finally allowed to teach at the Bishop's school on the island. See NOMINALISM; REALISM.

As a result of all this commotion an amazing development had taken place. For the first time in history two schools, each teaching different and contradictory doctrines, existed side by side. By bringing this about, Abélard had inadvertently invented the university—something completely different from the purely local schools, as patterned after Plato's academy, which had existed before.

Moreover, the content of what Abélard taught was revolutionary. With his *Sic et Non* (Yes and No)—in which he placed side by side the various mutually contradictory views of the many authorities of the church of the preceding 1,000 years—Abélard literally founded Scholasticism—scientific, systematic, dialectical theology. This movement culminated in the "Summa," the summing up of all church doctrine. In founding the University of Paris, Abélard made Paris "the Brain of the Occident," and his *Sic et Non* imparted clarity and brilliance to French literary style. See SCHOLASTICISM.

Abélard's solution to the problem of universals was a profound one. He held that words are neither real in the sense that the realists contended, nor merely arbitrary constructions as the extreme nominalists maintained. A *sermo*, or expression, is the way a man must speak for the time being among men in fellowship. Important words become universals by their being accepted as universal, and used as such to express necessary truths. Abélard was also the only major medieval thinker to consider ethical questions; he asserted that the intention is as important, as the act growing out of it.

From the time of his first rebuffs on the Bishop's Island, Abélard was a rebel. As his *Historia calamitatum* shows, Abélard's castration by thugs hired by Canon Fulbert, uncle of Abélard's wife Héloïse, did little to make him more co-operative, even though it developed that Fulbert had acted on the mistaken idea that Abélard planned to abandon Héloïse. Twice Abélard was condemned by church councils. After the first at Soissons in 1121 his response was defiant: he founded an oratory dedicated to the Holy Ghost—the Paraclete—thereby asserting the right of the mind to freedom. A later condemnation in 1141 by the council at Sens, instigated by Bernard of Clairvaux, "last Father of the Church," was endorsed by the pope. A few months later Abélard died at the priory of St. Marcel, near Châlon-sur-Saône. Héloïse, who had succeeded Abélard at Paraclete, died in 1164. See BERNARD OF CLAIRVAUX.

ABENAKI. See ABNAKI.

ABENCERRAGES, an ancient and powerful Moorish family of Granada. Engaged in a feud with the family of King Abul Hassan, they were lured by him into the Alhambra, and assassinated within the hall of the Abencerrages in the fifteenth century. Their story was used by Châteaubriand in his famous novel, *Adventures of the Last Abencerrage*.

ABEKUTA, city, W Africa, SW Nigeria, in the Western Provinces, on the Ogun River; 60 miles by rail N of Lagos. The city is spread over a wide area, and most of its inhabitants are artisans, weavers, or traders. Commerce in foreign goods is carried on with the surrounding district. Pop. (1953) 84,000.

ABERCROMBIE, LASCELLES, 1881-1938, British poet, playwright, critic, and professor. He was educated in Manchester where he studied science. His first book, *Interludes and Poems*, was issued in 1908. Preserving ties with the Victorian tradition, especially with Browning, he frequently used the dialogue

form in his verse. Most popular of his six plays was *Deborah* (1913), and most critically acclaimed, *The Sale of St. Thomas* (first part 1911; completed 1930). He wrote convincingly of wild country folk, but his chief influence was felt among literary coworkers, whom he addressed on technical and critical matters, as in his *Poetry, Its Music and Meaning* (1932).

ABERCROMBY, JAMES, 1706-81, British soldier, was born in Scotland. He was sent to America in 1756, and in 1758 became commander of the British and Colonial forces in the French and Indian War. In July, 1758, he led an attack on Fort Ticonderoga, but he met a severe defeat and was soon relieved of the command. Later, as a member of Parliament he supported George III's colonial policy.

ABERDARE, urban district, Wales, Glamorgan-shire, four miles SW of Merthyr-Tydfil. It has coal mines and iron and tin works. Pop. (1951) 40,916.

ABERDEEN, GEORGE HAMILTON GORDON, 4th EARL OF, 1784-1860, British statesman, was born in Edinburgh, and educated at Cambridge. In 1813 he was appointed minister to Austria, and conducted the negotiations which led to the alliance of that power with Great Britain. At this time he formed a close friendship with Prince Meternich, which decidedly influenced his subsequent policy as a statesman. In 1828 he entered the new Wellington ministry as foreign secretary. He was colonial secretary in 1834-35. In 1841 he again became foreign secretary in Peel's administration. He was friendly to France and the United States, and helped conclude the Webster-Ashburton Treaty (1842), and the Oregon Treaty (1846). In 1852 Aberdeen became head of an able coalition ministry, but diplomacy leading to the Crimean War caused its downfall.

ABERDEEN AND TEMAIR, JOHN CAMPBELL HAMILTON GORDON, 1st MARQUIS OF, 1847-1934, Canadian governor-general. He was born in Edinburgh, Scotland, and educated at Oxford; he succeeded to the earldom of Aberdeen (7th earl) while still an undergraduate. In 1886, and again from 1905 to 1915, he was lord-lieutenant of Ireland. He became governor-general of Canada in 1893 and served in this post until 1898. During his administration he had to deal with difficulties created by the death of the prime minister, Sir John Thompson, in 1894, the revolt of the "seven bolters" in the cabinet of Sir Mackenzie Bowell in 1896, and the defeat of Sir Charles Tupper's government in the same year. In 1913 he was elected lord rector of St. Andrew's University. In 1915 he was created first Marquis of Aberdeen and Temair. With Lady Aberdeen he published his reminiscences under the title *We Two* (2 vols., 1925).

ABERDEEN. See ABERDEENSHIRE.

ABERDEEN, third largest city of Scotland, seat of Aberdeenshire, royal and municipal burgh, and important North Sea port; 92 miles NE of Edinburgh. The municipal burgh comprises the district between the Dee and Don rivers, embracing Old Aberdeen, Woodside, Cults, and Torry.

Aberdeen is known as the "Granite City," because most of its public buildings are built of this material. Chief among them are the municipal buildings, the parish council offices, Marischal College, the United Free Church College, the Market Trades Hall, the art gallery and school, and Gordon's College. Of Aberdeen's 60 churches, the most noteworthy are the St. Machar Cathedral, a fourteenth-century Gothic Perpendicular edifice built of polished silvery granite; the John Knox parish church, and the Roman Catholic cathedral, with a 200-foot spire. Also interesting are the Market Cross (1686), and the ancient Bridge of Dee. King's College and University, founded in Old Aberdeen in 1494 by George Keith, and Marischal College, founded in New Aberdeen in 1593 by Bishop Elphinstone, were in 1860 united as the University of Aberdeen. The town was settled about A.D. 700, and was first known as Devana, but it

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though in modern times we find that some races kill and eat the object of their reverence (as in the case of northern Asiatics and American Indians), this apparent inconsistency may be explained by assuming that their ideas on the subject are passing through a state of transition. Then, again, there are instances in which animals are held sacred, not out of fear for them, but because their bodies are believed to be the homes of the tribal deity or deities—an idea almost inseparable from that of demoniacal possession, and akin to the doctrine of metempsychosis, or the passage of the soul at death from one body to another human or animal. Animal worship in this aspect survives among Polynesians, and in a still more distinct form among Hindus. "The sacred cow is not merely to be spared; she is, as a deity, worshiped in annual ceremony, daily perambulated and bowed to by the pious Hindu. Hanuman, the monkey-god (whose living representative is the entellus monkey), has his temples and his idols, and in him Siva is incarnate, as Durga is in the jackal; the wise Ganesa wears the elephant's head; the divine king of birds, Garuda, is Vishnu's vehicle; the forms of fish, and boar, and tortoise were assumed in those avatar legends of Vishnu which are at the intellectual level of the American Indian myths they so curiously resemble." The religion of ancient Egypt was permeated with these ideas. Cats were held sacred in the cities of Bubastis and Beni-Hassan; cat cemeteries existed in both these cities. In Herodotus' time bulls were worshiped, the most popular of whom was Apis, in the temple of Ptah at Memphis. At his death the pious mourned for 60 days. Strabo tells how an unwilling sacred crocodile was dined and wined. Even the lowly scarab beetle was revered by the Egyptians as a holy thing. So was the snake and the baboon. Serpent worship forms a separate phase of this question, and involves totemism, animism, and ancestor worship. In some cases a particular animal is held in reverence, not because the spirit of a deity dwells within it, but because it represents the tribal ancestor.

ANIMATED FILM. Animation refers to the film processes by which the illusion of life and movement is given to an inanimate image. This is usually accomplished by photographing specially prepared drawings. The drawings are photographed a single picture (or "frame") at a time, after they have been inked on transparent sheets of celluloid called "cells." Each single cell contains a fraction of the movement of a single subject, with separate drawings for the backgrounds. The cells are photographed on the film strip in proper order, and when the film is later projected at the normal speed of 24 frames per second, the impression of movement is created.

The process, although basically simple, is highly costly. Large staffs of cartoon draftsmen are maintained by producers in such centers as Hollywood. Painstaking work is required to complete a simple-looking cartoon strip. The highly organized and expensive process has led to a virtual monopoly of the world market by American interests, with the largest supplier, the pioneer Walt Disney. The advent of UPA, a new American enterprise, provided a new approach to the medium with the release of *Gerald McBoingboing*, the tale of a little boy who speaks in sound effects, and of the Mr. McGoo series.

The puppet film, a form of three dimensional animation, is largely the domain of the Russian and Czech cinema, although the Canadians have shown imagination in this field.

Canada. In the genre of the puppet film, the Canadians produced an excellent film in the classic *The Loon's Necklace* (1948, Crawley Films), the portrayal of an old Indian legend by means of authentic native masks. Moreover, the Canadians produced many excellent animated films, due mainly to the creative genius of Norman McLaren and the imaginative National Film Board of Canada. The latter's *Romance of Transportation* (1952) was a splendid example of an

animated educational film. McLaren's hand-painted films, such as *Five for Four* (1943) represented a new frontier in cinema expression.

ANIMISM, from the Latin *anima* ("soul"), a term originally used to denote the theory of the German chemist Georg Ernst Stahl, who early in the eighteenth century developed and modified the classical theory which identified the vital principle with the soul. Stahl attributed to the soul the function of ordinary animal life in man, while the life of other creatures was assigned to mechanical laws. It was applied by Sir Edward Tylor in his *Primitive Culture* to express the doctrine which attributes a living soul, not merely to human beings, but also to the lower animals, and to inanimate objects and natural phenomena generally. Since the publication of Tylor's work it has been almost exclusively used in that sense, though some anthropological writers have employed it more loosely to include the simpler conception that all beings, animate and inanimate, are endowed with personality and conscious life. Many peoples believe or have believed that a human being has more than one soul, among them being certain North American Indians, Melanesians, Negro tribes, Chinese, Hindus, and Egyptians. There are traces of this belief in Homer.

Another belief relative to animism is that the soul can exist apart from the body. Some peoples have maintained that such souls or spirits haunt the air, the earth, the heavens. As the ethical sense grew with advancing civilization, they began to be differentiated into favorable and hostile, good and evil. Many of the former thus developed into gods, the latter into devils. They were regarded as able to hold commerce with the human race, and even to enter into individuals, to inspire them and take entire possession of them. They were equally able to inhabit the lower animals, trees, and other natural objects. In polytheistic religions they are conjured by appropriate ceremonies into idols intended to represent them.

As a philosophical concept, animism ascribes life to nature as a whole. To some also it signifies the idea that all organic development springs from the soul.

ANIMUCCIA, GIOVANNI, c. 1500-1571, Italian composer, served as music master at St. Peter's, Rome (1555-71), where he was succeeded by Palestrina and upon whom he exerted some musical influence. His friend and confessor, Philip Neri, requested him to compose *Laudi spirituali* (2 vols. 1565 and 1570), to be interspersed throughout his sermons; these hymns were the origin of the oratorio. His chief works are *Madrigali e Motetti a Quattro e Cinque Voci* (1548), and *Il Primo Libro di Messe* (1567). His brother Paolo (d. 1563) was also a musician and composer.

ANINA, or Steierdorf Anina, town, W Rumania, in Timişoara Region, in Banat; in the W Transylvanian Alps, on a railroad; 210 miles WNW of Bucharest. The town is a coal-mining center, and has important steelworks. Anina is also a winter sports center, and health resort. Pop. (1958) 8,811.

ANION. See ION; ELECTROLYSIS.

ANIO RIVER. See ANIENE RIVER.



Anise, an aromatic plant

ANISE is a common plant native to the Mediterranean area but cultivated throughout the world. Anise, *Pimpinella anisum*, is a member of the family **UMBELLIFERAE**. Anise seeds are used as a flavoring in the preparation of liqueurs and as a condiment. It is an annual which is easily grown from seeds in warm soil, and reaches a height of about two feet.

ARISTOPHANES, c. 448–380 B.C., Greek comic playwright and poet. He produced his first play in 427 B.C., his last in 388 B.C. Of the more than 40 comedies that he wrote, only 11 survive completely. The modern world admires his brilliant, exuberant genius and fertility of comic invention; it does not always feel equal admiration for the violent attacks on living persons, who sometimes had done little to deserve them, and for the broad and coarse humor, which often descends to slapstick farce. Unrestrained by strict rules of correctness in the situations and dialogue which he introduced into his plays, he was basically a conservative, even puritanical, moralist. He upheld the old-fashioned manners and attacked the new with wit, licentiousness, and buffoonery. Aristophanes' kind of comedy, based on the satirizing of public events, died with him; and a new comedy, based on private individuals' foolishness arose.

The Acharnians, *The Peace*, and *Lysistrata* are pleas for peace, produced in the midst of the Peloponnesian War. *Lysistrata*, the most brilliant of all his plays, relates the strike of the women of a city against their husbands in order to win peace. This play has lived longest in production; an Austrian moving picture version was made in 1947. *The Knights* is an abusive attack on Cleon, a leading politician. *The Wasps* ridicules the Athenians' love of lawsuits. *The Clouds* attacks Socrates and, through him, the philosophers of the day. *The Birds* describes the attempt of two Athenians to found an ideal city in the clouds, which shall be free from the imperfections of contemporary Athens. *The Thesmophoriazousae* and *The Frogs* ridicule Euripides, the dramatist, as a clever but dangerous poet. *The Ecclesiazusae* makes fun of "votes for women." In the last play, *Plutus*, the blind god of wealth receives his sight and redistributes property, giving the poor and just a fair share. See DRAMA, Ancient Origins, Greek Comedy.

ARISTOTLE, 384–322 B.C., outstanding Greek philosopher and one of the greatest thinkers of all time. He was a disciple of PLATO and a tutor of ALEXANDER THE GREAT. Interested mainly in understanding the essential nature and relations of life, Aristotle thereby differed from Plato, whose chief concern was the improvement of life. Aristotle wrote and lectured on logic, physics or the general study of inorganic nature, astronomy, biology, psychology, metaphysics or pure philosophy, ethics or moral philosophy, politics or political philosophy, economics, and aesthetics as embodied in rhetoric and poetics. Thus his encyclopedic writings laid the foundation of all the sciences and all the branches of philosophy known today, and many of his ideas are still held to be valid.

Aristotle was called the Stagirite because he was born at Stagira, a Greek colonial town on the coast of Macedonia. His interest in physiological and zoological phenomena may have resulted partly from his father's being court physician to the Macedonian king, Amyntas II, grandfather of Alexander the Great. Aristotle's Ionian descent was no doubt partly responsible for the thoroughness of his studies, Ionian philosophers having had a passion for exactitude.

He became at 17 a pupil of Plato at the Academy of Athens, and studied or taught there for 20 years, until Plato's death in 347 B.C. Disappointed with the appointment of Plato's successor, he spent the years 347–335 B.C. in wandering and teaching. His tutorship of Alexander the Great occurred during this period. When Alexander ascended the throne of Macedon, Aristotle returned to Athens and established a school, the Lyceum, which he headed until 323 B.C., and where he produced most of his numerous writings. This school of philosophy became known as the *Peripatetic* because of the discussions carried on between teacher and students on a covered walk, *peripatos*, in its garden. Anti-Macedonian agitation in Athens in 323 B.C. caused Aristotle to leave the school and flee to Chalcis, where he spent the remainder of his days.

Major Works. *Organon*, consisting of six treatises on logic, is regarded as Aristotle's chief work, the other most famous ones being the *Metaphysics*, *Physics*, *On the Heavens*, *History of Animals*, *On the Parts of Animals*, *De Anima*, *Politics*, *Nicomachean Ethics*, *Rhetoric*, and *Poetics*. In addition there is the renowned *Constitution of Athens*, Aristotle's description of Athenian government, a work which was found late in the nineteenth century. He produced descriptions of 158 "politics" or constitutions, but all the others are lost.

It has been said that Aristotle's philosophy was a reaction against the idealism of Plato, the theory that the ultimate reality as regards anything is an idea. Aristotle maintained that the world consists of substances, each existing in itself. Universals, according to him, exist only in individual substances. Fundamental in Aristotle's philosophy is the distinction between matter and form and that between the actual and the potential. He believed there is a purpose in the world, also that God is both its first cause and final objective.

Aristotle's biological information is remarkably accurate. The same cannot be said of his astronomical deductions, nor of his theory that the basic components of nature are earth, air, fire, and water, an error common among the ancient Greeks. His psychological concepts were not successfully challenged until late in the nineteenth century. Aristotle's political and ethical theories emphasize his acceptance of the world as it is. Though he believed in benevolent monarchy, he did not build up a case for any specific form of government, as Plato did. An exponent of the golden mean, nothing in excess, Aristotle considered happiness the chief end in life and believed that to attain happiness a man must have a measure of good luck as well as adequate worldly goods.

Influence. In ancient times and the early Middle Ages, Aristotle's works, though extensively used, played only a secondary role compared to the philosophy of Plato. In later medieval times, after the twelfth century, however, Aristotle was regarded as the final authority in every field, and he has probably had greater influence on the intellectual life of Western civilization than any other individual.

The Arabs took up Aristotle in the ninth century, and it was Jewish and Arabian scholars that brought Aristotle's ideas to Christendom in the Middle Ages. The Mohammedan AVERROËS, the Jew MAIMONIDES, and the Christian St. Thomas Aquinas all sought to harmonize their theology with Aristotelian thought. Eventually, however, it hardened into a dogmatic system quite different in spirit from the original and has been widely considered an obstacle to further intellectual development. This gave rise to a successful revolt against its dominance, a revolt led by FRANCIS BACON and RENÉ DESCARTES. In recent years efforts have been made to revive the dominance of Aristotelian scholasticism in a modified form, known as Thomism. (See NEO-SCHOLASTICISM.) Aside from that his influence remains vital in philosophy, science, literary criticism, and social thought.

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ARITHMETIC is a branch of mathematics which deals with numbers and operations involving numbers (see ALGEBRA). The ancient Greeks divided the study of numbers into two fields, arithmetic and logic. The first of these we now call NUMBER THEORY, and the second we call arithmetic, or the art of computing.

Numeration. A large part of the subject of arithmetic is concerned with the question of numeration or notation (see NUMERAL; NUMBER, Classification of Numbers). Our number system uses the ten Hindu-Arabic symbols called digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. All whole numbers can be written by arranging these digits in such a way that the value of any one of the

peace was faulty in that it did not recognize CALVINISM, another Protestant faith. Eventually, the settlement broke down and the THIRTY YEARS' WAR (1618-48) resulted. See GERMANY, History.

AUGSBURG COLLEGE AND THEOLOGICAL SEMINARY. See COLLEGES.

AUGSBURG CONFESSION, the chief statement of faith of the Lutheran church. In 1530 Emperor Charles V of Germany, desirous of effecting an amicable settlement of the religious differences between Protestants and Catholics, summoned the German Diet to meet in Augsburg (April 8, 1530) and requested from the Protestants a statement of the doctrines in which they differed from the Catholic faith. Such a statement, known as the Torgau Articles, was accordingly drawn up by Luther, Jonas Bugenhagen, and Melancthon, and with this as a basis Melancthon, aided by suggestions from Luther and others, drew up the Confession of Faith which was presented to the Diet on June 25.

AUGUR. See DIVINATION.

AUGUST, the eighth month of the modern calendar, 31 days long, was originally called Sextilis, the sixth month, in the old Roman calendar. The Roman senate renamed it in honor of the Emperor Augustus during his reign to commemorate his admission to the consulate, his receiving the allegiance of the soldiers stationed on the Janiculum, his successful conclusion of the civil wars, three triumphs which he celebrated; and the submission to him of Egypt—all events which occurred during that month. In the Northern Hemisphere, August marks the waning of summer and the threshold of harvest time. The flower for August is the poppy; its stone, the sardonix. See MONTH, *The Calendar Months*.

AUGUSTA, or **Agosta**, port, Italy, SE Sicily, in the province of Syracuse, located on a small island at the northern end of the Bay of Megara, 12 miles N of Syracuse. Grapes and olives are grown nearby; fishing is carried on; and there is trade in salt, clay, and clay products. Augusta was founded by Frederick II in 1232 on the site of the ancient Niphonia and was rebuilt after an earthquake in 1693. The French defeated the Dutch and Spanish under De Ruyter in a naval battle near the port in 1676. Augusta became an important naval base and naval air base and was bombed in World War II. Pop. 17,716.

AUGUSTA, city, E Georgia, county seat of Richmond County, on the Savannah River, which here forms the border with South Carolina; on the Atlantic Coast Line, the Augusta and Summerville, the Central of Georgia, the Charleston and West Carolina, the Georgia, the Georgia and Florida, and the Southern railroads and U.S. highways 1, 25, and 78; a scheduled airline stop; 110 miles NW of Savannah. Situated in the lower Piedmont, Augusta is noted as a winter resort. The surrounding area is a fertile one in which cotton, corn, peanuts, fruit, vegetables, and pulpwood are grown. The city is a cotton trading and shipping center and manufactures cotton cloth, cottonseed oil, and fertilizer. Other products are clay, bricks, flour, lumber, tile, iron and steel, and candy. The Medical College of Georgia, Paine College (established for Negroes), and the Junior College of Augusta are located here. The United States arsenal was established in 1819. Augusta is the scene of the Masters golf tournament.

Augusta was founded in 1735 as a fort and trading post by Gen. James E. Oglethorpe. It shifted hands several times in the course of the Revolutionary War and was the capital of the state briefly during the war and during the period 1785-1795. At the outbreak of the Civil War, Augusta became one of the Confederate centers for the manufacture of powder. A 250,000-acre tract in South Carolina, near Augusta, is the site of installations of the Atomic Energy Commission. Pop. (1960) 70,626.

AUGUSTA, city, SE Kansas, in Butler County, on the Walnut River, the Santa Fe and the St. Louis and

San Francisco railroads, and U.S. highways 54 and 77; 20 miles E of Wichita. Center for a region producing oil, grain, and livestock, Augusta has oil refining and auto trailer industries. Pop. (1960) 6,434.

AUGUSTA, city, capital of Maine and county seat of Kennebec County, on both banks of the Kennebec River, on the Maine Central Railroad and U.S. highways 201 and 202; an airline stop; 52 miles NE of Portland. Situated in a lake region, it occupies the site of an Indian village where the Plymouth Colony established a trading post about 1628. Here in 1754 Fort Western was erected as an outpost against the French and Indians. The settlement centered around the fort and became known as Hallowell. It was later renamed Augusta for the daughter of Henry Dearborn, Revolutionary War general. Fort Western has been restored as a historic monument. Augusta's executive mansion was once the home of James G. Blaine, who lived here during most of his public life. Pulp, paper and paper products, cotton goods, shoes, and printing and publishing are among the city's industries. Pop. (1960) 21,680.

AUGUSTANA COLLEGE. See COLLEGES.

AUGUSTANA COLLEGE AND THEOLOGICAL SEMINARY. See COLLEGES.

AUGUSTAN AGE, a period of achievement and refinement in a national literature, so named because the reign of Augustus (27 B.C.-A.D. 14) was a high point of accomplishment in Roman literature. The term is also used to characterize the reign of Augustus in its political aspects, signifying a golden age when the Roman Empire reached its greatest glory, though not its greatest territorial extent. During this time a measure of peace and tranquillity was secured, and the arts were actively encouraged. The outstanding literary figures were the historian Livy, and the poets Albius Tibullus, Sextus Propertius, Virgil, Horace, and Ovid. See LATIN LANGUAGE AND LITERATURE, *Literature, Augustan Age*.

Later literary periods stressed the excellence of form of the first Augustan Age by establishing its works as models of correctness. In French literature the period of the dramatists Pierre Corneille, Jean Racine, and Molière is considered as the Augustan Age. (See FRENCH LANGUAGE AND LITERATURE, *Literature, Classicism*). In English literature Alexander Pope, Richard Steele, Joseph Addison, Jonathan Swift, and others of their circle comprise the writers of the Augustan Age; John Dryden is also sometimes included. English Augustan Age prose was distinguished by the development of an easy, straightforward style. Poetry was distinguished by the perfection and polish of form, particularly of the couplet. The use of satire figured prominently in both prose and poetry. See ENGLISH LITERATURE, *Eighteenth-century Classicism, Pope*.

AUGUSTA PRAETORIA. See VALLE D' AOSTA.

AUGUSTA SUESSIONUM. See SOISSONS.

AUGUSTA TAURINORUM. See TURIN.

AUGUSTA VEROMANDUORUM. See ST. QUENTIN.

AUGUSTA VINDELICORUM. See AUGSBURG.

AUGUSTINE, SAINT, also called **Aurelius Augustinus**, A.D. 354-430, bishop of Hippo, was born at Tagaste, in what is now Algeria, the son of SAINT MONICA and a pagan father. At the age of 16 he entered the University of Carthage and as a student lived a life of dissipation, fathering a "son of his sin" and otherwise giving himself up to promiscuous pleasure seeking. However, he achieved first place in the school of rhetoric.

At 20 Augustine began to desire "with an incredible ardor the immortality of wisdom." Turning to the Scriptures to satisfy his new hunger, he was disappointed, for they seemed to him "unworthy of being brought into comparison with the majesty of Cicero." In his dissatisfaction Augustine turned to MANICHAISM and for more than nine years was a Manichean. He opened a school for instruction in grammar and

rhetoric in his native town, but before long gave up the school and went to Carthage. Because of the lack of discipline among the students, he decided to go to Rome (383). Despite the opposition of his mother he opened a school in Rome. Here his students behaved well but failed to pay their fees. Augustine obtained a post as teacher of rhetoric in Milan, where he drew a salary from the government.

Before leaving Carthage his enthusiasm for the teaching of the Manichaeans had considerably lessened. In Milan various influences led him to accept Christianity. The study of Plato completely undermined his old heretical faith, and the preaching of SAINT AMBROSE, bishop of Milan, completed the process. About this time his mother arrived from Africa. As a result of her influence and that of others, and of the study of the New Testament, Augustine was convinced of the truth of Christianity. On Easter eve, 387, he was baptized in Milan by Ambrose. Tradition, groundlessly, associates with this memorable occasion the composition of the great Christian hymn the *Te Deum*. Shortly afterward, when about to return to Africa, his mother died. Returning to Tagaste, he sold all his goods, gave the proceeds to the poor, and withdrew to lead a life of prayer and study. In 391 the Christian community of Hippo Regius, a town close to the borders of modern Algeria and Tunis, prevailed upon him to accept ordination. Within five years Valerius, the bishop, secured him as his colleague, and after Valerius' death in 395 Augustine held that office till the end of his own life. In 430 the Vandals besieged Hippo and three months later (August 28) Augustine died.

No theologian has made a deeper impression on the mind of Christendom than Augustine. He is considered the greatest of the Latin fathers of the Christian church. This fame he achieved by his writings and by the devotion revealed in the story of his inner life. As against the Manichaeans he maintained the doctrine that evil was not inherent in the nature of matter. Everything that God made was good. Evil was a corruption of nature brought about by the exercise of the human will. In opposition to the Donatists, who claimed that the Catholics had ceased to be a holy church by admitting those who had been unfaithful, Augustine denied that the church now existing was intended to be coextensive with the final and glorious church. Augustinianism—the doctrines with which the name of Augustine is universally identified—was developed by its author in controversy with Pelagius, a British monk, and others who more or less supported his views. The point of conflict was the relation between truth and individuals—the conditions and process of salvation. Augustine employed all his energies to establish the position that man is unable of himself to will anything good, and that divine grace is necessary for every act leading to salvation. Following the death of Augustine, his teachings on grace were modified into the doctrine of predestination, which denied that God will to save all mankind. See PELAGIUS; PREDESTINATION.

Embracing expositions of Scripture, letters, philosophical and strictly theological works, Augustine's writings are voluminous. But the two best-known works are undoubtedly the *De Civitate Dei*, or *City of God* (413-426) and the *Confessiones* (397). The former appeared after the fall of Rome (410), and is an attempt to create a philosophy of history. It brought before men's minds the conception of a spiritual city of God which had been slowly rising in the past, and which was destined to include all the kingdoms of the earth. The *Confessiones* is the history of Augustine's thoughts and emotions, his sins and his struggles, his defeats and delays, and ultimate triumph. See CITY OF GOD; CONFESSIONS OF SAINT AUGUSTINE.

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AUGUSTINE OF CANTERBURY, SAINT, d. about 604, first archbishop of Canterbury. He was sent by Pope Gregory I to England at the head of a mission of 40 Benedictine monks for the purpose of converting Britain to Christianity. The mission arrived in Kent in 597, and Augustine succeeded in converting King Ethelbert. Later (601) he founded the see of Canterbury and was consecrated its first archbishop.

AUGUSTINIANS, fraternities in the Roman Catholic church which follow the rules originated by St. Augustine. The origin of the order is in dispute. The principal congregations are the Canons Regular, the Hermits, the Special Congregations (of which Luther was a member), and the Barefooted Augustinians. The Canons Regular, or Austin Canons, founded at Avignon about 1061, made their first appearance in Britain about 1100. At the Reformation they owned 200 houses, the chief being at Pontefract, Scone, and Holyrood, and from their habit they were sometimes called the Black Friars. The Hermits, or Austin Friars, were under a rule much more severe, and were one of the four great mendicant orders of the church, thus the name "Begging Friars." The Special Congregations and Barefooted Augustinians were even more rigorous in their discipline. The Augustinian nuns are said to have founded their first convent at Hippo, under Perpetua, the sister of Augustine. See AUGUSTINE, SAINT.

AUGUSTOBONA. See TROYES.

AUGUSTODUNUM. See AUTUN.

AUGUSTONEMETUM. See CLERMONT-FERRAND.

AUGUSTORITUM. See LIMOGES.

AUGUSTÓW, town, Poland, in the province of Bialystok, on the Netta River, 50 miles NW of Grodno. It lies in the so-called Suwalki Triangle, at various times disputed with Poland by Germany, Lithuania, and Russia. Founded in 1557, Augustów gained commercially from a canal, built in 1825-30, which united the Netta at this point with the Neman River. The canal is used chiefly for logging from the nearby Augustów forests. The town's industries include sawmills, flour mills, tanneries, and cement and brick works. The town's fairs were known for trade in horses, cattle, pork, poultry, and grains. Early in World War I Augustów was the scene of battles between Russian and German forces. In World War II the town was occupied by the Russians in 1939, and by the Germans in 1941. The town was captured by Soviet forces in 1944. Pop. (1954) 12,700. ALBERT PARRY

AUGUSTUS, 63 B.C. A.D. 14, the first emperor of Rome, was the son of Caius Octavius, by Atia, daughter of Julia, the sister of Julius Caesar. His name, after his father's death in 59 B.C. and his mother's second marriage, became Gaius Julius Caesar Octavianus, the title Augustus, "the revered," being added by the senate and people in 27 B.C. Augustus was studying at Apollonia, in 44 B.C., when the news of the murder of Caesar reached him. Proceeding to Rome to claim his inheritance from Caesar, and ignoring warnings not to involve himself in public affairs at that time because of his close connection with Caesar, he at first professed adherence to the republican party.



VATICAN, ROME
Augustus, Emperor of Rome

BACON, NATHANIEL, 1647–76, American colonist, emigrated from England to Virginia in 1673, where he became a leader of the more democratic element in the colony. In 1675–76, in violation of the orders of Governor WILLIAM BERKELEY, he led a force against the Indians; and his attempted arrest for this led to a revolt of the entire colony. See **BACON'S REBELLION**.

BACON, PEGGY, 1895–, U.S. artist and writer, was born in Ridgefield, Conn. Her drawings, dry points, and pastels are in leading U.S. museums. For years she wrote poems and did illustrations and caricatures for *The New Yorker* and other magazines. Her marriage (1920) to the artist, Alexander Brook, ended in divorce (1940). In addition to illustrating many children's books, she wrote and illustrated *Funeralities* (1925); *Mercy and the Mouse* (1928); *The Terrible Nuisance* (1931); *Off With Their Heads* (1934); *Starting from Scratch* (1945). A mystery, *The Inward Eye*, appeared in 1952.

BACON, ROBERT, 1860–1919, U.S. banker and public official, was born in Jamaica Plain, Mass. Educated at Harvard, he joined J. P. Morgan and Company in 1894 and took part in the formation of the U.S. Steel Corporation (1901). He was assistant secretary of state (1905–09) and served as secretary during the last few weeks of Theodore Roosevelt's administration. He was Ambassador to France (1909–12) under Taft, and served during World War I as chief of the U.S. military mission to British headquarters.

BACON, ROGER, called *Doctor Mirabilis* (Wonderful Doctor), 1214?–292, English monk, scholar, and scientist. Nearly everything about Bacon except the great impression he made on the learned minds of his day and of posterity is clouded by uncertainty. Born near Ilchester in Dorsetshire or at Bisley in Gloucestershire, he had his first schooling in the city of Oxford. He studied and taught at the University of Paris until about 1247. He joined the Franciscan order in either Paris or Oxford about 1250.

His earliest interest and his greatest final fame were in experimental science. Ill health interrupted his studies for ten years. His disregard for other scholars of the church, notably the Scholastic philosophers (see **SCHOLASTICISM**), made him numerous enemies; and his work and the publication of it seem to have been discouraged by his order. At the request of Pope Clement IV that he secretly prepare a systematic and critical account of the state of learning despite any prohibition by his superiors, Bacon wrote his *Opus majus*; *Opus minus*, a condensation of the former; and a later supplement, *Opus tertium*. Clement died in 1268 before Bacon could profit from his support. Stories that Bacon was imprisoned by his order for ten years in Paris lack substantiation. In Oxford, after 1268, he wrote on natural science, philosophy, and theology.

Clearly Bacon intended as his life work an encyclopedic and critical account of all knowledge. His range was great. He advocated the study of ancient languages, both for the good of philosophy and for the more accurate translation of the Scriptures; he wrote Greek and Hebrew grammars; he wrote works on logic, mathematics, and a condemnation of magic. Despite the last, he was popularly credited in his day

with being an adept in magic and was consequently feared. His belief in **ASTROLOGY** and **ALCHEMY** was a common characteristic of learned men of his time. In the realm of science, his quarrel with the Scholastic philosophers was based on an emphasis on a divine intelligence and a separation of science and theology which was probably derived from the Arabian commentators on Aristotle, such as **AVERROËS**. Certainly his knowledge of the science and pseudoscience of his day was great, including that of the manufacture of gunpowder and the manufacture and use of the magnifying glass. His writings include prophecies of the telescope and microscope, steam engines, the airplane, and circumnavigation of the earth. He detected errors in the Julian calendar through his knowledge of astronomy.

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BACON, a meat product derived from side, belly, or back of a hog, is cured by smoking or salting processes. Preparation requires 20 to 30 days, depending on the method used. Only 12 to 15 per cent of the weight of a 250-pound hog is suitable for bacon cuts. Bacon is high in energy, a pound containing about 3,000 calories. The fat is easily digested. See **MEAT INDUSTRY**.

BACON BEETLE. See **DERMESTES**.

BACON-SHAKESPEARE CONTROVERSY.

The theory holding that the works of William Shakespeare were actually written by Sir FRANCIS BACON is believed to have been first urged by Herbert Lawrence in England in 1869 in his *The Life and Adventures of Common Sense*, a book that did not prove influential. Large-scale controversy resulted after an American, J. C. Hart, developed the theory in 1848 in a book called *The Romance of Yachting*.

The American eccentric, Delia Bacon, who habitually referred to Shakespeare as "Lord Leicester's stableboy," devoted her life to expounding the theory. She lived in poverty in a London garret until she was brought home to America, violently insane. Her book, *Philosophy of the Plays of Shakespeare Unfolded*, with an introduction by Nathaniel Hawthorne (1857) is a literary curiosity. She assigned all the work of Shakespeare to a literary group composed of Bacon, Sir Walter Raleigh, and Edmund Spenser. She suggested that they wrote under the name of Shakespeare in order to expound a political attitude, liberal in character, that they were not free to express openly.

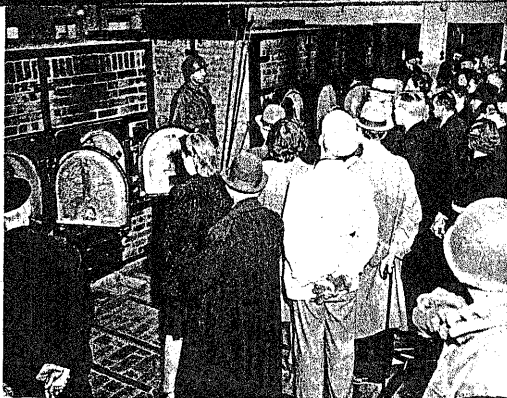
Following the initial American impetus, even stranger speculations were made about the authorship of the dramas commonly assumed to have been written by Shakespeare. Among them were the theories of **IGNATIUS DONNELLY**, U.S. Congressman from Minnesota, and once vice-presidential candidate of the People's party. His *The Great Cryptogram* (1887) assigned the authorship to Bacon on the basis of a code which Donnelly felt he had discovered. The theory converted Shakespeare's entire printed works into one vast secret code.

In general, proponents of Bacon's authorship have simply assumed that the "Stratford actor Will Shaxper" could not have authored the plays. William Jaggard's *Shakespeare Bibliography* (1911) listed over 500 volumes dealing with the controversy. In the twentieth century interest in the theory diminished. Other theories have at various times assigned the authorship of Shakespeare's works to Christopher Marlowe and to the earls of Rutland, Derby, and Oxford.

BACON'S REBELLION, an uprising of Virginia colonists in 1676, headed by **NATHANIEL BACON**. It was partly in protest against long-standing abuses, especially governmental restrictions on commerce, and the concentration of authority in a small Tidewater group surrounding the autocratic British governor, **SIR WILLIAM BERKELEY**. The immediate cause was the frontier planters' anger at lack of government



Roger Bacon



U.S. ARMY SIGNAL CORPS
Buchenwald camp furnaces where some prisoners were burned, evidence of the extent of German war atrocities, are shown to a German civilian group by the U.S. military.

Concentration camps were used also by the U.S. Army to restrain Filipino guerrilla activity during the Philippine Insurrection, 1899-1902.

The most notorious concentration camps, different in character and purpose from earlier ones, were those of Nazi Germany. Established in the 1930s to deal with Jews, political opponents, and other "enemies," these camps were not merely for the purpose of restraint, but part of a technique of breaking opposition by torture and extermination. With the outbreak of war and subsequent German conquests in Europe, nationals of conquered countries were added to the population of the camps. Estimates of the total thus held were from 12 to 20 million. Habitual criminals were included with the political and other inmates. Prisoners were subjected to hard labor, filthy living conditions, brutality, and torture. Great numbers were exterminated by means of starvation, hanging, shooting, and poison gas. Camps included Dachau, Buchenwald, and Belsen in Germany, and Oświęcim (Auschwitz) and Maidanek in Poland. Official investigations after the war and testimony at the Nuremberg war crimes trials furnished detailed accounts of torture and death in the camps.

Complaints against concentration camps operated by the Japanese during World War II were many, but such deliberate and extreme measures as those used by the Germans were rarely alleged. See **BATAAN**; **WAR CRIMES**; **WORLD WAR II**; and separate articles on the camps.

CONCEPCIÓN, province, S central Chile, bounded by the provinces of Nuble on the N and E, Bio-Bio on the SE and S, and Arauco on the SW, and by the Pacific Ocean on the W; area 2201 sq. mi.; pop. (1957 est.) 495,765. The province consists of a coastal mountain region in the west and a portion of the central valley of Chile in the east. The Bio-Bio is the principal river. Concepción has a mild climate with moderate precipitation. Leading crops in the fertile central valley region are wine grapes, grains, beans, and fruits. Cattle and sheep are the main livestock. Industrial centers include Concepción, the provincial capital, and Talcahuano, which manufacture textiles, metal goods, chemicals, leather, and food products; Huachipato, which has an important modern iron and steel plant; and Penco, Lota, and Tomé. Coal is mined in the coastal area and there is a small production of copper. Other activities are fishing and lumbering.

CONCEPCIÓN, city, S central Chile, capital of the province and department of Concepción, near the mouth of the Bio-Bio River, about 260 miles SW of Santiago. Concepción, the third largest city of Chile, is an important industrial, commercial, and cultural center. Industries include the manufacture of textiles,

Conceptualism 5-1022

metal goods, leather, food products, and chemicals. Nearby Talcahuano is the port of the Concepción region, which is mainly noted for coal mining and agriculture. The city is the seat of Chile's second largest university (founded 1919). Concepción was founded in 1550 by Pedro de Valdivia on the site of what is now Penco. Repeated destruction by earthquakes led to its removal to the present location in 1730. The disastrous 1939 earthquake destroyed much of the city, which was rebuilt in modern style. Pop. (1952) 119,887.

CONCEPCIÓN, city, central Paraguay, capital of the department of Concepción, on the Paraguay River, 130 miles N of Asunción. Concepción, a river port and communications center, is important commercially and as the processing center for local produce. Industries include the manufacture of sugar, leather, and food products. Quebracho and other lumber products, maté, tobacco, and cattle are shipped from Concepción. Pop. (1951) 28,650.

CONCEPCIÓN DE LA VEGA. See **LA VEGA**.
CONCEPCIÓN DEL URUGUAY, city, NE Argentina, in the province of Entre Ríos, on the Uruguay River, 140 miles N of Buenos Aires. Concepción del Uruguay is a river port, railroad terminus, and commercial center for an agricultural region. Industries include sawmilling and the processing of meats and other food products. There is an important trade, partly with Uruguay, in grain, meat, maté, and lumber. Pop. about 31,500.

CONCEPTION is the union of the male and female elements of procreation from which a new being develops. The act of conception is also known as impregnation, fecundation, and fertilization. See **EMBRYOLOGY OF MAN**; **PLANNED PARENTHOOD**; **REPRODUCTION**, Animal Reproduction, *Sexual Reproduction*; **REPRODUCTIVE SYSTEM**; **STERILITY**; **PREGNANCY**.

CONCEPTION, IMMACULATE. See **IMMACULATE CONCEPTION**.

CONCEPTION BAY, inlet, SE Newfoundland, in N part of Avalon Peninsula, 9 miles W of St. John's; 60 miles long, 13 to 20 miles wide. Bell Island, off the southeast shore, has important iron mines. ✓

CONCEPTUALISM, in philosophy, is a point of view which seeks to mitigate between realism and nominalism on the question of whether or not words (particularly general terms) are in themselves real (see **NOMINALISM**; **REALISM**). In the Middle Ages, the extreme realist William of Champeaux maintained that class names, or "universals," are inherently real in themselves, and that individual specimens within a class derive their appearance of reality from the universal. Thus, the idea of a horse is truly real, while the reality of any particular horse is a reflection of the idea; hence, no particular horse is real in and of itself. The extreme nominalist Roscellinus disagreed completely, stating that only the particular horse is real, and it is real in and of itself; moreover, this "idea" of a horse is an arbitrary and whimsical invention of the mind of man and has no reality or necessity whatsoever. This dispute was central to the philosophy and theology of the Middle Ages. It was argued with considerable heat, often accompanied by physical violence; no one cared much about the word *horse*, but the word *Trinity* was a different matter. It was of vital importance to a believer in the Holy Trinity to know if the object of his belief was real, or simply an arbitrary notion of the mind.

Concordance. Medieval philosophy is understandable only in terms of dispute and "concordance"—the mitigation, sometimes the synthesis, of opposing views. Pierre Abélard's concordance of nominalism and realism is regarded as a classic of its kind (see **ABÉLARD, PIERRE**). "You are both right and you are both wrong," Abélard said, in effect. Particular objects are undeniably real, he declared, and their reality cannot be explained away as being derived from a general class name. Yet words are real too, and cannot be explained away as whimsical and arbitrary

inventions of the mind. A word such as *horse* can be fully present in consciousness, and hence can be fully as real as any particular horse. This concept (*sermo*) of a horse becomes more real and pervades the consciousness more persuasively through use in human speech. Although a *sermo* can never become more real than a living, breathing horse, it can become fully as real as a horse and, when considered in terms of some exceptional horse (for example, one with five legs) the *sermo* might well serve to correct the particular. This view appeared to allow for the true reality of the Trinity, and implied the feasibility of a congruence of the Trinity itself and man's word or concept for it.

Although some modern thinkers dismissed or embraced Abélard's conceptualism as a disguised nominalism—notably Richard M. Weaver in his book *Ideas Have Consequences* (1948), and others who advocated a return to extreme realism—many others believed Abélard's concordance still valid and applicable in the seemingly perennial dispute over universals and particulars.

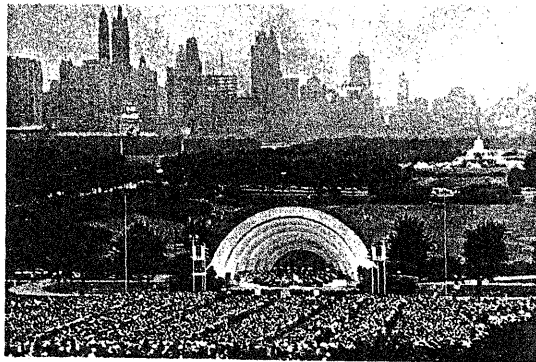
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CONCERT, a public musical performance. Originally such performances were private entertainments given by the ruling classes for invited guests. The later system of paid performances was started late in the seventeenth century by John Banister in London and during the eighteenth century was developed in Germany and other countries. In Paris the famous "Concerts Spirituels" began in 1725. These concerts were given during the church holidays before and after Easter by members of the Paris opera.

CONCERT OF EUROPE, the diplomatic arrangement followed by the major powers of Europe, although not consistently, in a series of conferences from 1815 to 1914. The theoretical basis of the conferences was the belief that peace could be maintained not by competition of the powers but by their agreement and common action. More than 20 conferences were called to consider specific problems between the time of the Congress of Vienna, 1814–15, and World War I. The powers forming the concert were Austria, Prussia, Russia, Great Britain, and, eventually, France. For a time, conferences and co-operative action kept peace, aided in practice by the actual balance of the powers. The concert also helped in the partition among the powers of colonies and concessions in Africa and Asia. Although the concert did not pre-

Outdoor concerts afford an ideal means of bringing music to large numbers of music lovers. This concert, given in a metropolitan park, was attended by 45,000 persons.

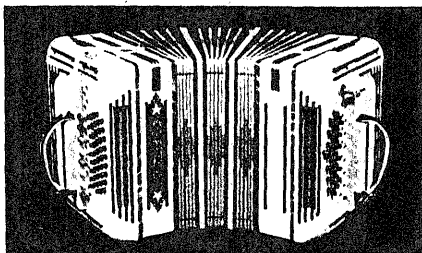
CHICAGO PARK DISTRICT



vent series of wars in the Balkans starting with the Crimean War, 1853–56, and ending with the Balkan Wars, 1912–13, the Austro-Prussian War, 1866, and the Franco-Prussian War, 1870–71, it often worked to localize wars and bring them to a close. With the rise of the alliance systems in the later nineteenth century, the Concert of Europe lost significance, and the outbreak of World War I was the sign of its collapse. See INTERNATIONAL RELATIONS; BALANCE OF POWER; HOLY ALLIANCE.

CONCERTGEBOUW, the symphony orchestra of Amsterdam, Holland. Begun in 1883 under private endowment, the orchestra later became state supported. The Concertgebouw introduced to the world such compositions as *Wozzeck* by Alban Berg and *Mathis der Maler* by Paul Hindemith. Among permanent conductors of the orchestra have been Willem Kes, Willem Mengelberg, and Eduard van Beinum.

CONCERTINA, a portable musical instrument invented by Sir Charles Wheatstone in 1829. The sound is produced by expandable bellows operating on free metallic reeds. There are tenor, bass, and double-bass concertinas, but the instrument most



STAR CONCERTINA AND ACCORDION MFG. CO.

Design of the concertina has undergone many changes since its invention in 1829. This modern version embodies many mechanical improvements and is covered by durable plastic.

commonly used is the treble concertina, which covers four octaves, including a complete chromatic scale. The tenor, bass, and double-bass instruments produce the sound only when the bellows are expanded, but the treble concertina produces the same note when the bellows are either expanded or contracted. A German concertina is constructed on another principle, producing one note when the bellows are drawn out, another when they are contracted. Serious music has been written for the concertina by W. B. Moliq, Sir George Macfarren, E. Solas, and Signor G. Regondi, among others.

CONCERTO, any composition for soloist and orchestra, involving musical contrast, repetition, and instrumental variety, and based largely on the sonata form (see SONATA). The concerto underwent numerous changes of structure until it was crystallized by Mozart into the form it was to have thereafter. The classic concerto is generally in the sonata form, but differs from the sonata itself in several respects. For example, the sonata has four movements; the concerto generally has only three, the first of which is in the tonic key and is usually a modified sonata in itself, featuring a cadenza toward the end. The second movement, usually in the dominant key, brings the soloist into greater prominence. The last movement is usually a rondo, which facilitates a show of brilliance by the soloist.

Historical predecessors of the classic concerto were the *concerto sinfonia*, *concerto grosso*, and *solo concerto*. The *concerto sinfonia* is based on contrasting musical sections rather than on contrasting instrumental groups. In a *concerto grosso*, a group of solo instruments is contrasted with a full orchestra. The *solo concerto* introduces the soloist, at first only in passages but later in full equality with the orchestra.

CONCORDANCE, in medieval thought, the method by which opposing or contradictory viewpoints were brought into accord. Bringing concord was also conceived as being a historical task, and concordance was regarded by some historians of the Middle Ages as a historical process, as well as a way of thinking. Concordance had to do with the resolution of paradoxes, whether in the realm of ideas or in the social order, usually in terms of the relative importance of conflicting ideas or actions.

The development of concordance as a method of thought was linked to the development in Europe, during the twelfth century, of the university, which came to be regarded as a place where opposing schools of thought were taught to the same student body at the same time in the same place. In this the university differed from the academy, where only one point of view could be taught. The universities were places of dispute, and the method of disputation was concordance. By the year 1000 the church was heir to a vast quantity of authoritative but frequently contradictory statements by the church fathers on every conceivable aspect of divine and human existence. Concordance developed first as an attempt to resolve the conflicting ideas contained in the early writings. The schoolmen assumed that while affirmation of a statement purporting to be truth could be total, negation could never be more than partial since all parties to a dispute agree on the *credo* (that which could not be doubted by reason of its overriding importance beyond logic) but they agreed to disagree on the unimportant or accidental things or the notions which could be rejected apart from the *credo*. Hence all agreed on the existence of God, but statements by human beings about supposed aspects of God were considered disputable.

Philosophy and Theology. Pierre Abélard's *Sic et Non* (Yes and No) was the first, and some have said the greatest, attempt to bring into concord conflicting assertions; in it he juxtaposed conflicting truths from the Fathers and then concorded them. At the University of Paris, the problem of universals was in dispute: the doctrine of realism dominated the local archbishop's school on the island, while the opposing doctrine of nominalism was prevalent within the international student body at the free schools on the left bank. Abélard earned the enmity of the realists by denying that all words are eternal, since only God is eternal; but he rejected nominalism by saying that an expression (*sermo*) may partake intimately of eternity by being the right and necessary word at the time. His concordance, then, consisted of distinguishing between unimportant words (horse, house) which are *arbitrary*, and important words (God, Trinity) which are *necessary*. Virtually all of the scholastic philosophers adopted the method of Abélard's *Sic et Non*, although some varied it a little. In each of his articles, St. Thomas Aquinas proposed a question, set forth objections to the affirmative position, replied to the objections, and came to a conclusion that may serve as the initial question (or proposition) in another article. See ABÉLARD, PIERRE; CONCEPTUALISM; NOMINALISM; REALISM; SCHOLASTICISM.

Law and Medicine. At Bologna, the leading center of juridical studies, canon lawyers competed with civil (Roman) lawyers. One of the most important questions in dispute was that of marriage: which had primary jurisdiction, church or state? The state, which permitted cradle engagements and the marriage of cousins, said that it should have jurisdiction so as to insure continuity of property ownership, inheritance of titles, and the like. The canon lawyers denounced cradle engagements and marriage between cousins, asserted that marriage was a sacrament, and claimed full jurisdiction for the church. There were sound reasons and authorities in support of both positions. The concordance, effectively ending the dispute, was to give the church authority over personal aspects: impediments abolishing cradle

engagements and other abuses were established, as was the idea of *unioprolium* (a man's children by several marriages became equal before the law). The state assumed control over civil aspects—inheritance of land, titles, and the like. Within canon law itself, Franciscus Gratianus' *Concordia discordantium canonum* was virtually the beginning of systematic canon law. At Salerno, base hospital for the Crusaders, Arabic medicine competed with the classic medicine inherited from the Greeks and Romans.

Modern Times. After the middle of the nineteenth century, with the development of existentialism and its concern with paradox, there was growing interest in concordance both as a method and as a process in the development of thought and action (see EXISTENTIALISM). This interest is exemplified in Eugen Rosenstock-Huessy's *Heilkraft und Wahrheit: Konkordanz der Politischen und der Kosmischen Zeit* (Healing Power and Truth: Concordance of Political and Cosmical Time, 1952).

CONCORDAT, an agreement made by the temporal authority of a state with the Roman Catholic pope, in his spiritual capacity, to determine their respective powers in the regulation of the affairs of the Catholic church within the state. A concordat usually involves state recognition of an official status for the Catholic church, guarantees certain rights and privileges of the church, and provides for state participation in important ecclesiastical appointments. The Concordat of Worms, a dual proclamation made in 1122 by Pope Calixtus II and Emperor Henry V of Germany, provided the basis for the later agreements. This concordat arose out of the long struggle between the temporal authority and the spiritual authority; the chief issue involved the investiture of ecclesiastical officials with their offices. The emperor gave up the rights of appointment and of spiritual investiture but retained the right of temporal investiture; this gave him the power to prevent appointments not to his liking. See INVESTITURE.

A famous concordat was that of 1801 made by Pius VII and Napoleon, re-establishing the Catholic church in France after the French Revolution. The government was granted the power to nominate bishops while the pope received the right of canonical installation. Parish priests were to be appointed by the bishops, but only with the approval of the government. The pope recognized the loss of church property confiscated during the Revolution, and in return the government agreed to provide support for the clergy. The concordat was abrogated by the French government in 1905 during a period of anticlericalism. Another notable concordat was the Lateran Treaty of 1929 between Pius XI and Premier Mussolini, an agreement which ended the long period of strained relations between the papacy and the Italian state, and established Vatican City as a sovereign state. (See LATERAN TREATY; VATICAN.) Concordats have been made with the following countries: Colombia, 1892; Poland, 1925 (abrogated by the Polish Communist government in 1945); Rumania, 1929 (repudiated by Rumania in 1948); Germany, 1933 (still in force in West Germany); Portugal, 1940; Spain, 1953; and *modus vivendi* with Ecuador, 1937. See ROMAN CATHOLIC CHURCH.

CONCORD COLLEGE. See COLLEGES.

CONCORDIA, city, N central Kansas, county seat of Cloud County, on the Republican River; on the Burlington, the Missouri Pacific, the Santa Fe, and the Union Pacific railroads, and U.S. Highway 81; 110 miles WNW of Topeka. Concordia is in a farming area which produces wheat, corn, alfalfa, and livestock. The city manufactures brick and cement products, and has food and agricultural processing industries, and railroad shops. Pop. (1960) 7,022.

CONCORDIA, city and port, NE Argentina, in the province of Entre Ríos, in the humid pampa, on the Uruguay River; opposite Salto, Uruguay, 220 miles N of Buenos Aires. Concordia is a railroad and

the Reformed church. In England the chief summary of Calvinism was the Westminster Confession (1645-47), which is accepted by many Presbyterian churches. In Scotland John Knox drew up the Scots Confession in 1560. See CALVIN, JOHN; CALVINISM; KNOX, JOHN; PRESBYTERIANISM.

The Thirty-Nine Articles (1562) are official in the Church of England, and with minor changes were adopted by the Protestant Episcopal church. The American Methodists, on John Wesley's advice, adopted 25 of the 39 articles. See CHURCH OF ENGLAND; METHODISM; PROTESTANT EPISCOPAL CHURCH; THIRTY-NINE ARTICLES, THE; WESLEY, JOHN.

The Baptists have no formal confession since they regard the New Testament as a sufficient basis of faith and practice. The Congregational churches and other churches in the Congregational tradition likewise have avoided confessions since with congregational autonomy each congregation may draw up its own statement. The Disciples of Christ were founded on the Bible alone. The Society of Friends, the Salvation Army, the Unitarians, and several other denominations use no formal confessions. See BAPTISTS; CONGREGATIONALISM; DISCIPLES OF CHRIST; FRIENDS, SOCIETY OF; SALVATION ARMY; UNITARIANISM.

During the Reformation the Roman Catholic church formulated its doctrines in the Decrees and Canons of the Council of Trent (1545-63). Other important Catholic statements were the Dogmatic Constitutions of 1869-70 and the Syllabus of Pius X in 1907 condemning all forms of modernism. See ROMAN CATHOLIC CHURCH; COUNCIL OF TRENT.

CONFESIONS OF SAINT AUGUSTINE, consisting of 13 books, was written sometime in the years 397-400 by the Bishop of Hippo (Africa), St. Augustine, 354-430 (see AUGUSTINE, SAINT). The first 10 books are ostensibly autobiographical; the last three have been described as an exegesis of the book of Genesis. In spite of this seeming division, the 13 books constitute a unitary whole. *The Confessions of St. Augustine* has been called the "history of Augustine's heart," while the *Retractions* (426-28), a chronological account of his works, with indications as to the occasion and the dominant idea of each, has been called "the story of his mind." These, together with his surviving letters, constitute the principal sources of direct biographical information about St. Augustine.

Because of its title, the *Confessions* has sometimes been confused with the "Confessions" of Rousseau, Don Juan, and others. But Augustine intended the word in the biblical sense of the Latin *confiteri*, literally "an acknowledgment." Augustine speaks not to readers, but to God. It has been said that Augustine's greatest work was his own life. But Augustine himself acknowledges that this "greatest work" was not his, but God's—for which Augustine was the material, and to which, in the *Confessions*, Augustine bears witness. Just as God created the Heaven and the Earth, so too did He create Augustine in the image of that which Augustine had been intended to be. "And being thence admonished to return to myself, I entered even into my inward self, Thou being my Guide: and able I was, for Thou were become my Helper. And I entered and beheld with the eye of my soul (such as it was) above the same eye of my soul, above my mind, the Light Unchangeable." But even as he acknowledges God's deed, he admonishes himself to remain true to it; he calls "to mind my past foulness, and the casual corruptions of my soul; not because I love them, but that I may love Thee, O my God." (Pusey's translation.) Hence, Augustine dwells on the period before his conversion. He knew of all, and embraced not a few of the many cults, and was even a celebrant of the rites of Manichaeism. The works of Plotinus enabled Augustine to shed materialism. Augustine received baptism during Lent, 387. Thus the war was won, though there remained many spiritual battles to be fought. One such, to make peace with his son, Adeodatus, was the biographical back-

ground of *De Magistro* (389, On Teaching), which should be read with the *Confessions* and the other autobiographical writings.

CONFIDENTIAL COMMUNICATIONS. See PRIVILEGE; EVIDENCE.

CONFINEMENT. See GESTATION; BIRTH AND LABOR; EMBRYOLOGY OF MAN.

CONFIRMATION, among Christians, a rite supplementary to baptism (see BAPTISM) and constituting full acceptance into the Christian fellowship. In the Roman Catholic and Eastern Orthodox churches confirmation is one of the seven sacraments. (See SACRAMENT.) The rite originated in the early Christian church; according to Acts (8: 14-17; 19: 5, 6) the apostles laid their hands on converts so that they might receive the Holy Spirit. In the Roman Catholic church confirmation is usually performed by a bishop, who makes the sign of the cross on the forehead of the candidate with chrism (a mixture of balm and oil), and also gives him a slight blow on the cheek to signify that he must be willing to suffer for Christ. Confirmation is believed to bestow a special grace which strengthens the Christian for the practice of his faith. Confirmation, according to Roman Catholic law, should be conferred at the age of discretion (7 years) and before first communion. In practice, confirmation in many countries of Spanish culture is conferred on infants shortly after baptism. And in many other countries it is conferred two or three years after first communion. In the Eastern church the priest anoints with oil blessed by the bishop, but there is no imposition of hands.

In the Church of England and the Episcopal church the rite is performed by the laying on of hands, but without anointing. Confirmation is necessary for admission to communion, and those who are confirmed renew the vows which were made in their behalf by their sponsors at the time of baptism. In America, Lutheran children are confirmed, after a public examination on the catechism, at the age of 13 or 14 (on completion of the eighth grade). Adults are often given informal private catechization followed by public confirmation. Most Protestant churches do not have the rite of confirmation.

Jewish confirmation, first recorded in 1810, is a ceremony of the Reform synagogue in which boys and girls publicly declare their adherence to Judaism and thus are received into the household of Israel. Confirmation, a development of the Bar Mitzvah, the rite in which the Jewish boy at age 13 accepts his responsibility as a member of the religious group, includes girls. There are Conservative and Orthodox congregations which retain the traditional Bar Mitzvah for boys and confirm girls in a ceremony of "consecration." Others have instituted a Bath Mitzvah service for girls at age 13.

CONFISCATION, the taking of private property by the state without adequate compensation. Under the due process clause in the United States no person may be deprived of life, liberty, or property without due process of law; the courts have held that any taking of property contrary to this provision is confiscation. (See DUE PROCESS OF LAW.) The taking of private property through the taxing power is not confiscation, even though the tax may be confiscatory in effect; nor when property is taken through the power of eminent domain, since there is a requirement that adequate compensation be paid. The slave owners charged confiscation after the Civil War when their property rights were abolished, as did also the alcohol beverage industry after the adoption of the prohibition amendment; whatever may have been the moral and political considerations, neither case involved legal confiscation since there was no taking of private property by the state. See CONDEMNATION PROCEEDING.

By the old common law of England confiscation was applied almost exclusively to the seizure by the state of stolen goods, stray cattle, and the goods

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The U.S. Department of Agriculture has operated a market news service since 1915. It issues reports on prices, stocks, carloadings, livestock receipts, cold storage holdings, and other market data. The department also publishes an annual outlook report each fall and issues situation reports periodically.

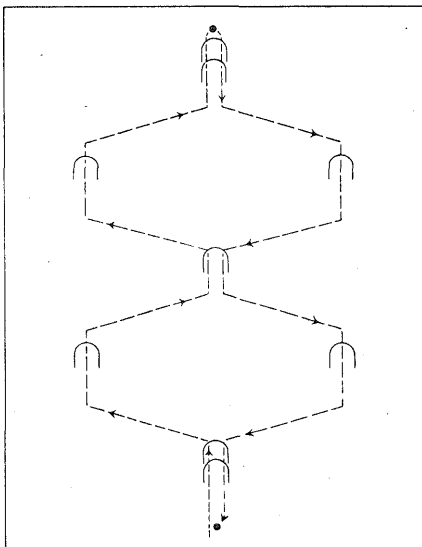
Many other countries maintain some type of official crop reporting service, and private reports are issued in the United States by grain and cotton organizations, newspapers, and other private agencies.

CROP INSURANCE, the insuring of farm crops against loss or damage occasioned by weather or pestilence. Insurance may be written against specific hazards or against all risks. In the United States all-risk insurance has been provided for some crops by the federal government through the Federal Crop Insurance Corporation since 1938.

History. An early experiment in crop insurance was undertaken by a Minneapolis fire insurance company in 1899 when it offered insurance against weather and pestilence hazards and price declines. The attempt resulted in large losses and was abandoned after one year. Attempts by two other companies in 1917 also failed. In 1920 the Hartford Fire Insurance Company offered to insure farmers their costs of production on the basis of a premium of 6 per cent, but this venture also resulted in such heavy losses that it was soon dropped. Since 1883 many companies have offered hail insurance for a wide range of crops with mixed results. Between 1911 and 1930 five states in the Great Plains area undertook to provide hail insurance, but only the programs in North Dakota, Colorado, and Montana were continued after the depression of the 1930s.

Federal Crop Insurance was initiated under the Agricultural Adjustment Act of 1938 which established the Federal Crop Insurance Corporation. From 1938 to 1941 the program covered only wheat and was on the basis of from 50 to 75 per cent of average yield. Cotton was added to the program in 1941. Congress suspended the crop insurance program in 1943 after both programs had shown continuous losses and low participation by farmers. The program was reactivated by Congress in 1944, and in 1945 insurance was offered for wheat, cotton, and flax on a nationwide basis and for corn and tobacco on a trial basis. In 1948-49 the entire program was put on an experimental basis and provision was made for multiple crop coverage and gradual widening of the program to cover other crops. Between 1950 and 1955 the crop insurance program covered an average of about 350,000 farmers with protection amounting to an average of over \$300 million. The program continued to show losses, but these were mainly due to damages in certain counties where droughts were prolonged. Fourteen such counties in the Southwest were dropped from the program in 1956 in order to develop a sounder basis of operation.

CROQUET, a nonprofessional outdoor game played with balls and mallets on a grass or clay court of varying size, but usually about 40 by 60 feet. The game is believed to have originated in France in the seventeenth century and probably derived its name from the French *crochet*, meaning crooked stick. Later played in England as "pall mall," it died out in the 1700s, experienced a short revival about 1850, and was supplanted by tennis in the 1890s. Equipment consists of eight color-striped wooden balls $3\frac{1}{4}$ inches in diameter, eight mallets, two stakes, and nine or 10 wire wickets. Object of the game, which is played individually or by teams of two, three, or four players, is to make a complete circuit of the wickets, the winning side being the first to complete the circuit. Players alternate in shooting and each ball passing through a wicket gives its owner an additional shot. Hitting an opponent's ball gives a player two extra shots, one of which may be used to knock his rival's ball away; the player then remains "dead" on that ball until he has passed through the next wicket.



Typical layout of American lawn croquet playing area, with broken lines indicating course of ball. Variations of the game use two transverse or crossed wickets in the center.

After making the complete circuit, but before hitting the home stake, a player may become a rover and play on any ball, usually with the object of delaying opposing players' progress. See **ROQUE**.

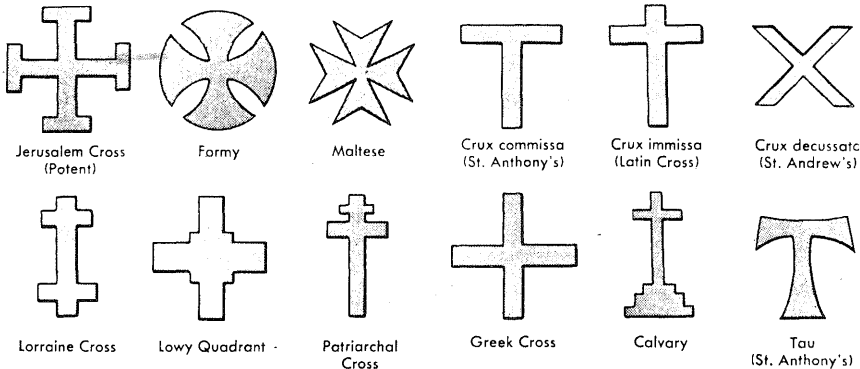
CROSBY, BING, real name Harry Lillis Crosby, 1904- . U.S. singer and motion picture actor, was born in Tacoma, Wash. He entered both the radio and motion picture fields in 1931, became famous as a singer, and amassed a large fortune. Crosby received the Motion Picture Academy Award, 1944, for his part in *Going My Way*. Appearing on television after 1952, he confined his shows to one each year after 1955. He wrote, with Pete Martin, *Call Me Lucky* (1953). His films include *The Bells of St. Mary's* (1945), *Welcome Stranger* (1947), *Riding High* (1950), and *The Country Girl* (1954).

CROSBY, FANNY, full name Frances Jane Crosby, 1820-1915, U.S. verse and hymn writer, was born in Putnam County, N.Y. Blind from infancy, she was educated at the New York Institute for the Blind, where she later taught until her marriage in 1858 to Alexander van Alstyne, a blind music teacher. She is said to have written nearly 8000 hymns, among them *Safe in the Arms of Jesus*; *Jesus, Keep Me Near the Cross*; and *I Am Thine, O Lord*. She also wrote *The Blind Girl*, and *Other Poems* (1844).

CROSBY, municipal borough, W England, SW Lancashire, on the Mersey River, 5 miles NNW of Liverpool. Crosby is primarily a residential area but has some industry, principally the manufacture of food products and metal goods. The municipal borough includes the towns of Great Crosby and Waterloo with Seaforth. Pop. (1951) 58,362.

CROSS, the intersection of two lines at right angles to each other, used as a religious symbol from the earliest days of antiquity, but most commonly associated in modern times with Christianity, of which it is the principal symbol.

Christian Usages. Crucifixion was a common method of punishment and execution for many pre-Christian peoples, and continued to be used after the advent of Christianity (see **CRUCIFIXION**). After the Crucifixion of Christ, the cross came to symbolize



The Cross, symbol of Christianity, is used in a great number of different forms as an organizational emblem.

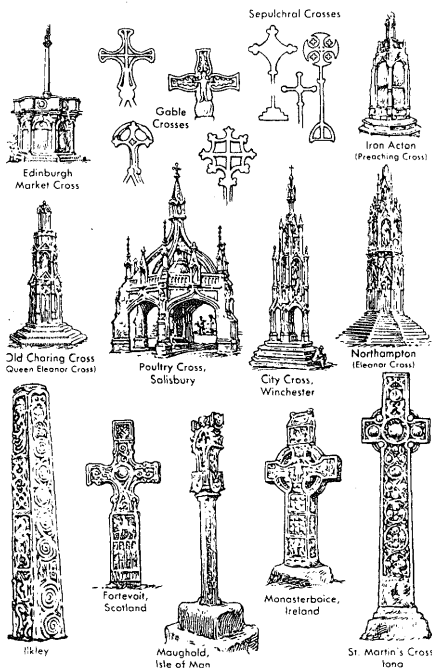
triumph over death and, more generally, triumph over all worldly things. The apostle Paul was instrumental in making Christianity "cross-centered." The practice of crucifixion was formally ended among the Romans by Constantine the Great, who made Christianity the official religion of the Roman Empire. According to tradition Helena, the mother of Constantine, discovered the true cross of Christ in 326. Part of this cross was deposited in a chest by Constantine and was preserved thereafter in Rome; other portions were distributed throughout Christendom. The tradition of "The Invention of the Holy Cross" by Helena conflicts with a still older tradition, according to which the true cross was found during the reign of Tiberius. An attempt during the nineteenth century to reconcile the two legends (by terming Helena's discovery a "rediscovery") was unconvincing to most scholars. Relics claimed to be from the true cross are found today in all parts of the world. Large and important relics are found in the Basilica of the Holy Cross in Rome and in Notre Dame, Paris.

During the medieval times and before, the influence of the cross upon life and thought was most pervasive: churches were normally built according to a cruciform plan (see CHURCH ARCHITECTURE); alleged relics of the true cross were common currency in the market place; the cross was perhaps the most used figure in heraldry; the sign of the cross was a part of the Christian ritual, and became almost commonplace in the everyday life of the people. The true cross was said to have been made of four kinds of wood (palm, cedar, olive, and cypress); to its four arms were ascribed many symbolical meanings, such as the four quarters of the world. In this light the cross influenced the form of the literature (theological and otherwise) of the period almost as much as did the idea of the Trinity.

In the course of time the basic design of the cross (two lines intersecting at right angles) was varied and elaborated in many ways, some of them harking back to pagan usages. The craftsmen who made crosses for liturgical and other purposes sometimes embellished the basic design to such a degree that it was hard to recognize the cross as such. The liturgical cross discovered in 1940 during excavations at Herculaneum at the foot of Mount Vesuvius is probably the oldest in existence. This city was wiped out by the eruption of Vesuvius at the same time as Pompeii, and liturgical crosses found in both cities date to the period before A.D. 79. Crosses uncovered in Pompeii apparently were scurrilized with obscenities, a fact which indicates that those who hated the Christians saw the cross as a Christian symbol even at this early date. It is a tribute to the vigor of the religion which the cross came to symbolize that

through 2000 years the cross came to mean one thing first of all, despite the ambiguity of its pagan origins and its variety of non-Christian uses.

Non-Christian Usages. A variety of meanings were attributed to the cross in antiquity. Among the Carthaginians and Phoenicians it was used as an instrument of sacrifice to Baal. The Persians considered it a charm against evil and death. To the Gauls it was a solar symbol endowed with creative and fruitifying powers. In Central and South America natives worshiped it as the emblem of the god of rain. It figured prominently in the observances of various phallic cults. It is clear from these examples that whether the cross signified life (fertility, rain, phallic



Memorial and Monumental Crosses

cism, and so on), or *death* (it was used as a means of killing by the Persians, the Assyrians, the Egyptians, the Greeks, the Romans, and the Jews), it was never neutral. The Christians appear to have been virtually unique in *combining* the two extremes of life and death. Jesus the Christ, although tortured and killed, emerged the victor, and the idea of a new life *through* death became central to Christianity: the cross came to symbolize this. Because the new conception was so much more comprehensive than those which had prevailed before, Christians were able to see the various pagan uses of the cross as signs or omens of the coming of Christ.

The cross has often been used symbolically for extrareligious purposes. Apart from such sporadic, transitory, or pagan aberrations as its use in the United States after the Civil War by the Ku Klux Klan (Knights of the Flaming Cross), and the use of the swastika (an ancient form of cross) by the National Socialists in Germany preceding and during World War II, such usages are almost invariably metaphorical. The "cross" in Red Cross, the cross symbolism of various fraternal organizations, and the appearance of various forms of cross in national flags (such as in Great Britain's Union Jack), all indicate an attempt to identify the user or his group with Christianity.

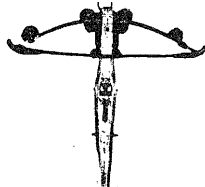
CROSSBILL, a perching bird belonging to the finch family, *Fringillidae*, and so named from the overlapping tips of its bill.



White-winged Crossbill

Various species and subspecies of crossbills, genus *Loxia*, are recognized. The American crossbill, *L. curvirostris*, also known as the red crossbill or common crossbill, is about 6 inches long. The body is plump, the wings long and pointed, and the tail forked, short, and narrow. The males are reddish brown or bright red, the females olive gray. The crossbill feeds on seeds which it scoops from pine cones with its spoonlike tongue. In range, the crossbill is usually limited to coniferous forests from Alaska to Michigan. The white-winged crossbill, *L. leucoptera*, is rosy red, with a black tail and black wings marked with white bars. Its general range, behavior, and habits are similar to those of the American crossbill.

CROSSBOW, arbalest, or arbalist, a medieval weapon consisting of a bow set at right angles to a musket-shaped wooden stock, a mechanism for drawing back and holding the bowstring, and a trigger for releasing it. The stock was grooved to guide the arrow or bolt, which was propelled with great force. Although used by the ancient Romans as auxiliary weapons, crossbows were in use chiefly from the twelfth through the fourteenth centuries. The crossbow had many forms and, as the bows were strengthened, many devices employing levers, ratchets, and windlasses were used to draw back the bowstring and arrow. As crossbows became more powerful they became heavy and cumbersome. English archers preferred the longbow, which they could fire faster and with almost equally effective force. Crossbow arrows varied in length with the size of the crossbow; com-



GEORGE F. HARDING MUS.
Crossbow

monly they were 18 inches long. The ends were usually tipped with metal, square-headed or sharpened to a point. Crossbows used by Oriental nations were sometimes decorated with inlays of pearl, silver, and gold. Large military engines such as the ballista, used in the Middle Ages to hurl heavy stones, were based on the principle of the crossbow. See **BOW AND ARROW**.

CROSS-COUNTRY, a foot race over a natural course which includes roads, ruts, ditches, streams, and even fences and gates. Marked by flags, arrows, or lined lines, cross-country courses vary in length from 3 to 7 miles except in high school races, which have a 3-mile maximum. Seven to eight men comprise a team, with only the first five finishers scoring points. One point is scored for first place, two for second place, and so on, with the winning team being that with the low aggregate score.

CROSSETT, city, SE Arkansas, Ashley County, on the Arkansas and Louisiana Missouri, the Ashley, Drew and Northern, the Rock Island, and the Missouri Pacific railroads and U.S. Highway 82; it is 75 miles S of Pine Bluff. The town was built and settled in 1901 by a lumber company that was a pioneer in scientific reforestation in the area. The city adopted a mayor-council form of government in 1902. Lumber, charcoal, chemicals, wood pulp, and cotton and paper bags are produced here. Pop. (1960) 5,370.

CROSS-EYE, an inward turning of either eye or both eyes, preventing focusing. See **STRABISMUS**.

CROSS KEYS, BATTLE OF, fought during the Civil War, on June 8, 1862, near Harrisonburg, Va. General Thomas J. "Stonewall" Jackson, the Confederate commander, was campaigning in the Shenandoah Valley to prevent the Union troops there from joining Gen. George B. McClellan in the assault on Richmond. At Cross Keys a Confederate force of about 6,500 under Gen. Richard Ewell repulsed an attack by Gen. John C. Frémont's force of 12,000. The Union force lost 684 men and the Confederates 288. As a result of this campaign the planned juncture of Union forces was prevented; Jackson was able to join Lee in the defense of Richmond. See **SHENANDOAH VALLEY CAMPAIGNS**.

CROSS OF GOLD SPEECH. See **BRYAN, WILLIAM JENNINGS**.

CROSSOPTERYGII, a group of fishes known mostly from fossil remains, the oldest of which occur in Lower Devonian rocks deposited about 350 million years ago (see **GEOLOGIC TIME**). Their most obvious distinguishing feature is in the fins, especially the paired fins, which are paddle-shaped with a muscular, scale-covered lobe at the base that permits great freedom of motion.

The more typical Crossopterygii, known as the order Rhipidistia, appeared in the Lower Devonian time and became extinct in the Permian, about 200 million years ago. Highly predaceous forms, they lived almost entirely in fresh water. They were moderate in size, although one species may have attained a length of several yards. In spite of their short history, the Rhipidistia are of importance because many features of their structure indicate that this was the group that gave rise in the late Devonian period to the first land vertebrates, the Amphibia (see **AMPHIBIA**).

A second group of Crossopterygii, known as the order Coelacanthus, is distinguished by its stocky body, the shortened gape of the mouth, and the loss of the large lateral teeth and their supporting bones. The earliest forms from the Devonian period were marine. Later Paleozoic genera were fresh-water inhabitants; during the Mesozoic era they returned to the sea. The latest fossil coelacanthus occur in Cretaceous rocks, 70 million years old, and for many years were thought to have become extinct at that time. In 1938, however, a living member of this group was caught off the east coast of South Africa and named *Latimeria*. Since 1952 several more specimens

ceeded to live out his days in hedonism and eccentricity. He was a masterly phrase maker, and knew well how to exploit the beauty of the Italian language, but here his value as an artist ceased.

DAN RIVER. See ROANOKE RIVER.

DANSKÖYA, or Danes Island, in the Arctic Ocean, one of the Spitsbergen Islands, off the NW coast of West Spitsbergen. Salomon August Andrée started from Dansköya in 1897 on his ill-fated balloon voyage across the north polar region. See ARCTIC REGIONS.

DANSVILLE, village, SW New York, in Livingston County; on the Delaware, Lackawanna, and Western, and the Dansville and Mount Morris railroads; 40 miles S of Rochester. Manufactures are periodicals, steam power equipment, nursery stock, and shoes. Dansville was settled in 1795 and incorporated in 1845. Clara Barton founded the first American Red Cross chapter here in 1881. Pop. (1960) 5,460.

DANTE ALIGHIERI, 1265-1321, was born in Florence, Italy. He is best known as author of the *Divine Comedy* (see DIVINE COMEDY). He was called the greatest singer of the Christian truth by Pope Benedict XV in 1921. Often called the father of the Italian language, he was in a very real sense the creator of the common literature of Western man.

BACKGROUND

Guelphs and Ghibellines. Dante began as a Guelph of the upper ranks (see GUELPH AND Ghibelline). In 1250 the Ghibelline emperor Frederick II died (he was the last emperor whom Dante recognized as the legitimate ruler over the whole of Italy). As the restoration of the empire was combated by the papacy, no less than 177 sovereign cities and princes sprouted between the Alps and Naples. Florence, a banking center, annexed from the Ghibelline nobles the villages of the surrounding country. Dante's family held real estate inside the walls: on the one hand they looked down on the new citizens from the countryside; on the other they dreaded the powerful families who had held office from the emperor. Until 1289 the Guelphs showed solidarity, with the popes their natural protectors. In that year the Guelphs of Florence, with Dante in the vanguard, vanquished the Ghibellines of Tuscany in the battle of Campaldino, but immediately fell out among themselves. Magnates, Popolo Grasso (the five richest guilds), and Popolani split. The latter demanded that all citizens must belong to a guild: Dante chose that of physicians and apothecaries. Later the relation to the papacy produced a second rift within the Guelphic party and it split into Neri (black) and Bianchi (white); the Neri were willing to help the world-wide papal plans for an alliance with France, while Dante's party, the Bianchi, tried to manage independently.

In 1301 Pope Boniface VIII and the Neri triumphed; by 1303 the pope himself was overpowered and his successor was removed to France. The popes had overreached themselves: for if there was no emperor, there also was now no pope in Rome. In vain did Henry VII of Luxembourg receive the imperial crown in 1312. He threatened to invade Florence but died near Siena, south of Florence, in 1313.

Dominicans and Franciscans. In this chaos, with tens of thousands of exiles and refugees milling through Italy, Italians were comforted by the almost 100,000 followers of St. Francis and St. Dominic. Francis of Assisi appeared to many as the sublime imitator of Christ; indeed the pope issued a bull forbidding too close an identification of St. Francis with Christ. Dominic was seen as the Lord's dog (*Dominus canis*), for St. Dominic's mother had dreamed that she had borne the Lord's dog. Both orders had an extraordinary effect through their schools, at which Dante studied in Florence and probably in Bologna. Among the hosts of teaching friars the Dominican Thomas Aquinas and the Franciscan Bonaventura held no

monopoly; they were the first among equals, a fact that has puzzled many a modern who finds Dante not at all surrendering to Thomism, which did not exist in Dante's day. Without the work of these orders Dante might have produced a Latin poem as had the Florentine Arrigo, who in 1193 wrote an elegy on man's fate in the manner of Ovid. But the friars had prepared the way for a new blend of paganism and theology. The Roman Aeneas who descended into the netherworld, and the Apostle Paul who ascended to the third heaven were blended by Dante. Francis was the imitator of Christ, Dominic was the Lord's dog, and Dante took inspiration from each of these two saints of his century. Moreover, the *Divine Comedy* contains prophecy and cipher which acknowledge their influence and which foretell Dante's own role in God's plan; three times the reader is told of it, I: 1, 108; II: 33, 43; III: 15-16. (Citations I, II, III are to the *Inferno*, *Purgatorio*, and *Paradiso*, respectively.) In the first, Dante is the greyhound (an allusion to Dominic) born in the sign of Gemini (twins) to redeem the world. In the second, he is D X V (500, 10, and 5 translated into Roman numerals). In Dante's day, X always meant Christ (an allusion to Francis); and the reader has already been prepared for V (for *Veltro*, greyhound in Italian). D X V reads, then, "Dante, Christ's Greyhound." And, lest there be misunderstanding, the poet adds, "messo di Dio," the literal translation of Paul's title of apostle. Finally, in part III (Paradise), Dante's ancestor reaffirms that the guest of Scaliger (to whom the manuscript of Part III was sent) would save the world. Clearly, Dante did not intend the *Commedia* merely to entertain, but rather to change the world.

OUTER LIFE

It seems Dante lost his mother at birth and his father in 1283, while the poet was still a young man; he nowhere mentions them. At the age of 12, after the custom, Dante was betrothed to Gemma Donati, a young girl of prominent family; the marriage seems to have been consummated after 1291. During Dante's exile, Gemma saved the family property. They had sons and daughters. When a daughter chose her name as a nun, she chose "Beatrice," we may think, in her father's honor. For Beatrice was Dante's name for the woman whom he decided to praise as nobody ever before had spoken of a woman. She was Bice Portinari, 1266-1290. He was aware of meeting her at the age of nine; at 18, because she showed some friendliness, he burst out in "the sweet new style." After her death, Dante turned to a course of studies lasting at least 30 months, during which his stupendous knowledge must have received its foundation.

After 1295, becoming more active politically, Dante was constantly in one or the other city office or diplomatic mission. The Bianchi made him one of the six Priori for the two summer months of 1301: it was his highest and his most disastrous political office. His best friend, Guido Cavalcante, was banished; Dante voted against military help to the pope; excommunication threatened. In the fall, Dante went to the papal court as an ambassador, and there learned that the Neri had taken over in Florence. Clearly, as a Bianchi he was no longer at home, and he could not be a Neri: from now on, only the Ghibellines could protect Dante and he, proudly calling himself a party of one, furnished the Ghibellines with a new political program.

Dante never set foot in Florence again. On Jan. 27, 1302, he was condemned unheard, and on March 10 was threatened with burning if he should return. It is true that by 1315, under certain conditions, he might have made use of an amnesty, but the conditions implied his guilt. In this period Dante wrote the letter (the ninth of 10 that have been preserved) which is so great that Mazzini recommended its study to the political refugees of 500 years later. In 1315 Dante and his sons were by name banned once more.

Barque of Dante by Delacroix
ART INST. OF CHICAGO

In 1310 Dante had hurried to pay his homage to the short-lived emperor Henry VII; but in the main, he depended for protection on the Malaspina family in the Lunigiana; the Scaligeri of Verona; Ugucione in Pisa; and perhaps for the longest number of years on the family of Guido Novello da Polenta in Ravenna. Here he died of a fever on Sept. 13 or 14, 1321, and in Ravenna is his grave. To his hosts, eulogized in his verse, went the *Commedia* as it grew. In baptism, Dante had been named Durante; yet he preferred to die as Dante, the Giving One. He had given to Bice her lasting fame as Beatrice—that is, the "beatifying one." And he had given to the then vulgar name of comedy the new meaning which after 1500 the printers expressed by the adjective "divine."

CREATIVE LIFE

Dante began as a songful minstrel: "Did you write the canzones in the new style?" he is asked in Purgatory (II: 24, 49), and he gently replies: "I am to me one who when love inspires me, gives heed and the melody which speaks inside, I disclose it to you."

From 1294 to 1302 he was absorbed by *le present cost*, the affairs of the day (II, 31, 34). Later he occasionally wrote a song (fourth letter) or went on political errands for one of his patrons as the persuasive orator he was. In the main, Dante became more and more the first creative Christian artist—that is, the combination of Israelitic prophecy and Greek art which later came to be expected from the creative man, a man twice-born and, besides, a man renewing the medium in which he works.

Out of the songs of his youth he composed *La Vita Nuova* (date unknown). Others have collected into the *Canzonieri* his 67 other sonnets and canzone, of which the first is addressed to Guido Cavalcante. After 1302 Dante seems to have written the three books by which he prepared himself for the main task: the *De monarchia* (On Government) in three parts; the *Convivio* (Symposium) planned in 15 treatises (four of which were completed), written in Italian for lay men and women; and the *De vulgari eloquentia*, two books completed out of four projected. He also wrote some Latin verses (*Elogar*) to an admirer in 1319 defending his writing in Italian; and his one and only scientific essay, *Quaestio de aqua et terra*, an academic disputation on the earth being created later than the water. The *Vita Nuova* (New Life) places side by side Dante's songs for Beatrice, a dramatic prose story of biblical coloring in which he quotes Jeremiah, the psalms, the gospel to adorn his own rebirth into a new life by his love, and a cut-and-dried analysis of the structure of each poem. The *De monarchia* revives the political order of centuries back. Free men must become united in a world government despite local autonomy (Book I). The Roman Empire has been necessary for the coming of Christ and must be enlarged from ocean to ocean (II). Government is directly from God; the Church

cannot overrule it (III). *Convivio* popularizes the philosophical doctrines on the virtue of Aristotle the Master and "Duke of Reason" (quoted 76 times). *De vulgari eloquentia*, written in Latin for the experts, surveys the dialects of Italy from Tirol to Sicily, and for the first time conceiving them as one language, proposes a nobler (*illustre*) idiom for writers in Italian.

Since Dante, the ideas of a Roman Empire or of a world emperor have been given up. Every nation's right to its own literature is accepted. But man's relation to the past as well as to future of the whole race, and to the present life of any nation within humanity, is in large measure inherited from Dante: for Dante was open to the whole of pre-Christian nature, to astronomy and philosophy, history of nations and art, geography, and so on. Indeed his generous treatment of Mohammed and of Islam has given rise to an as yet unsettled controversy. One scholar, Asin Palacio, thinks that Dante imitated an Arabic model in writing his *Comedy*. In any case, mankind after Dante was heir to his catholicity. For the future, Dante warned that non-Christians—he mentions the Hindus—might win out before God unless Christians make better use of their privilege. For the nations, Dante created a faith that united Italy through 500 years of chaos and servitude. Without Dante's three contributions, man might still live in a provincial universe.

Man may improve on Dante's world, but amplify its immensity he cannot. In the very year in which Boniface VIII claimed to be both emperor and pope, Dante the exile turned and asked: "What is left to me?" And he replied: "Let Love be warm and let hope be alive. Then, even though heaven's kingdom may seem violated, Aye, Divine Will may seem overcome . . . that is only the way a man triumphs of man. Ov'r God they win as He wills to be won who, conquer'd, from within by bounty conquers" (III: 20, 95ff). Because Dante recognized the Christian quality of victory in defeat as the divine spark in all men and in himself, the *Divine Comedy* became the justification of Dante's own divinity: for a faith that did not mold the believer's own works, would not be faith.

Therefore, Dante is a different man in different hands. Exactly to the degree that the reader's own experience extends does he ascribe to Dante an artistic or poetical license, a trick, a device; or recognizes in Dante's journey the chaste good thrown around 20 years of suffering: decent folk do not parade their wounds before the world without a garment of *vergogna* (reverend shame) such as Dante requires of the creative man in the *Convivio*. Dante says that he undertook the journey (of the *Commedia*) from April 4 to 7, 1300, as our representative, since every man is in hell or purgatory or paradise. For this feat he is called the central man of all the world by John Ruskin. "The man behind the verse is far greater than the verse itself. . . . A man who reads the last three cantos of the *Commedia* cannot do a mean thing for several weeks afterwards," added James Russell Lowell.

What, then, were the phases of Dante's development? In his youth, he exploited the biblical language to adorn his personal love. But the "Divine Comedian" reversed his course. Now it was Dante who contributed the tender language of a lover to the drama of God and men's souls. When Dante would have been 70, in 1335, Giotto who knew him well (and whom Dante praises, II: 11, 96), painted him with the Saints in the Palazzo del Podestà in Florence. By 1373 Florence was ready to ask Boccaccio for the first *Lettera Dantis*, still given annually in many Italian cities. With Greek and Latin abandoned by American schools, Dante has been proposed in their place. For all must now agree with Boccaccio that Dante "is a river in which a tiny lamb wades and a large elephant has ample depth to swim."

EUGEN ROSENSTOCK-HUESSEY

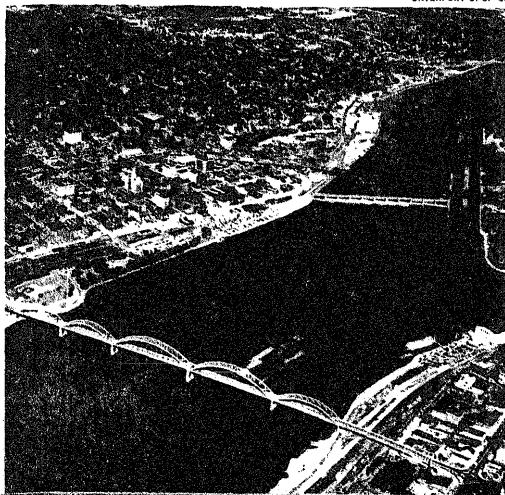
DAVENPORT, HOMER CALVIN, 1876–1912, U.S. caricaturist, was born in Silverton, Ore. After 1895 he achieved fame and political influence as a cartoonist, working successively for the *New York Evening Journal*, the *New York Evening Mail*, and the *New York American*. Davenport's representation of Uncle Sam became a popular national symbol. He wrote *The Country Boy* (1910).

DAVENPORT, JOHN, 1598–1670, American colonial clergyman, was born in Coventry, England. A minister of the Church of England, he became a non-conformist and in 1633 fled to Holland. In 1637 he led an expedition from England to Boston, and in 1638 founded New Haven, Conn., where he was pastor of the church and a leader of the colony. Davenport was pastor of the First Church in Boston after 1667.

DAVENPORT, city, E Iowa, county seat of Scott County; on the Mississippi River; on the Burlington, the Rock Island, the Milwaukee, and the Davenport, Rock Island, and North Western railroads and U.S. highways 6, 61, and 67; a scheduled airline stop; 150 miles E of Des Moines. Davenport lies across the river from Rock Island, East Moline, and Moline, Ill.; the four are known collectively as the Quad Cities. The business and industrial districts of the city are located adjacent to the river; the residential area is chiefly on the limestone bluffs to the north. Davenport is on the site of an early trading post and was the scene of a battle fought in the War of 1812. The actual fighting took place on Credit Island in the Mississippi, Sept. 5-6, 1814, now the site of a city park. Fort Armstrong was established two years later on Rock Island, now a part of Illinois. In 1836, four years after the Black Hawk Purchase was negotiated on the town's site, Col. George Davenport, a trader at the fort, founded the town that later bore his name. Davenport was the first city to be served by a railway bridge across the Mississippi River, completed in 1856. Several camps were located near Davenport during the Civil War. Following the war it prospered as a sawmilling center and a river port.

Davenport is the site of St. Ambrose College, Marycrest College, and the Palmer School of Chiropractic. The Iowa Soldiers' Orphans' Home and a museum are also points of interest. A roller gate dam and locks provide a 9-foot navigation channel and protect the industrial area from floods. Principal products include agricultural implements, aluminum sheet and plate, pumps, toys, airplane parts, food, feed, and gas and diesel engines. Pop. (1960) 88,981.

This aerial view of Davenport, Iowa, shows the roller gate flood control dam and navigation channel, and two of the three Mississippi River bridges that link the Quad Cities.



DAVID, 1030?–960 B.C., ruler of the united kingdom of Judah and Israel. Historically the most influential Jewish monarch, his life span was midway between Abraham and Christ. David has his day in the Christian calendar on December 29.

His Name. "David" is usually explained simply as a personal name. However, David appears as a title for a military leader in texts of the second millennium B.C. found in the excavations at Mari (on the upper Euphrates), 1933–38. In the light of this, it is possible that he was named for the outstanding innovation he represented in Israel: for years he commanded a mercenary professional soldiery, winning his kingship and the possession of Jerusalem with the help of this system which, because of its effectiveness, he had copied from the enemies of Israel, the Philistines.

His History. David's non-Israelitic use of mercenary soldiery enabled him to rise above the jealousies of the militias of the various tribes; on the other hand, this innovation had to be reconciled with the ancient loyalties of the people. Our sources of knowledge about David's reign, in the main the two books of Samuel (in the Roman Catholic Bible the first two books of Kings), are dedicated to this reconciliation. The loyalty of David for the first King Saul and for Saul's family often seems to be their main theme. For example, the same act of loyalty—sparing Saul's life when David could have slain him—occurs several times. Obviously, the court of David and Solomon dreaded that anyone might replace David's dynasty as he had replaced Saul's; for some, David ranked as a pretender until his death. Hence in Samuel 16 we are told that the seer Samuel once came to the house of David's father Jesse (Isai) in Bethlehem and looked over all the seven sons present. But Jehovah (Jahve) told him to wait for David. When David entered, fair-haired, tall, bright-eyed, Samuel anointed him and in him recognized God's Spirit. David slew the iron-clad Goliath in a single combat with his stone sling. Later David became Saul's arms bearer and played the harp before him. And "the soul of Jonathan, Saul's son, entered into a knot with David's soul, and Jonathan held him dear as his own soul, with God between them."

Scholars say that jealousy made Saul hate David, and David fled. His farewell to Jonathan (I Sam. 20) is a sublime homage to friendship. Later David formed a guerrilla band of several hundred social outcasts and approached the Philistine prince, Achish, of Gath, who invested him as his vassal with the city of Ziklag. David was now working for the enemies of his country. The Philistines slew Saul and Jonathan while David saved his Ziklag from a raid of the Amalekites (I Sam. 28–29). When Saul's kingdom of Israel had ended, a magnificent dirge was composed and sung. The second Book of Samuel, Chapter 1, ascribes the dirge to David. In any case, David exploited the new political vacuum by moving eastward from Ziklag and receiving the anointment as king over the House of Judah in the grove of Mamre near Hebron in the south. In Hebron, the city once given to Caleb, David ruled for the next seven years (around 1000 B.C.) over the six subdivisions of Judah. Six sons were born to him in Hebron by various wives. In the meantime, the Israelitic remnants of Saul's army and family (the northern tribes) disintegrated. When they had perished (David's generals murdered some of them), the elders of Israel came to Hebron expressing their preference for David of Bethlehem rather than anarchy. David employed his mercenaries to conquer from the Canaanites the city of Jerusalem, with its northern castle Zion; here rose his palace, the City of David. Phoenicians from Tyre provided the techniques for this construction, which were as yet unknown in Israel. Then began a mighty expansion—Damascus was subdued, as was the land toward the Bay of Akaba.

DAVID'S FUNCTION IN RELIGION

Despite such great and complex power, David built on the Mosaic traditions. He danced in jubilation in front of the Ark when it entered Jerusalem (II Sam. 6). The co-ordination of the new kingship of David and Jehovah's kingship of Israel is illustrated by (1) the role of Nathan, (2) the new literature, (3) the census.

Nathan. David's last years were ones of unending trouble arising out of the problem of succession. His son Absalom drove him out into East Jordan and reigned briefly in Jerusalem, but the army saved David. Then another son stirred up trouble; David did nothing. The decision was forced by the prophet Nathan, who had reproached David some 20 years earlier for the death of Uriah, the Hittite mercenary who lost his life at the time David committed adultery with Uriah's wife Bathsheba. Nathan had demanded that David repent and David had humiliated himself before the prophet. Now Nathan prevailed upon David to use his soldiers to install Solomon, the son of Bathsheba and himself, as his heir. Nathan also vetoed David's plan to build a temple to Jehovah; Solomon would do this. In the official annals Nathan is credited with these three measures in influencing royal decisions.

The New Literature. In this new center of spiritual power (the City of David), a Davidic literature sprang up, dealing first with David's own reign and other historical records. Obviously the new order led to taking stock of the previous days when no king stood between Jehovah and his followers, and this spiritual center organized the liturgy and the singing on Mount Zion. To David himself 75 of the 150 psalms in the Bible are attributed, and during his reign psalmody was organized.

The Census. David influenced Israel to leave its purely inner and almost incognito existence and to look at itself from the outside, as the Gentiles saw them. In addition David forced a census upon Israel. The Israelites felt that by such statistics the king's power was increased beyond the democratic way of equality, and the repentance of David over the census is twice reported in the Bible with great prominence (II Sam. 24 and I Chron. 31).

David's true greatness rests solidly on his religious and political accomplishments. He was not merely "the sweet singer of Israel." He brought the ark of the covenant to Jerusalem and established there the center of Jewish worship. He led the Israelites in expelling from their borders the last of their unsubdued enemies. He established a strong monarchy on ruins of the feeble foundation laid by Saul. And, most significant for Christians, is the fact that through the Davidic line, 10 centuries later, was to come the Messiah, in the person of Jesus Christ. See *Jews, The First National State*.

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DAVID I, 1084–1153, king of Scotland, the son of Malcolm Canmore and St. Margaret of Scotland, succeeded to the Scottish throne in 1124. David instituted various domestic reforms, among them the consolidation of the feudal system in Scotland. He encouraged trade and the establishment of towns, built many monasteries, and created several bishoprics. His foreign policy was less successful: his attempted invasions of England in 1135, 1138, and 1140 all failed.

DAVID II, 1324–71, king of Scotland, succeeded his father Robert I (the Bruce) in 1329. As a child of nine he was sent to France for eight years, returning to Scotland in 1341. He soon made several unsuccessful raids into England on behalf of France. He was

taken prisoner in 1346 and confined in the Tower of London. Later removed to Odiham, he remained there until ransomed in 1357. He had no descendants and was succeeded by Robert II, his cousin, who founded the royal house of Stuart.

DAVID, GÉRARD, 1460?–1523, Dutch painter, was born in Oudewater and about 1483 settled in Bruges, where his painting was much influenced by the work of Rogier van der Weyden, the Van Eycks, and Hans Memling. The last great painter of the Bruges school, David was highly regarded by his contemporaries and received many commissions from his own country and from France, Portugal, and Italy. Named town painter of Bruges in 1494, he began work on *The Judgement of Cambyses*, completed four years later. David's painting is characterized by the brilliant but subtle coloring of the Flemish school, a monumentality of design probably derived from Italian influence, and great simplicity of form and elimination of detail, with emphasis on human figures. Among his many celebrated works are the *Crucifixion* (at the Palazzo Bianco in Genoa), *The Transfiguration* (at the Bruges Cathedral), and the great *Madonna Enthroned* (at the Louvre).

DAVID, JACQUES LOUIS, 1748–1825, French painter and political figure, was born in Paris. Of well-to-do parents, he was tutored by the fashionable painter François Boucher and won the Prix de Rome in 1774. In Italy he was influenced by the painters of the Bologna school and later, when the excavations at Herculaneum and Pompeii were being made, he became passionately interested in Greek and Roman antiquities. He returned to Paris, where his historical painting *Brutus* (1789) was interpreted by the revolutionaries as a tribute to their cause and he became a leading figure in the French Revolution, which broke out the year the painting was shown. He was elected to the revolutionary convention as a Jacobin and promptly abolished the stultified Academy of Painting; he also championed art in the new state and succeeded in getting large credits voted for the purchase of paintings which were being taken out of France. He also helped found the museum which later became the Louvre, and organized the mass Republican Pageants. His portraits of the leading revolutionaries were definitive in identifying those figures; the *Death of Marat* (1793) became the *pietà* of the revolutionary movement. On Napoleon's ascendancy, David became chief court painter; his masterful *Coronation* (1805–08) records Bonaparte's crowning of Josephine as empress. With the restoration of the Bourbon monarchy, David was exiled to Brussels, having been among those who voted for the death of Louis XVI. He taught art until his death, and his chief pupil and disciple, Jean Ingres, continued David's neoclassicism, or more accurately, his revolutionary classicism. David was a painter of several social classes—he painted royalty when there was a king, agitators during the republic, and Napoleon during the Empire. His feelings for each subject seemed to determine the degree of dynamism in its treatment. His portraits are classic studies; perhaps his best known is the one of Mme. Récamier (1800). He painted only one known landscape—the view from his window while he was under arrest. Most of his paintings and drawings are in the Louvre.

ANTHONY KERRIGAN

DAVID, PIERRE JEAN. See **DAVID D'ANGERS**.

DAVID, city, W Panama, capital of the province of Chiriquí, the third largest city in Panama, on the David River, on the Pan-American Highway; it is 205 miles WSW of Panama. David, a commercial and industrial center, is linked by rail to its seaport, Pedregal, on the Pacific Ocean. Its principal industries are leather goods, especially saddles, harness, and shoes; clothing; ceramics; and sugar milling. The chief points of interest are the old park and two early churches. Pop. (1950) 14,847.

DAVID D'ANGERS, real name Pierre Jean David, 1788–1856, French sculptor, was born in Angers. A



David's conquest starting point was drawn up giant Philistine him in mortal with a slingshot killed Goliath, the destiny of. After the death led his united



Dervishes, members of a Moslem religious order, perform whirling dances as part of their worship. Although Persian in origin, dervishes are found throughout Islamic lands.

SE of Manchester. Settlement was made in Derry about 1720 by Scotch-Irish settlers who introduced the linen making industry which flourished in the town until the beginning of the nineteenth century. Chief manufactures are shoes and textiles. Pop. (1960) 6,987.

DERRY. See LONDONDERRY.

DERVISH, a Moslem devotee, usually member of an order or group, practicing piety, poverty, and often mendicancy. Though most dervishes are banded together in communities, some live solitary lives. There are a number of independent orders, each with its own rules and customs; often these are secret. Associated with the orders in many cases are laymen, as individuals or in societies, desiring to live better according to the law of Islam. European observers have stressed the practices of the so-called whirling dervishes, whose ritual includes a dance which grows wilder and more rapid, and the howling dervishes, whose prayers and chants grow louder and more frenzied. These groups and others known to cut and otherwise injure themselves are exceptional and not characteristic. Dervishes or men of similar character are found throughout Islamic lands. Dervish is a Persian word; the Arabic word *fakir*, or *faqir*, is used especially in India and Pakistan, sometimes of Hindu as well as Moslem holy men; *marabout* is common in North Africa. See also MOHAMMED, Islam.

DERWENT RIVER, NE England, E Yorkshire, rises in the North York Moors, 10 miles NW of Scarborough and flows S, W, and S to join the Ouse River 5 miles SE of Selby. The river has a total length of 60 miles and flows through rich farm land.

DERWENT RIVER, S Tasmania, rises in Lake St. Clair and flows SE for a course of about 107 miles into Storm Bay, an inlet of the Tasman Sea. The river is navigable from the port of Hobart inland to New Norfolk.

DERWENT WATER, or Keswick Lake, NW England, S Cumberland, on the Derwent River. Derwent water is roughly oval in shape with a length of 3 miles from north to south and a width of 1 mile from east to west. The lake contains wooded islets and occupies a picturesque location among mountains. North of Derwent water are Keswick, a resort center, and the famed Falls of Lodore.

DERZHAVIN, GAVRIIL ROMANOVICH, 1743-1816, Russian lyric poet, was born in Kazan. An enthusiastic admirer of Empress Catherine II, he was her poet laureate, her governor of Olonetz, and later her secretary. He also held posts under Emperor Paul I and Emperor Alexander I. He was regarded as the greatest Russian poet before Alexander Pushkin. Derzhavin's best known work is *Oda Bog*, 1784 (*Ode to God*, 1861); he also wrote *Monody on Prince Mestcherski* and *The Taking of Warsaw*.

DES. See DEJ.

Descartes

6-1000

DESAGUADERO RIVER, W Bolivia, in the departments of La Paz and Oruro, forming the outlet of Lake Titicaca near Guaqui, and flowing generally SE to enter Lake Poopó. The Desaguadero River has a total length of about 200 miles and flows across part of the Altiplano, or high plateau, of Bolivia. Its principal tributary is the Mauri River.

DESAIX DE VEYGOUX, LOUIS CHARLES ANTOINE, 1768-1800, French general, was born in Saint-Hilaire-d'Ayat. After distinguished service in Germany and in Italy, Desaix fought with Napoleon Bonaparte in the Battle of the Pyramids, and conquered Upper Egypt, 1798-99. His administration prompted the Arabs to call him The Just Sultan. Rejoining Bonaparte in Italy, Desaix turned apparent defeat into victory by his brilliant attack at Marengo on June 14, 1800, but was killed during the battle.

DESALTING, the chemical removal of salt from water to make the water useful for drinking and other purposes. It is accomplished by ion-exchange materials selected for the specific need (see ION EXCHANGE). Salty water can be made as pure as distilled water; the process, however, is not economically competitive with distillation (see DISTILLATION). Emergency desalting equipment has been developed by the U.S. armed forces to convert sea water into drinkable water for men who have been shipwrecked or forced down at sea. The equipment is provided in lifeboats, life rafts, and survival kits.

DE SANCTIS, FRANCESCO, 1817-83, Italian literary critic, educator, and patriot, was born in Morra Irpina, Avellino. An anti-romantic, he encouraged students of his private school of literary studies to participate in the life around them; he followed his own advice and was long active in the complicated and bloody struggle for Italian unification and independence. He resigned a professorship of literature at Zurich to become governor of Avellino province (appointed by Garibaldi) in 1860, and later served as minister of education, 1861 and 1878-81. Apart from his political writings and activities, De Sanctis was in large measure the founder of modern literary criticism in Italy, favoring a synthetical (as opposed to analytical) method. His most important works in this vein are *Saggi Critici* (1881), *Storia della Letteratura Italiana* (1871), *Nuovi Saggi Critici* (1872), and *La Letteratura Italiana nel Secolo XIX* (1897).

DESBARRES, JOSEPH FREDERICK WALLEY or WALSH, 1722-1824, English military engineer and hydrographer of Huguenot parentage, was aide to Gen. James Wolfe, who was killed in 1759 during the siege of Québec. After 1763 Desbarres made surveys in the British colonies and charted the coast of North America, publishing these charts as *Atlantic Neptune* (1777).

DESCARTES, RENÉ, 1596-1650, latinized "Cartesius" against his will, was called the father of modern philosophy by Schopenhauer. Descartes was characterized by La Fontaine as "this mortal of whom former ages would have made a god and who holds midway between Man and Pure Spirit." Descartes enriched mathematics, physics, metaphysics, medicine, and technology; he created analytic geometry. But more important was the fact that he showed that society should make organized scientific research an essential part of its way of life. He gave the Western world its good conscience in such activity. "He nearly dominates the French mentality, France's civilization, her literature, and her language," wrote Eduard Benés.

Life. Descartes' father held office in the parliament of Rennes, France, but the well-to-do family came from La Haye, Touraine, where Descartes was born. His mother died when he was one year old and rarely has such a loss played such a great role in the life of the human mind as in this case. At 19 he graduated from the new, ambitious college La Flèche of the Jesuit order and embarked upon the traveling life of a young cavalier. A trip to Holland in 1618 gave Descartes a new friend, Isaac Beeckman (eight years

his senior), with whom Descartes agreed to proceed by a method in which physics and mathematics should go hand in hand. Descartes' mind was geometrical and he improved this field, invented index notation, and found that his analytic geometry could solve "an unlimited number of problems if he assumed that the solution already was known."

Although Descartes joined the French army marching through Germany, he remained preoccupied with his geometrical success. While billeted near Ulm in a well heated room on Nov. 10, 1619, he had his famous dream (actually three dreams) in which he was told that an "admirable science" would chain together all particular sciences into a single order and that he would have the enthusiasm to carry this revelation to fruition. Overjoyed, he vowed a pilgrimage to Our Lady of San Loretto. Descartes' joy and certainty did not immediately lead him to a change of life. He traveled in Bohemia, Hungary, Switzerland, and Italy, and from 1625 to 1628 lived in Paris. Warned by the Cardinal Pierre de Bérulle that realization of his extraordinary gift would require faithful service, Descartes gave up his cavalier existence in Paris and from 1628 to 1649 lived in no less than 13 different Dutch cities while working on his system. Although he never taught, Descartes kept in touch with the scientific world through correspondence; 138 letters written to Marin Mersenne (1588-1648), who acted as the scientific journal in those days, have been preserved. Descartes never married, since the doctors had not given him long to live, but he was not insensible to joy and grief: in 1635 a servant girl bore him a daughter and when the child (who had been baptized a Protestant) died in 1640 the Catholic Descartes was deeply distressed.

In 1649 Dutch antagonists made his life less pleasant in that country; at the same time civil war threatened in France. Queen Christina of Sweden, who already was his correspondent and hoped to found an academy of science in Stockholm, prevailed upon him to transfer to her court. In her zeal for learning, the queen asked for instructions from him three times a week at five o'clock in the morning; three weeks of this regime brought on pneumonia, and within nine more days Descartes was dead. His remains rest in Saint-Germain-des Près in Paris.

Doctrine. Descartes wrote on many disparate subjects, but all his writings were not of equal importance. Before Galileo was condemned by the Church, Descartes expected to win over the Jesuits and the public with his physics; after Galileo's trial Descartes dropped this plan and put the metaphysics first on his timetable. These maneuvers had little real influence on his ultimate purpose—to conquer with a method of research. To this goal he subordinated everything else.

Descartes said of himself that he wore a mask and, although his doctrine was in fact quite revolutionary, he diplomatically avoided open conflict with the other scholars of his time, most of whom were teachers content to repeat with but slight variations the ideas and ways of thought hallowed by many centuries of use. Indeed, Descartes was at some pains to point out that he had no desire to controvert the old ideas; moreover he avoided teaching as much as possible; instead he desired to live the life of pure mind, and "*Cogito, ergo sum*" (I think, therefore I am) was his proud motto.

The scholastic teachers were accustomed to begin with the assumption of God or of Nature: God (or Nature) exists, therefore this and that must follow. Descartes would have none of this, but looked to his own mind as the starting point. Amid the innumerable



René Descartes

stimuli, sensations, memories of mind, he asked; what can I regard as certain? His answer was radical, but he hoped that others would not notice just how radical it was. Motherless, Descartes had been the product of an ambitious boarding school which had tried to smother his mathematical genius with scholastic book learning; it was not entirely surprising, therefore, that he decided that everything he had learned, believed, felt, or hoped in the first 20 years of his life was at best uncertain, at worst mere nonsense. He concluded that only those propositions are certain which can be communicated perfectly from mind to mind, that is, things demonstrable through mathematical deduction or by the immediate evidence of experimental repetition. What actually was Descartes' "first mind"—the poetical, religious, affectionate, and loyal impressions of youth—he dismissed as naive. His "second mind," critical, reflective, and generalizing, he insisted on calling his "*prima philosophia*," the title of one of his books, *Prima Philosophia* (1641). He considered memories of his first 20 years as clogging his mind. He wished to free his mind from such incumbrances. Obviously if the human mind was to be the starting point of philosophical and scientific research, it must be universalized to a stature comparable with previous starting points, such as God and Nature. Therefore all personal singularity must be stripped away and abandoned. Accordingly Descartes humbly removed from his conception of his own mind all of its sparkling genius, its creative originality, the dregs that were left, the indifferent and transferable intelligence, he called the mind. Those mental qualities or actions which do not have to do with these dregs Descartes considered less valuable and less rational. The lasting effect of this arbitrary division between his "first" and his "second" mind was that thereafter the second mind was mistaken for the mind in general. See EXISTENTIALISM.

Descartes (and his followers into the twentieth century) viewed his own youthful vitality, and birds, mammals, flowers, and trees as well, as mere machines, which now or later would be reduced to mathematical explanation: beneath their higher selves (that is, in Nature) Cartesians recognize mechanisms only. Moreover, God was also made dependent upon the human mind's own certainty, for Descartes taught that God's existence could be proved solely by the fact that the mind is able to think of a perfect being, and since one necessary attribute of a perfect being would be its existence, God exists because the mind says so!

The Cartesian starting point (*Cogito, ergo sum*) implied that all sense data could be reduced by mathematical deduction to mere extendedness of moving particles in space. While Descartes promised mastery of the physical universe, the price to be paid for this mastery was that the body lose its significance for the fulfillment of the soul's destiny. The fact that Descartes separated body and soul into two separate substances has always been felt to be the weakest point in his system. However, if he is read as the advocate of the new enterprise of organized research, then his neglect (even denial) of the unity of body and soul seems to have been largely of a tactical nature—a way of winning acceptance for the idea of free research. The lasting merit of Descartes' method is the very fact that doubt is its first breath. But this doubt is not a permanent doubt of the whole universe, after the manner of the skeptics and cynics. Descartes introduced the method of intermittent, yet perpetual, doubt of every individual detail.

As Descartes isolated space, he completely misunderstood time. He said that God seemed to re-create time afresh every second, since otherwise time would seem inexplicable. But the anti-Cartesian movement of the twentieth century recognized that time was wronged by the Cartesians. It was more and more realized that time is as much deserving of its own science as space, perhaps more so.

The question of the relation of his own limited lifetime to history Descartes solved by his "provisional morality." The scientist (he wrote) with his life dedicated to research, and having to doubt every proposition in the course of this research, must not doubt in matters of religion and government, since only after centuries will these topics be covered by the admirable new science. In the meantime, all scientists have to remain law-abiding citizens of church as well as state. As scientists, the mind is free to doubt, but social and political actions must enact the existing order. That Descartes held such a view suggests why he was more successful in wedging scientific research into the structure of society than were many more vehement spirits. In Descartes were united a conservative Christian, a loyal citizen, a mathematical genius, and a bold innovator. It will not do to treat him as a mere opportunist, hypocrite, or coward. However his tactics may have changed, his goal remained the same, and he devoted his energies to one task only: convincing people that they should begin to investigate by his method.

His "heroic pioneering in utopia" (B. Bauer's apt phrase) bore fruit. During Descartes' early years an enormous skepticism undermined the medieval traditions based on Aristotelian book knowledge. By the end of Descartes' life both the book learning from Aristotle and the crude empiricism of Aristotle's enemies were giving way to regulated progress in the sciences: (1) a theory (mostly mathematically conceived); (2) experiments construed to test this theory; (3) correction of the theory and the experiments until theory and experiment are congruous; (4) technical application of the new harmony.

Descartes' Works. His most famous book, *Discourse on Method*, published anonymously in 1637 in the French tongue, was the first to be put in print. His earlier manuscripts and the letters were collected (in a classical edition in memory of the tercentenary of his birth) by Charles Adam and Paul Tannery (12 vols. 1896-1912); this definitive edition also included the books edited after 1637 by Descartes himself as the *Prima Philosophia* (1641), *Principia Philosophiae* (1644), and *Passions of the Soul* (1649), the last named a work written for the young Princess Elizabeth of Holland. A careful translation of all his work, by E. S. Haldane and by R. T. Ross (2 vols. 1911-12), is available in English. See PHILOSOPHY. EUGEN ROSENSTOCK-HUESSEY

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DESCENT AND DISTRIBUTION is the method by which private property, both real and personal, passes by operation of law to heirs and next of kin when the owner dies intestate. Realty is said to descend and personality to be distributed. If the intestate leaves no heirs the property escheats, that is, reverts to the sovereign or state; eventually it is sold and, according to the most prevalent practice, the proceeds are turned over to the educational fund of the county or counties having jurisdiction.

The intestate's widow's half of community property in those eight states (Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, and Washington) in which that system obtains is not subject to the law of descent and distribution. The political units which have jurisdiction of realty and personality are, respectively, the county in which the land lies and the county of which the intestate was a resident at the time of his death.

DESCHAMPS, EUSTACHE, 1346?-1406, French court poet, was born in Vertus, Champagne (later Châlons-sur-Marne). He was a pupil of the poet

Guillaume de Machaut, by whom he was brought up, and was a figure at court after 1368. He held various minor posts under Charles V and took part in several missions abroad. He wrote 1175 *ballades* (one of them addressed to Chaucer), in which he brought this complex form to a high state of development—at least technically—and more than 200 short pieces in the *rondeaux* and *virelais* forms. Of less importance is his *Miroir de mariage*, a long (over 12,000 verses) satire against women. He also wrote the first French "ars poetica," *L'Art de dicter* (1392). His work is marred by an overemphasis on technique and a didactic tone. *Oeuvres complètes*, edited by Saint-Hilaire and Raynand in 11 volumes, appeared, 1878-1904.

DESCHANEL, PAUL EUGENE LOUIS, 1856-1922, French author and tenth president of the Republic, was born in Brussels, Belgium, the son of Emile Deschanel (1819-1904), French author and critic, who was in exile at the time of Paul's birth. Paul Deschanel was in the chamber of deputies after 1885. A leader of the Progressive Republican party, he called for separation of church and state. He was president of the chamber of deputies in 1898-1902 and in 1912-20. Elected president of the French Republic in January 1920, Deschanel resigned in September of the same year because of ill health. A member of the French Academy, he wrote *Orateurs et hommes d'état* (1888), *La Question sociale* (1898), and *Gambetta* (1920).

DESCHUTES RIVER, N Oregon, rises in the Cascade Range, flows generally N for its course of about 250 miles, joining the Columbia River 14 miles E of The Dalles. The river is used for irrigation and power. See COLUMBIA RIVER.

DESCRIPTIVE GEOMETRY, a method of representing and solving space, or three-dimensional, problems by means of lines and points drawn on a plane, or two-dimensional surface. The principles of descriptive geometry form the basic theory underlying the more common means of graphical expression used by engineers and architects to prepare drawings for the instruction of workmen. The principles also include those of design. Thus, descriptive geometry is graphical mathematics and can be used to obtain numerical results that would otherwise be found by means of analytic geometry. See ANALYTIC GEOMETRY.

Descriptive geometry is particularly applicable to the study of those curved surfaces which can be formed by bending a plane surface without tearing, crumpling, or stretching. Such surfaces are called developable surfaces. A cone or stove pipe is developable whereas a sphere is not. A typical problem involving developable surfaces would be that of finding the shape of a plane surface which when properly bent or rolled would form a teapot.

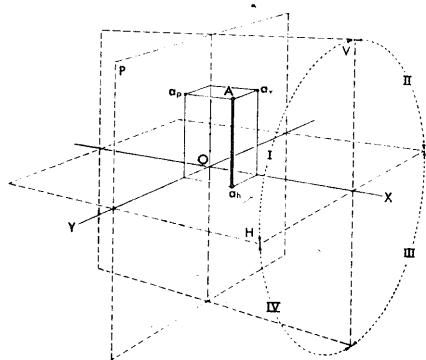


Fig. 1. Vertical, Horizontal, and Profile Planes in Space



Fig. 2. R

Artists drawing in perspective place many structuralizing elements in a similar way from some object placed in a house applying the perspective corner. A perspective view on the horizon in a similar way of the horizon.

Descriptive geometry point in space is usually perpendicular to the plane of the drawing. These planes are the third length if the

For example, a vertical plane is perpendicular to the horizontal plane. The projection of a point on the horizontal plane is the same as the projection of the point on the vertical plane. (To distinguish between the two planes, the vertical plane is referred to as the vertical plane and the horizontal plane as the horizontal plane.)

When the vertical plane is rotated to rest in the horizontal plane, the reference line OY is the line of intersection of the two planes. (See COORDINATE GEOMETRY, Figure 3 is

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DIALECTIC, or dialectics, from the Greek "to reason through opposites," was called by the philosopher Hegel "at bottom the organized and deliberately cultivated lust for dissent in every man, a great gift for the distinction of true and false, and not to be judged by its abuses." (See HEGEL, GEORG WILHELM FRIEDRICH.) Dialectic as a method in philosophy is based on the assumption that at least one dissent or negation must have been inserted into the definition of any proposition before it can be considered valid; for instance, a kettle is not a kettle until it is declared that the kettle is *not* a pot. Negations, however, never add a new quality to propositions, and dialectic as a method of thinking is prone to empty statements. In the proposition "God is invisible" a negative quality is implied, but nothing said about who God is. In the Western tradition, dialectic has played a threefold role: (1) as a part of logic; (2) as the method of philosophers and theologians; and (3) as the key to revolutionary communism.

Logic. Logic analyzes the meaning of propositions; dialectic supplements such analysis by investigating all the possible contradictions to any proposition. In court, lawyers of both prosecution and defense always had to negate the opponent's thesis; dialectic appeared when Zeno (490?-2430 B.C.) introduced this method of the courtroom into scientific debate. Plato enlarged upon Zeno.

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Biblical speech rejects dialectic, and Scholastic theology, founded as it was upon the opposing traditions of the bible and Greek dialectic, had to compromise. Radical dialecticians such as Berengar of Tours (died 1086), who judged biblical truth by dialectic, were banned; dialectic was to be the servant, not the judge of revealed truth. See SCHOLASTICISM.

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Communist Dialectic. Hegel was outdone by Karl Marx. Marx read dialectic not only into man's conscious statements but into man's material functions. "Classes" to Marx are, throughout history, theses and antitheses. Capital is negated by Labor because, says Marx, Labor wants low profits for Capital and high wages for itself. The dialectic or revolution was based by official communism on this logic of matter:

"Dialectics is nothing more than the science of the general laws of motion and development of Nature, human society, and thought" (in the words of Nikolai Lenin). Although this doctrine in and of itself is palpable nonsense, it did serve the purpose of negating the liberal idea of mere political equality (without reference to economic equality) founded by the French Revolution. The negative, "Not all men are born free and equal under capitalism," was Labor's effective way of telling the bourgeoisie that political equality was not enough. See MARX, KARL; MATERIALISM.

In the period following World War I, a group of dialectical theologians including Karl Barth, Gogarten, Brunner and others, stressed (like Sören Kierkegaard) the "otherness" of the Divine Revelation as against all earthly knowledge. Since Barth and the others tore the two orders of sinner and saint asunder, they were not really dialecticians; rather, they divided reality into two entirely separate parts, one black and the other white. See DIALOGUE.

EUGEN ROSENSTOCK-HUESSEY
DIALECTICAL MATERIALISM. See MARX, KARL; MATERIALISM, DIALECTICAL.

DIALLOGUE. See DIOPSISIDE.

DIALOGUE, from the Greek *dialogos*, meaning the process of clarifying a problem, is the conversation between two or more people; its essence is that the participants alternately speak and listen.

In Greek tragedy, dialogue (not labeled "dialogue" in Greek) filled the intervals between the songs of the chorus and the utterances of the hero. From this originally subservient function, dialogue rose to sole dominion in modern drama, to such an extent that the audience usually received all its information from the stage through dialogue only. A revolt against this situation was evident in the works of such twentieth century playwrights as Hugo von Hofmannsthal, George Bernard Shaw, and Thornton Wilder, who sought to have chorus, off-stage "voices," prologues, and the like, implement dialogue again.

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In the twentieth century, however, particularly after World War I, dialogue was championed by some thinkers as a serious method of social science and, moreover, as a check on the social scientists. In free research, a group of thinkers including William James, Franz Rosenzweig, Gabriel Marcel, Eugen Rosenstock-Huessey, Martin Buber, and Hans Ehrenberg attacked the method of Greek logic which divides subject and object ("I" and "It") and which in its extreme consequences in Marxism leads to the eternal war between thesis and antithesis. Stalin himself, before his death, warned that real speech is greater than logical antitheses. All the more natural, therefore, that responsible men in the West began to fight the social consequences of the prevailing scientific dichotomy of Descartes (see DESCARTES, RENÉ). In society, the person who speaks is transformed by his speaking. The minds of speaker, listener, and object are not unrelated but are held together by one spirit: he who speaks must also be willing to listen, and to be spoken of by another. And the alleged object talks back. It is impossible, for instance, to call God the object of man's praise, for this might suggest that no God listens to man's prayers. Humans are "He" or "She," "You,"

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DIALYSIS COLLOID as (see CRYSTAL) in 1861, the or molecular certain type colloids will materials has including an and cellulose.

The rate depends on either side of the membrane separation rate of either side of or difference. ELECTRIC C particles or Osmosis.

By dialysis or sugar starch, gelatin from sugar solution of the wall of the p crystals in s wall but the pulp. Further sion cells of ment and Osmosis.

DIAMAC certain material field. Z stances. See

DIAMANT of Entre Rio 30 miles SSW junction, river raising, and v town has mar 1851 Gen. Jo Manuel de R

DIAMANT Minas Gerais N of Belo Horizonte diamond mines carats between has declined, mining region and shoe and as Tejuco, and Pop. (1950) 1

DIAMETER



circle and line
DIAMETER

and "I," in alternation. The groundswell of this dialogical, grammatical school was considerable, its publications numerous. A good introduction to the subject, with bibliography, was published in 1955: *Martin Buber: The Life of Dialogue*, by Maurice S. Friedman. See EXISTENTIALISM.

DIALYSIS is a method by which colloids (see COLLOID) are separated from crystalloids in solution (see CRYSTALLOID). Discovered by Thomas Graham in 1861, the method makes use of the fact that atomic or molecular-sized particles will usually pass through certain types of membranes, whereas larger-sized colloids will not. Various natural and manufactured materials have been used to make these membranes, including animal intestines, parchment, cellophane, and cellulose acetate. See GRAHAM, THOMAS.

The rate of separation of colloids from crystalloids depends on the concentrations of the solutions on either side of the membrane, the size of the pores of the membrane, and the area of the membrane. The separation rate may be increased by raising the temperature of the solution or by inserting electrodes on either side of the membrane and applying a voltage, or difference of potential, across the electrodes (see ELECTRIC CIRCUIT) in order to attract the ionic particles or crystalloids. See ION.

By dialysis such crystalloids as common table salt or sugar may be separated from colloids such as starch, gelatin, gum, or glue. The extraction of sugar from sugar beets is an example of commercial application of the process. Diffusion of the sugar through the wall of the plant cells is a dialytic process; the sugar crystals in solution come through the membranous wall but the colloidal material is left inside with the pulp. Further dialysis takes place in the 5-ton diffusion cells of the sugar refinery before chemical treatment and concentration of the juice. See SUGAR; OSMOSIS.

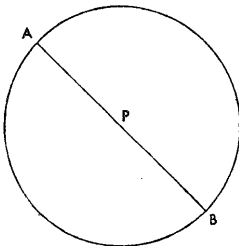
DIAMAGNETISM, a physical property in which certain materials tend to be feebly repelled by a magnetic field. Zinc and bismuth are diamagnetic substances. See MAGNETISM.

DIAMANTE, town, NE Argentina, in the province of Entre Ríos, on the E shore of the Paraná River; 30 miles SSE of Santa Fe. Diamante is a railroad junction, river port, and market center for a livestock raising, and wheat, flax, and alfalfa growing area. The town has maté mills, distilleries, and sawmills. Here in 1851 Gen. José de Urquiza defeated the dictator Juan Manuel de Rosas. Pop. 13,600.

DIAMANTINA, city, E Brazil, in the state of Minas Gerais, in the Serra do Espinhaço; 115 miles N of Belo Horizonte. The city is the center of a famous diamond mining district that produced 5 million carats between 1730 and 1770. Although production has declined, the area is still the leading diamond mining region of Brazil. Diamantina has tanneries and shoe and textile factories. It was originally settled as Tejuco, and contains interesting colonial landmarks. Pop. (1950) 10,177.

DIAMETER, in geometry, is a straight line that bisects given parallel chords of a simple curve (see CONIC SECTION). In the circle, ellipse, and hyperbola, every diameter passes through the center of the curve; in the parabola all diameters are parallel to the principal axis. In the figure, which is a circle, line *AB* is the diameter. Point *P* is the center of the circle and lines *AP* and *BP* are radii.

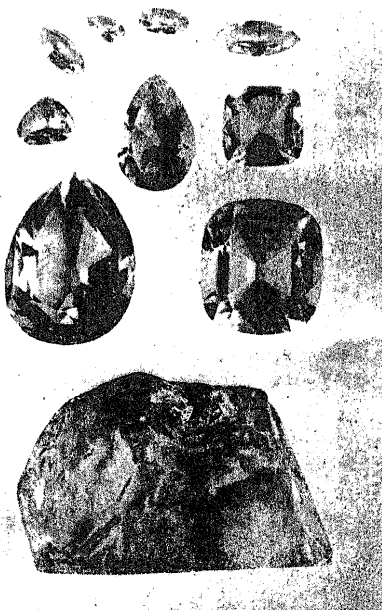
DIAMINES. See AMINES.



DIAMOND, a crystalline form of pure carbon highly valued as a precious stone (see GEM; CARBON) and as a cutting edge. Diamonds are usually octahedral, or eight sided, and commonly have flattened and elongated crystals. A great variety of forms symmetrically derived from the octahedron are assumed by the mineral, but the crystals frequently have curved or pitted faces. The diamond has perfect cleavage (see CLEAVAGE) parallel to the eight faces. This cleavage is used to advantage by diamond cutters who are able to split off thin fragments in a definite direction. Some colorless diamonds are more clear than the finest glass, while others, owing to the presence of impurities, are pink, yellow, red, brown, black, blue, or green. Red, green, and blue diamonds are rare. The colorless, pink, and blue stones are most often used as gems.

Black diamonds and impure crystals and fragments called bort are not usable as gems. Like all diamonds, they are very hard and so are used in diamond drills for rock boring, in drills for cutting porcelain, for bearings in fine watches, in making wire-drawing dies, in glass cutters, and as pivot supports in fine balances and meters (see CARBONADO). Diamond dust or chips are used in the manufacture of grinding wheels or other grinding surfaces to increase their cutting power on hard materials. Shaped diamond tools are used chiefly to machine finely finished sliding and rotating parts and to reshape grinding wheels. Materials that have been turned, milled, or bored with polished diamond tools include aluminum, magnesium alloys, copper, brass, precious metals, cast iron, steel, and graphite. See ABRASIVE.

Properties. The brilliance of the diamond is the result of its ability to refract light (see REFLECTION AND REFRACTION OF LIGHT). The brilliant luster of the diamond is increased by polishing with diamond dust to remove surface impurities, and by cutting facets. The transparency of the diamond to X rays



CHICAGO NATURAL HISTORY MUS.
The rough Cullinan diamond, bottom, is famed for its size. The nine principal stones cut from the Cullinan are part of the British crown jewels. Left center, Star of Africa.

but his purchaser, recognizing his worth, set him free and Diogenes spent the rest of his life in that city. Diogenes taught that extreme self-denial and disregard for the conventions of society were the only way to the attainment of truth and goodness. He was contemptuous of artists, writers, and scientists, who, he claimed, were concerned with seeking truth but not practicing it. The legend of his search with a lighted lantern, in broad daylight, for "an honest man" aptly illustrates his cynical appraisal of his contemporaries. See **CYNICISM**.

DIODEGENES LAERTIUS, Greek biographer of the third century, was born in Laerte, Cilicia. The sole source of information about many of the Greek philosophers, his chief work, *Lives of Philosophers* (10 books), traces the history of Greek philosophy from Thales to Sextus Empiricus. But his work is more concerned with anecdotes and biographical sketches of the philosophers themselves than with a critical appraisal of the development of philosophic thought. Long the basis of histories of philosophy, Diogenes' work, despite his inability to handle his subject adequately, is considered an invaluable source.

DIOMEDE or **DIOMEDES**, the successor of Adrastus as king of Argos, was one of the second Seven Against Thebes, and was conspicuous in the Trojan War as a friend of Odysseus.

DIOMEDE ISLANDS, two islands and an islet in the Bering Strait, midway between Cape Prince of Wales, Alaska, and Cape Dezhnev, U.S.S.R. The largest island, Big Diomede, or Ratmanov, belongs to the U.S.S.R.; Little Diomede and Fairway Rock are part of Alaska. Only a few Chukchi Eskimos inhabit the islands, which were discovered by Vitus J. Bering in 1728. See **BERING SEA**.

DIOMEDES, in Greek legend, a king of Thrace who owned horses to which he fed the flesh of men. As his eighth labor for Eurystheus, whom he served, Hercules slew Diomedes and fed him to the horses.

DION, 408?-353 B.C., philosopher (a disciple of Plato) and political leader of Syracuse. While he was in Athens, Dion's property was confiscated by the tyrant of Syracuse, Dionysius the Younger. Dion thereupon gathered together a small army and attacked Syracuse, eventually capturing the city and proclaiming himself ruler in 355. His reign proved unpopular and he was assassinated in 353 by one of his henchmen.

DION or **DIO CHRYSOSTOMUS**, or Chrysostom, A.D. 40?-215, Greek sophist and scholar, was born in Bithynia, but spent most of his life in Rome where he enjoyed the favor of emperors Nerva and Trajan. Later a convert to Stoicism, he led with Plutarch the first century revival of Greek literature.

DION CASSIUS, COCCEIANUS, 155?-230, Roman politician, was born in Bithynia. He was consul about 220 and again in 229, and wrote a history of Rome (80 books).

DIONE, in Greek legend, a Titan, the daughter of Oceanus and Tethys (or, according to some accounts, of Uranus and Gaea). Beloved by Zeus, by him she became the mother of Aphrodite.

DIONNE QUINTUPLETS, famous Canadian daughters of Mr. and Mrs. Oliva Dionne, were born May 28, 1934, in a farmhouse near Callander, Ont. Named Annette, Cécile, Emilie, Marie, and Yvonne, the quintuplets, weighing in all about 12 pounds and born prematurely, were delivered by Dr. Allan Roy Dufoe (1883-1943) and reared under his supervision. Privately educated until 1952, the quintuplets then entered the Institute Familial in Nicolet, Que. Emilie died on Aug. 6, 1954, on the eve of her planned entry into a convent. (Marie had entered a convent in 1953, but later returned to Callander.) In 1954-56 Annette studied music and art in Montreal, where Cécile and Yvonne attended a school of nursing. On May 28, 1955, their twenty-first birthday, each of the surviving quintuplets came into possession of about \$250,000.

DIONYSIA, festivals in honor of Dionysus, Greek god of fruitfulness and vegetation, and especially of the vine. The most famous of these festivals took place in Attica. They were the Little Dionysia, in December; the Lenaea, held at Athens in January; the Great Dionysia, celebrated in March with festive processions and dramatic performances; and the Oschophoria (the carrying of the grape clusters), an October feast. The Dionysia were at first fertility rites, but after the sixth century B.C. a notable feature of the festivals was dramatic competitions; and eventually the production of dramas took precedence over religious ceremonies. See **DIONYSUS**.

DIONYSIUS, SAINT, Pope, 259-68, was born in Greece. After the persecutions by Emperor Decius in 250-51 Saint Dionysius restored order in the church. His feast day is December 26.

DIONYSIUS EXIGUUS, Christian monk and scholar of the sixth century, was born in Scythia. The author of a collection of ecclesiastical works still in existence, he also translated into Latin and preserved many early Christian writings. In his *Cycelus Paschalis* Dionysius in 525 was the first to introduce the custom of dating events from the birth of Christ.

DIONYSIUS OF ALEXANDRIA, 190?-265, bishop of Alexandria, was a pupil of Origen, and became head of the Alexandrian catechetical school in 232. As bishop of Alexandria from 247, he suffered persecution and banishment under Decius, 251, and again under Valerian, 257; he was restored to his see in 260. Dionysius followed Origen in his extreme orthodoxy. Only fragments of his writings are extant. See **LOGOS**.

DIONYSIUS OF HALICARNASSUS, first century B.C. Greek scholar, was born in Halicarnassus and settled in Rome about 30 B.C. His chief work was a 20-volume history of Rome covering the period from the earliest times to the first Punic war. Much of this work, *Roman Antiquities*, is extant, as are several of his critical treatises such as *On Thucydides*; *Commentaries on the Attic Orators*; and *On the Admirable Style of Demosthenes*.

DIONYSIUS THE AREOPAGITE, a name associated with three persons: (1) One who listened to St. Paul's preaching in Athens and was converted by him. His name is mentioned in Acts 17:34. (2) Saint Dionysius of Paris, also called Saint Denis of Paris, who is the patron of all France and the principal patron of Paris. According to the sixth century *Historia Francorum*, Dionysius was the first bishop of Paris and was martyred there in the third century. His feast day is kept on October 9. (See **DENIS, SAINT**.) (3) The author of a group of Greek theological writings (four treatises and 10 letters) which appeared in the sixth century in the East and exercised great influence on medieval theological thought in the West. He is known also as the pseudo-Areopagite or the pseudo-Dionysius.

These three persons have frequently been thought to be identical. However, scholars today recognize that they cannot be the same person. Of the Dionysius converted by St. Paul in Athens, nothing more is known beyond what is found in Acts 17:34.

The author of the Greek theological writings does not call himself the Areopagite, but claims to have been converted by St. Paul, to be a convert from paganism, to have seen the eclipse of the sun on Good Friday, and to have been present at the death of the Virgin. When his works were first cited (sixth century), he was identified with the Areopagite of Acts 17:34. Although doubts were cast on this identification during the Middle Ages, the defense of the authenticity and orthodoxy of these writings by the seventh century Maximus the Confessor was widely accepted. Even up to the nineteenth century some accepted this view.

The identification of St. Denis of Paris with the disciple of St. Paul was claimed by the monks of St. Denis in Paris in the ninth century when the

works of the pseudo-Arcopagite became known in Paris and were translated into Latin.

DIONYSIUS THE ELDER, 430?-367 B.C., was born in Syracuse, the city of which he was tyrant from 405 to 367 B.C. Distinguishing himself against the Carthaginians near Agragas, 406 B.C., and having secured his own election as sole general with sovereign power, he made peace with Carthage, 404. But he soon converted his office into a despotism by raising a bodyguard of a thousand mercenaries, 405 B.C., and sternly repressing all insurrections against his power. His rule was oppressive to his subjects; but during his 38-year reign he made Syracuse one of the most powerful cities of its time. He was a patron of literature and was himself a tragic poet, winning first prize at the Lenaea in Athens in 367 B.C.

DIONYSIUS THE YOUNGER, 396?-330 B.C., tyrant of Syracuse, succeeded his father in 367, and after a brief despotic reign was driven into exile by Dion. He returned to the throne after Dion's assassination, 353, but was again deposed after being defeated by Timoleon and was sent to Corinth, 344 or 343, where he remained until his death.

DIONYSUS, in Greek mythology, generally the fertility god, but more specifically the god of wine and strong drink. He was also called Bacchus (the riotous god) by both Greeks and Romans. Dionysus was thought to symbolize the reproductive powers of nature, and is traditionally represented as having wandered over the whole known world introducing cultivation of the vine. He was regarded also as a lawgiver and (although terrible in his wrath) as a lover of peace. Since Greek drama developed out of the Festivals of Dionysus, he was also spoken of as the god of the art of tragedy, and as a protector of theaters (see **DRAMA**; **GREEK LITERATURE**). He was a principal in the so-called Orphic Mysteries, and a minor figure in the Eleusinian Mysteries (see **ELEUSINIAN MYSTERIES**). The vine, laurel, asphodel, and ivy were sacred to Dionysus, as were the ass, panther, tiger, lynx, dolphin, and serpent.

The cult of Dionysus was a violent one. Dionysus was thought to be attended by lustful satyrs and frenzied women, and participants in the dissolute Bacchic festivals sought to be worthy of this retinue. The very birth of Dionysus, according to the story, was violent and bizarre. He was the son of Zeus and Semele, daughter of Cadmus of Thebes. Hera (wife of Zeus), jealous and spiteful, persuaded Semele to ask Zeus to reveal himself to her in his full glory. Reluctantly, Zeus appeared to Semele as thunder and lightning, and the woman was consumed in flames, but at the same time gave premature birth to Dionysus. Zeus seized the fetus and sewed it up in his thigh, where it remained until completely formed. Later, Dionysus was brought up by the nymphs of Mt. Nysa. Later, driven mad by the vengeful Hera, Dionysus commenced his eventful wanderings. The paradoxical image of Dionysus, embodying both lustful abandon (passion) and law-giving (form), was ever a favorite of poets and artists. See **ARIADNE**. F. S.

DIOPHANTINE EQUATION. See **INDETERMINATE EQUATION**.

DIOPHANTUS, Greek mathematician, probably of the third century, who lived in Alexandria. A pioneer in solving indeterminate algebraic equations, his principal work, *Arithmetica*, consisted of 13 books, of which six are extant.

DIOPSIDE is a crystalline mineral with a chemical formula of $\text{CaMg}(\text{SiO}_3)_2$. It crystallizes in the monoclinic system, the prismatic crystals usually showing a square or eight-sided cross section. (See **CRYSTALLOGRAPHY**.) The mineral has a specific gravity of about 3.2 and a hardness between 5 and 6 (see **HARDNESS**). In color it may be white or light green. It is transparent or translucent, with a vitreous luster. Iron may replace the magnesium in diopside to form the dark green mineral hedenbergite, $\text{CaFe}(\text{SiO}_3)_2$.

Diopside is usually found in crystalline limestone and in regionally metamorphosed rocks. Two varieties of diopside, malacolite and allalite, have been used as gem stones.

DIOPTER, a unit used in optics to measure the power of lenses. A lens of +1 diopter is a magnifying or convex lens of a focal length of 1 meter; a lens of +2 diopters has a focal length of half a meter; and generally a lens of +*n* diopters is a convex lens of a focal length of 1/*n*th of a meter. A lens of -*n* diopters is a concave or diverging lens of a focal length of 1/*n*th of a meter. Two thin lenses put close together are equivalent to a lens whose diopter is the sum of the diopters of the component lenses. See **LENS**.

DIORITE is a granular igneous rock of the plutonic group, having in general a structure similar to the granites. (See **IGNEOUS ROCK**.) These rocks consist essentially of plagioclase feldspar, with a ferromagnesian mineral, which may be augite, hornblende, biotite, or hypersthene, or any mixture of these. Some diorites contain quartz. They have a higher specific gravity and a darker color than the granites, and contain less silica and alkalies, but more magnesia, lime, and iron oxide. Deposits of diorites are located throughout the world. Although diorites have the structural properties of a building material, their dark color limits their use.

DIOSCOREA, a genus of widely distributed, mostly tropical plants belonging to the yam family, *Dioscoreaceae*. There are 400 to 500 species of *Dioscorea*, many of which are cultivated for their edible tubers. Species of this genus, known as true yams, are not to be confused with the so-called yam or sweet potato (see **SWEET POTATO**) of the United States. The leaves of *Dioscorea* are generally broad and ribbed and the flowers are small. The seeds are winged. The tubers of *D. alata* may be 6 to 8 feet in length and weigh 100 pounds. For eating, the tubers are boiled or roasted. Other cultivated species include the air potato, *D. bulbifera*, of tropical Asia and the Philippines; Chinese yam, *D. batatas*, also known as cinnamon vine; and the cush-cush, *D. trifida*, of South America. *Dioscorea* have been found to contain large amounts of a substance called diosgenin, which is used in the commercial synthesis of the hormone cortisone (see **CORTISONE**).



HAMILTON WRIGHT
U.S. scientists have discovered that tubers from the tropical yam *Dioscorea*, which grows wild in Puerto Rico, are a source of diosgenin, used in making synthetic cortisone.

precipitation in the kidney tubules of such drugs as the sulfa compounds. Their greatest value, however, is the removal of excess water and salts from the body in edema, especially that brought about by dysfunction of the heart (see EDEMA; HEART; CARDIOVASCULAR HEART DISEASE). With the proper doses of appropriate diuretics a patient may lose 40 to 50 pounds of edema fluid within a week or two. Diuretics also have some unpleasant side actions. Many diuretics irritate the stomach, and some may damage the kidneys.

THEODORE KOPFANYI

DIVER, any one of several species of aquatic birds noted for their ability to dive into water from the surface. The most common divers are the grebes and loons. See AUK; DUCK; GREBE; LOON.

DIVER'S PARALYSIS. See DECOMPRESSION SICKNESS.

DIVES-SUR-MER, town, NW France, in the department of Calvados, on the right bank of the Dives River, near the Bay of the Seine; 9 miles NE of Caen. From here in 1066 William the Conqueror embarked on his conquest of England (see WILLIAM I). Pop. (1954) 5,543.

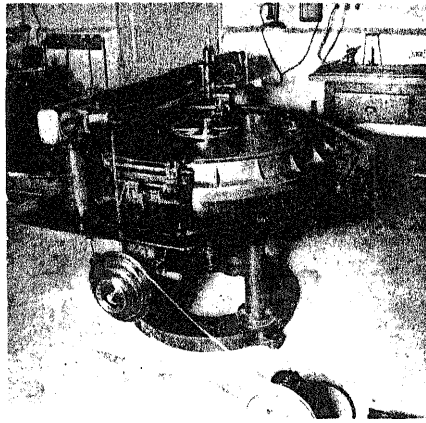
DIVIDE, in geography the land area between two drainage systems. The most familiar divides are uplands like the Appalachian Mountains. A continental divide separates streams that flow to each side of a continent; in North America the divide runs along the Rocky Mountains. See CONTINENTAL DIVIDE.

DIVIDEND, the amount of net earnings that a corporation distributes to its stockholders. The decision to make such a distribution rests with the board of directors of the corporation and the amount of payments made to each shareholder is determined by the class of stock and the number of shares he owns.

Dividends are usually paid out of current or accumulated net earnings, and most states have laws that require that dividends should not exceed the recorded total of retained earnings except in the case of companies exploiting wasting assets, such as in the case of mining companies. However, many states permit dividend payment from paid-in capital to holders of preferred stock. Dividends are usually paid in cash, but distributions of stocks, bonds, or property of various kinds are also made. Cash dividends are usually preferred by stockholders, and are more readily divisible in the appropriate amounts. Stock dividends are not distributions of corporate earnings and do not change the equity position of stockholders. Dividend payments may be regular or irregular. Most successful corporations in the United States pay dividends on a quarterly basis, but some pay monthly, semiannually, or annually.

After a dividend is declared by the board of directors, it becomes a legal obligation of the corporation, and the distribution is made to stockholders of record as of a given date. The board of directors has wide discretion in deciding dividend policy, and neither preferred nor common stockholders have contractual rights to receive dividends. Holders of preferred stock have priority in dividend distribution and are entitled to a limited annual dividend out of available earnings before holders of common stock get anything, except in the case of preferred shares with participating rights. Most preferred stocks are cumulative and provide for payment of all dividends omitted in the past before holders of lower ranking shares receive payment. In the case of noncumulative preferred stock, if a corporation is forced to omit a dividend at the regular payment date, the holders lose their claim to payment for that period.

Dividends may be used to return capital funds to shareholders through liquidation. Corporations with wasting assets, such as mining companies, return funds to investors by means of liquidating dividends, as the resource is exhausted. When a company is liquidated because of the sale of assets or business failure, liquidating dividends are paid out to stockholders and other claimants. See STOCK.



NATL. BUR. OF STANDARDS
High-precision, motor-driven circular dividing engine used in dividing circles for theodolites and other instruments of the Coast and Geodetic Survey is accurate to a half second.

DIVIDING ENGINE, a machine for marking accurate graduations on the scales of various measuring instruments. Dividing engines reduce the cost of such instruments by providing identical scales in large numbers. Some dividing engines mark straight scales such as those on rulers; others mark circular scales such as those on protractors and other angle-measuring devices. They also have been used to space off and cut gear teeth.

DIVIDING RANGE. See GREAT DIVIDING RANGE.

DIVINATION, the act of obtaining knowledge of things of the past, present, or future by supernatural revelation. Divination is based upon the belief that the unknown can be comprehended by the human understanding through supernatural means, with or without the concurrent agency of reason.

Divination has been practiced from the earliest times. In the Chinese "Book of Changes" (*Yi King*), compiled about 1140 B.C., the art of divining by geometrical figures was explained. The method is said to have prevailed in China as early as 3000 B.C. The same method was in use among the primitive magicians of Chaldea, and the Lapp wizards of the seventeenth century are described as divining by means of the symbols on their sacred drum.

A broad distinction applies between artificial divination (by astrology, lots, the interpretation of prodigies, or omens; lightning, and augury) and natural divination (by means of prophetic oracles), considered as the direct revelation of divine will or an inward intuition flashed with irresistible conviction upon the human soul. See HARUSPEX.

Surviving Ancient Forms. Many of the most ancient forms of artificial divination have survived. Early ideas of supernatural interference with games of chance linger as the card player walks around his chair, or attaches importance to certain numbers, to "change his luck." Some of the many forms of divination are crystallo-mancy, or looking into a crystal to see the future represented directly in pictures; geomancy, or the observation of points or lines on the earth, or on paper; and pyromancy, study of the behavior of fire. See MAGIC; ORACLE.

DIVINE COMEDY, THE, the greatest symbolical poem of all times, was composed by the Italian writer Dante Alighieri. Originally called *Commedia* ("Divine" was added later), the 100 cantos, in more than 14,000 verses in triple rhyme, are divided into three sections, 34 cantos being devoted to the *Inferno* (I), 33 cantos to *Purgatorio* (II), and 33 cantos to *Paradiso* (III).

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In the *Myth of Felt* (1949), Leonardo Olschki aptly describes *The Divine Comedy* as an attempt at "the reconquest of God's creation so that the destinies of mankind may be altered." This aim is conveyed in the fourfold significance of the journey of Dante's soul (during the Easter Week of the year 1300) through the nine circles of Hell (I), the nine stories of the Mountain of Purification (II), and the nine spheres of the heavens (III). The fourfold meaning is: (1) the literal (fictional) story, called by the poet himself "the pretty lie"; (2) the political experiences; (3) the soul's judgments; and (4) the eternal meaning of man's redemption. A common mistake is to look for politics in the *Inferno*, for morals in *Purgatorio*, for mysteries in *Paradiso*, an approach that ignores Dante's intent. What Dante attacks is that man separates poetry, church, state, and personal life. *The Divine Comedy* is written to clothe us in our righteous mind of "straight, right, sane, free will," where we are king, priest, poet, prophet at the same time (III 61, 139-142). In this state, that is, in heaven, the soul achieves the flight through all the spheres in but a few hours of Easter Morning. (It had taken two days for the trip through purgatory, while the descent to hell had been even slower.) Love governs heaven; hope sustains the souls on Purgatory Mountain; only faith in God's eternal justice sustains Dante through man's self-made hell at whose gates the famous line reads: "abandon all hope ye who enter" (I 3, 9).

Inferno. The souls in hell overwhelm their two visitors (Dante and his guide Virgil) by their obscene curses, yet, these damned souls often remain great souls. Hence, there are "sanctuaries of poetry" in the verses on Francesca da Rimini's illicit love (I 5, 88ff) and on Count Ugolino's death watch over his children (I 32, 125-33, 78), among others.

Purgatorio. Purgatory, according to Dante's highly original conception, is not laid out as a second hell, but as "stadiums" on the way to heaven. The scenery is an open air landscape, with the sea bathing the foot of the mountain, the sun and the stars alternately shining in. And, unlike the *Inferno*, the people sympathize with each other. Whereas *Inferno* isolates each soul, *Purgatorio* groups. "Together" is the *Purgatorio*'s key word. Together the souls listen to hopeful song (II 36, 115). Together, Sordello and Dante mourn—in famous verses—Italy's fate (II 40,

76). Together, we regain our earthly paradise, our Eden (II 61-67).

Paradiso. In heaven Christ so increases human love that such earthly opponents as Thomas Aquinas and Siger of Brabant, Bonaventura and Joachim may see eye to eye. For in heaven people rise beyond self. Here too, revelation enters: Flying upward, Dante permeates the spheres of (1) Moon, (2) Mercury, (3) Venus, (4) Sun, (5) Mars, (6) Jupiter, (7) Saturn, (8) the Fixed Stars, to (9) the Prime Movement. But then, looking downward from his personal constellation (Gemini) near the Rose of the Trinity, Dante sloughs off these astrological terms; behind them, Dante recognizes (9) Seraphim, (8) Cherubim, (7) Thrones, (6) Dominions, (5) Virtues, (4) Powers, (3) Principalities, (2) Archangels, (1) Angels. Thus, from the vantage point of paradise, the cosmos takes on a new appearance. In heaven, Beatrice gladly yields her personal rights over Dante to St. Bernard, and Dante himself puts mind, wish, and will at the disposal of "The Love who moves the Sun and the other stars" (last line).

The subtle and intricate filigree of this awe-inspiring poem is not limited to the small units of rhymes and cantos; "consonances" pervade hundreds of verses as in the *Leitmotifs* of modern music. For instance, the poem's future effect is prophesied three times: after the first 100 verses of *Inferno*, before the last 100 verses of *Purgatorio*, and exactly at the center of *Paradiso* (plus or minus 2371 verses). See DANTE ALIGHIERI. EUGEN ROSENSTOCK-HUESSY.

DIVINE RIGHT OF KINGS, the theory that monarchs rule by God's direct appointment, a doctrine which was based upon the belief that monarchy is a divinely ordained institution, that kings are accountable for their acts to God alone, and that non-resistance and passive obedience on the part of subjects is enjoined by God. Although all adherents of the doctrine agreed on these points there was a profound difference of opinion on one important matter. According to one school, obedience was due to the office of king, irrespective of who occupied this office or how he had acquired his rank. According to the other school, obedience was due to the person of the king and to his legitimate heirs, according to the law of primogeniture. This second school, therefore, insisted that hereditary right was indefeasible. According to the first school, passive obedience was due to Henry VII of England as a *de facto* monarch, even though he had secured the crown by force, but the second school held that the right acquired by birth could not be forfeited through any acts of usurpation or by any acts of deposition.

The germ of the doctrine of divine right goes back to ancient times. At the dawn of history there were numerous rulers who claimed to be the direct representative of the chief god of the local pantheon. (In Japan a slight variation of this doctrine persisted down to her defeat in World War II.) The doctrine tended to disappear in civilized communities, especially after the overthrow of the ancient monarchies in such important states as Athens and Rome. But it was revived in the Middle Ages during the long controversy between the papacy and the Holy Roman Empire; adherents of the emperor advanced the theory that this secular ruler was God's vicar, directly responsible to God, and that he could not therefore be the pope's vassal. But not until the sixteenth and seventeenth centuries did the doctrine gain widespread support, largely because of the Reformation and the Counter Reformation. It was in sixteenth century France that the concept of divine right first gained wide acceptance, especially among French Catholics who were desirous of getting the political benefits of the Reformation without breaking with the historic Roman church. Matters came to a head when the House of Valois died out and the legitimate heir, Henry of Navarre (later Henry IV) ascended the throne. Henry was a Protestant and because of this



A Woodcut for *The Divine Comedy*, Executed by Doré in 1861

DUNMORE'S WAR, a campaign by the Virginia militia against the Indians of the upper Ohio River country, in 1774. The Shawnees especially resented the white encroachments on their hunting grounds and raided exposed settlements. Lord Dunmore, the royal governor, had Col. John Connolly take possession of Fort Pitt, abandoned two years before; Connolly renamed it Fort Dunmore. In the summer the militia were called up and two expeditions organized, one under the governor by way of Fort Dunmore and Wheeling, the other under Gen. Andrew Lewis from Lewisburg. The two forces were to join at the Ohio. Dunmore made treaties with the Delawares and other tribes. Lewis' troops met the Shawnees at Point Pleasant, near the junction of the Great Kanawha and the Ohio rivers, Oct. 10, 1774, and decisively defeated them. Dunmore later made treaties that kept the peace for several years.

DUNN, town, central North Carolina, Harnett County; on the Atlantic Coast Line and the Durham and Southern railroads and U.S. highways 301 and 421; 32 miles S of Raleigh. Textiles, hosiery, farm implements, wood products, and flour are processed in Dunn. It is a market town in the center of a corn, cotton, and tobacco raising area. The town was founded about 1850 and incorporated in 1887. It has a council-manager form of government. Pop. (1960) 7,566.

DUNNE, FINLEY PETER, 1867-1936, U.S. journalist and humorist famous as the creator of Mr. Dooley, was born in Chicago. After working on several Chicago newspapers, Dunne was editor of the *Chicago Journal*, 1897-1900. His Mr. Dooley, whose humorous and philosophical monologues first appeared in 1893 in the *Chicago Evening Post*, became known to millions for his incisive comments on politics and society in the United States. Written in the dialect of an Irish saloonkeeper, Dunne's series includes *Mr. Dooley in Peace and War* (1898), *Mr. Dooley's Philosophy* (1900), *Dissertations by Mr. Dooley* (1906), and *Mr. Dooley Says* (1910).

DUNNET HEAD, promontory, NE Scotland, in the county of Caithness; at the western end of Pentland Firth, 7 miles NE of Thurso. The northernmost point on the mainland of Scotland, Dunnet Head has an elevation of 364 feet. A lighthouse stands there.

DUNNVILLE, town, Canada, SE Ontario, in Haldimand County; on the Grand River, near Lake Erie; on the Canadian National and the Toronto, Hamilton, and Buffalo railways and provincial highway 3; 25 miles SE of Hamilton. Dunnvill is in a resort area. Manufactures include knitted, woven, and spun glass fabrics, tiles, flour, dairy products, electronic goods, fish nets, and canned goods. The area was settled in 1824 and owed its early growth to the opening of a feeder canal to the Welland Canal five years later. It was incorporated in 1860 and became a town in 1900. There is a mayor-council form of government. Pop. (1951) 4,478.

DUNOIS, JEAN, COMTE DE, 1403?-68, French soldier, called the Bastard of Orléans, the natural son of Louis, Duc d'Orléans, was born in Paris. He ended a series of French defeats in his first engagement, defeating the English at Montargis in 1427. In 1428 he held Orléans until the arrival of Joan of Arc and then helped her to win the Battle of Patay, 1429. After taking Chartres, 1432, and forcing the duke of Bedford to raise the siege of Lagny, he drove the English from Paris, 1436. He then reconquered Guianne and Normandy, 1436-51, and eventually freed all of northern France. For joining the league of nobles against Louis XI in 1465, he was deposed from his office and his estates were confiscated, but all was restored by the Treaty of Conflans the same year.

DUNOON, burgh, W Scotland, E Argyll, on the Firth of Clyde, 27 miles WNW of Glasgow. Dunoon is a resort and yachting center. Although it has the ruins of a twelfth century castle, the town is fairly modern, having developed in the nineteenth century

from a fishing village into a resort. Nearby Hunter's Quay is part of the burgh and is the Royal Clyde Yacht Club's headquarters. Pop. (1951) 9,940.

DUNQUERQUE. See **DUNKERQUE**.

DUNSANY, EDWARD JOHN MORETON DRAX PLUNKETT, 18th **BARON**, called Lord Dunsany, 1878-1957, Irish poet and dramatist, was born in London, England. After serving in both the Boer War and World War I, Lord Dunsany was Byron professor at Athens University. Known for simplicity of style, his works are often fantastic accounts of gods, fairies, and men. Among his poems and stories are *The Gods of Pegana* (1905), *Evil Kettle* (1926), and *Fifty Poems* (1929). Other works include the plays *The Glittering Gate* (1909) and *If* (1921) and the autobiographical *Patches of Sunlight* (1938) and *The Sirens Wake* (1945).

DUNSINANE, hill, E Scotland, SE Perth, in the Sidlaw Hills, 7 miles NE of Perth. The hill (1,912 ft.) is surmounted by the ruins of an ancient fortress, known as Macbeth's Castle. Dunsinane is the traditional scene of the defeat of Macbeth by Siward, an earl of Northumbria, in 1504. Shakespeare makes reference to Dunsinane in the play *Macbeth*. See **MACBETH**.

DUNS SCOTUS, JOHANNES, 1266?-1308, the Doctor Subtilis of Scholastic philosophy, was probably born in Duns (or Dunse), Scotland. Scotus became the pride of the Franciscan order, but when Scholasticism fell into disrepute, his name (Dunse) became a byword of abuse and suits for libel were instituted when the name was used. See **FRANCISCANS**; **SCHOLASTICISM**.

Of Duns' life very little is known. He grew up in England, began to teach in Oxford, and later taught in Paris. He did return to Oxford possibly in 1305, to give a famous course of lectures commenting on the writings of Petrus Lombardus, his *Opus Oxoniense*. In Paris he was made *magister* at the request of his order. A few months before his death Duns was sent to Cologne, obviously for a university task of some sort, but not (as is sometimes stated) to found the University of Cologne, which already existed.

As he died young, the extant works are mostly lecture notes, commentaries, and the like, and are lacking in great formal beauty or warmth. It is important to note that many of the writings that have been gathered under his name were actually not written by Duns Scotus; in this category is the often treated (last by Martin Heidegger in 1916) speculative grammar. The genuine writings show such extreme precision that the name Subtle Doctor was obviously well deserved. The Franciscan order found in him a true expression of its founder's spirit. Although by this time dry and rational, the Franciscan spirit still did not wish to concentrate (as did the Dominicans) on contemplation, reason, and teaching; charity, will, and action were the mainstays of the Franciscans. As a third generation Franciscan, Duns called God pure Act and maintained that Will is the agent of cognition as well as of everything else (see **BONAVENTURA**; **DOMINICANS**; **FRANCIS OF ASSISI, SAINT**; **THOMAS AQUINAS, SAINT**). Our cognition of God is a practical matter, he said, and theology is a practical science. From this "voluntaristic" base, Duns had no qualms in assigning limitations to the philosopher's reason: Aristotle's God had no life, Duns said, while theology should deal with God's life in us, and with thoughts only in so far as they are alive in men.

As Duns attributed Will (not just mirroring) to the human mind, so he sharply contrasted this "minding will" as producing objects, with the underlying real subjects. For Duns, objects are man's mental creations, while subjects are the underlying, real, substantial facts. This division remained fundamental in philosophy, but in a strangely inverted way: after 1750 the definitions of subject and object were reversed. See **PHILOSOPHY**.

EUGEN ROSENSTOCK-HUESSY

to the Grenadier Guards. After the Armistice and his return from France, Edward traveled widely in the British Empire, the United States, and South America. He succeeded to the throne on the death of his father, Jan. 20, 1936. Shortly after his accession he announced his intention of marrying Wallis Warfield Simpson, an American divorcee; but the government and the opposition, led by Prime Minister Baldwin, decided that the country could not retain a king married to a twice-divorced woman. On Dec. 10, 1936, declaring that he "could not discharge the duties of King . . . without the help and support of the woman I love," Edward abdicated in favor of the Duke of York, and left England as Duke of Windsor. He went into a voluntary exile in France with his duchess, the former Mrs. Simpson, whom he had married shortly after the abdication. When war came in September 1939, Edward was made a major general in the British army. He was governor-general of the Bahamas, 1940-45, and then returned to France. His memoirs appeared in 1951 under the title *A King's Story*, and the Duchess' memoirs, *The Heart Has Its Reasons* (1956), was her story of the abdication.

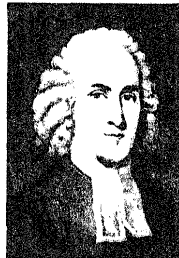
EDWARD, THE BLACK PRINCE, 1330-76, eldest son of Edward III of England and Philippa of Hainaut, was born in Woodstock and during his own lifetime was known as Edward of Woodstock. He was the first duke created in England, being made Duke of Cornwall in 1337. He became Prince of Wales in 1343 and commanded the English right wing at Crécy, 1346. On an expedition against Aquitaine, 1355-56, he defeated and captured King John of France and brought him to England in 1357. Created prince of Aquitaine and Gascony, Edward sailed in 1363 to Gascony but there contracted a fatal disease in his campaign against Henry of Trastamare, 1367; he relinquished his principality after his return to England in 1371. His death left John of Gaunt, duke of Lancaster in control of an England whose senile king, Edward III, was no longer able to rule effectively. The name Black Prince, perhaps deriving from Edward's custom of wearing black armor, was first used in the sixteenth century.

EDWARD, LAKE, or Edward Nyanza, formerly Albert Edward Nyanza or Lake Albert Edward, NE The Congo and W Uganda, in the Great Rift Valley. Lake Edward is roughly oval in shape and has a surface elevation of almost 3000 feet above sea level. It is about 50 miles long and 25 miles wide. Major rivers flowing to Lake Edward are the Rutshuru and Ruindi. The lake has its outlets on the northwestern shore and it drains to Lake Albert through the Semliki River. The shores of Lake Edward are generally marshy and are saline in several places. Lake Edward is visited by great numbers of birds and is the habitat of many hippopotamuses, crocodiles, and fish. During the rainy season the lake is swept by severe storms and in the dry season a thick haze hangs over the water. Lake Edward was discovered by Sir Henry Morton Stanley in 1889 and named for Albert Edward, then Prince of Wales and later king Edward VII.

EDWARDS, JONATHAN, 1703-58, the first colonial American thinker to be famous in Europe, author of the classic of religious revivalism, and last defender of a strictly religious task for New England. He was born in East Windsor, Conn., the son of the Congregational minister there, and grandson of the leading divine, Solomon Stoddard of Northampton, Mass. Edwards spent his first 13 years in eager contemplation of nature and of God's mysteries. At 11 he wrote a precocious research paper on the spider. During his childhood he and his friends built themselves a prayer booth, but for himself alone Jonathan found an even more secret place of worship in the woods. He kept the habit of long endless solitary work and earnest meditation throughout his life; at his death he left no less than 1074 sermon notebooks. From 1716 to 1727 he received his training from Yale College, which was still in an unsettled phase of its development, and

from 1727 to 1750 was Congregationalist pastor at Northampton.

During his years at Yale, Edwards was deeply impressed by John Locke's *New Logick* and Isaac Newton's physics. Edwards' awareness of science and its significance gave him an advantage over his religious colleagues in America, but created enemies because he was far ahead of them in understanding scientific method; he was therefore much better able to see the unchangeable character of his faith as distinct from scientific progress. His enemies, representing the so-called eighteenth century Enlightenment, but often knowing science from hearsay only, took the easy way out of the religion versus science dilemma by whittling away at the hard core of revelation.



FRANKLIN J. MEINE
Jonathan Edwards

Edwards' opponents held the tenets of Arminianism (see ARMINIANISM), which declared that God was free, and that man also was free, but that the universe was under inescapable necessity (see DETERMINISM; FREE WILL). Edwards' international fame rests on his refutation of this belief in his *Freedom of the Will* (1774).

"How can man have a free will of his own in the midst of a law-governed nature?" he asks. He cannot. God alone is free. The individual, then, must look through the mechanism of his own petty will and drive out the narrow passions of self by the nobler passions of God's creative action. The senses buffet man from one mechanistic reaction to the next; reason never can triumph over passion: the "sense of the heart," however, makes man God's partner. Hence, Edwards' own resolve: "To live with all my might while I do live." All those who have followed the "sense of the heart" form the Church since the days of Adam. Whenever they are overwhelmed by the sensualists, the world comes to an end; hence, "the world has several endings, one after another" (*A History of the Work of Redemption*, p. 426). With this bequeathal, Edwards belongs to the ages.

For his own time, he applied his belief in the Great Awakening of the 1730s and reported its fruits in the *Faithful Narrative of the Surprising Work of God in the Conversion of Many Hundred Souls in Northampton and the Neighboring Towns and Villages* (1737), a pamphlet which went through 20 printings in four years; its effect as a manual of emotionalism has been likened to that of Goethe's *Sorrows of Young Werther*. Edwards' own eloquence in the revival lives on in the fame of his Enfield sermon, *Sinners in the Hands of an Angry God* (1741). See AWAKENING.

The revivals cost Edwards his pulpit. The self-made men of the new wealth boasted of man's free natural will; the routine Christians considered they had inherited their right to the church. Both groups were infuriated by Edwards' exacting Christian discipline; his dismissal on June 22, 1750, amounted to an excommunication. Edwards, his devoted wife Sarah, and their 11 children went to the frontier at Stockbridge on a mission to the Indians. There Edwards lived, writing his books, until a council of his friends on Jan. 4, 1758, persuaded him that it was the will of God that he accept the presidency of Princeton College. He arrived in Princeton on Feb. 16, 1758, but succumbed to a vaccination against smallpox on March 22, leaving his most significant work unfinished. Fortunately, its raw draft was published in 1774 by a Scottish publisher. This work, *History of the Work of Redemption*, has remained the last universal history based on the premise that man always has been of one faith.

EUGEN ROSENSTOCK-HUESSEY

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EDWARDSVILLE, city, SW Illinois, county seat of Madison County, on the Nickel Plate, the Illinois Terminal, the Wabash, and the Litchfield and Madison railroads and U.S. Highway 66; 18 miles NE of St. Louis, Mo. Clothing, food products, and bricks are manufactured. Coal has been mined in the area since about 1850. The area was settled about 1800, laid out as a city in 1813, and incorporated in 1837. It has a mayor-council form of government. It was named for Ninian Edwards, governor of Illinois Territory, 1809-18. Pop. (1960) 9,996.

EDWARDSVILLE, borough, NE Pennsylvania, in Luzerne County, on the Susquehanna River and U.S. Highway 11; 3 miles NW of Wilkes-Barre. Anthracite coal mining is the principal industry. It was incorporated in 1884 and has a mayor-council form of government. Pop. (1960) 5,711.

EDWIN or EADWINE, Latinized Aeduinus, 585?-633, king of Northumbria, son of Aella, king of Deira, succeeded the Bernician Ethelfrith in 617 as king of Northumbria. Edwin was baptized in 627, and during his reign encouraged Christianity. The city of Edinburgh is named for him.

EEL, any of a group of bony fishes having long and sinuous bodies. The more than 500 different kinds of eels are grouped in 25 families that comprise the order Apodes. The true eels are distinguished by their lack of pelvic fins and by having the other fins reduced or absent; the vertebrae are also greatly increased in number. Some kinds of eels have as many as 225 vertebrae. See FISH.

Fossil eels have been found in rocks of the Cretaceous period (see GEOLOGIC TIME). A fossil of the genus *Anguillarus* had not lost its pelvic fins and that of another genus, *Urechelys*, still had a separate caudal fin with supporting skeleton. Both of these fossil genera had elongate bodies with numerous vertebrae. The eels appear to be related to such primitive herring-like fishes as the bone fish, genus *Albula*, and the big-eyed herring, genus *Elops*; all have similar transparent and ribbon-shaped larvae called leptocephali.

All species of eels live at least a part of their lives in the ocean. The few kinds that spend part of their adult life in brackish or fresh water return to the ocean to spawn (see CATADROMOUS FISHES). The eggs hatch into leptocephali that are pelagic (see PELAGIC ANIMAL) but change into small eels, called elvers, after reaching the proper habitat. The eels as a group are nocturnal, hiding under rocks, in rock crevices, or in burrows in the mud or sand during the day. At night they become active predators. All eels are carnivorous,

preying upon all kinds of fishes, crabs, shrimps, worms, octopuses, clams, and snails. They actively pursue their prey by swimming with snakelike motions of their entire bodies.

There are 16 species of fresh-water eels, genus *Anguilla*, one species in eastern North America, one in western Europe, and the rest in the Indo-Pacific region. Eels of the genus *Anguilla* have very small elongate scales embedded in the skin and have well-developed vertical and pectoral fins. These eels may be yellow, brown, or almost black, but when migrating to the sea to spawn they turn silvery. The females grow 2 to 3 feet in length and may produce more than 10 million eggs. The males are only 12 to 18 inches in length.

Conger eels are very similar to the fresh-water eels but do not have scales. They live in brackish and salt waters along the Atlantic coasts of North America and Europe. Like the fresh-water eels, congers migrate out to sea to spawn, but they go only to the edge of the continental shelf where they spawn once and then die. American congers grow 4 to 7 feet in length and weigh 4 to 12 pounds. The European conger reaches 9 feet in length and weighs about 160 pounds.

Morays are active, voracious, nocturnal fishes living around the coral and rocky reefs of all tropical oceans. They are the largest of the eels. (See MORAY.) Morays have a thick leathery skin; pectoral fins are absent. They have the reputation of being very ferocious and are likely to attack when caught on a hook and line or when provoked by divers.

One very slender moray, genus *Erechelys*, found in the estuaries of the East Indies, reaches 10 feet in length. Another very thick-bodied moray, genus *Enchelymusa*, grows to 7 or 8 feet and has teeth 1 to 1.5 inches long. One moray lives along the rocky shores of California.

Eels are captured with nets, traps, and weirs. They are eaten fresh but are also salted, smoked, or marinated in spiced vinegar. In the United States the yearly catch is limited to only about 4 million pounds, but in Europe about 20 million pounds are consumed each year.

Certain fishes not related to the eels are called eels because of their elongate shapes. See LAMPREY.

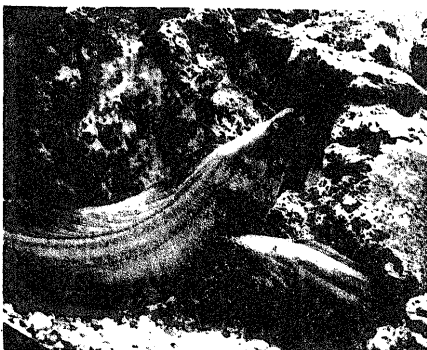
LOREN P. WOODS

EELGRASS, or tape grass, an aquatic plant of the frogbit family, *Hydrocharitaceae*. Eelgrass, *Vallisneria spiralis*, is found in fresh-water lakes and streams from Nova Scotia and North Dakota to Florida and Louisiana. Its ribbon-like pale green leaves grow from an underwater tuft to a length of up to 6 feet, depending on the water depth. The small male and female flowers develop on separate plants. Flower buds break away from the base of the male plant and float on the surface of the water where their pollen fertilizes the female flowers which are at surface level. The stem of the pollinated flower coils, pulls it underwater to ripen. Eelgrass is a favorite food of fish, muskrats, and ducks and other waterfowl.

EESTI. See ESTONIA.

EFATE, French Vatié, formerly Sandwich Island, island in the SW Pacific Ocean, central New Hebrides; area 300 sq. mi.; pop. about 6500. Efate is roughly oval in shape with a length of about 30 miles and a width of 20 miles. It is of volcanic origin and generally mountainous. There are numerous good harbors on the coasts, principally Vila and Havannah. The island's main products are coconuts, cacao, coffee, and sandalwood. Fishing is an important activity. Vila, in the southwest, is the chief town on the island and capital of the New Hebrides.

EFFICIENCY, in machines, is the ratio of useful work produced to the energy expended in producing it. In keeping with the law of conservation of energy, the energy input must equal the energy output; however, in all machines only a portion of the output is involved in useful work. Some of the energy may be lost as heat resulting from friction, as is the case in the



Green Moray Eels

NEW YORK ZOOLOGICAL SOC.

County, N.C., produces a few pale emeralds. The so-called Oriental emerald, which is extremely rare and precious, is not a real emerald but a variety of corundum, as are the ruby and sapphire. See GEM; BERYL; CORUNDUM.

✓ **EMERSON, RALPH WALDO**, 1803-82, U.S. essayist and poet known as the Sage of Concord (Mass.), was born in Boston, the grandson and son of ministers. His father, William, was pastor of the First Church (Unitarian) in Boston but left his mark as cofounder of the Anthology Club, out of which came the famous Athenaeum. At his father's death, 1811, the earthly inheritance was nil; but he left his six children, all under 10 years of age, "the heirs of whatever was rich and profound and efficient in thought and emotion." The father's sister, Mary Moddy Emerson, remained on the scene, with her brilliant mind and such an "elevated" viewpoint that society disliked her while being impressed by her high standards. Ralph leaned on his older brother Edward for moral support. After attending Harvard, Ralph became minister of the Second Church in Boston, 1829. In the same year he married Ellen Luisa Tucker, who already was seriously afflicted with pulmonary tuberculosis.

In all these first steps, it can be seen in retrospect, Emerson tried to live his life by precedent. It was his fate to see all and everything of this "first life" vanish: Boston, the church, his brother, his marriage—all were to be replaced. His brother Edward went insane. His wife died in 1831. He voided his relationship with his church by a famous sermon in which he denied the necessity of the sacraments (*Works* 11, 7, Sept. 9, 1832). On Christmas Day, 1832, he sailed for Europe. Upon his return in October of the next year, he took up residence in Concord, Mass., at first in the Manse built by his grandfather. He remarried in 1835 and by this marriage to Lydia Jackson of Plymouth had four children. He exchanged the pulpit for the lecture hall and entered upon a 40-year-long friendship with Thomas Carlyle, a new "brother."

Emerson's life was unusual in that its significant events occurred during a few years, 1832 to 1837. He did go to Europe twice again, 1847-48 and 1872, but whereas the first trip had established the life-long exchange with Carlyle, the two later ones had no similar consequences. His life in Concord alone was what mattered. In Concord he was loved and here his grave is found. When his mind declined after 1873 and he shied away from the public because of his growing inability to find the right words for what he wished to say, Concord protected his peace against the curious world. It is necessary to concentrate on his decisive years in order to understand why Emerson could impregnate a whole century with his spirit, and to relate the truly significant events of his life to the most influential aspects of his doctrine.

Emerson's contribution was well summed up in a sentence in *Nature* (1836): "Why should not we too enjoy an original relation to the universe?" This creed moved Emerson's life in three ways: first, the denominational Emerson had to go; second, the new form of his utterances had to become the free essay and the lecture instead of the system and the sermon; and third, the nurture of the mind had to be derived from secular resources. In the century after Emerson these three steps were to be taken by millions of people, but superficially; all three aspects of the Emersonian agenda have to be qualified carefully for his real role to be clear.

Farewell to the Pulpit. The minister-of-the-gospel Emerson preached in his own church for the last time in September 1832; and in 1838 before the graduating class of divinity students at Harvard he reaffirmed his conviction that going to a visible church is unnecessary for salvation (*Works* 1, 117). But there was another side to his nature. Before the Board of Harvard Overseers, to which he was ap-

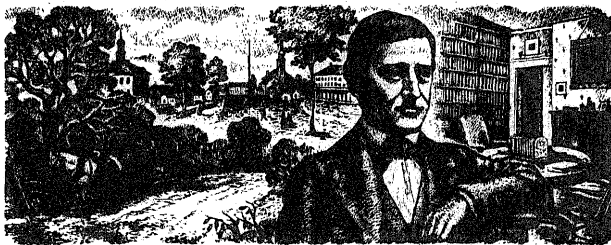
pointed in 1867, a motion was placed to dispense with compulsory attendance at morning prayers in the college; the motion would have prevailed but for the vote of Emerson, who was "loath that the young men should not have the opportunity afforded them, each day, of assuming the noblest attitude man is capable of—that of prayer" (Cabot, *Memoir* 2, 630).

Incoherence Made a Virtue. Before Emerson the formal style in dealing with religion, nature, politics, and literature had been systematic and based on solemnly proclaimed principles. In a famous letter (1837) Emerson denied that he was gifted in logic and argumentation; not only this, he made a virtue of his lack of coherence. Freely roaming through his impressions, he responded to single aspects of truths as they struck him. In Europe and America Emerson's subjective style was hailed. His two volumes of *Essays* (1841 and 1844), immediately successful, were devoured as the firstlings of a new species of literature, and influenced the manner of writing of such men as Nietzsche and Bergson. His volume *The Conduct of Life* (1860) excelled the volumes of essays and reassured the public in its admiration.

But Emerson's enthusiasm for subjective feeling and emotion requires qualification. A casual reader, for example, might interpret Emerson's poem "Give All to Love" as an invitation to illicit love and divorce—but wrongly. Emerson, a placid, unaggressive, rather thin-blooded man, could cultivate the passions because he himself knew the nobler ones exclusively; lawlessness was abhorrent to his saintly nature and was not implied in his gospel of total freedom for the creative moment. Instead, Emerson issued such ordinances of self-denial as this one from his thoughts on American civilization, June 1862: "The destiny of America is mutual service; labor is the cornerstone of our nationality—the labor of each for all." Emerson believed in the presence of a higher authority for all the utterances of the Self. He considered his Self the instrument of an Over-Soul. The more we dare to be Self-reliant, the more the Over-Soul can work on us as its "harps" or "mouth-pieces." Emerson's prose abounds in utterances like these: "The words of these persons perhaps are wiser than they knew." "They are wiser than their teachers." "God is the me of me." This sifting process between the higher and the lower wisdom inside "me," between the coarse and the nobler self, was Emerson's translation of the traditional division between sinner and saint. Thus man transcended himself and the public caught on to "transcendental" as a name for Emersonianism.

Secular Content. For Emerson the question was, what was to be the new source of inspiration once recourse to Europe, to the Bible, to systems of tradition, was abandoned? In his *The American Scholar*, the Phi Beta Kappa address of 1837, which Oliver Wendell Holmes called "our Intellectual Declaration of Independence," Emerson proposed that not in European modes of thought, nor in her concepts of philosophy, but through the enchanting experiences of life in the New World itself was the ground to be laid for the American's cognition of the universe. This was to be like a new dawn of consciousness; it was refined, "high brow," generous, and Christian. In 1836 Emerson gave a series of lectures which he called the Philosophy of History. He covered: 1. The Humanity of Science; 2. Art; 3. Literature; 4. Politics; 5. Religion; 6. Society; 7. Trades and Professions; 8. Manners; 9. Ethics; 10. The Present Age; 11. Individualism. In this list of diverse topics Emerson anticipated the diversification of twentieth century higher education. Emerson once confessed that he aimed at "consecutiveness"; the fact that his taste was to become the taste of American higher education would indicate that his mind was not an arbitrary one. Emerson replaced logical system by biographical order, but order it was, not mere rambling.

Ralph Waldo Emerson, noted nineteenth century American author, is pictured before a background, from left to right, of "The sled and traveller stopped," from "The Snowstorm," view of the town of Concord, and his Concord study.



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Thus, Emerson's gospel about man's intellectual freedom is heavily qualified. The test of a man's righteous choice of mental activities is their fruitfulness, and Emerson's mind was immensely fruitful. This was his paradox: total devotion to the moment, absence of all cliché; yet these flashes of insight had far-reaching consequences. Oliver Wendell Holmes wrote of Emerson: "To hear him talk was like watching one crossing a brook on stepping stones. His noun had to wait for its verb or its adjective until he was ready; then, his speech would come down upon the word he wanted, and not Worcester or Webster could better it from all the wealth of their huge vocabularies." Yet, of this constantly groping veracity of a pure-hearted "subject," firm truths were the objective fruits. Emerson must have divined this, for he could write: "A want of veracity does not remain in speech; it proceeds instantly to manners and behavior. How any want of frankness on one part destroys all sweetness of discourse! But veracity is an external virtue, compared with that inner and higher truth we call honesty; which is to act entirely, not partially. You may attract by your talents and character and the need others have of you; but *the attempt to attract directly is the beginning of falsehood.* You were sent into the world to decorate and honor that poverty, that singularity, that destitution, by your tranquil acceptance of it. If a man is capable of such steadfastness, though he see no fruit to his labor, the seed will not die; his son or his son's son may yet thank his sublime faith, and find, in the third generation, the slow, sure maturation" (*Truth*, 1861). Here Emerson has written his own eulogy; for "what he wrote or thought, in our time has lost its punch. It is solely as a character that he is important," in the words of John Jay Chapman. By his character, without any attempt on his part, Emerson within his own lifetime became an irresistible influence, and was the foremost member of the Transcendentalist group of Thoreau, Margaret Fuller, Amos Alcott, Orestes Brownson, and others. See BROOK FARM; COMMUNAL SETTLEMENT; TRANSCENDENTALISM.

EUGEN ROSENSTOCK-HUENESSY

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EMERSON COLLEGE. See COLLEGES AND UNIVERSITIES.

EMERY is an impure variety of crystalline corundum, Al_2O_3 , being mixed with the oxides of iron, hematite, and magnetite. The amount of corundum varies from 55 to 75 per cent. Emery is a purple-black solid, which is next in hardness to the diamond and hence is used as an abrading and polishing agent for cutting and grinding glass, nictals, and gems. For commercial use, large blocks of emery are reduced to powder, which is then sifted and graded into various degrees of fineness. Emery paper and cloth are

made by coating the paper or fabric with glue, and, while still hot, dusting fine emery powder onto it. Emery wheels are made by mixing the powder with some binding agent, such as soluble glass or shellac, and drying or heating the mixture. Pure corundum (see CORUNDUM) and the artificial compound carborundum, SiC , have replaced the use of emery in some lines. Originally emery was obtained only from Cape Emery in the island of Naxos, but it is now also obtained from Turkey, Asia Minor, and in the United States, near Peekskill, N.Y.

EMESA. See HOMS.

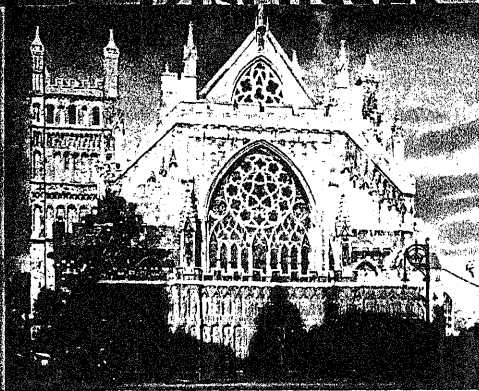
EMETIC, a drug that brings about retching and vomiting, or emesis. Vomiting is a reflex that involves the co-ordinated activity of abdominal muscles, the esophagus, and the stomach. Occasionally the intestines are also involved. Emetic impulses may originate not only from the stomach and the upper part of the alimentary canal, but also from many other parts of the body. In seasickness, for example, the emetic impulses emanate from the inner ear. Excessive stimulation of the heart, pleura, liver, and even of the muscles may likewise result in vomiting. Psychological factors including disgust, emotional upset, and psychoneurosis are also causative. See VOMITING; MOTION SICKNESS.

Vomiting Centers. A nerve center located in the medulla of the brain regulates the muscular changes in vomiting. It is close to the center that governs breathing. When this area is destroyed, vomiting is no longer possible. When a portion of the medulla in dogs is removed, the animals fail to respond to the usual emetic stimuli. Research has shown the vomiting center to be associated with the nucleus of the sensory part of the vagus nerve. Animals in which these nuclei in the medulla have been removed may survive indefinitely but never vomit following the injection of apomorphine, a reliable emetic agent which normally induces prompt vomiting when only one-thousandth of the minimum injection dose is placed on this region. The brain cortex and hypothalamus, the regulator of the autonomic nervous system, may also be involved in emesis. See BRAIN.

Types of Emetics. Emetics that stimulate the vomiting centers directly, or increase the irritability of the centers to the emetic impulses originating in the intestinal tract and elsewhere in the body, are centrally acting emetics. Among these are apomorphine and picrotoxin, which cause vomiting when injected intravenously. The reflexly acting emetics initiate and intensify emetic impulses arising in the upper part of the gastrointestinal tract by irritating the mucous membrane of the stomach and intestine. These include copper sulfate, zinc sulfate, mustard, and all irritant poisons that produce vomiting by overstimulation of the sensitive lining membrane of the upper alimentary tract. A few substances, such as ipecac and aconite, act as both central and reflex emetics. See APOMORPHINE HYDROCHLORIDE; ACONITE; EMETINE; IPECAC.

Uses of Emetics. Emetics are occasionally used in medical practice to empty the stomach in cases of acute poisoning with alcohol, arsenic, and iodine, and in various food intoxications, including mush-

Windsor Discusses



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Exeter Cathedral is a combination of architectural styles, one dating from the Norman period. The sculptured screen of the western façade and the twin towers are noteworthy.

ancient cities in England. The Roman fortifications, known as *Isca Dumnoniorum*, were established on the site of a British settlement. During the late Middle Ages the city was frequently besieged. German air raids during World War II destroyed or damaged many of the ancient buildings of Exeter. Pop. (1951) 75,479.

EXETER BOOK, in Latin the *Codex exoniensis*, a folio manuscript collection of Anglo-Saxon poems which one Bishop Leofric gave to the library of Exeter cathedral sometime between 1046 and 1073. The book probably dates from the first half of the same century. It contains poems whose dates of composition vary from that of *Widsith* (which is certainly older than *Beowulf*) to that of some later poems dating to the period of the manuscript itself. Some of the poems, apparently fragmentary, appear to have constituted one connected work, possibly written by Cynewulf.

EXETER COLLEGE. See OXFORD UNIVERSITY.

EXILE, a form of punishment that forces a person to leave his home country, usually imposed by a court sentence or a decree of the public authorities. In modern times, however, some persons have gone into voluntary exile to avoid the consequences of revolutionary activities, political opposition, or intellectual deviation. Exile was used in ancient times for ordinary crimes as well as for those of a political nature (see ASYLUM, RIGHT OF). The Bible tells of the Exile of the Jews from Judah to Babylon in 597, 586, and 581 B.C., and of their residence there until they were permitted to return to Palestine in 538. In ancient Greece many persons adjudged dangerous to the state were penalized by ostracism (see OSTRACISM) for a period of ten years—a weapon often used by political parties to get rid of opponents. In the earliest period of Roman history a citizen might evade punishment by going into voluntary exile; if he should ever return, anyone might legally kill him. Under the Roman Empire two forms of exile were used: *deportatio*, which carried with it the forfeiture of citizenship, and *relegatio*, in which the person exiled was merely forbidden to depart from certain assigned limits. Exile was also used by the Italian city-states during the late Middle Ages to punish political offenders. In modern times, however, with the growth of large national states exile has been little used, although many countries including the United States, Great Britain, and the Soviet Union have employed deportation to remove criminals and political offenders. See DEPORTATION; DISPLACED PERSON; REFUGEE.

EXILE, JEWISH. See JEWS.

EXISTENTIALISM, a poorly defined doctrine in philosophy. It is popularly understood to be a school of philosophy that began with the Danish

philosopher Søren Kierkegaard's revolt against systematic philosophy as exemplified for him in the philosophy of Hegel; thought of in this way, existentialism is supposed to have reached its greatest development in Germany and France after World War I, with Karl Jaspers, Martin Heidegger, and Jean-Paul Sartre among the major figures. Actually, however, existentialism is less a school than it is a tendency, or a manner of approaching philosophical problems, that has existed at least from the time of Socrates, and probably from an even earlier time. Thinkers, poets, and others not immediately identified with the intellectualized existentialism that gained popularity after World War II under the aegis of Jean-Paul Sartre are usually described as existential. Sartre himself has objected to being called an existentialist, since this word has been loosely applied to a wide variety of thinkers, many of whom completely disagree with each other on most issues.

At least four different approaches may be discerned in twentieth century existentialism, with a considerable degree of interlocking among them. The most commonly noted division exists between the Christian existentialists and the atheistic existentialists. But both "Christian" and "atheistic" are misleading in this context: a leading Christian existentialist like Gabriel Marcel, for example, probably would feel a closer affinity to the atheistic existentialist Jean-Paul Sartre than to what he might call "conventionalized Christianity"; Sartre probably would feel a closer identification with Marcel than, for example, with the logical positivists who share his tendency to aggressive atheistic protest. Marcel, a Christian, probably would feel closer to Martin Buber, an existential Jewish theologian, than to Jacques Maritain, a leading representative of Neo-Thomism. Neo-Thomism is the third existentialist group and involves an explication of what the Neo-Thomists consider the existential aspects of the thought of St. Thomas Aquinas; the other important Neo-Thomist is Etienne Gilson, the noted medievalist. Both Buber and Marcel are important exponents of the "philosophy of dialogue" (sometimes called the higher grammar and philosophy of meeting), a fourth major tendency in twentieth century existential thought. The other major figures in this school are the Jewish philosopher and theologian Franz Rosenzweig and the Christian philosopher of history Eugen Rosenstock-Huussy, who of the four was the most germinal since he was the first to explore this line of thought (in the essay "Grammar of the Soul," 1916, in *Angewandte Seelenkunde*, 1924) and was the most penetrating and versatile in applying it to his life and work (see DIALOGUE). With the exception of the Neo-Thomists, the philosophers of dialogue most successfully avoided the taint of cultism that characterized much of the existentialist movement after World War I, particularly in France after 1945.

Life as the Existentialists See It. Despite the immense areas of disagreement among existentialists, it is possible to discern certain themes which, however variously expressed, seem common to them all. All agree on the contingency of human life. Man shares life, but "life is that process which produces corpses" (as defined by the German physiologist Rudolph Ehrenburg) and "we think because we are going to die" (Rosenstock-Huussy). Death looms large: it is one of the "existential moments" (in Kierkegaard's phrase) that cannot be avoided or shared. Sartre is at some pains to stress the fact that no one can die for anyone else. Because of this, say the existentialists, it is folly for the philosopher or the artist to imagine that his system of thought or feeling is in any real sense objective. Objectivity is possible only for God; since the atheistic existentialists deny the existence of God, or even the possibility of His existing, there is for them no such thing as objective truth; for the Christian existentialists it is deemed presumptuous for any man to claim possession of ob-

jective truth. For Kierkegaard, Hegel was wrong in thinking that he was not himself a character in his massive system. René Descartes, the great "scientific rationalist," began his system with the single assumption, "*Cogito ergo sum*" (I think, therefore I am). The "I"—Descartes himself or any thinker—is presumed to be constant: Descartes was ashamed of his prerational life as a child and he imagined that having reached rational maturity he could speak of himself as "I" with perfect objectivity. See DESCARTES, RENÉ.

Not so, say the existentialists. Both Hegel and Descartes delude themselves into thinking that essence (the abstract it-ness of a thing, person, or idea) precedes existence (the concrete thou-ness of a thing, person, or idea). For the existentialist, existence precedes essence, which means that a person lives (is involved in contingent change, and can himself change so as to be different than before) before he dies (is no longer able to change or to be changed, and is therefore knowable for what he is, or was). Until a person dies, he can always change his essence; hence his essence (his Being) cannot be known until after his death. Kierkegaard's title *Stages on Life's Way* (1845) expresses the existentialist's awareness that the "I" of the thinker is not the same throughout his life: that the "I" changes as the thinker moves through the stages toward his own death, the awareness of which becomes the beginning of his thought. The interpretation of the Crucifixion is, in this light, important to the Christian existentialists. Throughout His life, Jesus never would admit He was the Christ; only on the cross would He admit that He was God; also, the "death" of Christ on the cross becomes the true beginning for any Christian—these are but two phases of the significance existentialists have seen in this important event in human and divine history.

Realizing that he will die and that at that moment he will cease to be a mystery and will become knowable (although perhaps with difficulty), the existentialist feels that everything he does, thinks, or says is of the utmost importance because by his actions, thoughts, and words he is creating in life what he will have become in death. The existentialists also believe that however they may strive, they will, in death, fail to "measure up"—either to God's wish, or to their own self-conception. Only God's grace could help, and this is denied by the atheists. Sartre's reaction to all this is nausea (the title of his first novel). Dread and anguish are felt by others. The existentialist maintains that the vices, the "seven deadly sins," the willful avoidance of life through alcohol and narcotics, and the like, are literally ways to avoid facing one's own death and its implications—for the existentialists believe that their doctrine consists of conceptions so fundamental as to be known intuitively by everyone.

What can man do in such dreary circumstances? It would be suicide to give up simply because the cause is hopeless. He must act. He must decide. He must commit himself. For the grammarians he must "speak himself into existence"—must enter into a dialogue, a meeting, with others of faith and so break "the chains of nothingness" (loneliness and estrangement). The slogan "*Cogito ergo sum*," which ignores time and contingency, is replaced (by Rosenstock-Huessy and others) with the contingent, time-conscious "*Respondeo ne moriar*" (I respond lest I die).

Influence of Existentialism. For the existentialists themselves existential thinking is considered the redemption of philosophy. Apart from the lunatic aspects of the Sarrist cult in France after World War II the movement had considerable influence, although less in the United States and Great Britain than in Europe. If the influence of such existential nonexistentialists as Friedrich Nietzsche, Franz Kafka, Rainer Rilke, Albert Camus, Miguel de Unamuno, André Malraux, Reinhold Niebuhr, and many others were considered, the ultimate impact of the

tendency might be considerably greater than the detractors of existentialism were at mid-twentieth century willing to admit. Existentialism also influenced formal philosophy, particularly metaphysics and ethics. Metaphysicians found refreshing the existentialist stress on "nothingness" as distinct from "being," and in existentialism's philosophy and theology of crisis and decision ethical relativism was formidably challenged.

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EXMOOR, or Exmoor Forest, upland region, SW England, in NE Devonshire and W Somersetshire. Exmoor covers an area of approximately 125 square miles and consists largely of wild moorland. It was formerly forested. Most of the region lies above 1000 feet elevation and is much cut up by deep glens or valleys. Dunkery Beacon (1708 ft.) is the highest point on Exmoor. Many tourists are attracted to Exmoor by its great scenic beauty. It is a noted stag hunting and trout fishing district. Sheep raising is the main activity, although there is some cultivation in the glens. The rare red deer and Exmoor ponies roam the moors. Richard Doddridge Blackmore's novel *Lorna Doone* is set in Exmoor. Numerous prehistoric earthworks occur in the region.

EXMOUTH, urban district, SW England, Devonshire, on the English Channel, at the mouth of the Exe River, 9 miles SSE of Exeter. Exmouth is an agricultural market and resort center. During the Middle Ages Exmouth was one of the leading English seaports but is now used only by fishing vessels and pleasure craft. Nearby Hayes Barton is the birthplace of Sir Walter Raleigh. Pop. (1951) 17,232.

EXODUS, the second book of the Old Testament, the name of which is of Greek derivation, meaning "departure." The book is naturally divided into three parts: the first part (chapters 1 to 18) is historical, describing the enslavement of the children of Israel in Egypt, the birth and upbringing of Moses, his mission as deliverer of his race, the 10 plagues, the institution of Passover, and the departure from Egypt; the second part (chapters 19 to 24) is legislative, narrating the giving of the law on Sinai, and the confirmation of the Mosaic covenant; the third part (chapters 25 to 40) is chiefly constructive, narrating the orders respecting the tabernacle, the consecration of Aaron's family as priests, the making of the golden calf and the resulting punishment, and finally the building of the tabernacle. Exodus appears to be a compilation by various editors from documents of different date, its sources, according to some authorities, being the same as those of Genesis. The sources, P, or the Priests' Code, J, and E, are generally readily recognizable; the last two are not always easily distinguishable in the legislative sections. See BIBLE; OLD TESTAMENT.

EXOGAMY, the opposite of endogamy, requires that an individual marry outside of his own group, and prohibits marriage within the group. Rules

material could be used. For the Romantic composers of the nineteenth century, however, the fantasia was a complete musical form in itself—a composition having a dreamlike or a whimsical quality; an example of the “mood fantasia” is Brahms’ *Fantasien*, Op. 116. Other nineteenth century composers used the fantasia as a free adaptation of the sonata form, such as Beethoven in his “Moonlight” sonata, Op. 27, Nos. 1 and 2. A mélange of operatic melodies or popular airs was often called a fantasia; Franz Liszt’s *Don Juan Fantasie* (1841) is such an operatic potpourri. Twentieth century composers wrote fantasias on themes already in existence, such as *Fantasia on a Theme of Thomas Tallis* (1910) by Ralph Vaughan Williams.

FAN VAULTING, a type of vaulting, frequently used in English Gothic architecture, in which a powerful feeling of verticality is apparent. In this type of vaulting, which is more decorative than functional, heavily ribbed trumpet-shaped vaults rise from equally spaced columns; the ribbing superimposed over the half cone of the vault gives the characteristic fan shape. A distinctive feature of the Perpendicular style, the fan vault was developed out of the ribbed tierceron vault by English architects in their search for strong structural membering and extreme vertical line. The fan effect was further enhanced by the use of fan tracery—decorative tracery in which the transverse ribs of the vaults, radiating from the capital of the supporting column like the spines of a folding fan, separated lacelike carving on the vault itself. The earliest example of true fan vaulting occurs in Gloucester cathedral, built during the last half of the fourteenth century; but probably the most famous is at Westminster Abbey, in the Chapel of Henry VIII, built 1500–12.

FAO or FA'W, town, SW Iraq, in the province of Basra, 55 miles SE of Basra, at the mouth of the Shatt al Arab, at the head of the Persian Gulf. Fao is a minor seaport and market center. Oil brought by pipeline from the Zubair oil field is exported from Fao. Fao was formerly noted for the export of dates until Basra was developed as a port. Pop. 2,916.

Gloucester Cathedral has early examples of fan vaulting, a type of masonry vaulting distinguished by equal curvature of all ribs and the use of delicate fanlike tracery.



FARAD, a unit of electrical capacity. It is used to measure the capacity of a conductor, such as a condenser, to store electrical charges. A conductor has a capacity of 1 farad if by the addition of 1 coulomb (see COULOMB) of electrical charges, the voltage on the conductor changes by 1. For practical uses, the farad is much too large a unit. More commonly used are the microfarad, μf , which is equal to 1 millionth of a farad, and the micromicrofarad, $\mu\mu\text{f}$, which is equal to 1 millionth-millionth of a farad. See CAPACITANCE; CONDENSER.

FARADAY, MICHAEL, 1791–1867, English physicist and chemist, was born in Newington Butts, near London, the son of a blacksmith. Although he was apprenticed to a bookbinder, his real interest was in science. In 1812 he attended a series of four lectures on chemistry given by the leading scientist of the day, Sir Humphry Davy; afterward Faraday sent the notes he had made at the lecture to Davy who, greatly impressed, hired Faraday as his laboratory assistant at the Royal Institution. In 1824 Faraday, largely self-educated, was elected to the Royal Society; in 1825 he became director of the laboratory of the Royal Institution; and in 1833 he succeeded Davy as Fullerian professor of chemistry without the obligation to lecture. Subsequently he was honored royally and offered the presidency of the Royal Society—an office he declined. From beginnings as a blacksmith's son Faraday had risen to become the most respected scientist of his day.

Accomplishments. During his early research Faraday discovered benzol, which was later widely used in making aniline dyes. He produced new kinds of optical glass, discovered two chlorides of carbon, and succeeded in liquefying several gases. More important, from his observation of the revolution of a magnetic needle around a wire carrying an electric current he concluded that a magnet should likewise be capable of producing electricity. In 1831 he reported to the Royal Society his two great discoveries based on this mutual principle—magnetolectric induction and electrodynamic induction. With these he invented the first electric generator and formulated the laws of magnetic induction. During the succeeding 15 years Faraday made some remarkable discovery almost every year. In 1834 he announced the method of electrochemical decomposition of salt solutions later to be known as electrolysis, and introduced the terms anode and cathode to describe the positive and negative electrodes of an electrolytic cell. His discovery of the plane of rotation of polarized light in a magnetic field, 1845, led him to predict that some day scientists would find that light is related to electromagnetic vibrations. He also discovered diamagnetism, 1846, and its relation to crystalline forces, 1849. The unit of electrical capacity (farad) and the unit of quantity of electricity (faraday) were both named in his honor.

Faraday's discoveries in the field of electricity were of overwhelming significance. Faraday can be said to have laid the foundations of the electrical industry which eventually, in the twentieth century, constituted a second industrial revolution. Still more important, Faraday was “the first scientist to suggest the modern idea of the field—that concept which was to become a keystone of James Clerk Maxwell's electromagnetic theory, Albert Einstein's general theory of relativity, and the twentieth century's progress toward understanding physical reality” (Herbert Kondo). Before Faraday physicists had concentrated exclusively on the concept of particle, in terms of which they attempted to explain all physical phenomena. Pushing the particle to the background, Faraday “enthroned in its stead lines of force throughout space. . . . What was of critical importance was not the electric or magnetic particles but the space in which they operated” (Kondo). Faraday wrote: “In this view of the magnet, the medium or space around it is as essential as the magnet itself, being a part of

the true and complete magnetic system" (*Experimental Researches in Electricity*, 1839-55). That Faraday believed intuitively that gravitational and electromagnetic forces were related is evidenced by an 1849 entry in his laboratory book: "Gravity. Surely this force must be capable of an experimental relation to electricity, magnetism, and the other forces, so as to bind it up with them in reciprocal action and equivalent effect. . . ." See ELECTRICAL AND MAGNETIC UNITS; ELECTRODYNAMICS; ELECTROSTATICS; MAGNETISM.

Had Michael Faraday's researches never produced important results, his life would still be worthy of study for its classic exemplification of the scientific attitude. Faraday's *Diary* (7 vols. 1932-36) reveals clearly his unswerving devotion to the search for scientific truth. Faraday was uninterested in money; he cared nothing for proving a point for the sake of being right. To discover truth that could be demonstrated experimentally was his goal; in its pursuit he was humble, persevering, painstaking, subtle, and ingenious. He was cautious, too, and in his diary constantly warned himself against becoming so fond of a theory as to be unable to abandon it in the face of facts to the contrary. He worshiped facts, but was aware that "facts" can be misleading, that "facts" can appear to change, and that facts, however certain, are meaningless by themselves. He was not addicted to random experiment; every experiment was designed to yield significant results, positive or negative, and careful records were kept. He was careful to remember, too, that secrecy has no place in science; his published reports are models of scientific exposition. Among them are *Experimental Researches in Electricity* (3 vols. 1839-55), *Experimental Researches in Chemistry and Physics* (1859), and *Lectures on the Chemical History of a Candle* (1861).

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FARADAY'S LAW. See ELECTROLYSIS.

FARAH or **FARRAH**, town, W Afghanistan, capital of the province of Farah, on the Farah River, 425 miles SW of Kabul. Farah is a communications, market, and agricultural center. It is strategically located at a junction on the Herat-Kandahar highway in an area of irrigation agriculture. Pop. 15,258.

FARAH RIVER, or Farah Rud, also Farrah, central and W Afghanistan, rises in the mountainous Hazarajat region 220 miles W of Kabul, and flows generally SW to the Hamun-i-Sabari. The Farah River has a total length of about 350 miles and provides a source of irrigation water.

FARALLON ISLANDS, or Farallones, group of rocky islets in the Pacific Ocean, W California, forming part of San Francisco city and county, 35 miles W of San Francisco; area 2 sq. mi.; pop. 30. These islets, extending for some 8 miles parallel to the mainland, are dry and barren. Only Southeast Farallon is inhabited, containing a lighthouse and U.S. Navy radar and radio installations. Large numbers of birds and seals frequent the islands, which form the Farallon Bird Reservation.

FARASAN ISLANDS, or Farsan Islands, archipelago in the S Red Sea, S Saudi Arabia, off the coast of the dependency of Asir, 30 miles W of Qizan. The Farasan Islands consist of two irregularly shaped major islands and numerous islets. The largest is 37 miles long and has a maximum width of 10 miles. All the islands are low and the highest point in the group is only 246 feet above sea level. Fishing, including pearl fishing, is the main activity on the islands and there are believed to be oil deposits.

FARCE, a dramatic composition in which the characters are caricatured for humorous or satirical effect rather than realistically portrayed. The major

purpose of farcical comedy is to amuse and it does not reject any device, however extravagant or improbable, that may serve this end. The word farce is from a metaphorical use of the French *farce* (from the Latin *farcire*), meaning stuffing. It was originally used to describe any explanatory or digressive material (not necessarily humorous) introduced into the liturgy; later it was applied to impromptu buffoonery and comic dialogue interpolated into mystery and miracle plays. Eventually the word became identified with any dramatic piece offered solely for the purpose of provoking mirth. Farce differs from comedy in that comic dramas usually retain a certain faithfulness to life and are set in plausible situations, whereas farces are often completely fanciful. Although farcical situations were used by dramatists from the time of Aristophanes, farce proper, as a recognizable dramatic form, was not developed until the eighteenth century, when such dramatists as Samuel Foote (*The Liar*, 1762) and Richard Brinsley Sheridan (*The Critic*, 1779), following the lead of George Etherege's comedies *The Comical Revenge, or Love in a Tub* (1664) and *She Would If She Could* (1676), produced straight farces. The early farces were usually satirical—Foote mercilessly (and hilariously) pilloried those who offended him—but later authors tended to caricature types rather than personalities. See DRAMA.

FAR EAST, an area comprising the easternmost Asian countries: Japan, Korea, China, and the Soviet Far East. The area is often understood as including the Malay Archipelago (including Indonesia and the Philippines), Malaya, former Indochina, now Vietnam, Laos, and Cambodia, Thailand, and Burma.

FAR EASTERN TERRITORY, former administrative division of the Russian Soviet Federated Socialist Republic, U.S.S.R. It extended in crescentlike form from the Transbaikalia to the extreme northeast of the U.S.S.R. and included Kamchatka Peninsula and Northern Sakhalin. The territory was established in 1926. In 1937 Chita Region was detached and in 1938 the territory was abolished and its area divided between the Khabarovsk Territory and the Maritime Territory.

FAREHAM, urban district, S England, S Hampshire, on Portsmouth Harbor, 11 miles ESE of Southampton. Fareham is an agricultural market, minor port, and railroad center. Marine supplies, leather, pottery, and food products are manufactured. Pop. (1951) 42,470.

FAREL, GUILLAUME, 1489-1565, French religious reformer, was born near Gap, Dauphiné, but after 1533 lived in Switzerland, where he took an active part in spreading Protestantism and organizing Protestant churches. Farel and his colleagues in 1535 influenced Geneva to adopt the Reformation. Together with John Calvin he attempted to institute drastic church reforms, because of which he and Calvin were expelled. By persistent effort Farel managed to reinstate Calvin in Geneva, 1641, and he became Calvin's lifelong friend.

FARGO, WILLIAM GEORGE, 1818-81, U.S. businessman, was born at Pompey, N.Y. In 1845 he and Henry Wells organized a carrying business, which in 1850 became the American Express Company, with Fargo as secretary and later as president. He and Wells also operated Wells, Fargo and Company, organized in 1852. Fargo was mayor of Buffalo, N.Y., 1862-66. See EXPRESS COMPANY, *History*.

FARGO, city, E North Dakota, county seat of Cass County, on the Red River, the Milwaukee, the Great Northern, and the Northern Pacific railroads, and U.S. highways 10, 52, 75, and 81; a scheduled airline stop; 190 miles E of Bismarck. The largest city in the state, Fargo is an important marketing and shipping center for the surrounding agricultural area producing grain (wheat, barley, rye, oats), livestock, wool, potatoes, and dairy products. Foundry items, structural steel, tanks, and automotive parts are manufactured in addition to agricultural products. The

principal work, *Correspondance littéraire, philosophique et critique* (1812-14), written 1753-90, is a brilliant and comprehensive commentary on events political, social, and literary in Grimm's time. Later in life he was Catherine II's minister at Hamburg.

GRIMMELSHAUSEN, JOHANN JAKOB CHRISTOFFEL VON, 1624?-76, German novelist, was born in Gelnhausen near Hanau, Hesse. He grew up while Germany was in the throes of the Thirty Years' War and, although he was able to attend school for a short time, he was only 11 years old when Hessian cavalymen carried him off to Kassel. From that time he was to be a soldier intermittently for most of his life. By 1638 Grimmelshausen was serving as a musketeer at Offenburg, and in 1649, while a regimental clerk in that city, he won the city commandant's favor by his prediction of a successful repulsion of the enemy. Originally Lutheran, he was later converted to Catholicism. His first book was *The Flying Wanderer to the Moon*, completed in 1659. Later he worked as a farm superintendent and owned a tavern, 1665-67. In 1669 he was appointed magistrate of the city of Renchen and published his most famous work, *Der abenteuerliche Simplicissimus*, 1669 (*The Adventurous Simplicissimus*, 1912), a novel based in large measure upon Grimmelshausen's own experiences. It is the picaresque story of how an innocent youngster encounters the lusty, confused, cruel world of the Thirty Years' War and how he matures and adjusts his outlook to meet life's challenges. Through the escapades of Simplicio, the hero (shown at various times as a soldier, lover, quack doctor, court fool, pilgrim), the reader is given an amazingly full picture of the age. Unrelenting realism merging with engaging fantasy and peppered with keen satire lift the novel above the ordinary picaresque tale to the high level of *Don Quixote* and *Gil Blas* as a significant work of art. Grimmelshausen's later works, although somewhat less rewarding, support his reputation as one of Germany's great prose writers. Much of his work appeared under various pseudonyms, not fully untangled until the nineteenth century. One of his most amusing works, date unknown, is the essay *Manifesto Against Those Who Roul at the Red and Gold Beards*.

GRIMM'S LAW, developed by the German philologist Jacob Grimm, formulates the parallel changes undergone by a characteristic group of consonants in the Indo-European languages in passing over into the Germanic languages. As finally formulated by Grimm in his *Deutsche Grammatik* (1822), the law holds that if the same roots or words exist in Sanskrit, Greek, and other Indo-European languages, a permutation of consonants (*Lautverschiebung*) will manifest itself in the Germanic languages in comparison with the others. In this permutation, as the sounds are produced they are "pushed" from one organ of speech to another. Examples of this correspondence in the labial consonants are Sanskrit *pitar*, Greek *pater*, Latin *pater*, Germanic *water*, English *father*; in the palatal consonants, Sanskrit *kas*, Greek *kos*, Latin *quis*, English *echo*; in the dental consonants, Sanskrit *danta*, Greek *odon*, Latin *dens*, Germanic *zahn*, English *tooth*. Grimm's formulation made use of the research of the Danish scholar Rasmus Christian Rask, and was one of the first important contributions of modern philology to the study of the relationships among the Indo-European languages. Irregularities in its operation were explained in large measure by Grassmann's law, enunciated by Hermann Günther Grassmann in 1863, and Verner's law, enunciated by Karl Adolf Verner in 1875.

GRIMSBY, county borough, E. England, in N. Lincolnshire, Parts of Lindsey, on the S. shore of the Humber River near its mouth on the North Sea, 30 miles NE. of Lincoln and 15 miles SE. of Hull. Grimsby is a seaport and industrial center. It is mainly important as the largest fishing port of Great Britain. Trawlers based on Grimsby visit fisheries in all parts

of the North Atlantic and adjacent seas. Besides fish, coal and timber are the main items passing through Grimsby's extensive dock facilities. Industries in the city include processing of fish, brewing, shipbuilding and repairing, and manufacture of ship's supplies, paper, construction materials, and food products. Grimsby is of ancient origin and contains several medieval buildings, including a thirteenth century church where King Richard I held Parliament. Most of Grimsby is relatively modern, however, having developed after port improvements were initiated in 1849. During World War II it was a naval base and mine-sweeping headquarters. Pop. (1951) 94,527.

GRIMSEL PASS, S. central Switzerland, in the Bernese Alps, connecting the Rhône and the Aare valleys, rising to 7,159 feet SW of the Rhône Glacier. The pass is one of the oldest and most frequented of Alpine passes. Below the pass to the north is the hydroelectric plant on Grimsel Lake; below to the south is Toten Lake (lake of the dead) which was the site of a French-Austrian battle in 1799. On the west of the pass rises the Kline Siedelhorn (9,075 ft.), and on the east the Saas (7,953 ft.).

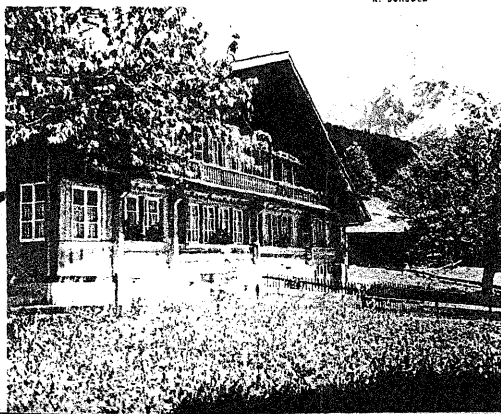
GRIMTHORPE, EDMUND BECKETT, 1st BARON, 1816-1905, English lawyer, horologist, and ecclesiastical architect, was born at Carlton Hall, Nottinghamshire. He published some interesting works on architecture but was better known as an authority on clocks. He helped design the final plans for Big Ben, the clock of Parliament.

GRINDELIA, or gum plant, a genus of ornamental perennial herbs of the Compositae, the aster, sunflower, or composite family. The 30 species of this genus are native to western North America. The stems of these plants are often woody at the base and bear alternate leaves. The showy flower heads bear yellow ray and disk flowers and a sticky balsam, especially before and during flowering. These gummy flower heads are responsible for the name gum plant. The only species of horticultural interest is *G. robusta*, which grows 1 to 2 feet high and is cultivated in California.

GRINDELWALD, popular resort town of the valley of Grindelwald or Blach Lütschine, S. central Switzerland, in the canton of Bern, in the Bernese Alps. The valley is surrounded by the Faulhorn (8,803 ft.) in the north, the Wetterhorn (12,149 ft.) and the Eiger (13,140 ft.) in the south, and Little Scheidegg (6,772 ft.) and the Wengern Alp (6,160 ft.) in the southwest, and the Great Scheidegg Pass (6,434 ft.) on the east. From Little Scheidegg and the Wengern there are magnificent views of the Jungfrau (see JUNGFRAU). There are also rail connections to the summit of the Jungfrau. There are numerous bob and toboggan runs in the Grindelwald area. The upper and the lower Grindelwald glaciers nearby are frequently visited. Pop. 3,400.

A Châlet in Grindelwald

R. SCHUEDEL



HOME OWNERS' LOAN CORPORATION, an emergency agency of the federal government under the direction of the Home Loan Bank Board, created by Congress in 1933 and dissolved Feb. 3, 1954. Its general purpose was to provide long-term mortgage loans at low interest rates to persons threatened with loss of their homes by mortgage foreclosure or otherwise unable to obtain financing. During its three-year lending period the HOLC granted more than 1 million loans totaling approximately \$3.5 billion.

In reorganization plans the HOLC was made a part of the Federal Loan Agency in July, 1939, and was transferred to the Federal Home Loan Bank Administration in February, 1942. Effective July 27, 1947, HOLC functions were transferred for liquidation of assets to the Home Loan Bank Board under the Federal Housing and Home Finance Agency. In May, 1951, the liquidation was completed, and the board paid to the U.S. Treasury the last of the HOLC original capital stock investment of \$200 million plus almost \$14 million in surplus funds.

HOMER, author of the earliest Greek epic poems, the *Iliad* and the *Odyssey*, and of a number of shorter poems and hymns. The *Iliad* and the *Odyssey* are composed in dactylic hexameters, the meter regularly used thereafter by both the Greeks and the Romans for narrative poetry. The *Iliad* describes a few weeks near the end of the 10-year-long Trojan War. The *Odyssey* describes the adventures of Odysseus (Ulysses) during his journey home after the fall of Troy. See **ILIAD**; **ODYSSEY**.

The ancients, with few exceptions, thought of the *Iliad* and the *Odyssey* as the work of one poet, Homer, whose work was regarded as the foundation of all Greek education and political unity, and as a definitive authority on most subjects of which it treated. During most of the Christian Era it was assumed that a single poet, Homer, had composed the two works essentially as they are known to modern readers. In 1730, however, Giambattista Vico suggested that "Homer" was actually a collective name for many successive poets who had elaborated the *Iliad* and *Odyssey*. Vico's theory received little or no attention, but Friedrich Wolf's *Prolegomena ad Homerum* (1795), holding that the Greek epics were composed by various poets whose works were later collected and edited to form the *Iliad* and *Odyssey*, caused a tremendous stir in literary and scholarly circles, and gave rise to the perennial "Homeric Question," which persisted even into the 1960's (see **WOLF**, **FRIEDRICH AUGUST**). Although almost every Homeric scholar after Wolf has had his own particular views, Homeric specialists have generally fallen into two schools: (1) the separatists, who insist that there was no one poet, but several, whose work was somehow combined to form the *Iliad* and *Odyssey*; and (2) the unitarians, who champion the older view that one man, presumably named Homer, composed both poems in their entirety.

Prior to the mid-1950's the unitarian view was still accepted, not without evidence, by some scholars, and the views of the more extreme separatists were no longer given much credence by most authorities; but a moderately separatist view was held by most. In 1953, however, it was announced by Michael Ventris that the "Linear B" script of the Cnossus tablets, dating from a time prior to the earliest dates ever postulated for Homer, was a medium for writing the Greek language. Thus, contrary to long-held assumptions, the Greeks had had a written language in Homer's time and centuries

before. This meant that it was at least possible for the poems to have been written in finished form during Homer's lifetime, which may have been during the seventh, eighth, or ninth centuries B.C.—most probably about 800 B.C., although in the early 1960's many scholars dated him as late as 700 B.C. Homer may have composed the *Iliad* and the *Odyssey* orally, using materials from other oral poets, and dictated them to scribes; or he may have actually written one or both himself; but in the light of Ventris' discovery it could no longer be assumed that it was impossible for Homer to have done either. The Trojan War occurred three, four, or perhaps five centuries before Homer's time, and some of his details would seem to be anachronistic referring to his own day rather than to the time of the war; but many of his details, long assumed to be anachronisms, were subsequently confirmed as authentic by later archaeological finds. In the 1960's the *Odyssey* was still thought by some separatists to be the work of a later poet. The poet of the *Odyssey* is fond of dogs, but the poet of the *Iliad* detests them—such evidence is cited. Other scholars point out, however, that such "inconsistencies" are no more significant of themselves than the contradictions in attitudes and manner between the first and second parts of Goethe's *Faust*.

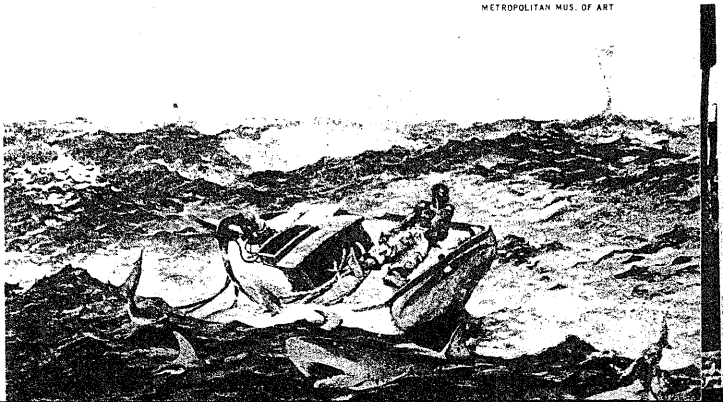
The *Iliad* and *Odyssey* indisputably stand at the beginning of Greek written literature, but probably toward the end of a tradition of oral poetry, and long after the poems were written out in full—even if this did not occur until the days of Pisistratus (sixth century) as separatists contend—the poems were to be recited aloud rather than read silently.

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HOMER, WINSLOW, 1836-1910, U.S. genre painter, was born in Boston, Mass. He did magazine illustrations for *Ballou's Pictorial* and *Harper's Weekly*, 1857-75, and covered the Civil War for *Harper's* as an artist-correspondent. Many sketches and paintings resulted from his war experience; perhaps the best is the oil, *Prisoners at the Front*. In 1867 he traveled in Europe. When he returned to the United States, Homer painted many scenes of farm life and children. He turned to Negro subjects, 1875-79, and, in England, 1881-82, painted seascapes. He settled at Prout's Neck, Me., 1883, and thereafter lived the life of a recluse, going to the Bahamas or Florida in the winter to paint tropical marine scenes. The dramatic interpretations of the sea to which he devoted himself after 1883 are notable for their realism, objectivity, and excellent color. His best paintings were water

The Gulf Stream, by Winslow Homer

METROPOLITAN MUS. OF ART



Coryndon Memorial Museum, the McMillan Library, and an Anglican cathedral. Nairobi National Park, a game reserve for lions, giraffes, antelopes, and hippopotamuses, is nearby. The site of present-day Nairobi was selected in 1899 as headquarters for the Uganda Railway. The city thus established grew rapidly, since the altitude and climate of the area was found to be ideal for European residents. The capital was moved there from Mombasa in 1907. Nairobi was proclaimed a city by Royal Charter in 1950. Pop. (1954) 186,000.

NAJIN, also Haji, city, North Korea, N Hamgyong Province, seat of Najin-gun (county); on the Sea of Japan; 40 miles NE of Chongjin. Najin is an ice-free fishing port and a military base, well sheltered by two islands. The commercial port (2/3 sq. mi. in area) can handle ten 8,000-ton ships, twenty 7,000-ton ships, and ten 4,000-ton ships. The port is connected by a 9½-mile tunnel with the nearby port of Unggi. Pop. (1951 est.) 50,000.

NAKHICHEVAN, city, Caucasian U.S.S.R., Azerbaijan Soviet Socialist Republic, capital of Nakhichevan Autonomous Soviet Socialist Republic; near the Aras River; 83 miles SE of Yerevan, Armenia. It has a cannery, a winery, a distillery, brickyards, lime kilns, farm implement repair shops, and a leather goods factory. A branch of the Azerbaijan Academy of Sciences is in the city. According to Armenian legend Noah founded Nakhichevan, which in Armenian means first descent. It was famed in antiquity for its rare Armenian wines and was the residence of Armenian princes of the second millennium B.C. Nakhichevan remained an important city of medieval Armenia under the Bagradunian dynasty until it fell to the Moslems in the eleventh century. Ptolemy called it Naxuana. Pop. (1956 official est.) 13,000.

NAKHICHEVAN AUTONOMOUS SOVIET SOCIALIST REPUBLIC, U.S.S.R., a detached part and SW of the Azerbaijan Soviet Socialist Republic; bounded on the N and E by the Armenian Soviet Socialist Republic; on the S and W by Iran, and on the NW by Turkey; area 2,010 sq. mi.; pop. (1956 official est.) 126,700. The region is highly mountainous in the north and east, reaching elevations of 13,100 feet, and is drained in the south and west by the Aras River whose valley lies at an average elevation of 2,650 feet. A branch of the Transcaucasian Railroad connects the region with Yerevan and Baku and another line runs to Tabriz. Winters are severe and summers hot. Principal products are cereals, apricots, grapes, tobacco, cotton, rice, sheep, salt, arsenic, and pyrites. Food processing, wine making, and silk and carpet weaving are leading industries. Main centers besides Nakhichevan, the capital, are Norashen and Dzhaulfa.

Nakhichevan's history dates from the third millennium B.C. when its Armenian inhabitants allied themselves with the Armenian Empire (2400-612 B.C.). In the latter year the population became vassals of the Medes. The region was regained by the Armenian Emperor Tigranes II the Great in the first century B.C. and became important for its mineral wealth. During the Middle Ages, as part of the Armenian kingdom of the Bagradunians, Nakhichevan was famed for its Oriental rug centers and its numerous red stone cathedrals, many of which were ravaged by the Mongols in 1235 and later by the Turks. Nearly 85 per cent of the Armenian population was forcibly converted to Islam and Turkified during the Ottoman period. In 1826 czarist Russia took the area from Persia. It was temporarily lost during the 1917 Bolshevik Revolution, reconquered by Armenian Communists in 1920, and formed into the Nakhichevan Autonomous Soviet Socialist Republic in 1924.

NAKHON RATCHASIMA, town, SE central Thailand, capital of Nakhon Ratchasima Province; on the Mun River; 135 miles NE of Bangkok. A

railroad, highway, and airline junction, Nakhon Ratchasima is the chief trade and communications center for eastern Thailand. Silkworm culture is a major occupation, and copper is mined nearby. Founded in the seventeenth century, the city formerly was referred to as Khorat or Korat. Pop. (1958) 25,000.

NALORPHINE, a rapid-acting drug that occurs as a colorless solid, soluble in water. It is derived from morphine by making a substitution in the chemical framework of morphine. Nalorphine is used chiefly to counteract morphine poisoning; it is injected to relieve circulatory or respiratory depression caused by morphine and other narcotics such as meperidine and methadone (see MORPHINE). Drug addicts respond to nalorphine by exhibiting many of the symptoms of narcotics withdrawal (see DRUG ABDICTION).

NAMALAND, or Namaqualand, region, SW Africa, along the Atlantic Ocean. It includes the southern part of South-West Africa and the northern part of Cape of Good Hope Province, Union of South Africa. It is divided by the Orange River into Great Namaland to the north and Little Namaland to the south. There are copper deposits and diamond and tungsten mines in the region. Natives of Namaland are the Hottentot tribe of Namaquas or Nama.

NAMANGAN, region, U.S.S.R., Soviet central Asia, Uzbek Soviet Socialist Republic; bounded on the N and NE by Kirgiz Soviet Socialist Republic, on the E and SE by Andizhan Region, on the SW by Tadzhik Soviet Socialist Republic, and on the NW by Tashkent Region; area 3,605 sq. mi.; pop. (1956 est.) 712,000. Namangan is drained by the Namangan and Syr Darya rivers and their tributaries flowing from the Kirgiz Mountains in the north. The region has a high water-power potential and there is extensive cotton farming on irrigated land, mainly along the North Fergana Canal. Grapes and other fruits are grown, and the sericulture of the region accounts for 10 per cent of Uzbek silk cocoon output. Industries process local agricultural raw materials. The chief cities are Namangan (the capital), Chust, and Kassansay.

NAMANGAN, city, U.S.S.R., Uzbek Soviet Socialist Republic, capital of Namangan Region; in the N Fergana Valley; on the Namangansay River, the North Fergana Canal, and a branch of the Tashkent Railroad; 50 miles NE of Kokand. Namangan's industries include cotton cleaning, oil, and cotton textile mills, meat processing and cold storage plants, a winery, a cannery, a brewery, and two hydroelectric power stations. The city has several technical and vocational schools. Pop. (1956 official est.) 104,000.

NAME, a characteristic word or combination of words applied to an entity or class of entities to distinguish it from all others. A branch of linguistics known as onomastics is concerned with the study of names. Every object has a class name which it shares with all specimens of the species to which it belongs; thus all buildings are buildings, all books are books. Many objects and practically all persons also have individual names, usually called proper names, or simply names. Proper names of greatest significance and interest are personal names; of slightly less interest are the names of places (Washington, Moscow, or Trafalgar Square) and of those "things" deemed of sufficient individuality and distinction to be properly named (Parthenon, THE AMERICAN PEOPLES ENCYCLOPEDIA, Sistine Chapel, or the *Mona Lisa*).

In Law, a name consists of the given names and surnames; the middle name or initial of a person is not generally recognized by the courts as a part of his legal name. Name prefixes (Mr., Mrs., and the like) and suffixes (Jr. and Sr.) are not part of a person's legal name. Abbreviations of Christian names are commonly recognized by the courts, but such recog-

nition has not generally been extended to abbreviations of surnames. Under the common law a person may adopt both a different surname and a different Christian name; if the new name is confirmed by usage and is generally known, and if the change was not motivated by fraud, it becomes his legal name. While this is the rule in the United States except where changed by statute, most states have statutes providing a method for changing a person's name with the sanction of the courts, usually requiring the applicant to state some reason for the step. In some jurisdictions a change of name will be permitted only upon a showing of a resulting pecuniary benefit. A woman upon marriage legally assumes her husband's surname and retains it even after an absolute divorce, unless the decree provides for the resumption of her maiden name. Under the doctrine of *idem sonans*, a document designating an individual by a name that corresponds in sound with the individual's true name is generally held legally sufficient notwithstanding an incorrect spelling of the name in the document. The common law right to do business under an assumed or fictitious name is largely subject to regulation by statutes designed to protect the public from fraudulent practices. The law generally protects persons and corporations in the use of trade names that have become generally known by usage as against persons who may fraudulently assume them for the purpose of benefiting by the business reputation and good faith that trade names may carry with them. The name of a corporation is said to be the very essence of its being, and in general a corporation must contract, sue, and be sued in its corporate name.

Personal Names. In modern civilized societies there are at least two elements in virtually every personal name: the given name or names (known among Christians as the baptismal or Christian name) and the family name, or surname. The latter, although seemingly the more fundamental, appeared relatively late (perhaps in the ninth century in Europe), and was not in common use (with a few exceptions) until the classical Renaissance when, in the sixteenth century, civil and ecclesiastical ordinances required the registration of surnames. After that time their use became standard, although with some national variations. In Spain and Latin America, and to a certain extent in Switzerland and elsewhere, it was customary to add the wife's maiden surname to that of the husband, using the word for *and* (*Ortega y Gasset*) or a hyphen (*Blasco-Ibañez*); elsewhere the surname of the husband (and father) was deemed paramount, the wife sometimes keeping her maiden surname as her own middle name (that is, as part of her given name). In some languages surnames have both a masculine and a feminine form; hence, in Russian, *Petrov* (masc.) and *Petrova* (fem.). The Jews in Europe and the Americas were late in adopting surnames (Austria 1782-83, France 1803, Prussia 1812, Bavaria 1813), and even at mid-twentieth century many orthodox Jews regarded the surname as a mere legal convenience.

First Names generally expressed, originally, circumstances of the child's birth or appearance, or the religion or position of the parents; or were given later in life in accordance with the appearance, character, or history of the individual. In early times plant and animal names, descriptive epithets, the names of qualities and deities, were commonly given to human beings as names. As Europe became Christianized, first names were more and more chosen in terms of their association with Christianity, and those relatively few Greek, Roman, and Hebrew names that came into common use among European (and later American) Christians were largely those associated specifically with the history of Christianity. In addition, Christianity absorbed and invested with Christian significance the many names deriving from the hundreds of pagan tribes that were gradually won over to the Christian persuasion.

Depending upon a host of factors, most of them matters of chance, there were many fashions in names involving both the revival of earlier names and the appearance of new ones. The unusual prominence of the bearer of a certain name has ever meant a vogue for that name; thus such names as Augustine, Benedict, Martin (popes) and Charles, William, Elizabeth, Mary, George, John (prominent rulers) have been popular. In later times the names of U.S. Presidents and other national figures have initiated vogues, even to the extent of transforming surnames such as Washington, Lincoln, Roosevelt, Dewey, and Wilson into given names. Historical events have influenced personal names. For example, the Norman Conquest of England (1066) brought German, and to a lesser extent French, names to the British Isles, displacing Old English names; the humanistic revival of Latin studies led to a revival of many Roman names and to the Latinizing of non-Roman ones (*Descartes*—*Cartesius*); the Reformation led to a vogue in Hebrew names from the Bible and to such new contributions as Faith, Hope, Charity, Prudence, Mercy.

A name such as Mercy, in having a meaning apart from its use as a name, does not differ in this respect from other names; all personal names, both given names and surnames, meant something originally. Francis, of Germanic origin, meant free. Anne, the Germanic version of Ann, from the Hebrew Hannah, meant grace. From the Greek, Theodore, the name given by St. Augustine of Hippo to his son, means gift of God. Rachel derives from the Hebrew word for ewe, Ruth from the Hebrew word meaning the compassionate one. Jonathan, from Hebrew, means God has given, and the Hebrew Nathaniel means gift of God (Nathan, a diminutive, means the given). The Gaelic Donald means prince of the universe, the Celtic Donald means the dark (closely related, the Celtic Douglas means from the black stream).

Surnames. In ancient Greece a patronymic was used as a surname of sorts; this use of the father's name as surname for the son (. . . the son of . . .) was later a common source of surnames. In Rome three or four names were employed, in this order: *praenomen* (first name, distinguishing the individual); *nomen gentile* (the name indicating *gens*, clan—actually closer to the modern first name than to the modern family name); *cognomen* (roughly the equivalent of the modern surname, or family name, and often also the name of a place); and finally, only sometimes used, the *cognomen secundum* or *agnomen* (a special surname given to a man for some service). Hence, in the full name of Publius' Cornelius Scipio Africanus major, Publius was a common Roman *praenomen*; Cornelius was a clan name, *nomen gentile*; Scipio (literally staff or wand) was a family name or *cognomen* of the *gens* Cornelia; and the Africanus (literally belonging to Africa) was an *agnomen* commemorating the elder (major) Scipio's victory in Africa over Hannibal. Such usages, however, were distinctly the exception in antiquity; they reflect the fact that Greece and Rome were culturally more complex than the rest of Europe. The surnames of modern times derive from a host of sources. All surnames originally had meaning, but in the course of time many of these meanings have been lost; relatively few people in the twentieth century are aware of them. Harkening back to Greek and Roman practice, many modern surnames derive from the first (and only) name of a father (patronymic); from the name of a place with which the person or his ancestors were associated (roughly equivalent to the Roman *cognomen*); and from his deeds or those of his ancestors (roughly, the Roman *agnomen*), analogous in the most general sense to his occupation, whether notable or not.

The name David Ben-Gurion means David son of Gurion, Gurion having been the given name of

David's father; even in modern usage Gurion is not regarded among Jews as a surname in the ordinary sense. More typical are these examples: *Fitz* (a form of the French *fits*), *p* or *b* in names of Welsh derivation (the equivalent of *ap*, son), *Mac*, *O'*, and final *s*, the Scandinavian *son* or *sen*, and the Russian *vich*, all of which convey the notion "son of" in such surnames as Fitzgerald, Ivanovich, Jones, Price, Pedersen, O'Connell, MacQuarrie, and McSorley. Surnames expressing local origin are usually (but not always) characterized by *de*, *di*, *du*, *von*, *van*, *atte*, *al*, or *a* before the name of the place: Devries, Dupont, Vanderwalker, Atwell, and the like. Continental place names are reflected in such family names as Fleming, Picard, St. Clair, Gascoigne, Berlin; such English names as London, Townsend, Welsh, and Scott derive from the names of districts, towns, estates, countries, and counties in England. Topographic peculiarities of the land of origin or association are expressed in such names as Field, Ford, Hill, Rivers, Bridges, Burroughs. Occupations are reflected in such names as Archer, Fisher, Porter, Shepherd, Smith, Taylor (Russian Portnoy, German Schneider), Baker (French Boulanger), Clark, Knight, Fuller, Spicer, Barker, and (presumably jocose) Pope and King; and outstanding personal or physical qualities and accomplishments gave rise to such names as Barbarossa (red beard), Dogood, Lovejoy, Lightfoot, Truman, Young, Black, Bold, Rich, Short, Whitehead, White (German Weiss, Italian Bianco, French Le Blanc). Animal names—some jocose, some alluding to emblems—include Fox, Bird, Lamb. Some names, such as Smithson and Clarkson, are patronymical expressions of occupation.

In the United States many new names came into existence through the tendency of immigrants to translate their names into English or to assume English equivalents. The Jews have shown the greatest willingness to change their names, partly because they did not assume surnames until forced to do so by legal decrees in the late eighteenth and early nineteenth centuries and are thus less bound to their surnames by tradition than are Christians. Americans of Spanish origin have preserved their names perhaps more insistently than any other group of immigrants. Negroes inherited no surnames from Africa, but assumed them, slaves taking the name of the master.

Place Names. As is the case with surnames, the origins of place names (studied by that branch of onomastics known as toponymy) are so plentiful as to be virtually limitless; although many place names are seemingly meaningless, all presumably had meaning at one time, and the quest for original meaning in place names often provides important clues for historians and philologists. Among thousands of sources, the physical characteristics of the area (Sleepy Hollow, Lake Street), personal names of families or heroes (Washington, Lawrenceburg, Leningrad), the religious beliefs of the inhabitants (San Francisco, Trinidad), and miscellaneous events, experiences, emotions and aspirations associated with the place (Sunset, Hard Times Landing, Sweet Home, Independence) are particularly common.

Occult, Magical Significance has often been ascribed to names in general or to particular names. In the earliest days of human speech all language was inherently of a sacred character; to a degree, even in modern times, any word may be invested with a certain magic by poets or orators, and personal and national names retain a power long absent from mere words. In antiquity words did not represent objects or persons; they were the objects or persons, and thus could be employed in magic spells and incantations to the betterment or detriment of the objects or persons involved. Hence the real name of the city of Rome, for example, was a state secret (since lost entirely); it was believed that if this real name were known to Rome's enemies, it could be used to control, even to destroy, the city and its people. In

the practice of "sympathetic magic" through the ages, even into the twentieth century, a person's name was thought to be the person; commonly so in antiquity, although considerably less so at mid-twentieth century, many people kept their real names secret or allowed them to be known only with the greatest of circumspection. Names were involved in many of the activities of astrologers, numerologists, and other practitioners of magical divination. Even at mid-twentieth century there were many people who associated names with certain movements and configurations of the stars and the planets, or who attached a numerical value to each letter of the alphabet and found significant meaning in the fact, for example, that the numerical total formed by the first name equaled the numerical total of the surname.

In Theology and Philosophy varying concepts of names have played significant roles throughout history. For example, among Hebrew tribes the name of God (the so-called Tetragrammaton, variously spelled IHVH, JHVH, JHWH, YHVH, YHWH, and variously transliterated by modern scholars as Yahweh, Yahve, Jehovah, and the like) could not be uttered or written except at Yom Kippur by the high priest, who pronounced it so softly that no one could hear the pronunciation (those in the congregation substituted the words Adonai or Elohim). In the Middle Ages, Jewish "wonder workers" were thought to be wonder workers precisely because they knew the pronunciation of this sacred name, and such a mystic was called a Baal Shem (Master of the Name). In medieval Europe the most crucial theological question centered around the degree to which a name is its referent, particularly such a name as God, Christ, Trinity, or Holy Ghost. This same question, in varying forms, remained important in philosophy past mid-twentieth century, and may be considered one of the perennial philosophical issues. (See ABÉLARD, PIERRE; CONCORDANCE; NOMINALISM; PHILOSOPHY; REALISM; UNIVERSAL; CONCEPTUALISM; YAHWEH). The important dialogical school (I-Thou philosophy) within the twentieth century philosophical-theological movement known as existentialism centers to a large degree around this issue, especially in the thought of Eugen Rosenstock-Huussy (first), Franz Rosenzweig, Ferdinand Ebner, Martin Buber, Joseph Wittig, Hans Ehrenburg, Gabriel Marcel, and others. See DIALOGUE; EXISTENTIALISM; GRAMMAR.

NAMPA, city, SW Idaho, Canyon County; on the Union Pacific Railroad and U.S. highway 30, 18 miles W of Boise. It is in the Boise River irrigation area between the Boise and Snake rivers. Nampa is the shipping center for a rich agricultural area; principal products include livestock, hybrid sweet corn seed, fruits, beet sugar, dairy products, feed, potatoes, flour, and beverages. Just outside the city are gold and silver mines. Nampa is the site of Northwest Nazarene College. The city was first settled in 1885 and was named for the leader of an Indian tribe residing there. Pop. (1960) 18,013.

NAMPO, or Chinnampo, city, NW Korea, in the province of South Pyŏngan, at the mouth of the Taedong River and on an inlet leading to Korea Bay; 40 miles SW of Pyŏngyang. Nampo has a deep water port, which is open to ocean vessels except during an occasional ice block in winter. The leading industries include the production of vegetable oil, flour, chemicals, and iron products. Gold is refined. Rice, coal, iron, and paper are exported. Pop. (1959 est.) 82,000.

NAMSOS, town, central Norway, Nord-Trøndelag County; near the entrance of the Namsen River into Namsenfjord, an inlet of the Norwegian Sea; a port and a railroad and highway junction; 80 miles NNE of Trondheim. Namsos' manufactures include lumber, wood products, cement, textiles, wool, leather, fish oil, canned fish, and margarine. Pyrite and copper are mined nearby. The town was founded in 1845. Pop. (1950) 4,573.

NEW JERSEY STATE TEACHERS COLLEGE. See COLLEGES AND UNIVERSITIES.

NEW JERUSALEM CHURCH. See SWEDEN-BORGIAN CHURCH.

NEW KENSINGTON, city, SW Pennsylvania, Westmoreland County; on the Allegheny River and the Pennsylvania Railroad; 15 miles NE of Pittsburgh. An industrial city, New Kensington has manufactures of aluminum, magnesium, glass, and electrical and metal products. It was established in 1891 on the site of Fort Crawford and incorporated as a borough in 1892. It was consolidated with Parnassus in 1931 and incorporated as a city in 1934. Pop. (1960) 23,485.

NEW KENT, village, E Virginia, seat of New Kent County; 25 miles E of Richmond. New Kent has been the county seat since 1691. Pop. about 50.

NEW KILPATRICK, or East Kilpatrick or Kilpatrick, parish, SW central Scotland, Dunbarton and Lanark counties; 6 miles NNW of Glasgow. New Kilpatrick includes the towns of Milngavie and Bearsden. Pop. (1951) 54,931.

NEWKIRK, city, N central Oklahoma, seat of Kay County; on the Santa Fe Railway and U.S. highway 77; 75 miles NW of Tulsa. Located in an agricultural area, Newkirk has several food-processing plants. The city was settled in 1893 near the site of a much earlier French settlement that was called Ferdinandina. Pop. (1960) 2,092.

NEWLAND, town, NW North Carolina, seat of Avery County; 25 miles NNW of Morgantown. Pop. (1960) 564.

NEW LEXINGTON, village, E central Ohio, seat of Perry County; on the New York Central Railroad; 20 miles SSE of Zanesville. It is a distribution point for coal, sand, and oil produced in the area. Tile, pottery, rock wool and machine tools are manufactured. The village was laid out in 1817. Pop. (1960) 4,514.

NEW LISKEARD, town, S central Canada, Ontario; on the Ontario Northland Railway, near the north end of Lake Timiskaming; 65 miles NNW of North Bay. New Liskeard serves vacationists in the surrounding resort area, and has food-processing plants and pulp and lumber mills. Pop. (1956) 4,619.

NEW LONDON, city, SE Connecticut, one of two county seats of New London County; at the mouth of the Thames River on its W bank; on the New Haven and the Central Vermont railroads and U.S. highway 1; 52 miles E of New Haven.

New London, stretching for 3 miles along Long Island Sound, is a port of entry with an excellent deep-water harbor. Its accessibility from the large eastern metropolitan centers and its ideal location on the sound make it a popular summer resort. Shipbuilding, marine construction, and the manufacture of textiles, dentifrices, turbines, collapsible tubes, printing presses, and paper products are major industries. The U.S. Coast Guard Academy and the Connecticut College for Women are located in the city, and a U.S. Navy Submarine Base and officers training school is 4 miles north. The annual rowing contests between the crews of Yale and Harvard universities, held in late June on the Thames, finish at New London. Historical points of interest include the schoolhouse at which Nathan Hale taught before the Revolution; the county courthouse, built in 1784; the Joshua Hempstead House, oldest residence in the city; the Lyman Allyn Whaling Museum, a memorial to a New London whaling captain; Fort Trumbull, a reconstructed Revolutionary fort; and the old New London Lighthouse, built in 1760.

The city was settled as part of the Massachusetts Bay colony by John Winthrop the younger in 1646. In 1658 the community's name, Pequot, was changed to New London, and the river on which it was situated was named the Thames. The first printing press in Connecticut began operation there in 1709. On Sept. 6, 1781, the town was attacked and burned by a British force under Benedict Arnold. Until the War

of 1812 New London carried on extensive trade with Gibraltar, the West Indies, and the Barbary States. After the war this trade declined and the city became an important whaling and sealing port. Maritime interests have dominated throughout New London's history. Pop. (1960) 34,182.

NEW LONDON, city, NE Missouri, seat of Ralls County; on U.S. highway 61; 8 miles S of Hannibal. The city is a trade center for the surrounding area. Pop. (1960) 875.

NEW LONDON, city, E central Wisconsin; at the confluence of the Wolf and Embarrass rivers; on the North Western Railway and U.S. highway 45; 20 miles NW of Appleton. The city has food-processing plants as well as wood products and brick manufacturing industries. New London was founded in 1853 and incorporated in 1877. Pop. (1960) 5,288.

NEW MADRID, city, SE Missouri, seat of New Madrid County; on the St. Louis Southwestern Railway and U.S. highways 61 and 62; 20 miles S of Sikeston. New Madrid has cotton gins. It was founded in 1783 as a fur trading post and in 1789 became the capital of a buffer territory lying between Spanish and American lands. Pop. (1960) 2,867.

NEWMAN, JOHN HENRY CARDINAL, 1801-90, English Roman Catholic prelate, was born in London, son of John Newman, a banker of Dutch extraction (Newmann), and the former *Jemima Fourdrinier*, of Huguenot ancestry. John Henry Newman took his degree at Trinity College, Oxford, 1820; became a fellow of Oriel College, 1822; was ordained in the Anglican church and made curate of St. Clement's, Oxford, 1824; became tutor at Oriel, 1826; and was appointed vicar of St. Mary's, Oxford, 1828. In 1831-32 he preached before the university; in the latter year, after a quarrel with the provost stemming from Newman's opposition to "liberalism" in religion, he resigned his tutorship. In 1833 he published a study of *The Arians of the Fourth Century* and then embarked on an extended trip to the Mediterranean countries in company with Richard Hurrell Froude (whom Newman regarded as "one of the acutest, cleverest and deepest men"). During this period Newman wrote a number of poems, including the hymn "Lead, Kindly Light," that later appeared in *Lyra Apostolica*.

Oxford Movement. After July 14, 1833, when John Keble of Oxford delivered his famous sermon on *National Apostasy*, Newman was active in the Oxford (or Tractarian) Movement, which sought to provide an apostolic foundation for the Anglican church, both High (ceremonial) and Low (liberal)—that is, to make it more "catholic." Newman made many important contributions to the series of *Tracts for the Times*, initiated in 1833, and furthered the Tractarian cause through his deliverances at St. Mary's; he was probably the most important figure in the movement. The central question for Newman during this period seems to have been: What are the necessary conditions for Christianity to be properly regarded as the "absolute religion"? European Protestantism and the Low church in England were insufficient, it seemed to him, based as they were on the Bible alone: "We have tried the Book and it disappoints because it is used for a purpose for which it was not given." This being so, it was necessary that there be an infallible church—infallible by reason of its being derived from a tradition that could be traced directly to the Cross. Newman's involvement in the Tractarian Movement may be interpreted as an attempt to discover within the Anglican church (the national establishment) roots in primitive Christianity. There are indications



Cardinal Newman

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that by 1839 Newman sensed that, for himself at least, the effort was doomed and that the *via media* "halfway" between Geneva and Rome espoused by the Tractarians would not satisfy the demands of his conscience.

In Tract XC (1841) Newman asserted that the basic creed of the Church of England (the 39 Articles) was not essentially in conflict with the fundamental tenets of Roman Catholicism. In the commotion that followed, the bishop of Oxford, Richard Bagot, angrily ordered Newman not to write any more tracts; the movement was placed under an official ban; Newman resigned from the *British Critic*, which he had edited since 1833, and went into seclusion. Subsequently he issued a public retraction of his criticism of the Roman Catholic church and resigned his vicarship at St. Mary's, 1843. He published an *Essay on the Development of Christian Doctrine* in 1845, the year in which he was formally accepted into the Roman Catholic church.

Newman As Priest and Controversialist. At Rome, in 1847, Newman was ordained a priest and given the degree of doctor of divinity. That same year he founded a branch of the Oratorians near Birmingham; in 1850 he founded a London oratory. To counter widespread antipopery sentiment in England, Newman published his *Lectures on the Present Position of Roman Catholics* (1851), in which he denounced an apostate Dominican monk named "Dr. Achilli," who was the tool of anti-Romanist agitators; Achilli was persuaded to sue for libel. In court Newman proved 23 counts of witnessed moral turpitude against Achilli, but a prejudiced judge and a "no popery" jury found against Newman, who was assessed £100 damages and about £14,000 costs. These amounts and more were raised by public subscription, the surplus being given to charity. The decision against Newman was almost universally decried, by Catholics and Anglicans alike, as a gross miscarriage of justice.

Newman spent the years 1854-58 in Dublin as rector of a Roman Catholic university. The most significant result of this period of his life was *The Idea of a University Defined* (1873), a revised version of some of his Dublin lectures. His attempt, 1858, to start a Roman Catholic college at Oxford was vetoed by Pius IX, who agreed with many English Catholics, among them Henry Edward (after 1875 Cardinal) Manning, that first attention should be given to Roman Catholic elementary education.

Throughout this period Newman was the subject of uneasy feelings among English Roman Catholics, including Manning (whose conversion to Catholicism apparently owed something to Newman's example); doubts as to the authenticity of Newman's conversion, however, were resolved for most people by Newman's eloquent *Apologia pro vita sua, or a History of My Religious Opinions* (1864). This masterpiece, considered one of the most important autobiographical works in the history of English letters, produced a great and favorable reversal of opinion about Newman, among Anglicans and Roman Catholics alike. It was written in reply to the violently anti-Catholic, romantic novelist, Charles Kingsley, who started the dispute in 1863 by casting aspersions on Newman's respect for the truth. In the *Apologia*, which was issued in seven parts between April 21 and June 2, 1864, Newman attempted to show that his spiritual development from childhood into adulthood had led him logically, even inevitably, to accept the teachings of the Roman Catholic church. Thus, he had not been led to his conversion by any kind of intellectual trickery; both his reason and his heart had been the prime factors in leading him to Rome. Apart from its being a detailed and convincing account of Newman's religious experience before his acceptance of Roman Catholicism, the *Apologia* is a valuable source for the history of the Oxford Movement and its leaders. Newman was still distrusted by some Catholics, however, especially during the controversy

preceding the proclamation of the doctrine of papal infallibility. Newman contended, against most other Roman Catholics, that publication of the doctrine should be deferred, although he left little doubt that he himself believed in it. After publication of the doctrine, 1870, Newman defended it and was especially convincing in his response, 1877, to William Gladstone's attack on the church; this response took the form of a letter to the foremost Roman Catholic layman in England, the Duke of Norfolk.

Cardinal. In 1877 Newman was elected an honorary fellow at his old college, Trinity, and visited Oxford for the first time in 32 years. When Leo XIII ascended the papal throne, 1878, representations in Newman's behalf were made by the Duke of Norfolk and others, including Manning. The result was that Newman, though only a priest, was created cardinal of St. George in Velabro, 1879, and because of his advanced age was permitted to live in England. Accepting the red hat at Rome, Newman recalled his lifelong opposition to liberalism in religion. In the context of his other utterances it is clear that for Newman opposition to liberalism did not imply acceptance of an equally undesirable rigidity in doctrine. For example, in his early work on the Arians he wrote: "There is something true and divinely revealed in every religion. Revelation, properly speaking, is an universal, not a local gift"; in 1882 he said that he still believed this. Two years later, in the magazine *Nineteenth Century*, Newman commented on the "higher criticism" of those scholars (largely German) who belittled Christianity because of supposed inconsistencies in the Bible: "The titles of the canonical books, and their ascription to definite authors, either do not come under their inspiration, or need not be accepted literally . . . nor does it matter whether one or two Isaiahs wrote the book which bears that prophet's name. The church, without settling this point, pronounces it inspired in respect of faith and morals, and if this be assured to us, all other questions are irrelevant and unnecessary."

Among other works of continuing interest by Cardinal Newman are *A Dream of Gerontius* (1866), probably his most popular poem; and *A Grammar of Assent* (1870), a logical argument for belief that should be read in conjunction with the *Apologia*.

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NEW MARKET, village, NE New Jersey, Middlesex County; on the Lehigh Valley Railroad; 6 miles N of New Brunswick. New Market is in an area of truck farms and nurseries, and has structural steel mills. The village was settled early in the eighteenth century, and during the Revolutionary War was a camp site. Pop. about 4,500.

NEWMARKET, town, S central Canada, Ontario; on the Holland River and the Canadian National Railway; 25 miles N of Toronto. Newmarket is primarily a trade center for the surrounding area. Pop. (1956) 7,368.

NEWMARKET, urban district, E England, in Suffolk County, on the Cambridgeshire border, 13 miles ENE of Cambridge. A railroad and highway junction, Newmarket is a trade center for agricultural products and has been one of the major racing centers in England since the seventeenth century. Pop. (1951) 10,184.

NEW MARTINSVILLE, city, N central West Virginia, seat of Wetzel County; on the Ohio River and the Baltimore and Ohio Railroad; 37 miles NW of Clarksburg. Main products are glassware, tiles, and other clay products. The first settler, Edward Doolin, arrived in 1780. Pop. (1960) 5,607.

can sometimes support life until the worst effects of the poison subside.

NIDWALDEN, demicanton, central Switzerland, a subdivision of Unterwalden Canton; bounded by Lake Lucerne on the N, the cantons of Uri on the E and Bern on the S, and the demicanton of Obwalden on the W; area 106 sq. mi. The region is generally mountainous and forested, with some meadow and pasture lands. There are woodworking, glass, and cement factories. The population is mostly German-speaking and Roman Catholic. The capital is Stans. Pop. (1950) 19,389.

NIEBUHR, BARTHOLD GEORG, 1776-1831, German historian, was born in Copenhagen. He entered the Prussian civil service, 1806; became royal historiographer and professor at the University of Berlin, 1810; and was ambassador to Rome, 1816-23. In 1812 he compiled from his lectures the first two volumes of his masterwork *Römische Geschichte (History of Rome)*; the third volume was published posthumously, 1832. This work, epoch making in its scientific and critical spirit, revolutionized the study of Roman history with its rejection of the legendary element in early Roman history and its reconstruction of early social and political developments. Niebuhr discovered the *Institutes of Gaius*, an early manuscript on Roman law, and edited the *Corpus scriptorum historiae Byzantinae*, a collection of Byzantine historical writing.

NIEBUHR, REINHOLD, 1892- , U.S. Protestant theologian, was born in Wright City, Mo., studied at the Eden Theological Seminary, St. Louis, and at the Yale Divinity School, and was ordained in the ministry of the Evangelical Synod of North America, 1915. As a pastor in Detroit, Mich., 1915-28, and subsequently as professor of applied Christianity at the Union Theological Seminary, Niebuhr became noted for his efforts to apply neo-orthodox Protestant Christian doctrine to social and political issues. Calling himself a Christian realist, Niebuhr strongly criticized those who considered Christianity other worldly and "only for Sundays," saying that Christians can and must apply their faith to everyday questions of living. He edited the periodicals *Christianity and Society* and *Christianity and Crisis* and wrote a number of books, among them *Moral Man and Immoral Society* (1932); *Christianity and Power Politics* (1940); *The Nature and Destiny of Man* (Gifford Lectures, 2 vols. 1941, 1943); *Faith and History* (1949); *Christian Realism and Political Problems* (1953); *The Self and the Dramas of History* (1955); and *Resurrection and Historical Reason* (1957). His brother Helmut Richard Niebuhr (1894-), a minister of the Evangelical and Reformed Church, taught at the Yale Divinity School after 1931 and wrote *The Social Sources of Denominationalism* (1929), *Christ and Culture* (1951), *The Purpose of the Church and Its Ministry* (1956), and other works.

NIELLO, the process of filling furrows incised upon a metallic surface (usually silver) with a metallic amalgam so as to produce a dark design on a bright surface. The process of incised engraving may have developed directly from the practice of taking an impression of the carved-out metallic surface before filling the furrows with the amalgam. The niello process was highly developed by fifteenth century Italian craftsmen, especially by the Florentine goldsmith, Maso Finiguerra.

NIEM, DIETRICH VON, also Nieheim or Nyem, 1340?-1418, German historical writer and papal notary, was born in Nieheim, Westphalia, and became a member of the papal curia at Avignon sometime after 1362 and, after 1376, at Rome. In his

writings, especially *Nemus unionis* (1408) and *De schismate libri tres* (1410), he traced the origin of, and sought a solution to, the great schism between Rome and Avignon. He supported the Council of Constance, 1415, which deposed Pope Gregory XII and the antipopes Alexander V and John XXIII, and which elected Pope Martin V.

NIEMEN RIVER. See NEMAN RIVER.

NIEMÖLLER, MARTIN, in full Friedrich Gustav Emil Martin Niemöller, 1892- , German Protestant churchman, was born in Lippstadt, entered the German navy at 18, and became a submarine commander. He was ordained a Lutheran minister in 1924. Assigned to a church in Berlin-Dahlem, 1931, Niemöller at first championed national socialism, but in 1933 turned against the Nazi party and in 1935 founded the Confessional church, which opposed Adolf Hitler. Niemöller was imprisoned in concentration camps from 1937 to 1945. After World War II he became president of the Evangelical church in Hesse and Nassau, and head of a union of all German Protestant churches. He lectured several times in the United States. Among his books are *Vom U-Boot zur Kanzel* (1934), *Alles und in allen Christus!* (1935), and *Herr ist Jesus Christus* (1946).

NIEPCE, JOSEPH NICÉPHORE, 1765-1833, French pioneer in photography, was born in Châlons-sur-Saône. He discovered that a sun-printed image could be permanently fixed by coating a metal plate with bitumen before placing it in the camera—the first process by which a camera picture was made. After 1829 he worked with Louis J. M. Daguerre to improve the process, particularly to shorten the exposure time. Daguerre made public the daguerrotype process six years after Niepce's death.

NIETZSCHE, FRIEDRICH WILHELM, 1844-1900, German philosopher and theologian, was born in Röcken, near Lützen in Saxony, the son of a Lutheran minister. When Friedrich Wilhelm was four, his father died; the family then moved to Naumberg. The boy was an excellent pupil (his schoolmates called him "the little minister") except in mathematics and sports. He liked poetry, music, the Bible, and the classics. During 1858-64 he attended the famous boarding school at Pforta (Schulpforte). At the university in Bonn he was admitted to the faculties of theology and philosophy, but increasingly devoted himself to classical philology under Friedrich Ritschl (1806-76); when this eminent teacher went to Leipzig, Nietzsche followed. Largely through Ritschl's influence, Nietzsche was elected, 1869, professor of classical philology at the University of Basel; he held this post until 1879, when he resigned because of ill-health dating from his brief service, 1870, in the ambulance corps during the Franco-Prussian War. A friend of his Basel years, the historian Jakob Burckhardt (1818-97), said in 1869, "Nietzsche is as much an artist as a scholar"—three years before this statement was proved true by Nietzsche's first book, *Die Geburt der Tragödie*, 1872 (*The Birth of Tragedy*, Francis Golffing trans. 1956).

Last Years of Sanity. In the 1880's Nietzsche wandered over most of Europe seeking a place where his health might improve. Despite the torments of disease, his mind remained sound until a few days before his mental collapse at Turin in January, 1889. The nature of Nietzsche's psychosis remains obscure; most authorities assume it to have been general paresis. Whatever the disease may have been, there are no indications of mental deterioration in the works he produced during his last years of sanity. Among these the following are especially significant:



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Reinhold Niebuhr



Nietzsche

that compares with a seasonally adjusted annual rate of 7.5 percent.

But he emphasized that his forecast of a stabilization was not based on a robust improvement in the manufacturing sector has stabilized

change all that Griffin said.

But Auld monthly empl

Die Morgenröte, 1881 (*The Dawn*); *Die Fröhliche Wissenschaft*, 1882 (*The Joyful Science*; book five added, 1887); *Also Sprach Zarathustra* (*Thus Spoke Zarathustra*; parts I and II, 1883; III, 1884; IV, 1885); *Jenseits von Gut und Böse*, 1886 (*Beyond Good and Evil*); *Zur Genealogie der Moral*, 1887 (*Toward a Genealogy of Morals*); *Der Fall Wagner*, 1888 (*The Case of Wagner*); *Die Götzendämmerung*, 1889 (*The Twilight of the Idols*). Certain works, written earlier, were published after his collapse, by his sister, Elisabeth Förster-Nietzsche: *Nietzsche contra Wagner* (in part, 1895); *Der Antichrist* (1895); and the autobiographical *Ecce Homo* (1908). Of various English translations, those of Walter Kaufmann (*The Portable Nietzsche*), Francis Golffing, and (though fragmentary) George Morgan are much more accurate than those in the Oscar Levy *Complete Works* (18 vols. 1909-13). The book *My Sister and I*, purportedly written by Nietzsche just before he went insane and then mysteriously lost, discovered by Levy in the 1920's, and widely circulated in an edition published (1952 and 1955) by Samuel Roth in the United States, is almost certainly spurious.

Nietzsche Against the Nineteenth Century. It has been said that in his life and his work Nietzsche embodied every significant tendency in the intellectual, religious, and moral life of nineteenth century Europe, and in this sense he has been called "Europe's bad conscience." In another sense, Nietzsche set himself against the nineteenth century—its hypocritical morals, decadence, racism, nationalism, militarism, and sterile rationalism. Nietzsche is claimed as their precursor by twentieth century existentialists who see in him an ideal case study of the crucial moral dilemmas of modern man.

In Nietzsche's dynamic view, history consists of great cultures created by vigorous, powerful peoples but prone to lapse into decadence. In periods of decadence, more than in others, great men appear (Socrates, Jesus "the noblest man," Shakespeare, Spinoza "the purest sage," Goethe)—men who transcend the decadence (weakness, self-destructiveness) around them and prefigure the future. In them, the "will to power" (self-control, self-surpassing, self-overcoming—*Überwindung*: power within and over one's self, not power over others) is strong. Nietzsche considered the Europe of his time was decadent in the extreme. Like Goethe, he toyed with romanticism, then rejected it as the epitome of decadence. In so doing he rejected his former friend, the composer Richard Wagner, whose example in large measure had inspired *The Birth of Tragedy* [*from the Spirit of Music*].

Nietzsche Against Wagner. For Nietzsche, Wagner's romanticism represented a willful surrender to the "Dionysian chaos" (whereas Nietzsche admired the Greeks and others for their "Apollonian power" to "organize the chaos"—to transcend it). Moreover Nietzsche could not stomach Wagner's obsessive anti-Semitism (the "mendacious race swindle," in Nietzsche's words) or his obeisance to the dogmas of German militarism and nationalism. Although Nietzsche admired the vigor of the early Aryan tribes, he concluded that "the Aryan influence has corrupted all the world"; moreover, he saw that the people of Germany in his time were not Aryans at all but the result of extensive (and desirable) racial mixture, and he considered the "racial purity" ideas of Wagner and other nationalists as hypocritical. Nietzsche thought of race not in terms of zoology and genetics ("blood") but in terms of culture. He regarded the Jews as one of the most vigorous and creative of peoples, by and large one of the better components of European culture.

Nietzsche Against Christianity. Personally an atheist "by instinct" (as he said), Nietzsche nevertheless had great respect for Jesus as a "noble soul," and for true Christianity as he imagined it may have been (and might be again at any time). But he despised the hypocritical "Christianity" of his time, and

asserted that Christians had never practiced the actions that Jesus prescribed for them. His often quoted (out of context) "God is dead" (in the essay "The Madman" in *The Joyful Science*) was intended as a descriptive statement, not unmingled with irony, of the progressive dilution of the meaning of God in philosophers from Gottfried von Leibniz to Gotthold Lessing, Immanuel Kant, Heinrich Heine, and Georg W. F. Hegel, and of the more general rejection by society of the "living God" in favor of a mere concept (the "moral God" of Voltaire). Yet Nietzsche perhaps was unique in willing that God be dead. Nietzsche wrote: "God is dead! God will remain dead! And we have killed him. How shall we console ourselves, we, the murderers among all murderers." And in another place: "The greatest of recent events—the 'death' of God . . . —is already beginning to cast its first shadows over Europe. . . . We must . . . expect a . . . long profusion of demolitions, destructions, ruins, and commotions: who could guess enough of them today to . . . become the prophet of such immense terrors, such darkness, such an eclipse of the sun as has never yet been known. . . ." Nietzsche clearly did not entirely relish the prospect of the nihilism and madness he saw approaching, but hoped that as the rubble of decadent Europe was cleared away there would occur a new mixture of fruitful forces and counterforces from which would arise a new European race of *Übermenschen* ("over-men" who have wholly mastered themselves) who would not be fettered by nationalism, socialism, militarism, racism, "Germanism," and other manifestations of a decadent society.

Nietzsche's Sister and the Nazis. During his last years Nietzsche's affairs were wholly under the control of his sister. Both she and her husband, Bernhard Förster, were prominent in the German anti-Semitic movement, and falsely represented Nietzsche as being anti-Semitic and in favor of pan-Germanism, Prussianism, militarism, "Wagnerism," and the like. A large portion of Nietzsche's writings, especially after 1885, were attempts to counter such misrepresentations. It has been said by those personally acquainted with both Nietzsche and his sister that she understood virtually nothing of his thought, and (as Walter Kaufmann has put it) she "inverted" her brother's philosophy into a crude doctrine of pagan mysteries. . . . This is especially evident in her mis-handling of the mass of unorganized and miscellaneous notes that she collected and published after Nietzsche's death as *Der Wille zur Macht* (*The Will to Power*), and misrepresented as his "final testament." In the notes to his definitive edition of Nietzsche's complete works, *Werke in drei Bänden* (1958), for which all surviving original manuscripts were consulted, Prof. Karl Schlechta proved that Frau Förster-Nietzsche resorted to numerous forgeries in order to reinforce the misrepresentation of her brother's views. Her distortions were later utilized by the Nazis in seeking to misrepresent Nietzsche as their precursor.

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NIUWPOORT, or Nieuport, town, W Belgium West Flanders province; on the Yser River; 40 miles SW of Ostend. The chief industries are fishing, and the manufacture of bricks and chemicals, and there are large oyster beds. Nieuwpoort was a strong fortress in the Middle Ages. In 1488-89 it resisted a siege by the French, and in 1600 it was the scene of a Dutch victory over the Spaniards. The locks of one of the main outlets of the drainage system of the Low Countries are located near Nieuwpoort; they were opened in 1914 to flood the battle front on the Yser and thus halt the advancing German troops. The

There are two fundamental ways to protect people from a noise once it has been created. Sound insulation is afforded by solid walls and closed windows. Although any barrier of this sort will reflect much of the sound that strikes it, satisfactory reduction of intense levels of noise may require exceedingly heavy structures—two 8-inch-thick concrete walls separated by several inches of air, for example. Because even small cracks and openings destroy the effectiveness of sound insulation, enclosures designed to stop sound usually must be airtight. The second approach to reducing levels of noise is that of sound absorption. A sound wave that strikes a porous, fibrous material will penetrate into the cavities and dissipate much of its energy there because of friction between the air and the material. Acoustical tiles and blankets of glass fibers are common examples of materials that will absorb noise. Such materials are used to line ventilation ducts so that the noise produced by the fan is gradually absorbed along the duct until the level is too low to cause a disturbance. Sound-absorbent materials covering ceilings also strongly reduce the noise levels at a distance from the source of noise in a room.

It is fundamentally the collective actions of individuals through selective buying, co-operation in community noise-abatement activities, and demands for the vigilant enforcement of local antinnoise ordinances that will prevent urban living conditions from becoming unendurable by reason of noise.

P. W. SMITH, JR.

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NOLA, town, S Italy, Campania Region, Naples Province, 15 miles NE of Naples. It is an agricultural center, and has macaroni and glass factories. One of the most ancient towns of Campania, Nola fell to the Romans in 311 B.C. St. Paulinus is said to have introduced at Nola the use of church bells. The Emperor Augustus died there A.D. 14, and the freethinker, Giordano Bruno, was born there in 1548. Pop. (1954) 22,211.

NOLDE, EMIL, real name Emil Hansen, 1867–1956, German expressionist painter and graphic artist, was born in Nolde, Schleswig, and studied in Munich, Copenhagen, and Paris, where he was attracted by the work of the French impressionists. Seeking a style that would express powerful concepts and emotions, he broke with the impressionists, about 1904, and aligned himself briefly with the German expressionist painters of the *Brücke* (Bridge) group. Too individualistic to remain long within any school, Nolde worked independently after 1907. He

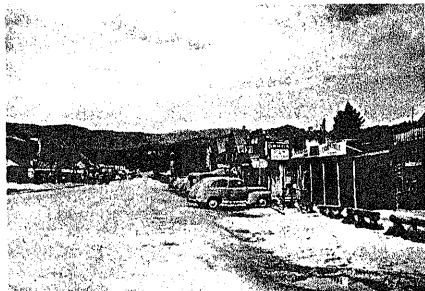
Emil Nolde's *Christ Among the Children*, 1910, is a fine example of the German artist's broad brush strokes that imbue his canvases with their characteristic intensity.



MUS. OF MODERN ART, N.Y.

began a series of religious paintings (*The Last Supper*, *Pentecost*, *Triptych of St. Mary of Egypt*, and others) distinguished by their violent and frightening feeling as well as by the artist's typically brilliant coloration. Later, after a trip to Russia and the Far East, Nolde executed water colors, engravings, and paintings that explored the nature of primitive societies.

NOLLE PROSEQUI, from the Latin meaning unwilling to prosecute, an entry of record made by the plaintiff in a civil suit or the prosecuting officer in a criminal action declaring that he will proceed no further as to some or all of the counts, or some or all of the defendants. In a criminal action *nolle prosequi* does not have the effect of acquittal, since the defendant can be reindicted; and in civil cases it does not bar future actions. In many jurisdictions *nolle prosequi* may be entered without the consent of a defendant before a jury is impaneled, but his consent is necessary if a jury has been impaneled.



WIDE WORLD
Nome, main supply center for the large and rich Seward Peninsula placer mining district, can be reached by dog team, airplane, and from May to November by steamship.

NOME, city, Alaska, SW Seward Peninsula; on the N shore of Norton Sound; 550 miles W of Fairbanks. The city is in a gold-mining, fur-trapping, and fur-farming area, and is the supply center for northwest Alaska. Its port, open from June to November, has steamer service to Seattle. Mark Field, a commercial and military air base, is nearby. Natives of the region produce needlework and ivory carving that are among the finest Eskimo craftwork. In 1898–99, gold was discovered in the vicinity and by 1900 Nome was the center of a gold rush. The population of the city reached more than 12,000 before it was sharply reduced by the dwindling number of gold strikes and the harshness of the climate. After a devastating fire in 1934 Nome was largely rebuilt, and in 1950–51 a sea wall was constructed. Pop. (1960) 2,316.

NOMENCLATURE. See CLASSIFICATION OF LIVING THINGS.

NOMENKAN, or Nomonhan, town, N China, Inner Mongolian Autonomous Region; near the border of the Mongolian Peoples Republic; 520 miles NNE of Peking. In the spring of 1939 the town was the scene of a clash between Japan and the Soviet Union preceding World War II and regarded as a test of modern means of warfare. Minor border incidents rising from Soviet aid to China and the controversy over fishing rights off the Kamchatka Peninsula led to large scale military action on the border between Outer Mongolia and Manchuria. Fighting raged through the summer into autumn, ending with an armistice after many casualties.

NOMINALISM, that philosophical viewpoint which insists that human language does not have in fact, and cannot have in theory, any necessary connection with ultimate reality. Metaphysically, nominalism assumes that a world of ideas such as postulated by Plato does not in fact exist. Plato believed

that all particular things and qualities are imperfect reflections of perfect, ideal forms (universals) which exist in the realm of ideas; for example, any particular cow is a more or less imperfect copy of the perfect, universal cow in the world of ideas. This universal cow is ultimately real, and such reality as any particular cow may have devolves upon it through its relation to the universal cow. The word *cow* as applied to particular cows is more real than these particular cows, since the word's ultimate referent is the universal cow. During the Middle Ages this doctrine came to be known as realism (see REALISM, Realism in Philosophy).

Since for nominalism there is no realm of ideal forms (or, if there is such a realm, human beings cannot know of it), it follows that words cannot refer to or derive their meaning from ideal forms, or universals; therefore such meaning as words may have, must derive entirely from the particular objects to which they refer—such, at least, is the "either/or" upon which nominalism depends. Carried to its logical conclusion, nominalism asserts that all words (*cow, truth, God*) are accidental, arbitrary, and based at best upon customary, conventional usage. Thus, even if the word *cow* is used without reference to a postulated ideal cow, the word is unreal as a designation for all particular cows since, despite apparent similarities, no two cows are exactly alike. Since only this or that particular object is real, the nominalists' references to seemingly similar particulars by common names is entirely a matter of social convention—perhaps useful if recognized and discounted as such, but harmful if accepted literally.

Although the tendency to think in this way existed in ancient philosophy, it did not achieve prominence (nor was it called nominalism) until the Middle Ages when nominalists such as the French ecclesiastic, Berenger de Tours (998-1088), and the scholastic theologian, Roscellinus (died after 1120), disputed with realists such as Guillaume (William) de Champeaux (1070?-1121). The greatest theologian of the twelfth century, Abélard (1079-1142), brilliantly concurred the two views (see ABÉLARD, PIERRE; CONCORDANCE, *Philosophy and Theology*; CONCEPTUALISM). In the fourteenth century the English "Doctor Invincibilis" William of Ockham, or Occam (1300-?49), fostered nominalism, stressing its virtues as a conceptual aid in the development of natural science. A tendency among many later thinkers and scientists was to regard the natural order of things in terms of nominalism while remaining realists in matters affecting faith and morals. The various positivist schools (see POSITIVISM) were nominalistic in their assumptions, as were most schools of philology, linguistics, and "language reform" in the nineteenth and twentieth centuries.

NOMOGRAM. See ALIGNMENT CHART.

NOMONHAN. See NOMENKAN.

NONAE. See CALEND.

NONCOMMISSIONED OFFICER, an enlisted person in U.S. military and naval service who holds a grade or rating conferred by special order of a local commanding officer authorized to confer or withdraw such ratings. A noncommissioned officer does not have rank as do commissioned officers, or a warrant of the type granted warrant officers. Hence, he can never issue a command, only an order. In naval service noncommissioned officers are called petty officers.

In the U.S. military and naval services noncommissioned officers are graded hierarchically according to position and pay scale. In the Army the grades of noncommissioned officers in charge of personnel are (in ascending order) corporal, E-4 (enlisted man fourth grade); sergeant, E-5; sergeant first class, E-6; and master sergeant, E-7. Corresponding specialist grades are specialist third class, E-4; specialist second class, E-5; specialist first class, E-6; and master

specialist, E-7. The Military Pay Act of 1958 recommended that pay grades E-8 and E-9 be added to both classifications. Navy noncommissioned grades are petty officers third, second, and first class; chief officer; senior chief petty officer; and master chief petty officer. Marine Corps noncommissioned grades are corporal, E-3 (grade E-3 is private first class in the Army); sergeant, E-4; staff sergeant, E-5; technical sergeant, E-6; master sergeant, E-7; first sergeant, E-8; and sergeant major, E-9. Air Force noncommissioned grades are airman first class, E-4; staff sergeant, E-5; technical sergeant, E-6; master sergeant, E-7; senior master sergeant, E-8; and senior master sergeant, E-9. See CORPORAL; INSIGNIA; PETTY OFFICER; SERGEANT; WARRANT OFFICER.

NONCONFORMITY, refusal to comply with established rules or ceremonies, especially religious rules or ceremonies. Historically notable nonconformists were those members of the Church of England who refused to attend the church's services, and clergymen who denied obedience to the Act of Uniformity, 1662, which required the use of the Book of Common Prayer in public worship. At the time of the passage of Queen Elizabeth's Act of Uniformity, 1559, which required kneeling at the altar and wearing specified vestments, there were nonconforming bishops. The climax of nonconformity came in the "great ejection," 1662, when 2,000 Puritan clergymen resigned rather than comply with the Act of Uniformity. The Religious Toleration Act of 1689 brought relief to nonconformists. In England all non-Anglican communions are technically nonconformist. Nonconformity is possible in any country with an established national church, but in countries where church and state are separate, such as the United States and France, nonconformity cannot exist. See CHURCH; PURITANISM; TOLERATION ACT.

JAMES D. MOSTELLER

NONFEASANCE, the nonperformance of some act that ought to be done. It generally does not indicate breach of contract, but rather failure to perform a duty, whereby some individual sustains damages. When a legislative act requires a person to do a thing, nonfeasance subjects that person to punishment. For example, if a statute requires supervisors of highways to make repairs, supervisors who neglect to do so may be punished.

NONFERROUS METALS AND ALLOYS. See ALLOY; METAL.

NONIMPORTATION, a policy adopted on several occasions by American colonists and later by the United States as a retaliation against measures of the British government. As a gesture of protest against the Stamp Act (see STAMP ACT), several colonies agreed in 1765 to refrain from importing British goods. The refusal of all 13 colonies to import from Britain in 1770 caused the repeal of most of the Townshend Acts of 1767 (see TOWNSHEND ACTS). A nonimportation resolution by the first Continental Congress in September, 1774, failed to win concessions. After the ensuing Revolutionary War the policy of nonimportation was revived by the United States in 1806 to discourage Britain from seizing U.S. vessels and seamen (see IMPRESSMENT). The trade restrictions were unpopular in New England, however, and the policy was abandoned the same year. See EMBARGO, *The American Embargo of 1807*; NONINTERCOURSE ACT; WAR OF 1812.

NONINTERCOURSE ACT, a U.S. law that became effective beginning Mar. 1, 1809, designed to induce Great Britain and France to repeal measures restricting free trade (see BERLIN DECREE; CONTINENTAL SYSTEM; MILAN DECREE; ORDER-IN-COUNCIL). It replaced the unpopular Embargo Act of 1807 (see EMBARGO, *The American Embargo of 1807*) by forbidding relations only with Britain and France, and provided that relations would be reopened with whichever of the warring nations first removed its restrictions on neutral trade. The act failed to impress

distance from P to the directrix DD' , a line parallel with and at a distance d' from the line OY . The angle JPF , formed by the tangent to the parabola at P , is equal to the angle PJF , and thus a light or sound ray leaving the focus F is reflected parallel with the axis by the parabolic curve. This property has important optical and acoustical applications.

The circular paraboloid is a surface in three-dimensional space obtained by rotating a parabola about its axis. It is a special form of the elliptic paraboloid (Fig. 2), such that a plane perpendicular to its axis always cuts the surface to form a circle. In this instance the plane of the parabola has been rotated about the Z axis to form the paraboloid. The circular paraboloid always has a single focus. A reflecting paraboloidal surface with a sound or light source at its focus will reflect radiation parallel with its axis. Paraboloidal reflecting surfaces are therefore used in such important devices as searchlights, automobile headlights, and radar directive antennas.

Since in practice only a finite part of the paraboloidal surface can be used in a real reflector, the reflected radiation is only approximately parallel with the axis. The greater the ratio of the wave length of the radiation to the focal length of the paraboloid, the larger the deviation from parallelism. This fact explains the reason for paraboloidal reflectors of practical size having sharp beams for visible light, less sharp beams for radar, and too little directional effect to be of value in the transmission of ordinary radio waves.

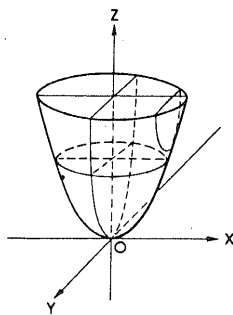


Fig. 2. Circular Paraboloid

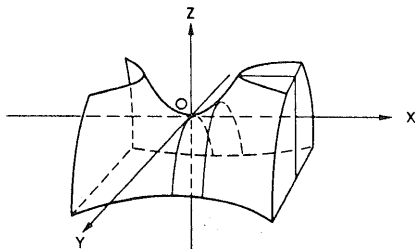


Fig. 3. Hyperbolic Paraboloid

More general quadric surfaces are also called paraboloids. An elliptic paraboloid as in Fig. 2, for instance, is a surface such that any plane parallel with its axis cuts it in a parabola, whereas any other plane cuts it in an ellipse. The hyperbolic paraboloid of Fig. 3 is defined similarly, but with hyperbolas replacing ellipses in the definition. See ELLIPSE; HYPERBOLA. EDMUND PINNEY

PARACEL ISLANDS, South Vietnam, a group of low coral and reef islands in the South China Sea, 440 miles W of Luzon and 220 miles E of Vietnam. The Paracels include the Amphitrites on the northeast, the Crescents on the west, Triton Island on the southwest, and Lincoln Island on the east. They are uninhabited except for a small number of guano workers, turtle hunters, and military personnel.

PARACELSUS, 1493–1541, Swiss-German physician and scientist, was born Philippus Theophrastus Bombastus von Hohenheim in Einsiedeln, Switzerland. He learned chemistry, botany, medicine, and mineralogy from his father, the physician Wilhelm von Hohenheim, who also taught him to learn from experience and not just from books. Theophrastus attended the universities of Tübingen, 1508, Vienna, 1511, and possibly Ferrara, 1513. Holding that "the human mind knows nothing of the nature of things from inward meditation," he traveled through Europe, the Near East, and the Orient, 1511–26, often serving as military physician and surgeon. Called to the medical faculty at Basel, 1527, he remained there only a year. His open scorn for ancient Greek and Latin medical authorities irked the humanists, who sarcastically dubbed him Paracelsus for apparently presuming to be "greater than (Aulus Cornelius) Celsus." Theophrastus disliked Latin nicknames but agreed that Paracelsus was accurate enough and bore the name proudly. He further scandalized classicists by lecturing in "barbaric" German on books written by himself instead of in Latin on texts by earlier scholars (see HUMANISM). He antagonized "pharmacists" by denouncing their concoctions (polypharmacy) as worthless. He embarrassed students by rejecting fundamental assumptions of medicine as then understood and by introducing new concepts and terminology of his own. He treated the poor without charge, but annoyed wealthier patients by demanding they pay for his services. His departure from the city, desired by many, was precipitated by a dispute over fees, 1528. From that time Paracelsus was an itinerant physician who claimed rightly that he could cure diseases others thought hopeless, while remaining a perennial student who knew that a scientist's knowledge is never complete. He died at Salzburg, and there is some evidence to suppose the contention that he was murdered.

Controversial Figure. During his lifetime and after, Paracelsus was identified by common folk and poets with the legendary Faust (see FAUST). The alchemists idolized him, and called him Aureolus (golden one) after a famous predecessor; some scientists later scorned him as an alchemist, although Paracelsus' purposes and methods had been opposed to those of alchemy (see ALCHEMY). Some accused him of stealing ideas from the *Triumph of Antimony* (1677) of Valentinus (Basil Valentine)—although Valentinus probably never existed (see VALENTINIUS) and in any case the book was a forgery written decades after Paracelsus' death, probably by Johann Thölde. Eventually Paracelsus' contributions to science were recognized and by mid-twentieth century he was acknowledged as among the most original and powerful influences that come to bear on the development of modern science.

Methods, Concepts, and Contributions. Acting on the credo that "the physician's business is to know the varieties of the processes that take place in the body, and the right remedies that exist in nature," Paracelsus rejected the old static theory of four humors whose relative proportions determine bodily condition (see HUMORS), and introduced the dynamic concepts of bodily process and metabolism into physiology and medicine. Rejecting the medieval hierarchic conception, he was among the first to view nature as an entity whose forces (laws) reign supreme, affecting plants, animals, and man alike; as he put it, "nature has within her visible and invisible forces, visible bodies and invisible, and all are bodies and are natural . . ." He originated and developed



Paracelsus

the theory of protoplasm and anticipated the germ theory of disease and much of cell theory in biology. He was first to recognize gases ("chaos") as distinct from air in general. The fundamental ideas of chemotherapy originated with Paracelsus (see CHEMOTHERAPY). He insisted that chemicals used to help nature cure must be specific, both in kind and in amount, and that almost any substance may be beneficial or harmful depending upon the amount used and the way it is combined with other substances. He introduced arsenic, mercury, sulfur, and other chemicals to medical practice. He anticipated Ambroise Paré (1517-90) in stressing asepsis in treating wounds and in surgery, and the conservative use of surgery. His accurate clinical description of syphilis was the first, and he introduced mercury therapy for the disease. He was the first to concern himself with gynecology as a medical specialty, and first to recognize the influence of heredity, occupation, and environment on disease. He wrote the first accurate clinical descriptions of mental illness (hysterical conversion symptoms and epilepsy) and recognized that such "invisible diseases" are different in kind from purely somatic illnesses. He was first to describe tartar and to discuss "tartaric diseases" such as arthritis. In sum, Paracelsus has been called by various historians the founder of gynecology, internal medicine, occupational medicine, chemotherapy, scientific pharmacology, biochemistry, and several other specialties.

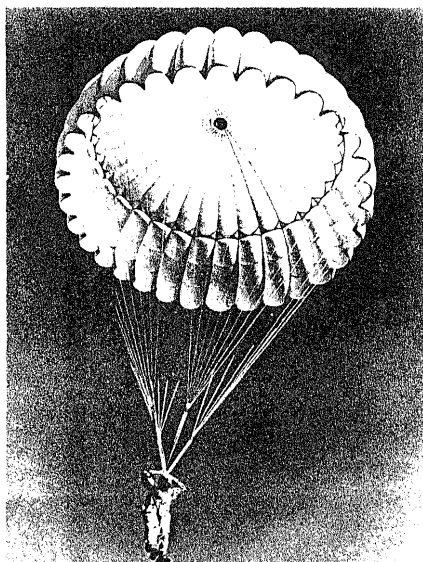
Works. Many spurious works were long accepted as genuine. In the genuine works Paracelsus coined dozens of words (many of them, such as *protoplasm*, still in use) and used many alchemical terms in a different way than had his predecessors. For these and other reasons, views opposed to those he actually held have often been attributed to him. The best critical edition of Paracelsus' works is that of Karl Sudhoff: *Samtliche Werke* (14 vols. 1922-33). Of various collections in English translation, *Paracelsus: Selected Writings* (J. Jacobi, ed., 1951) is especially good.

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PARACHUTE, a device that opens like an umbrella to retard the descent of an attached object falling through the air. The parachute is used chiefly to enable an occupant of an aircraft to reach the ground safely after abandoning the craft in flight. It is also used to drop military equipment, food, and supplies to the ground from aircraft flying overhead, and to return to earth instruments and cameras sent aloft in rockets or guided missiles.

Structure and Operation. The chief element of a parachute used for personnel is its canopy, usually 24 to 30 feet in diameter and made of a light fabric such as silk or nylon. At close intervals around the periphery, or hem, of the canopy, suspension cords of cotton, silk, or nylon cording about 25 feet in length connect the canopy to straps that meet in a harness worn by the parachutist. For dropping supplies, a cheaper parachute, square and made of cotton, has been developed.

When not in use the parachute for personnel is folded compactly in a back pack, seat pack, or chest pack. The first two cannot be detached from the harness, and form a back cushion or seat cushion for the wearer. The chest pack fastens to the harness by means of snap rings. It is usually kept near the person who is to use it, and can be attached to the harness quickly. The harness consists of canvas straps that fasten about the chest and legs. The harness for the chest pack also has a canvas back. The seat or back pack is usually used in light aircraft, the chest pack in heavy aircraft. So important is the correct packing of



U.S. OFFICE OF WAR INFORMATION
A parachutist descends at the rate of 12 miles per hour. The shock of his landing may be equated with the shock that is felt after a free fall from a height of about 8 feet.

parachutes that parachute riggers are licensed by the U.S. Civil Aeronautics Authority. Parachutes must be inspected every 10 days and repacked every 60. It is not required that they be carried in civil aircraft except when acrobatic flying is to be done. Occupants of military and naval aircraft, however, must wear parachutes.

To open any type of parachute, the wearer normally pulls a handle attached to the ripcord; the ripcord then releases a small parachute called the pilot chute, which as it fills with air pulls the main canopy out of the pack. In mass jumps, as of paratroopers, the ripcord is fastened to a static line, which pulls the parachute open after the wearer leaves the aircraft. In either case the main canopy becomes inflated in less than a second after the ripcord is pulled. This quick rate of opening makes it desirable, if there is time, for the wearer to make sure he is well clear of the aircraft before opening the parachute, so that it will not become fouled on some part of the aircraft. The shock of opening is quite severe; its effects are lessened if the harness is fitted snugly. Because of the time required to get clear of the aircraft and pull the ripcord, a parachute jump cannot usually be made safely from an altitude of less than about 500 feet. Parachute jumps have been made from altitudes in excess of 40,000 feet.

A man falling freely will reach a terminal velocity of about 118 mph; with a standard parachute he will descend at about 12 mph, or 17 feet per second. The shock of landing in a parachute is about equivalent to that of a jump from an 8-foot wall. It may be increased if there is a strong wind. Because of the danger of being dragged by the wind, upon landing, the harness should be disengaged quickly or the parachute collapsed by pulling on the risers of one side.

At high altitudes and speeds, the opening shock force of a standard-type parachute reaches great proportions. More effective under such conditions is the ribbon parachute, made of interlaced ribbons designed to allow the air to leak between them. The air seeps through at first, but as the parachute fills out,

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PLATEAU, an elevated land mass, often deeply cut by valleys having flat interstream areas and local relief of more than 500 feet. A plateau is distinguished from a plain by the magnitude of the local relief and by the abrupt termination on one or more sides. Most of the great plateaus of the world are in dry areas, and are more than 2,000 feet above sea level. The intermontane plateaus were uplifted in association with the enclosing mountains. The plateau of Tibet and the Altiplano of the Andes are 10,000 to 15,000 feet above sea level. The Great Basin and Columbia Plateau in the United States are other examples. Greenland's great ice plateau lies between mountain ranges. Piedmont plateaus, lying between mountains and bordering plains or the sea, are usually small. Patagonia (Argentina), which is a plateau of this type, ends in an escarpment 300 to 600 feet above the Atlantic. The Piedmont Plateau of the Appalachian region is bordered by coastal plains. Continental plateaus or tablelands are extensive. The Iberian (Spain), Iranian, Arabian, and Anatolian (Turkey) plateaus rise from narrow coastal plains and—like Africa, the greatest plateau of this type—have small, interrupted mountain ranges that tower over the general level of the plateau. See **LOWLAND**; **PLAIN**.

PLATEN HALLERMUNDE, AUGUST PLATEN, COUNT VON, 1796–1835, German poet and dramatist, was born in Ansbach. After a brief career in the army he went to study at Würzburg. A devoted student of the classics, Hallermünde (or Hallermund) soon became known as a bitter foe of the Romantic movement, and his satirical play *Der romantische Oedipus* (1828) touched off a long literary feud with Heinrich Heine and other romantic poets of the day.

PLATINUM, a tin-white precious metal and element, symbol Pt, that has an atomic weight of 195.09 and an atomic number of 78. It is a member of group VIII in the periodic table (see **PERIODIC TABLE**) and has a specific gravity of 21.37. Platinum is malleable and ductile, melts at 1774°C (3227°F) and boils at 4300° (7740°F), and is a poor conductor of electricity. It is easily welded at red heat, and since its coefficient of linear expansion is approximately equal to that of glass, wires made of platinum can be sealed hot into glass vessels without causing the vessels to crack upon cooling. This property is of especial importance in the manufacture of electrical apparatus. Since platinum is chemically inactive, it is a useful noncorrosive material as well.

Properties. Platinum is insoluble in nitric acid, HNO₃, and hydrochloric acid, HCl, but is soluble in hot aqua regia. It does not oxidize in air at any temperature and is highly resistant to the action of most chemical reagents, although it is corroded by chlorine, bromine, cyanide, sulfur, and caustic alkalis. It is made brittle in smoky flames, and easily forms fusible alloys with lead and similar metals. When in a spongy form prepared by heating some of its compounds, platinum has the remarkable property of bringing about the union of oxygen and hydrogen. Thus, a jet of hydrogen is ignited if a bit of platinum sponge is held in it, a principle made use of in Döbereiner's lamp and in self-lighting gas burners. In a similar way it brings about the union of sulfur dioxide and oxygen to form sulfur trioxide, employed in the manufacture of sulfuric acid by the contact process.

Platinum forms two classes of compounds, platinum and platonic, of which platonic chloride, PtCl₄, is the best known. This compound combines with hydrochloric acid to form chloroplatinic acid, H₂PtCl₆, when platinum is dissolved in aqua regia. The chloride can then be extracted by cautious heating. Chloroplatinic acid is valuable as a reagent for potassium, ammonium, and the amines, yielding somewhat insoluble precipitates with them. These precipitates yield metallic platinum on heating.

Platinum also forms several oxides. Platinous oxide, PtO, may be formed by continuously heating de-

hydroxide. This oxide reacts with acids to yield platinous salts, in which the metal has a valence of 2. Platinum dioxide, PtO₂, is a black solid that is formed when platonic hydroxide is gently heated.

Extraction. Crude platinum is obtained by two methods: panning by hand and dredging. It is extracted from its ores by wet and dry methods. In the wet method the ore undergoes preliminary purification by heating and digestion with acids, and is then heated with aqua regia, which dissolves the platinum, palladium, ruthenium, and some of the iridium. The palladium is then removed and the platinum is precipitated by ammonium chloride.

The dry process depends on making a fusible alloy of platinum and lead. With a little glass for flux, a mixture of ore and equal weights of galena and litharge are heated to full redness in a reverberatory furnace lined with clay. The sulfur of galena is oxidized and expelled, and the liquid alloy of lead and platinum is allowed to rest for some time so that the osmide of iridium sinks to the bottom. The upper portions of the alloy are then decanted and cast into ingot molds. The metallic platinum remaining is melted and refined.

Occurrence. Platinum was first discovered in South America in 1735. It occurs in alluvial deposits, as small grains or pebbles or in rock-forming minerals. Native or crude platinum usually occurs with some gold, copper, iron, and sand, and as an admixture in varying proportions in several metals including iridium, rhodium, palladium, osmium, and ruthenium. Sometimes, however, it is in the form of masses and pieces weighing 10 to 20 pounds. It is found principally in the Ural Mountains of the U.S.S.R., South Africa, Colombia, and in the western United States—chiefly in Alaska; in Butte, Humboldt, Plumas, Sacramento, and Yuba counties in California; in southwestern Oregon; and along the Gila River in Arizona. In Canadian nickel deposits platinum is found as sperrylite, PtAs₂.

Uses. Because of its luster and permanence, platinum is used in the manufacture of jewelry, especially as a setting for precious stones. In the chemical industry platinum is employed for making and covering apparatus and utensils such as crucibles, spoons, blowpipe points, boilers, pyrometers, and tongs. In the electrical industry it is used for contact points and resistance wire, as electrodes, and in X-ray apparatus, permanent magnets, and jet engines.

Platinum is used in dentistry for fillings and instruments. The wearing quality of platinum is increased by alloying it with other metals, usually iridium or palladium. Platinum in the finely divided state or in the form of fine wires is used as a catalyst. Compounds of platinum are used in photography and in petroleum cracking.

PLATO, real name Aristocles, 429?–347 B.C., Greek philosopher, was born probably in Athens, the native city of his parents: Ariston, of the aristocratic Codrus family; and Perictione, or Potone, who was descended from Solon. In antiquity it was supposed that Plato was descended from the god Apollo, and that while he was a child his future eloquence was foreshadowed when a swarm of bees settled and deposited honey on his lips. Plato received the customary education of the well-born Athenian: reading and writing, music and painting, and gymnastics. Like most of his class he memorized the works of Homer and the lyric poets; and he tried his hand at epic poetry, but burned the results. His lyric poetry proved equally unfortunate, and he turned to the drama, but soon gave up the attempt. Having failed to accomplish anything worthwhile, he became a philosopher.

Philosophical Apprenticeship and Travels. Plato came under the influence of Cratylus, disciple of the "weeping philosopher" Heraclitus, but this and other early influences were eventually overshadowed by that of Socrates, with whom Plato became associated at about the age of 20 and with whom he remained

for eight or nine years until Socrates' death in 399 B.C. In Plato's writings the Western world has a vivid picture of the character of Socrates, a picture almost wholly at variance with that presented by several contemporary authors. There is no doubt, however, that the Athenians hated Socrates, and after his death Plato and other Socratics felt it would be advisable to leave the city.

According to Platonic tradition—a tradition often questioned but never disproved in any major way—Plato's subsequent travels included a visit to the Pythagorean school (see PYTHAGORAS) in Magna Graecia (Italy), where he became the friend of the Pythagorean Archytas of Tarentum (died ?365). Leaving Tarentum, Plato tarried briefly in Sicily, then perhaps went to Cyrene, a Greek colony in Africa. More certain is the ensuing visit to Egypt, where the philosopher, disguised as an oil merchant, picked up a certain amount of astronomical lore. According to some interpreters Plato borrowed most of his cosmology from the Egyptians, but it seems unlikely that the Egyptian priests would have confided their most esoteric secrets to a Greek oil salesman. Moreover, all of the ideas that he allegedly acquired in Egypt were undoubtedly already known to him before his visit there—part of the intellectual currency of dozens of wandering scholars and sages of the Aegean-Mediterranean region, many of them forced to travel from place to place by fear of unruly tyrants and populace.

Leaving Egypt, Plato passed through Sicily again and at Syracuse, 388, engaged in disputation with the tyrant Dionysius I (see DIONYSIUS THE ELDER). Enraged at being bested in argument, Dionysius almost killed Plato, but instead sold him as a slave to the people of Aegina. Soon ransomed, Plato returned to Athens, 387, and within the next year or two founded the Academy—in substance a shady grove where Plato talked and pupils listened, in form a corporate body that continued in existence until A.D. 529, when Justinian abolished it.

Forty Years of Teaching. Plato devoted most of the last 40 years of his life to the Academy and to the composition of his philosophical works. In 367, however, his friend Dion of Syracuse (see DION) told him of the death of Dionysius the Elder and suggested that the teachings of Plato might appeal to Dionysius II (see DIONYSIUS THE YOUNGER). Hoping that the new ruler could be transformed into a philosopher-king, Plato journeyed to Syracuse, 367, but found the younger Dionysius to be as unphilosophical as the elder. Plato made a third trip to Syracuse, 361, but was again unsuccessful and was even imprisoned briefly. He was soon back in Athens, and continued to teach and write until his death.

Platonism, or the Platonic tradition, proliferated throughout the Western world and became an important influence on most of the major intellectual currents of the Christian Era, including Christian theology itself. Platonism embraces a web of sometimes superficially contradictory elements, one or another of which has often been stressed at the expense of others. Of prime significance in the tradition is the life of Socrates as told by Plato, including the master-pupil relationship of Plato and Socrates, the dramatic conflict of Socrates (and thus of Plato) with the Sophists and with Athens, the formation of the Academy as a school within but opposed to the city-state, and the master-pupil relationship of Plato and Aristotle (see ARISTOTLE; SOCRATES). Another factor is the philosophical method of Socrates as described by Plato, and as modified by him: the method of dialectics. Out of this method Plato and Aristotle developed specific doctrines of a metaphysical nature—doctrines that apparently conflict on virtually every fundamental point, and that prefigure virtually every issue in later philosophy. Even within the body of doctrine developed by Plato alone there are apparently (but perhaps not actually) divergent trends. On the

one hand there are the ethical, political, and educational theses based on a hierarchical theory of truth (most systematically expressed in the *Republic*), on the other hand a strong emphasis on arithmetic and geometry conceived in terms of a living cosmos (best expressed in the *Timaeus*).

Authenticity of Plato's Works. The only dialogues of Plato mentioned by Aristotle are the *Hippias I*, *Meno*, *Gorgias*, *Phaedrus*, *Republic*, *Law*, and *Timaeus*, but other ancient authors listed many additional ones. In the first century A.D. editors of works ascribed to Plato arranged them in nine tetralogies—36 works in all; in addition, there were some 13 letters. In subsequent centuries various editions of Plato's "complete" works appeared, but few agreed as to the number of authentic works. A "complete" edition produced early in the nineteenth century included some 55 dialogues; later in the century the "higher critics" rejected many of them as unauthentic. Yet even at mid-twentieth century experts continued to disagree radically as to the number of authentic works, and much criticism of the Platonic canon continued to be marred by inconsistencies in the evaluation of evidence.

Of central importance to the problem is the fact that no original manuscripts exist. The best manuscripts of most of the dialogues, but not including the *Republic*, are those of the *Codex Clarkianus* (Bodleian Library, Oxford) which dates from 896 and can be presumed to be far removed from such autographs as may once have existed; the earliest satisfactory manuscript of the *Republic* is the eleventh century *Codex Parisinus A*. Thus the best available manuscript sources are centuries removed from the originals and presumably reflect the efforts of various copyists over many generations. For this and other reasons many twentieth century authorities question the wisdom of nineteenth century "higher critics" who rejected many works solely on the basis of minor inconsistencies in style and vocabulary. The dialogue *Theages*, for example, was long regarded as definitely unauthentic by reason of the appearance in extant manuscripts of one word—a Christian term—that Plato could not have known, but it has been accepted as Plato's work by some modern authorities who regard it as being among the most significant of the dialogues. Some have asserted that there is no conclusive evidence that any one of the dialogues is authentic or unauthentic, either wholly or in part, and that there is therefore little reason not to accept all of the works sanctioned by the Platonic tradition before the nineteenth century—for it was this tradition, more than the works themselves, that remained a powerful force in cultural history for more than 2,000 years.

In forming this Platonic tradition in the West, the *Timaeus* was of greater importance than any other single work of Plato, for it was the only one of which any considerable portion was known throughout the Dark and Middle Ages. It was translated into Latin in 325 by Chalcidius who, for this one act, has been credited with saving Plato for Christianity. The *Republic* was unknown in Europe until 1440, after which those who favored the secular state as against the church used the "new" dialogue as a political weapon and (as part of the Humanist program of belittling everything "medieval") minimized the importance of the *Timaeus*. Only in the twentieth century was it recognized by more and more scholars that the *Timaeus* remains the more important of the two works, for it prefigures many of the conceptions of post-Newtonian physics and cosmology, whereas the doctrines of the *Republic* (and, by extension, of the *Law*) have their ultimate application in Fascist and Communist totalitarianism. See REPUBLIC; TIMAEUS.

Order of Composition. Authorities continue in almost total disagreement as to the order in which Plato wrote his dialogues. The German philosopher Friedrich Schleiermacher (1768-1834), for example, classified the dialogues according to several periods,

contending that in works of the first period (of three) one can discern the germs of the dialectic and the doctrine of universals developing in the freshness of youth; in this group are the *Phaedrus*, *Lysis*, *Protagoras*, *Laches*, *Charmides*, *Euthyphro*, and *Parmenides*, all supplemented by an "appendix" consisting of the *Apology*, *Crito*, *Ion*, *Hippias Minor*, *Hipparchus*, *Minos*, and *Alcibiades II*. In the second period posited by Schliermacher, the philosophy of universals is further developed (by means of the dialectical method) to the end that Plato's fundamental distinction between common sense (opinion) and philosophical supersense (knowledge) is clarified; this is accomplished in the *Gorgias*, *Theaetetus*, *Meno*, *Euthydemus*, *Cratylus*, *Sophists*, *Politicus*, *Symposium*, *Phaedo*, and *Philebus*, supplemented by the *Theages*, *Erastae*, *Alcibiades I*, *Menexenus*, *Hippias Major*, and *Clitophon*. In the third period the matters treated in the earlier ones are worked out objectively and scientifically—that is, ethics and physics and their implications are separated in the final works: the *Republic*, *Timaeus*, *Critias*, and *Laws*. Schliermacher's analysis, although useful in the study of Plato, is unsupported by evidence other than the assumption that Plato worked systematically. Although this assumption is for many reasons implausible, most later authorities who have attempted to determine the order of composition have made it, but their notions as to the order of composition has varied according to differing conceptions of Plato's over-all objectives.

Other scholars have attempted to fix the order of composition in terms of biographical and autobiographical allusions within the various dialogues, or in terms of apparent changes in Plato's literary style. Biographically it would seem, for example, that the *Apology* was written quite soon after Socrates' death. Stylistically, the works can be arranged according to the emphasis put on the dialogue form, which is said to be dominant in the earlier works and almost totally absent in the later ones. This view accords with the theory that the earlier, more dramatic dialogues date from a period when Plato's philosophy was little different from Socrates', whereas the later, less dialogical works, in which Socrates is less and less in evidence, date from Plato's maturity—a time when he became more intellectually independent. Such speculations cannot be substantiated and are open to many objections—the *Apology*, for example, while biographically one of the earliest works, is essentially monological in form—but most modern authorities accept them as plausible and the bulk of the literature about Plato assumes their essential validity.

A typical modern division posits two periods: early (399?–387) and late (from the late 360's). Among the supposedly early works are *Hippias Major*, *Charmides*, *Laches*, *Lysis*, *Euthydemus*, *Cratylus*, four dialogues dealing with Socrates' last days (*Euthyphro*, *Crito*, *Apology*, and *Phaedo*); *Meno* and *Protagoras* (both perhaps written in 387); the "first European sermon," *Gorgias*; *The Republic*; and the two principal dialogues on love, *Phaedrus* dealing with the physical, *Symposium* with the "cosmical" aspects. The later works (in order of Socrates' diminishing role) are supposed to be the *Parmenides* and *Theaetetus* (both perhaps about 368–367), *Sophist*, *Politicus*, *Philebus*, *Timaeus*, and *Laws*. The *Laws*, a ponderous, exceedingly long (but never completed) and largely unnecessary supplement to the *Republic*, is regarded by some as his last work, but other authorities believe that it preceded the *Timaeus*.

THE GIST OF PLATONISM

Without exception, Plato's works were written against the decadence and corruption of the Greece of his time—a corruption epitomized for him in the fact that the high and mighty of Athens all but murdered Socrates, the city's most noble citizen—and most were written specifically against one symptom of that decadence: the prevalence of the Sophists (see SOPHISTS). These were intellectuals, some of

them brilliant, who pandered to the ordinary man's prejudices and who would say and teach anything if well paid for it. Theages, in the dialogue of that name, says that he would like if possible to become a god and asserts that all men probably have the same wish; the Sophists were men who, if the price were right, would virtually guarantee to bring Theages' wish to fruition—even though they knew it to be impossible.

Shadow Versus Substance. Common sense and the Sophists held (and continue to hold) that reality, if knowable at all, is no more than the sum of what is perceived; or that reality is unknowable and that therefore whatever a man thinks, is real—thinking makes it so, and the consent of the many (convention) enforces it. Not so, said Plato: there is a reality independent of what is perceived by any man or all men; indeed, whatever can be perceived is by definition unreal.

Among several myths composed by Plato to illustrate this thought, the most famous is his Myth of the Cave (*Republic*, Bk. VII). Human beings live in a cave and are chained so that they can see only the wall in front of them. On the wall they see flickering shadows (the world of the senses) but they are unable to see, above and behind them, the light (truth) that comes into the cave from outside and produces the shadows. If freed to turn and look, the cave men are blinded by the light and most, preferring restful shadows, will turn away. But a few will try to climb the treacherous ascent to the cave opening. Once outside in the light (wisdom, knowledge), few will want to return to the cave, and these few will be as idiots once they return, for the light will have blinded them. Outside, the ultimate source of the light is the sun (the Idea of the Good). The Idea of the Good stands at the apex of a World of Ideas (or Universals). That is, above and beyond the sensible world of particular things there is a World of Ideas—of universal essences that either must be presumed to exist conceptually so as to impart intellectual significance to the particulars, or are the sources from which all particulars emanate as imperfect copies. In some of his writings Plato seems to imply the former; in other passages he implies the latter. All of the Ideas have at least 10 qualities in common. Any Idea is (1) being ("substance") in itself, (2) universal, (3) a thought not a thing, (4) a unity, (5) immutable and imperishable, (6) an essence, (7) absolutely perfect in and of itself, (8) outside of space and time, (9) rational (can be apprehended through reason), and (10) in some way identified (in later works) with "number" in the Pythagorean sense. In his doctrine of Ideas, Plato inaugurated perhaps the most important of the perennial philosophical issues, one with ramifications in almost every aspect of all subsequent philosophy, the question of the relationship of the universal and the particular—the necessary and the accidental.

Education and the Knowledge of Reality. For Plato, the lowest stage of education is concerned with the visible world, which manifests itself objectively in natural things plus reflections of them (works of art and literature), and subjectively in beliefs and opinions plus the fancies of the imagination, conjecture, and guesswork. Above this, in the intellectual world, there are the objective "objects" of mathematics and the like, manifested subjectively as the processes of abstract thought and hypothesizing. This realm is surmounted by the highest stage of education, that which has to do objectively with Ideas as such, and subjectively with higher reason in man.

Thus, Plato's epistemology (theory of knowledge) places complete emphasis on the Ideas. There is literally no such thing as knowledge attained through the senses. Knowledge is attained solely through the ultimate science, dialectics, whose subject matter is the world of Ideas. By means of dialectics (the study of the interrelationships of ideas without reference to the senses), the philosopher may hope to

attain some awareness of the most universal of the universals: the Idea of the Good, the knowledge of which is the ultimate goal of all philosophizing. See ABÉLARD, PIERRE; AUGUSTINE, SAINT; CONCEPTUALISM; CONCORDANCE; COSMOLOGY AND COSMOGONY; DIALECTIC; DIALOGUE; EPISTEMOLOGY; ETHICS; IDEALISM; KNOWLEDGE; NEOPLATONISM; PHILOSOPHY, History of Philosophy, *Socrates, Plato, and Aristotle* and *Middle Ages: Augustine to Thomas Aquinas*; PLOTINUS; REALISM; SCHOLASTICISM.

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PLATOON, a small body of troops, usually a subdivision of an infantry company. It may also be a formation of specialized military troops smaller than a company. See COMPANY.

PLATT, CHARLES ADAMS, 1861-1933, U.S. architect, painter, and etcher, was born in New York, N.Y. His ability as a landscape architect is especially evident in his plan for Phillips Academy, Andover, Mass. Platt designed nine buildings for the University of Illinois, 1922-30, and with Charles L. Freer designed the Freer Art Gallery, Washington, D.C.

PLATT, THOMAS COLLIER, 1833-1910, U.S. politician, was born in Owego, N.Y. He was active in business for many years, becoming president of the United States Express Company, 1879. He served in Congress, 1873-77. In 1881 he was chosen U.S. senator but resigned in May (see CONKLING, ROSCOE). As "boss" of New York's Republican organization from 1894, he again served in the U.S. Senate, 1897-1909. Platt secured the election of Theodore Roosevelt as governor, 1898, and his Republican vice-presidential nomination, 1900, but Roosevelt's succession to the presidency, 1901, helped bring about a decline in Platt's power.

PLATT AMENDMENT, eight articles included in the Army Appropriation Act of 1901 by the U.S. Congress, which placed Cuba under virtual U.S. suzerainty from 1902 to 1934. The provisions of the amendment—named for Orville H. Platt (1827-1905) of Connecticut, chairman of the senate committee on Cuban relations—limited the treaty-making and financial powers of the infant republic, and provided for American intervention in Cuban affairs to protect life, liberty, and property. They were incorporated in a formal treaty between the two countries in 1903. During the following three decades the amendment was a source of bitter resentment among the Cubans and in 1934 under the impetus of the Good Neighbor Policy the United States agreed to the abrogation of the Platt Amendment. See CUBA, History, *Independence*.

PLATTE CITY, city, W Missouri, seat of Platte County; on U.S. highway 71; 20 miles NW of Kansas City. The city is a trade center for the wheat and corn produced in the area. Pop. (1960) 1,888.

PLATTE RIVER, in Nebraska, Colorado, and Wyoming; formed by the confluence of the North Platte and South Platte rivers near the city of North Platte in W central Nebraska; flows eastward across the Great Plains into the Missouri River about 12 miles S of Omaha. Together with the North Platte,

which rises in the Park Range northwest of Denver and arches northward into Wyoming and flows south-eastward into Nebraska, the Platte is about 990 miles long. Its drainage basin covers about 90,000 square miles. The South Platte rises in central Colorado east of Leadville and flows northeast. The Platte's shallow depth and numerous sand bars make it nonnavigable. During winter and spring it may reach a width of three miles in places; in summer it is often dry. The Platte is used for irrigation of the farm lands on the adjacent high plains and for hydroelectric power. Principal dams are the Kingsley, Glendo, Pathfinder, and Seminole, all on the North Platte. The Platte River valley was an important migration route to the west in the nineteenth century, and today it is paralleled for much of its length by U.S. highway 30 and the Union Pacific Railroad. Principal cities along its course are Fremont, Grand Island, and Kearney on the Platte, Casper on the North Platte, and Denver and Greeley on the South Platte.

PLATTEVILLE, city, SW Wisconsin, Grant County; on the North Western and the Milwaukee railroads and U.S. highway 151; 20 miles NE of Dubuque, Iowa. The city is a market center for nearby dairy farms and lead and zinc mines. Platteville was founded in 1827 and incorporated in 1876. Pop. (1960) 6,957.

PLATT NATIONAL PARK, S central Oklahoma, in Murray County, 75 miles SSW of Oklahoma City. The park's 911 acres contain mineral springs, campgrounds, horseback riding trails, and a museum. The land was purchased from the Chickasaw Indians in 1902. In 1906 the park was named for Sen. Orville H. Platt (1827-1905) of Connecticut.

PLATTSBURG, city W Missouri, seat of Clinton County; on the Santa Fe Railway; 25 miles SE of St. Joseph. The city is a commercial center for corn, wheat, and oats produced in the area. Founded in 1833 as Concord, it was renamed Plattsburg and incorporated in 1835. Pop. (1960) 1,663.

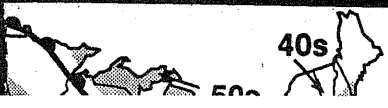
PLATTSBURGH, city, NE New York, seat of Clinton County; on the W shore of Lake Champlain at the mouth of the Saranac River; on the Delaware and Hudson Railroad and U.S. highway 9; a scheduled airline stop; 20 miles S of the Canadian border and 150 miles N of Albany. Plattsburgh is a principal urban center for the northern Adirondack Mountain resort area. The city's principal manufactures are wood pulp, paper, lumber, machinery, dairy products, and leather goods. Many of the residents are French Canadians. Places of interest include monuments to Samuel de Champlain, who discovered the lake in 1607, and Com. Thomas Macdonough, a naval hero of the War of 1812. At the Battle of Plattsburgh in 1814, U.S. forces under Macdonough and Gen. Alexander Macomb defeated the British. The city is the site of a state university of New York College of Education and a Catholic summer school. Plattsburgh was laid out in 1784 by Zephaniah Platt as a settlement for colonists from Long Island, and was incorporated in 1902. Pop. (1960) 20,172.

PLATTSMOUTH, city, E Nebraska, seat of Cass County; on the Burlington and the Missouri Pacific railroads and U.S. highways 34, 73, and 75; 3 miles S of the confluence of the Missouri and Platte rivers and 14 miles S of Omaha. The city is a market center for grain and dairy products. Refrigerator cars are made and repaired there. Plattsburgh was incorporated in 1855. Pop. (1960) 6,244.

PLATYHELMINTHES. See FLATWORM.

PLATYPUS, or duckbill, a primitive egg-laying mammal found only in Australia and Tasmania and belonging to the genus *Ornithorhynchus*. The platypus and the echidna, or spiny anteater, are the only members of the most primitive order of living mammals, Monotremata (see MAMMAL; MONOTREMATA).

The platypus is a smallish creature, its length including tail being only two feet. Its legs are quite short and its feet are webbed. It has dense, dark fur, a furry



in general resemble those of the viperids in their effects upon warm-blooded animals. See SNAKE.

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REPTON, village, central England, Derbyshire; on the Trent River; 6 miles SSW of Derby. The village is the site of a famous school, founded in 1556, that incorporates remains of a priory built before 660 and destroyed by the Danes in the 870's. Saint Wyston's Church has a tenth century chancel and seventh century crypt. In the seventh century Repton, then known as Hreopandum, was the seat of the Bishop of Mercia. Pop. (1953 est.) 2,000.

REPUBLIC, town, N Washington, seat of Ferry County; on the Sanpoil River and the Great Northern Railway; 91 miles NW of Spokane. Republic is a trade center in a timber, mining and agricultural area. Gold is mined nearby. Pop. (1960) 1,064.

REPUBLIC, in classical political theory, a form of government wherein sovereignty is essentially in the hands of the majority of the people (irrespective of financial status), yet not so much so that injustice is done to the few in the interests of the many; that is, the people are subject to the law, and the law cannot properly be set aside at the whim of the mob or its demagogues. According to the foregoing definition, republic is roughly equivalent to Aristotle's polity, or constitutional government, characterized by him (*Politics*, IV, 9) as combining certain aspects of oligarchy with certain aspects of democracy. Thus, polity typically (but not invariably) combines the oligarchical principle of election to political office with the democratic disregard of wealth as a qualification either for office or for voting. Once elected, officials of the polity would be—theoretically, at least—more responsive to the Law (the constitution) than to private class interests. Thus, an official whose private allegiance might be to the wealthy, would not rule in such a way as to favor the wealthy at the expense of the poor; an official whose private allegiance might be to the poor, would not demagogically favor that class at the expense of the wealthy class.

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The U.S. Constitution was conceived by men who, from childhood, had been familiar with Aristotle's *Politics* and who regarded it as one of the fundamental and eternally valid texts on the subject of government. According to many authorities, the framers of the Constitution wrote into it Aristotle's conception of polity. Thus, the three elements or powers specifically described by Aristotle as good are embodied in the U.S. republic as the Presidency (kingship—usually an elective office in Aristotle's time, and in most periods of European history), the Judiciary (aristocracy in the best sense), and the Congress (polity). Moreover, those who interpret the Constitution in this way hold that the first 10 Amendments to the Constitution (The Bill of Rights) are directed against precisely those vices of government that Aristotle emphasized most in his descriptions of the bad forms. It may also be noted that the three philosophers (apart from Aristotle) whose works most influenced the men who conceived and wrote the U.S. Constitution were John Locke, Thomas Hobbes, and Baron Charles Louis de Secondat de Montesquieu—all of whom were basically Aristotelians in that Aristotle's political categories constituted the conceptual framework in terms of which they developed their political ideas.

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Just as each aspect of a man partakes of the whole man, yet performs certain specialized functions, so with Plato's ideal *polis*: each part has its vital role and its virtues, each is symbolized by a certain metal, each is one part of a man written large. The head (logic) is written large in the philosopher-kings, who shall rule the state just as one's reason should rule one's body; the virtue of the philosopher-kings will be wisdom, which is knowledge of what is good; this class is symbolized by the metal gold. Guarding the state, virtuous by reason of a passionate courage, symbolized by the metal silver, and specifically identified by Plato with the wild nomadic tribes of his own day, are the soldiers—the individual man's heart (good emotion—knowledge of what to fear and what not to fear) written large. The third class, the individual viscera (base emotion—the digestive functions but not the procreative), symbolized by the metals bronze and iron, virtuous only insofar as its members are temperate and content to be ruled by head and heart, will consist of farmers, artisans, and the like, identified with the Egyptians of Plato's time. Plato took it for granted that all three classes would be served by slaves, but these folk—who might well comprise the bulk of the population—would not, in Plato's view, contribute to or partake of the blissful justice that would be achieved through the harmonious, organic, unitary functioning of the three classes of *men*. At least among the philosopher-kings and the guardians, day-to-day existence would be communal, including community of women and children; state control of every aspect of life; rigid control of all education; and a rigid and strict censorship of art, literature, music, and so forth lest alien and disruptive ideas or emotions excite the desire to depart from the ideal harmony within the state (the works of Homer, in particular, would be forbidden, as would the comedies of Aristophanes and virtually the whole of drama as it existed in Plato's time). In sum: Justice in man or in the state is the perfect functioning together of all parts; virtue in man or in the state is that quality within the man or in the state that best fosters justice. The head (philosopher) knows this; the heart (warrior) knows perhaps a little of it (and may know more) but most of all loves it and will risk all for it; the viscera puts up with it, and is functioning best when not bothering head and heart with complaints. See PLATO, *Authenticity of Plato's Works, The Gist of Platonism, Shadow Versus Substance*.

Plato's *Republic* was largely unknown in Europe throughout the Middle Ages. It was not translated into Latin—and thus was not accessible to medieval scholars, most of whom did not read Greek—until the 1440's when Decembrio, at the order of the pope, made the first translation. Subsequently it was used by secular Humanists in their attacks on religious authority, and became the model for many literary utopias (ideal places that do not exist, but should), such as that of Sir Thomas More.

REPUBLICAN PARTY, one of the two major political parties of the United States. The modern Republican party was organized, 1854-55, from various political elements that were opposed to the Kansas-Nebraska Act of 1854.

Earlier U.S. political parties had used the designation Republican in one way or another, but differed from the modern Republican party in political philosophy and in many other ways. Thomas Jefferson and other opponents of the Federalists organized, 1791, a Republican party that under several names retained its identity and continued its opposition to the Federalist party until after the election, 1824, of John Quincy Adams to the presidency. At about that time Andrew Jackson emerged as the leader of the Democratic party (the ancestor of the present Democratic party) and the opposition, led by John Quincy Adams and Henry Clay, called itself the National-Republican party. In 1834 the National-Republicans joined with other political elements to form



The Republican party was first symbolized by an elephant in an 1874 cartoon, "The Third Term Panic," satirizing Democratic objections to a third term for President Grant.

the Whig party, and from that time until 1854-55 no significant political group called itself Republican.

Background of the Modern Republican Party. Although the Whigs lost the presidential election of 1852 (Franklin Pierce defeated Gen. Winfield Scott), they did poll some 1.3 million votes (as compared to the Democrats' 1.6 million) and appeared to be reasonably healthy. Slavery was not a party issue but cut across party lines; indeed, the Compromise of 1850, following the Missouri Compromise of 1820, was thought to have removed the slavery issue from party politics. The issue arose when the Democratic Congress passed, 1854, the Kansas-Nebraska Act to permit those two territories to determine their own status respecting slavery; this aroused the indignation of many Northerners. The northern reaction had little to do with the moral issues of slavery, but was an expression of disappointment that slavery would be introduced into territory that Northerners had assumed would consist of small, slaveless "family farms." Since it was generally believed that small farms could not compete or coexist with the large slave-operated farms, the "free-soilers" of both major parties (the Whigs and the Democrats) were indignant. Opposition to the act was so strong that its opponents (known as anti-Nebraska men) gained a majority in Congress within six months after its passage.

Organization of the Republican Party was accomplished through hundreds of anti-Nebraska meetings, particularly among the farmers of the Northwest. One important meeting was held at Ripon, Wis., Feb. 28, 1854, under the leadership of Alan E. Bovay, who is generally credited with suggesting the name for the new party in a letter to Horace Greeley. This meeting was attended by Whigs, Free-Soilers, and Democrats. Another important meeting was that of May 16, at Friendship, N.Y. A. N. Cole, a Free-Soil newspaper editor, was the guiding spirit. Another meeting, that at Jackson, Mich., July 6, has been called the first formal Republican meeting; a platform calling for the abolition of slavery in the District of Columbia and opposing further extension of slavery elsewhere in the United States was adopted at this meeting.

The new party attracted followers from all parties—the Free-Soilers, Independent Democrats, anti-slavery Whigs, Know Nothings, Barnburners, and Abolitionists. Prominent leaders included Charles Sumner (Mass.), William H. Seward (N.Y.), Horace Greeley (N.Y.), Thaddeus Stevens (Penn.), Gideon Welles (Conn.), Salmon P. Chase (Ohio), George W. Julian (Ind.), Edwin M. Stanton (Ohio), and Hannibal Hamlin (Me.). At its first national convention (Pittsburgh, Pa., February, 1856) the party declared that Congress has the power to exclude slavery from the territories, and advocated the admission of Kansas as a free state and the construction of a railroad

tion of paper currency payments, 1933, was partial and concealed repudiation. Concealed repudiation usually takes the form of payment in a cheaper coin, paper currency instead of coin, or a devalued currency.

In international custom repudiation of war debt has been viewed differently than that of other public debt. After World War I debtor countries contended that U.S. loans were a necessary contribution to the common victory, and that payment of war debts should be contingent on collection of reparations from the defeated countries; thus when reparations payments were defaulted, the debtors stopped repayment of the loans. Repudiation of war debts was also justified on the grounds that repayment in gold would disrupt the currency of both the debtor and the creditor nations and that repayment in goods would disrupt the production of the creditor nation. See REPARATIONS.

Complete repudiation of public debt has been rare. Pressure of foreign creditors has usually forced repudiating debtor states to recognize their debts, but usually on some basis equivalent to partial repudiation. During the nineteenth century, strong nations occasionally intervened to compel payments from repudiating states, but such forcible means were not used in the twentieth century. Repudiations are most common in states that are politically unstable or in states where revolutionary governments have come into power. Repudiation of domestic public debts is a political matter between the repudiating state and its citizens. International complications arise, however, when a repudiation affects the rights of foreign states and foreign citizens.

When one state is annexed or dismembered by another, the question frequently arises as to whether the succeeding state is bound to recognize the public obligations of the annexed or dismembered state. International custom and the opinions of most qualified international legal students support the obligation to recognize and not to repudiate such debts, but there is custom and opinion to the contrary. Germany, for example, refused to recognize the foreign debts of Austria after annexing Austria in 1938. The question is even more unsettled when one state cedes part of its territory to another state. Some authorities contend that the annexing state is bound to recognize all the local debt of the ceded territory and a proportionate amount of the general public debt of the ceding state; others allow the annexing state to repudiate all of the debt. See PUBLIC FINANCE.

REQUIEM, in the Roman Catholic church, the Mass for the Dead. The name is derived from the first word of the Latin prayer, "Eternal rest (*Requiem aeternam*) grant unto them, O Lord," occurring frequently in this Mass. Black vestments are worn by the priest, and the prayers are specially adapted to signify mourning, penance, and joyful hope. See MASS.

FRANCIS L. FILAS, S.J.
REREDOS, in church architecture, a decorative wall facing or screen of wood, stone, or alabaster, placed behind the main altar. The reredos evolved from tapestries hung behind altars, and in the course of time came to be richly adorned with carvings and paintings. In Spanish churches especially reredoses are elaborately decorative, often as wide as the nave and reaching to the vaulting of the roof. There are richly decorated and carved English examples in the cathedrals in St. Albans, Manchester, Durham, and Gloucester and in Christ Church, Hampshire.

RESACA, BATTLE OF, an American Civil War engagement fought May 13-15, 1864, at Resaca, Ga., about 18 miles SE of Dalton, Ga., during the advance of the Union Army against Atlanta. After the fighting near Dalton in early May, Confederate Gen. Joseph E. Johnston withdrew to Resaca. There he took up strong defensive positions and repulsed several Union frontal attacks before being forced to withdraw because of flanking movements by the Union commander, Gen. William T. Sherman. See ATLANTA, *History*.

RESACA DE LA PALMA, BATTLE OF, a battle of the Mexican War, fought on May 9, 1846, between Gen. Zachary Taylor's force of some 2,300 men and about 5,000 Mexicans under the command of Gen. Mariano Arista. The battle was fought at Resaca de la Palma, a small valley thickly overgrown with palm trees, in Cameron County, Texas, about 4 miles north of Brownsville. Taylor's forces defeated those of Arista, who was forced to withdraw to a position south of the Río Grande. The U.S. forces lost 33 killed and 89 wounded; total Mexican losses may have been as high as 1,000, although Arista's official report listed only 160 killed, 228 wounded, and 159 missing. See MEXICAN WAR, *Northern Campaign*.

REŞADIYE YARMADASI, peninsula, SW Turkey, in Muğla Province; bounded by the Kerme Körfezi (bay) on the N, the Köyceğiz Gölü mountains on the E, and the Mediterranean Sea on the S and W. Islands of the Dodecanese lie offshore to the south and west.

RESCHEN SCHEIDECK. See RESTA, PASSO DI.
RESCUE, in criminal law, the offense of freeing a person or thing from lawful custody. According to the English common law, the rescue of a person is punishable as a treason, a felony, or a misdemeanor, according to the character of the criminal rescued. In the United States it is generally a felony irrespective of the degree of criminality of the rescued prisoner. In maritime law, rescue is the retaking of a prize by a person taken with the prize. Rescue differs from recapture by a friendly or neutral force in that the prize reverts to the original owner and does not become a new prize for the recapturer. See PRIZE.

RESCUE GRASS, an annual or biennial grass that is native to South America and belongs to the family *Gramineae*. Rescue Grass, *Bromus catharticus*, is cultivated for winter forage in the southern United States and planted in waste places northward to hold the soil. It grows 2 to 3 feet in height and has broad flat spikelets. It is best adapted to humid regions with mild winters. It is planted in fall and matures by early summer. See BROME GRASS.

RESEARCH, the orderly investigation of a subject matter for the purpose of adding to one's own or to humanity's knowledge of it. Apart from hundreds of variations in purposes and methods (as determined by different subject matters and other factors) there are basically only two different types of research, each of which, in actual application, has much in common with the other. The essence of the first type is easily understood when the word research is hyphenated. Thus, *re-search* implies that the subject matter is already familiar—or so it has seemed—yet for one reason or another it is to be studied again. Quite often such research is undertaken because facts become known about a subject matter that do not seem consistent with previously accepted ideas about it; the earlier ideas are recognized as inadequate and the whole subject matter is *re-searched* with an eye to modifying the earlier ideas, or replacing them with new ideas that seem to comprehend the old facts (if the *re-search* confirms their facticity) and the new ones. The sequence of events by which, in the twentieth century, the long-accepted Newtonian conception of the physical cosmos came to be displaced by the so-called wave mechanics is a familiar modern example of *re-searching* of this first type.

But the same example illustrates the second basic type of research, which would better be called search since it involves the investigation of subject matter whose existence had not been recognized before. The search may arise out of the discovery of facts that seem wholly unrelated to anything known before (accidental discovery of a new continent; the first sighting of an object in outer space or of a tiny particle—both the incidental result of an improved method of observation; the unforeseen discovery of a previously unknown painting or manuscript by an unheard of painter or writer). Such facts may later

be recognized as related to something previously known and thus may lead to re-search, and/or they may open up whole new fields of investigation. Thus, research may be undertaken as the result of a more or less accidental event, and may from that moment be re-search or search or both.

Prior to 1900 the vast bulk of research of both types in all realms of knowledge came about through the accidental discovery of facts of one kind or another, or through an individual's fortuitous recognition of apparent paradoxes and inconsistencies. In the twentieth century, however, and particularly after World War I, attempts were made in many fields to produce such "accidents" systematically, and in many fields it came to be habitually assumed that no matter how many alleged facts were already known, there could never be enough of them. The re-searching of the already known and the search for and accumulation of new data about all areas of knowledge came to be regarded as ends in themselves. Manufacturers of products, merchandisers, advertising and promotional enterprises, governments, educational institutions, philanthropic foundations, and professional associations spent increasing amounts of time, manpower, plant, and money on research projects of all kinds. By mid-century, in the United States alone, billions of dollars were expended annually on research of various kinds; only a small portion of this expenditure was expected to produce tangible results by which new sources of income would be recognized and developed. See AMERICAN COUNCIL OF LEARNED SOCIETIES; ENDOWMENT; EPISTEMOLOGY; KNOWLEDGE; PHENOMENOLOGY; PHILANTHROPY; SCIENTIFIC METHOD; STATISTICS; SOCIETIES; ECONOMICS, *Careers for Economists*; ANTHROPOLOGY; ARCHAEOLOGY, *World-wide Activities, Methods, Careers, Schools*; AMERICAN ARCHAEOLOGY, *Radioactive Carbon (C-14)*; MARKETING RESEARCH; EDUCATION, Research; GEOGRAPHY, Investigating World Patterns; GEOLOGICAL SURVEY; GEOLOGY, Development of the Science; HISTORY, The Work of the Historian, The Profession of History; NUMISMATICS; HISTORICAL ASSOCIATIONS; CRITICISM, Literary Criticism, *Criticism in History and Philosophy*; LINGUISTICS; PHILOLOGY; LANGUAGE, *The Scientific Study of Language*; SOCIOLOGY; LAW; BIOLOGICAL RESEARCH; BOTANY, *Careers in Botany, Research*; CHEMICAL ANALYSIS; CHEMICAL ENGINEERING, Modern Chemical Engineering, *Work of the Chemical Engineer*; CHEMICAL RESEARCH; CHEMISTRY, *Careers in Chemistry*; MEDICINE; HISTOLOGY, *Histological Technique, Microscopic Methods*; PHYSICS; NUCLEAR ENGINEERING; ASTRONOMY.

RESERVE, village, W New Mexico, seat of Catron County; on the San Francisco River, in the Apache National Forest; 155 miles SW of Albuquerque. The village is a trade center for a livestock and timber region. Pop. about 300.

RESERVE, that portion of a nation's armed forces which is trained and organized but required to serve with the active forces only in time of war or emergency. In most countries that adopted conscription, all male citizens were required to undergo a period of active service and were then furloughed to the reserve, in which they were subject to call to the colors in time of war. In Germany before World War I, for example, conscripts served 3 years in the active army, 4 years in the reserve (during which they were mustered twice annually and given about 6 weeks' training), 12 years in the Landwehr and finally in the Landsturm, where they were subject to call for limited service.

In the United States the Organized Reserves (as distinguished from militia) originated in the establishment of the Medical Reserve Corps, 1908, the Army Reserve, 1912, and the Officers and Enlisted Reserve Corps, 1916. The Universal Military Aid Training Act of 1951 placed on reserve status all men 18½ to 26 years of age who had served in the Armed Forces; the Armed Forces Reserve Act of 1952

created the U.S. Army Reserve and placed reservists in the Ready Reserve, the Stand-by Reserve, or the Retired Reserve. The reserve components of the U.S. Navy, Air Force, and Marine Corps developed along the same lines as did that of the Army. See AIR FORCE, U.S., Civilian Components of the Air Force, *The Air Force Reserve*; ARMY, U.S., Organization of the Army; MILITIA, *United States*; NAVAL RESERVE, U.S.; RESERVE OFFICERS TRAINING CORPS.

RESERVE OFFICERS ASSOCIATION OF THE UNITED STATES, an organization open to reserve officers of the U.S. Army, Navy, and Air Force. Purpose of the organization is to further the development and execution of U.S. military policy. In 1957 the association's 1,100 chapters had 70,000 members. Its monthly magazine is *The Reserve Officer*.

RESERVE OFFICERS TRAINING CORPS, the students enrolled in civil educational institutions who receive special military instruction and upon graduation are awarded reserve commissions in the Armed Forces of the United States. The earliest official measure that touched upon the training of civilians for military leadership was the Morrill Act of 1862, which donated lands for the establishment of colleges devoted to practical instruction in agriculture and the mechanic arts, including military tactics. There was considerable question as to whether or not military instruction was mandatory under this law. No provision was made for a comprehensive reserve program, however, until the passage of the National Defense Act of 1916 (amended in 1920).

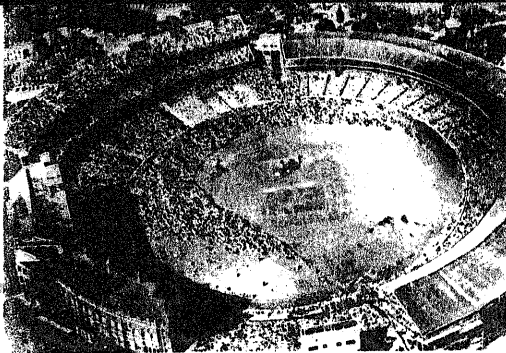
The 1916 act set up the composition of the Regular Army of the United States and the organization of the National Guard, the Organized Reserves, and the Reserve Officers Training Corps (ROTC). The President was authorized to establish and maintain in civil educational institutions one or more units of the ROTC. Senior divisions were to be organized in universities and colleges granting degrees, including state universities and land-grant colleges, and in certain essentially military schools not granting degrees; and junior divisions were to be organized at all other public and private educational institutions. By 1919 some large city public school systems had established ROTC programs. The law requires that state institutions agree to establish and maintain a two-year elective or compulsory course of military training as a minimum for its physically fit male students, and that any student who begins such a course must complete it as a requisite for graduation. During World War II more than 100,000 ROTC graduates saw active duty in the Army.

The 1916 Act was amended to provide ROTC for the Navy and Air Force. The Reserve Officer Training Programs of the Army, Navy, and Air Force are directed by the assistant secretaries of the respective services for manpower, personnel, and reserve forces or other officials who direct this function. See AIR FORCE, U.S., Civilian Components of the Air Force, *The Air Force Reserve Officers Training Corps*; ARMY, U.S., Organization of the Army, *Staff*; MILITARY AND NAVAL EDUCATION, United States; NAVAL RESERVE, U.S.; RESERVE.

RESERVOIR, a relatively large water-tight containment built wholly or partly in the earth, for storing large quantities of water for domestic, industrial, or municipal use, or for flood control, power generation, irrigation, river regulation, or for a combination of those purposes. Reservoirs are mainly of three types: (1) storage or impounding reservoirs, which are located at the source of supply and designed to replenish deficiencies caused by drought; (2) supply reservoirs, located near the point of consumption and designed to meet fluctuations in rate of consumption from season to season, day to day, or hour to hour; (3) equalizing reservoirs, planned to maintain a constant, uniform flow, to provide a constant level or head of water, or to afford a fairly uniform pressure.

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An aerial view of the huge Olympic Stadium at Melbourne, Australia, shows an estimated 140,000 people gathered to take part in evangelist Billy Graham's religious crusade.

Outbreaks of religious zeal that occurred in the Middle Ages in connection with the Crusades, the sixteenth century Protestant Reformation, and the Roman Catholic Counter Reformation have sometimes been referred to as revivals, but were not commonly so called until after the sweeping results of the eighteenth century movement led by John Wesley, his brother Charles, and George Whitefield, became apparent in England. See CRUSADES; REFORMATION; COUNTER REFORMATION.

The Great Awakening, which flourished in colonial America, 1725-75, under the leadership of such men as Jonathan Edwards and Gilbert and William Tennent, had little or no connection at the outset with the Methodist movement in England, but the two later became connected through Whitefield's seven evangelistic tours in America, 1738-70.

A period of stagnation after the Revolutionary War was followed by a series of revivals called the Second Awakening. The most significant of these were the revivals starting in 1802 at Yale College, New Haven, Conn., under Yale's president, Timothy Dwight. A student destined to play an important role in the college's later revivals, Lyman Beecher, was converted about 1796; by 1837 there had been 17 distinct revivals at Yale. The Scotch-Irish revival in Kentucky, 1796-1800, under the leadership of James McGready was effective among immigrants to the Kentucky mountains despite its emotional excesses. See AWAKENING.

Giants among the revivalists of the period 1825-44 were Charles Grandison Finney (1792-1874) who did effective although controversial work in both America and England, and Asahel Nettleton (1783-1844). In 1839 the attention of Scotland was drawn to a revival movement at Kilsyth, which had begun with the powerful and dedicated preaching of William Chalmers Burns (1815-68).

For four years following the financial panic of 1857 the United States experienced a strong revival effort conducted largely by local pastors in their own churches. Starting in New England, it quickly spanned the continent; conversions were reported to have reached 500,000 in a single year. A similar movement on a smaller scale swept Ulster, Ireland, 1859.

Revivalism along modern lines began with the revival in Great Britain, 1874-77, originating in the labors, 1873-75, of two Americans, Dwight Lyman Moody, evangelist, and Ira David Sankey, choir leader and hymn writer. From this time on, the great tabernacle, the massed choir under a capable director, and the effective use of gospel hymns comprised a characteristic setting for the evangelist's sermon. Moody and Sankey repeated their successes in America and revisited Great Britain during 1881-84. In the period 1904-06 a young Welsh theological student, Evan John Roberts (1878-1913), became

the central figure in the spiritual awakening in Wales known as the Great Welsh revival. The Salvation Army, founded in England in 1865 by William Booth, carries on its work largely by revivalistic methods. See SALVATION ARMY.

Later revival leadership in America included such evangelists as J. Wilbur Chapman (1859-1918), whose world revival tour of 1909-10 reached 60 cities in 11 countries; Reuben Archer Torrey (1856-1928), who excelled as a teacher of revival methods and, like Chapman, had been an associate of Moody; and William Ashley (Billy) Sunday, converted baseball player whose unorthodox pulpit methods attracted and won thousands in his great city-wide campaigns from 1896 until 1936, the year of his death. See SUNDAY, BILLY.

During World War II a new approach to youth evangelism was begun by the Youth for Christ movement, which by the end of the war was established in cities throughout the United States and which, after the war, sent teams of evangelists to reach the youth of Europe with modern revival techniques. William Franklin (Billy) Graham was a member of the first team to go abroad. Graham's city-wide campaigns in the United States began to attract attention in 1947, and these, together with his overseas mission, reached more people personally and by radio and television than had the activities of any other evangelist in history.

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REVOLUTION, a complex cultural, social, economic, religious, and political upheaval in the history of a nation whereby the lives and values of the people are radically transformed. Revolution is, by definition, forward looking; something new is established. Its antithesis is the Crusade, which by definition is conservative, and seeks to restore or reconquer something lost. See INSURRECTION; RADICALISM; REBELLION.

The Essence of Political Revolution is that the existing government and all that it stands for are deprived of power and authority by means that are illegal when judged in terms of existing civil law. However, the act of depriving a government of power has the effect of nullifying that government's laws: a new law comes into being. Its primary article, whether codified or not, is that the action of the revolutionaries in overthrowing the previous order was right and necessary. Thus, so eminently respectable a gentleman as George Washington would have been hanged, drawn, and quartered as a traitor if he and the other North American colonists had failed in their "Revolution War," as they called it, the word "revolutionary" having not yet been coined. Although some historians doubt that the American Revolution, so-called, can properly be termed a revolution, the example of what would have happened to Washington and his cohorts is commonly and aptly cited to point up the fact that in political matters a man may be judged a traitor or a hero according to whether or not he is successful.

Properly speaking, there can be no such thing as an unsuccessful revolution. If a revolutionary effort fails, it may be termed an insurrection, a rebellion, a revolt, or some such thing, but not a revolution. The period of disorder involved in bringing about revolution may, of course, be called various things by the parties concerned, or by historians. The English Revolution, for example, is said by some historians to have been the Civil War of the 1640's; by others to have comprised the Civil War and the Cromwellian years up to the Restoration, so-called, in the

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person of Charles II, 1660; and by others to have comprised the Civil War, the period of Cromwell's rule, and the so-called Glorious Revolution of 1688. See ENGLAND, History.

In striking contrast, the French ruling classes, long before the success of the French Revolution was assured, were calling it a *révolution*. Frenchmen of all classes were fascinated by the very idea of *révolution*, but prior to 1789 there existed but this single word for it in the French language (and in the other European languages); yet within a short period of time many words had been coined to express the idea in French alone. As with the English Revolution, historians differ in assessing just what events comprised the French Revolution. Some limit it to the years 1789-95; others see it continuing to 1815 or even 1875. See FRANCE, History.

Controversies Over the Significance of Revolution in History. Some historians and sociologists regard revolutions as the most important single motivating force in bringing about historical change; others minimize their importance. During the nineteenth century Karl Marx and others, in urging the workers of the world to unite in a revolution by which their capitalist oppressors would be overthrown, deprived the concept of revolution of what little respectability it had known before.

Almost simultaneously Charles Darwin and others were postulating theories of organic evolution that soon inspired social theorists, historians, and others, to suppose that the basic historical process is evolutionary rather than revolutionary. At mid-twentieth century the dispute between evolutionists and revolutionists still raged, although not so much among scholars and historians as among social reformers, political leaders, ideologists, and the like, among whom the new word for political evolution was "gradualism." It is entirely possible, of course, to regard both evolution and revolution as factors in historical change; revolution, in this light, might be likened to genetic mutations.

In antiquity, the problem of revolution was conceived differently, for it was conditioned by the conviction (implicit in the writings of Aristotle, Polybius, and others) that time and history are cyclical in movement. Polybius, for example, described the regular "rotation" of governments from monarchy through aristocracy, democracy, and tyranny back to monarchy, with each form degenerating and thus giving way to the next in a regular and inevitable progression. These revolutions were the analogues to the "revolutions" of the heavens, or the orderly movement of the constellations. In the twentieth century, Oswald Spengler and Arnold Toynbee, in different ways, preserved something of this conception of revolution in their descriptions of the life cycles of civilizations. Spengler stressed the inevitability of decadence and collapse. Toynbee, while denying the inevitability of collapse, pointed out that of 20 or more civilizations studied by him, all but one (Western civilization at the moment) had in fact collapsed.

At mid-twentieth century, Crane Brinton's *The Anatomy of Revolution* (1938; ed. 1952) and Eugen Rosenstock-Huussy's *Out of Revolution* (1938) and *Die Europäischen Revolutionen und der Charakter der Nationen* (1931; eds. 1951 and 1961) were among the more penetrating non-Marxian works on similarities and dissimilarities among revolutions and their significance for the study of history generally. Brinton's study of four specimen revolutions (English, American, French, and Russian) points to several "tentative uniformities" among them, but tends to minimize the role of revolution in the historical process generally. Rosenstock's works, on the other hand, stress the role of "total revolutions" (as distinct from what he terms the "half revolution," such as that of the North American colonists) in forming "the character of the nations." In Rosenstock's judgment, the history of Europe in the Christian Era has been marked by

at least four total revolutions, each of which occurred more or less under the aegis of the earlier papal and monastic revolutions of the Middle Ages, when the popes and monastic orders succeeded in establishing, among other things, (1) the principle that the secular state should not be the complete and absolute authority over the people; and (2) the principle, embodied in twelfth century Canon Law and in such later documents as the Declaration of Independence, that people have the duty to revolt against a tyranny that refuses to reform itself. The total revolutions that ensued first in Germany and then in England, France, and Russia, represented "renewals" of history. That is, each was an attempt to return to the "first principles" of social order. Each sought to recreate mankind and to start history anew. In each total revolution certain qualities and potentialities of man, previously acknowledged insufficiently or not at all by the powers-that-were, were stressed by the revolutionists to a degree so extreme that the rest of the Western world felt threatened. In each case, the revolutionaries attained within a relatively short time a success within the country of origin apparently so complete as to make its leaders confident that "soon" their revolution would transform the earth. There then ensued, however, a period of "humiliation" when other countries, putting aside earlier differences, united against the revolution. Ultimately, however, each revolution did effect a transformation of the world in that other countries, having succeeded in largely confining the revolution to the country of origin and no longer fearful of being overrun, gradually came to accept the reality and the essential legitimacy of the issues that had given rise to the revolution and the relative permanence of the new order in the country in which the revolution had begun, and gradually adapted to their own systems some of the principles and values of the revolution. Thus, did the total revolutions complement each other, creating a "family of nations" in Europe.

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REVOLUTION, the turning or spinning of a body about a point or axis outside the body itself. In astronomy the point or axis about which the motion is executed is usually another heavenly body. Members of the solar system revolve about the sun, and the satellites of the planets, in turn, revolve about their primaries. Revolution differs from rotation, which is a spinning of a body about an axis in the body itself. For example, the earth revolves annually about the sun and rotates daily about its axis, that line which determines the geographic poles. Revolution, implies a periodic change in the configuration.

REVOLUTIONARY WAR, commonly called the American Revolution, 1775-83, the "Revolution War" by which 13 British colonies in North America rebelled against Great Britain and became an independent nation—the United States of America.

The Fundamental Causes of the Revolution were political and economic. Englishmen and American colonials, because of their different physical environment and social experiences, and for other reasons, had come to have divergent political ideals. These differences had to do with (1) the theory and practice of political representation; (2) ideas of the rights of the individual and the nature and extent of governmental authority over individuals; and (3) the extent and character of local self-government—that is, the

the fourteenth century town hall; and La Tour Museum.

Of Roman origin, St. Quentin was a battlefield in the days of Attila the Hun, and frequently thereafter. It was ravaged by the Northmen during the ninth and tenth centuries, and captured by the Burgundians, 1420-71. Pop. (1954) 52,850.

ST. QUENTIN, BATTLES OF, several of the more fierce engagements in World War I action in the environs of St. Quentin, Aisne Department, N France. St. Quentin was occupied by the Germans during the Allied retreat from the Mons and Sambre in August, 1914. It became one of the most important points in the Siegfried, or Hindenburg, line of defense, which was built by the Germans for their strategic retreat following the first Battle of the Somme, 1916. St. Quentin again became a military objective during the second Battle of the Somme, 1918, when the Allied troops took the offensive. After heavy fighting, in which U.S., French, and British troops participated, the British took the town on Oct. 1, 1918, while U.S. forces advanced in the Argonne Forest.

SAINT-SAËNS, CHARLES CAMILLE, 1835-1921, French composer, was born in Paris. Having shown great musical talent even in infancy, Saint-Saëns gave his first piano concert at the age of 10, and had been composing music for some time when he enrolled at the Paris Conservatory in 1847. He was organist at the Church of St. Merri, 1853-57, and then at the Madeleine, 1858-77, and taught piano and religious music at the École Niedermeyer, 1861-65. A leader in the movement to free French music from the domination of German and Italian influences, and to encourage a native French idiom in symphonic composition, Saint-Saëns was co-founder of the National Music Society, 1871. He gained international fame as a composer and as a concert pianist and organist; became a chevalier, 1868, and a commander, 1913, of the Legion of Honor; and a member of the French Academy, 1881. He died in Algiers.

A devotee of the music of Jean Philippe Rameau, whose works he helped edit, Saint-Saëns was conservative in his criticism of contemporary composers and, although he frequently experimented with tone color and harmony, he remained a conservative in his own writing. He pioneered in the French symphonic poem, contributing *Le rouet d'Omphale* (1871); *Phaëton* (1873); *La danse macabre* (1875); and *La jeunesse d'Hercule* (1877). Other works include three symphonies (1855, 1878, 1886), five piano concertos, three violin concertos, a violoncello concerto, and much chamber music. Of Saint-Saëns' many operas, *Samson et Dalila*, first produced by his friend Franz von Liszt at Weimar in 1877, remained the most popular. A "zoological fantasy" for chamber orchestra, *Le carnaval des animaux* (composed 1886, published 1922), notable for its humorous imitations of animals and people, became a favorite with both adult and juvenile audiences.

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SAINTSBURY, GEORGE EDWARD BATEMAN, 1845-1933, English literary critic, was born in Southampton, was educated at King's College School, London, and at Merton College, Oxford, taught classics at Elizabeth College, Guernsey, 1868-74, worked as a journalist in London, 1876-95, and was

professor of rhetoric and English literature at the University of Edinburgh, 1895-1915. He was conservative in politics, orthodox in religion, and prodigious in learning. His critical writings cover many different phases of English and Continental literature and are distinguished by their engagingly chatty, informal style. They include *A Primer of French Literature* (1880), *Essays in English Literature* (1890; 2nd series 1895), *Essays on French Novelists* (1891), *Nineteenth Century Literature* (1896), *A History of Criticism* (3 vols. 1900-04); *Minor Caroline Poets* (3 vols. 1905-21); *A History of English Prosody* (3 vols. 1906-10), *The English Novel* (1913), *The Peace of the Augustans* (1915), *History of the French Novel* (2 vols. 1917-19), *A Consideration of Thackeray* (1931), and *Shakespeare* (1934). See ENGLISH LITERATURE.

SAINT-SIMON, CLAUDE HENRI DE, 1760-1825, French socioeconomic theorist and reformer, was born Claude-Henri de Rouvroy in Paris, the eldest son of the distinguished but relatively indigent Comte Balthasar-Henri de Saint-Simon, to whose title and indigency Claude-Henri succeeded in 1783. Subsequently he abandoned the title, and at various times styled himself Henri or Henry de Saint Simon, Henri Simon, Henri Saint-Simon; during the period of the French Revolution he was "Citizen Saint Simon, called Bonhomme."

Saint-Simon's education was that customarily accorded the sons of ancient and noble families, including paradoxically both ancient history and languages and the works of the anti-aristocratic *philosophes*, including those of Denis Diderot. After military service in France, Saint-Simon joined the Revolutionists in America and won distinction at Yorktown. In the next few years military and diplomatic duties took him to the West Indies, to several Latin American countries (while in Mexico he proposed that a canal be cut across the Isthmus of Panama), and to Holland.

He was back in France in 1786 and was promoted to colonel, 1787, but was allowed to go to Spain to help promote a project for constructing a network of canals and other public works. The Spanish venture failed (through no fault of Saint-Simon) and by 1789 he was back in France. His name precluded active participation in the French Revolution, but he sympathized with its principal aims. His lucrative real estate speculations involving confiscated estates, coupled with vague suspicions inspired by his noble lineage, led to his arrest, Nov. 19, 1793, and for a time his head seemed in danger; but he won his freedom, Aug. 28, 1794. Wealthy for the first time in his life, "Citizen Saint-Simon" had the leisure to develop, and the money to put to the test of practical action, the many original sociological and political theories that had long been germinating in his mind.

Doctrine. Recognizing that profound changes in the economic order of the world (the so-called Industrial Revolution) had profound implications for the whole social structure of Europe, Saint-Simon proposed the total reorganization of society and called upon all mankind to join him in living *la vie expérimentale*. In expounding his theories and proposals, Saint-Simon produced something over 50 major works, of which the most important were produced in 1817 and after. In such works as *L'Industrie* (1817) and *Du système industriel* (1821) his views are couched in secular terms; in his final works, such as *Catechisme des industriels* (1824) and, most important in Saint-Simon's own opinion ("The whole doctrine is there . . ."), *Nouveau Christianisme* (1825), his socioeconomic doctrine is integrated with a dialectical and Christian interpretation of history.

In a deathbed statement, Saint-Simon said that "religion has only to bring itself into harmony with the progress of the sciences." This seems a pithy summary of his *Nouveau Christianisme*, in which, without using the Hegelian terminology of thesis-antithesis-synthesis, Saint-Simon characterized human history in terms of a continuing dialectic



Camille Saint-Saëns

between generalization and particularization. Thus, from the establishment of Christianity until the fifteenth century the human species was occupied principally with the co-ordination of its general feelings and the establishment of a universal principle and with the subservience of all particular interests to the general interest. Contrariwise, with the dissolution of the European spiritual power in the fifteenth century the species gave itself over to specialization, putting particular facts and private interests ahead of all else. This antithesis brought with it the evils of selfishness and egoism and, according to Saint-Simon, it must give way to a "synthesis": the "new Christian society," in which both general and particular interests will be fostered in the light of the one essential Christian principle—the Golden Rule of love one's brother as oneself. Accordingly, the various civil, military, and religious institutions embodying general human feelings (Roman Catholicism, the Holy Roman Empire, feudalism, militarism) and particular human feelings (the Reformation and Protestant sectarianism, nationalism, economic individualism) must either be reformed or replaced by institutions embodying the "new Christianity"—a social global order that is to be oriented to the necessities and potentialities, for both good and bad, of the Industrial Revolution, that is dedicated to the service of all humanity, and that is yet mindful of the inalienable rights and claims of the individual.

Influence and Significance. Saint-Simon was never content merely to theorize, and during the several decades in which he developed and modified his doctrine he risked his personal fortune in putting his ideas to the test of practical action. Every one of the social experiments failed, and in the end he was a bankrupt. In the light of this, it has been pointed out, Karl Marx's derisive characterization of Saint-Simon as a "utopian socialist" seems inaccurate, if not unfair. Marx, the self-styled "realist," risked nothing, for he had nothing to lose; he lived most of his life as a scholar issuing manifestos from the safe utopia of the British Museum and like sanctuaries. Saint-Simon, however, was not content to let others take the risks involved in living his theories; he lived them himself. For this reason he has been called the "first enactor of sociology" (Eugen Rosenstock-Huussy, *Soziologie*, 1958). Ultimately, Marx was an ideologist, while Saint-Simon was a social scientist who made himself an "experimental animal." Saint-Simon was probably the first European to recognize that there was such a thing as the Industrial Revolution; certainly he was the first to realize that the tremendous economic changes which the vastly improved technology had already brought, and would continue to bring with it in the future, had created a problem which had very definite implications in every aspect of social life.

It has been said rightly that without the example of Saint-Simon neither his pupil Auguste Comte (see **POSITIVISM**) nor Karl Marx (see **COMMUNISM**) could have accomplished what they did; the fact that both Comte and Marx, having begun with a problem first posed by Saint-Simon, "solved" it in ways that Saint-Simon would have abhorred, does not lessen their debt to him. Similarly, virtually every nineteenth and twentieth century sociopolitical movement, both of the right and of the left, was influenced directly or indirectly by the doctrines of Saint-Simon. After World War I, a number of U.S. and European social scientists, disturbed by the misapplication of Saint-Simon's doctrines in various Socialist, Communist, and Fascist movements, and by the perversion of the human intellect induced by various Positivist schools of thought, urged a return to the original inspiration of Saint-Simon—the "Founder of the Industrial Doctrine"—as one way in which to reassess the social, political, and religious implications of industrialism in the hope of re-creating the social order without violating either general or individual interests.

SAINT-SIMON, DUC DE, Louis de Rouvroy, 1675–1755, French writer, was born in Versailles. He joined the army as a musketeer, 1691, and distinguished himself at Naumur and Neerwinden, but he did not receive an expected promotion and left the service, 1702. Although out of favor with Louis XIV, he attached himself to the court at Versailles. Saint-Simon played a minor, ineffectual role in the politics of the last years of Louis XIV's reign, became a member of the council of regency, 1715, and in 1721 was sent as a special ambassador to Spain to negotiate the marriage of the infanta and Louis XV. After the death of the regent, Philippe II, duc d'Orléans, in 1723, Saint-Simon retired to his chateau at Ferté-Vidame, near Chartres and began writing his *Mémoires*. He had been recording his observations since about 1694 and these, together with the *Journal* of Philippe de Courcillon, marquis de Dangeau (1638–1720), provided the basis for Saint-Simon's commentary on French affairs and court life.

The *Mémoires* cover a period of about 30 years, 1694–1723. Saint-Simon presents the great and little figures of the court in brilliant, incisive character studies, and the picture he creates of his times is a vivid and psychologically adept one. However, in his political ambitions Saint-Simon was consistently disappointed and he directed his resentment chiefly against Louis XIV, whom he detested for elevating the bourgeoisie at the expense of the nobility. Saint-Simon refused to acknowledge (or perhaps never understood) how completely Louis had subjugated the nobility. Usually a partial observer, Saint-Simon allowed his own likes and dislikes to distort facts and personalities. The *Mémoires* are nevertheless a valuable source of historical information. They were published in part in 1788, but the first complete edition was *Mémoires complets et authentiques de duc de Saint-Simon sur le siècle de Louis XIV et la régence* (20 vols. 1829–30); the definitive edition is that of Arthur de Boislile (45 vols. 1879–1930). Abridged versions in English include *Saint-Simon at Versailles* (1958).

ST. STEPHEN, town, Canada, SW New Brunswick, Charlotte County; on the St. Croix River across from Calais, Me.; on the Canadian Pacific Railway; 65 miles W of St. John. The town has manufactures of candy, woollens, and fertilizer, and is a lumber-milling center. A large cotton mill is in adjoining Milltown. St. Stephen was founded in the 1780's by Tory refugees from the American Revolution, and was incorporated in 1871. Pop. (1956) 3,491.

ST. THOMAS, city, Canada, SE Ontario, seat of Elgin County; on the Canadian National, the Canadian Pacific, the Chesapeake and Ohio, and the New York Central railroads; 15 miles S of London. St. Thomas is an important railroad center and has railroad repair shops, iron foundries, machine shops, flour mills, and textile factories. It is also a trade center in a fruit and farming area. St. Thomas was first settled in the early 1800's as Sterling. It was incorporated as St. Thomas in 1881. Pop. (1956) 19,129.

ST. THOMAS, U.S. Virgin Islands; in the West Indies; between Culebra Island of Puerto Rico on the W and St. John Island on the E, the Atlantic Ocean on the N and St. Croix Island and the Caribbean Sea on the S; area 27 sq. mi.; pop. (1960) 46,046. The island is rugged and deeply indented and has volcanic mountains that slope sharply to the sea on all sides. The island's small areas of arable land are located in the ravines between mountain ranges. St. Thomas' mean annual temperature is about 75°F; rainfall averages about 45 inches annually. Because of St. Thomas' porous soil and high rate of evaporation, there are no large permanent streams on the island.

St. Thomas is the economic and social center of both the U.S. and British Virgin Islands. About 83 per cent of the island's inhabitants live in the capital city, Charlotte Amalie, which is located on a fine

The social psychologist, however, while not rejecting the foregoing ideas, views language as belonging to the individuals who learn it in varying degrees and make it a part of themselves. In this way language opens up the avenues of communication with others and makes it possible for a person to enter into the world of ideas and ideals as represented, for example, by religion, ethics, philosophy, art, and science. As an integral part of daily life, language profoundly influences the way an individual thinks about himself, about others, and about the external world. It probably affects even those mental processes that are usually considered purely individual or non-social, such as memory, perception, imagination, and "motivation." The problem of determining exactly the nature and degree of such linguistic influences is considered to be one of the central theoretical problems in social psychology.

History of Social Psychology. Although philosophers, from antiquity through the Middle Ages and into modern times, speculated about human nature and behavior, modern social psychology departed from this philosophical tradition and attempted to use scientific methods of investigation to secure evidence for establishing its theories. Nevertheless, social psychologists continued to draw upon philosophical sources for ideas, while also borrowing concepts and evidence from such disciplines as cultural anthropology, biology, psychology, sociology, psychiatry, political science, economics, and linguistics. The work of Charles Darwin and his successors in formulating various theories of human evolution; the writings of Sigmund Freud and other workers in psychiatry and psychoanalysis; the socio-economic theories of Karl Marx; the work of the French sociologists Auguste Comte and Emile Durkheim; the pragmatic school of philosophy, especially the works of John Dewey and George Herbert Mead; scientific psychology, with its emphasis upon exact quantitative and experimental methods; and much research in the fields of cultural anthropology, sociology, and linguistics, were among the many and varied influences on scholars interested in problems of social psychology.

Major Problems. The area of study that probably receives most attention from the social psychologist is the process of "socialization," that is, the manner in which the human infant acquires the customs and values of his society. Why, for example, do people develop specific individualities as adults? Why do some people conform to customs while others do not? Why do certain types of training and experience have particular effects upon a growing child? These are typical of the questions involved in investigations of the process of socialization. Throughout such investigations, attention is focused on the influence of the family. A subsidiary study is that of the differences between people from different cultures in terms of differences in the socialization process in these cultures. See **FAMILY**; **PERSONALITY**.

Another important field of interest concerns the manner in which social influences enter into such nonsocial activities as motivation, emotional behavior, perception, memory, imagination, and learning. This kind of investigation has brought about a much deeper appreciation of the social nature of man, and suggests that much of the subject matter conventionally considered as general psychology may properly belong, in part at least, to social psychology. See **AMES, ADELBERT, JR.**; **LEARNING**; **MOTIVATION**; **PERCEPTION**.

The study of attitudes, opinions, propaganda, and the influence of newspapers, radio, and television is an important area of investigation in social psychology. Tests or questionnaires and polling or survey techniques are often used in studying the way people make up their minds on social, political, economic, and other questions, and the factors that may cause them to change their views. Social psychologists have

devoted much attention to analyzing the contacts between persons of different racial and religious groups, and to the nature and sources of racial and religious prejudices. See **PROPAGANDA**; **PUBLIC OPINION**.

The study of deviant behavior has been a subject of perennial interest to social psychologists. Criminals, drug addicts, prostitutes, homosexuals and other sexual deviants, alcoholics, the mentally ill, and other "abnormal" persons and types are studied in an effort to understand and explain the deviant behavior of such persons, but more importantly to the end that ordinary, nondeviant behavior may be better understood. Many important theories about normal behavior have been formulated on the basis of studies of abnormal behavior. See **ALCOHOLISM**; **CRIMINOLOGY**; **Criminal Psychology**; **DRUG ADDICTION**; **MENTAL ILLNESS**; **PROSTITUTION**.

Among many other significant areas of research, the following may be mentioned: the study of small groups and of the behavior of individuals in them; collective, or crowd psychology, which deals with the behavior of people in crowds, audiences, and mobs; and the study of fads and fashions, panics (as, for example, after a tornado or earthquake), and mass movements of all kinds. See **CROWD BEHAVIOR**; **MOB**, *Mob Psychology*. ALFRED R. LINDESMITH

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SOCIAL SCIENCES, the dozen or so academic disciplines that are devoted to the study of various aspects of the individual and collective activities of man within diverse social contexts and groups, and to the study of the activities of such groups as groups. Historians of the social sciences differ markedly in classifying them. Some count such disciplines as history, jurisprudence, linguistics, and even philosophy as being among the social sciences; others exclude some or all of these. Among the many other disciplines that have been included in various lists of the social sciences by one authority or another are cultural anthropology, social psychology, economics, geography (particularly economic geography and demography), political science and "international relations," ethnology (sometimes equated, but wrongly, with cultural anthropology), comparative religion and folklore, archaeology, business administration, public administration, sociology, and others. Physical anthropology, psychology and psychophysics, animal psychology, and certain other disciplines are rarely classified among the social sciences as such, but often are studied and taught in conjunction with one or another of the social sciences. Psychology and sociology are often regarded as the most "basic" of the social sciences. See articles on **ANTHROPOLOGY**, **SOCIOLOGY**, and other disciplines mentioned.

Bitter rivalries exist between or among a number of the social sciences, and between the social sciences generally and other disciplines. Sociology, for example, was long excluded from German universities, whose faculties regarded it as a threat to a long-favored German academic discipline, that of cultural history; chairs of sociology had existed in French and

U.S. universities for several decades before the first such chair was established in Germany, and as late as 1960 a German sociologist would hardly dare publish his "system" without prefacing it with a lengthy, philosophically complex, and often polemical defense of sociology in general and of his system in particular. Sociologists, in their turn, came to resent social psychology as vigorously, and for much the same reasons, as historians had resented sociology. Apologists for sociology regarded the proper province of psychology as individual psychological phenomena, and more specifically as the study of human perception and other basic mental processes (psychophysics); many psychologists, however, came to be more and more of the opinion that perception is in large measure influenced by various social factors and, in addition, became increasingly interested in problems relating to group or mob psychology. At mid-twentieth century sociologists generally felt free to interest themselves in matters that formerly were considered the sole province of psychology, and psychologists were similarly prone to delve into sociological matters—and also into areas of economics, cultural anthropology, and virtually all of the other social sciences, as well as into medicine, physiology, and other theoretically nonsocial disciplines.

Objectives and Methods. As late as 1960 the majority of workers in the more basic social sciences (psychology and sociology) in the United States and Great Britain sought to achieve results similar to those achieved in the natural sciences, and generally employed methods of study derived from the methods of those sciences. To be able to predict social behavior accurately was the prime objective; while various experimental and semi-experimental procedures such as to permit both repeated verification and quantification were the preferred methods (see STATISTICS). As yet these methods had failed to yield information of sufficient accuracy and completeness as to enable those who used these methods to predict behavior more accurately than could be accounted for by the laws, so-called, of chance, and many social scientists and other interested persons maintained, on various and differing grounds, that (1) the stated objective of being able to predict with great accuracy would never be achieved, and (2) that if indications were that it might be achieved, it would then be in the interest of all concerned, including the social scientists themselves, to do everything possible to prevent it. Such views had long been held by perhaps a majority of the social scientists of Germany, France, and other European countries, most of whom rejected the philosophical doctrines of logical positivism and pragmatism, and not a few of whom embraced some or all of the central doctrines of Christianity, Romanticism, Hegelianism, and other antipositivist world views. See PHENOMENOLOGY; POSITIVISM; PRAGMATISM; SCIENTIFIC METHOD.

Unified Social Science. The many obvious indications of the substantive and methodological interrelatedness of the various social sciences have led to various proposals for a unified social science, of which the separate disciplines would be merely aspects. The Polish-American social philosopher, Florian Znaniecki, having concluded that "specialization [of the social sciences] is objectively justified and cannot be overcome" but that ambiguities stemming from use of the word "social" would have to be eliminated, asserted that there is a "cultural order" comparable to the "natural order" (that is, Nature) and proposed that the social sciences, the "humanities," and other fortuitous groupings of academic disciplines concerned with this cultural order be subsumed under the general name, "cultural sciences," of which sociology—the study of any human social action (from praying to conducting an experiment in chemistry) would be "the basic cultural science, just as physics is the basic natural science" (*Cultural Sciences: Their Origin and Development*, 1952).

The German-American social philosopher, Eugen Rosenstock-Huussy, on the other hand, viewed the various social sciences not merely as potentially one, but as actually one already despite their apparent separateness. This is so, he maintained, precisely because any social scientist, whatever his area of specialization, is inevitably and irrevocably himself part of the social order that he studies, even if, for example, the social scientist is a European doing research in some aspect of Polynesian life. However "objective" the European may try to be, whatever the apparent differences between his way of living and that of the Polynesian islander, both the scientist and his "object" of study, the islander, will recognize each other as human beings, each will learn something of himself in studying the other, and each will be in some measure changed by the encounter. This reciprocal understanding is, according to Rosenstock, a common objective of all the social sciences. As to method, while rocks studied by the geologist, plants studied by the botanist, and the multitude of the other natural objects studied by specialists in aspects of the natural science cannot speak to the scientists investigating them (with the result that the scientist must resort to mathematics, experimentation, classification), human beings studied by social scientists can and do speak to the scientists—directly in face-to-face talk, by means of personal documents of all kinds (diaries, letters, and the like), expressive works of art, and so forth. Thus, in all of the social sciences the "objects of study" are not merely objects, but can speak for themselves and can respond positively or negatively to what the social scientist says to or about them. Therefore, neither the objectives nor the methods of social science in general, or of any of the social sciences, can be the same as those of natural science. See DIALOGUE; EXISTENTIALISM.

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SOCIAL SECURITY comprises various public measures taken by a government to protect families and individuals against economic insecurity and to provide for certain social services considered necessary for individual and family welfare. Social security thus includes (1) social insurance programs that pay cash benefits when earnings are diminished, interrupted, or ended because the family breadwinner becomes old, disabled, or unemployed, or dies leaving dependents; (2) public assistance programs that provide help to persons whose incomes and resources are insufficient to meet their basic needs; and (3) special child health and welfare services.

All modern industrial societies have found that some form of social security is necessary for the optimum functioning of the economy and for the individual and social well-being of the people. The hazards of unemployment, old age, and disability are common to all, yet relatively few persons can expect to be able to meet these hazards entirely through their own efforts. Unemployment, old age, and disability are social risks that have increased with growing industrialization and with the greater dependence of people upon money incomes for their livelihood.

on "national culture societies." German sociology was and remained primarily philosophical and sometimes even theological in nature and interests. Much attention was given to the continuing controversy over the relation of the natural to the social sciences (and to the place, if any, of sociology among the latter) and to elaborating the concepts of sociology and the philosophy of social relationships and social structures. In addition, important German contributions to sociology, and especially to historical sociology, were made by Franz Oppenheimer, Julius Lippert, Franz Müller-Lyer, the Weber brothers, Eugen Rosenstock-Huessy, Max Scheler, and others.

French and Italian sociology was notable for its emphasis upon psychological studies of social processes. Characteristic were Tarde's analysis of imitation, Durkheim's studies of the effect of social impression, the treatment of the crowd and mob mind by LeBon and Sighele, and the elaborate analysis of rationalization in social processes by Pareto. Spanish sociology was more erudite than original, being limited chiefly to the history of sociological doctrines and to systematizing the main sociological writings of the past; José Ortega y Gasset's remarkable work, *The Revolt of the Masses* (1930) should be mentioned, however, although strictly speaking it is not a sociological work.

English sociology was pre-eminently either philosophical or practical. The philosophical trends were best exemplified by the early evolutionism of Herbert Spencer and the more critical adaptation of evolutionary principles by Leonard T. Hobhouse. The more practical vein in British sociology was exemplified in the population studies of A. M. Carr-Saunders and others, the promotion of eugenics by Frances Galton and Karl Pearson, and the notable contributions to the social survey technique and the urban planning movement by Patrick Geddes and Victor Branford.

Sociology in the United States remained more eclectic and diversified than in any of the European countries. A few writers, like Lester F. Ward, showed great originality and independence in their work, but most merely borrowed from European masters, some of whom (Znaniecki, Rosenstock-Huessy, Sorokin, and others) did much of their best work in the United States. Native born U.S. sociologists did, however, make elaborate and comprehensive contributions to psychological and cultural sociology. It should also be noted that by 1960 sociology had gained far greater academic acceptance and prestige in the United States than elsewhere. Only in the United States was the field of sociology widely and generally recognized as a social science to be considered to be on a par with the related fields of economics and political science. See SOCIAL SCIENCES.

HARRY ELMER BARNES

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SOCONY MOBIL OIL COMPANY, the second largest petroleum enterprise in the United States with facilities for exploration, production, pipeline and marine transmission; refining, wholesaling, and retailing of petroleum products. Incorporated in New York, 1882, as the Standard Oil Company of New York, the company was controlled by Standard Oil of New Jersey until 1911, when a dissolution decree was issued by a federal court. The name was changed to Socony-Vacuum Corporation in 1931, and to its present form in 1955. In 1958 the company had interests in almost one hundred subsidiary corporations, the majority of them in foreign countries. Research activities are carried on in three laboratories which employed about 1,600 people and spent about \$22 million in 1958. In addition, the company completed construction of a nuclear research laboratory near Princeton, N.J., in 1959, and a nuclear research reactor, jointly owned with nine companies from other industries, was placed in operation in 1958. Sales in 1959 exceeded \$3,092 million.

SOCORRO, city, central New Mexico, seat of Socorro County; on the Rio Grande; on the Santa Fe Railway and U.S. highways 60 and 85; 70 miles S of Albuquerque. The city is in an area of metal mines and livestock and grain farming. Socorro's San Miguel Church, an example of early Spanish-Indian architecture, dates from 1598. The city is the site of the New Mexico Institute of Mining and Technology (1889). Cibola National Forest and White Sands Proving Grounds are nearby. Socorro was founded by the Spanish during the sixteenth century. Silver mining, which had flourished in the area after the Civil War, was insignificant after 1900. Pop. (1950) 4,334.

SOCOTRA ISLAND, NW Indian Ocean; 140 miles ENE of Cape Guardafui, Somalia; a part of Eastern Aden Protectorate of Great Britain; belongs to the Mahri Sultanate of Qishn and Socotra; extends about 70 miles E-W and is about 25 miles at its widest point; area about 1,400 sq. mi.; pop. (1959 est.) 12,000. The island is mountainous and reaches an elevation of more than 4,950 feet in the Jabal Ha-Geher. Intermittent streams, which flood during the heavy rains from November to March, have cut deep gorges through the uplands. Economic activity is generally limited to livestock grazing and coastal fishing. The inhabitants of Socotra, although presently Moslem, are thought to have been Christian at one time. Hadibu is the major settlement. The British established the protectorate in 1886.

SOCRATES, 469?-399 B.C., Greek philosopher, was born in Athens, the son of the midwife, Phaenarete, and the sculptor, Sophroniscus, whose trade Socrates is said to have adopted early in life. He served as a soldier in the Peloponnesian War, was a reluctant figure in Athenian political life (he was president of the prytanes, 406), and was an unhappy husband—or so it is said—for his wife, Xanthippe, was as shrewish a woman as ever lived.

Unlike the other great Greek philosophers, Plato and Aristotle, Socrates did not write books, and knowledge of his life and thought is derived very largely from the writings of two of his pupils, Plato and Xenophon. Socrates is the chief speaker in most of Plato's famous *Dialogues*, and although it is uncertain how far the Socrates represented is fact and how far dramatic creation, it is generally agreed that a considerable part of what Plato makes him say represents actual teaching, just as it is reasonably certain that the events in his trial and death, described in the dialogues known as the *Apology* and the *Phaedo*, did occur.

Socrates' powers of wit and argument won him a reputation among the young men of Athens. His way of making important, apparently knowledgeable people look foolish was much enjoyed by their juniors. For example, Socrates tells a story of how he visited the famous Oracle at Delphi in search of wisdom and asked who was the wisest man in Greece. The Oracle

replied that he was. Socrates was astonished by this answer, being only too well aware of his own ignorance. He investigated by interviewing a number of eminent men with the object of discovering a wise man and so proving the Oracle wrong, but to his surprise he found that these eminent men did not know the basic principles or purposes of their respective professions. They did not know why they practiced them or what they expected to achieve by them. Having demonstrated the ignorance of these important men, Socrates concluded that the Oracle must be right, since while nobody seemed to possess any wisdom in regard to the things that mattered, he, Socrates, was the only person who did not make the mistake of supposing that he did possess wisdom.

This sort of thing, although it delighted the irreverent young, did not make Socrates a popular figure with the authorities who looked upon him as an eccentric, disintegrating influence in the city. There may also have been political motives for his arrest on the part of an unpopular government seeking a scapegoat. Whatever the motives, Socrates was arrested and brought to trial on the charge of "impiety" (that is, introducing the worship of new gods) and of corrupting the city's youth. The *Apology* contains an account of the trial and Socrates' speech in his defense. He was adjudged guilty, but it was made clear that he could choose to escape death by going into exile. This he refused to do, however, and he was consequently sent to prison where, refusing to avail himself of chances to escape, he ultimately died by drinking poison (hemlock). The *Phaedo* records Socrates' talks in prison with his disciples immediately prior to his death.

The Essence of Socrates' Teaching may be conveyed in terms of three main doctrines. First, as regards the understanding of the world and the meaning and purposes of life, previous philosophers had sought to achieve these by the methods of what later came to be called science; that is, they had focused their attention on the workings of external Nature. Socrates, however, wanted to know *why* external nature behaved as it did and realized that no amount of additional scientific information would help to satisfy his curiosity on that score. His general conclusion was that it behaved as it did because it had been constructed for a purpose. Since purposeful construction could only have been accomplished by a mind, the key to the understanding of the world might well be found in the study of such minds as were available for inspection. Socrates, therefore, redirected the attention of philosophers by turning from the external world to the study of what he called man's soul, which he defined as that in man by virtue of which he chooses to live rightly or wrongly.

The second main Socratic doctrine was that virtue, excellence, rightness of all kinds, is a sort of knowledge. Everybody, he pointed out, has a natural tendency to pursue the good. Thus, other things being equal, man is honest and does not cheat. When man does lie and cheat, he does so in order to serve a purpose or to gain an end, but truth-telling and honesty require no incentive, precisely because they are pursued for themselves. Socrates concluded that man naturally tends to go toward what is good. How, then, to explain evil? Evil is due to error—to a mistaken view of what good is, as when a selfish man mistakenly identifies good with his own personal comfort achieved at others' expense. Thus, evil is not voluntary but involuntary, being due to a mistake in regard to what is good, and the cure for it lies in acquiring greater knowledge, knowledge, that is, of the nature of "good."

This doctrine had, for Socrates, political implications, for it gave rise to his third main idea—the idea that government should be entrusted to wise men, wise men being those who know what the "good" is. Despairing of the Athenian democracy, Socrates constantly makes the point that when people want to

build a house or a ship they go to the expert architect or shipwright and ask him to do the job; but when they want to build something much more important, a community of wise and happy citizens, they ignore the expert on government and entrust the job to anybody who is successful in achieving favor with the citizens by flattering their prejudices and making fine promises about what he will do for them if he is elected to power. Socrates' antidemocratic views were developed and elaborated by Plato in *The Republic*.

C. E. M. JOAD

Plato, Socrates, and Athens. Besides Plato, several other ancient Greek writers made reference to Socrates in their works, yet it is only through Plato's dialogues that Socrates remains a person of enduring interest and importance. The Socrates of Xenophon's *Memorabilia* is a person of no great interest, while the Socrates of Aristophanes' comedy, *The Clouds* (423), is one of the sophists or, as Aristophanes put it, a *phronistes* (abstract thinker), whose vague and wispy thoughts (*phrontides*) are the "clouds" of the comedy's title, and who runs a "thinking factory" (*phronisterion*). It is entirely possible, of course, that Xenophon's or Aristophanes' Socrates is a more accurate representation of the actual man than the Socrates of Plato's works. For this and for other reasons many historians prefer to assume that the philosophical utterances of Socrates in the Platonic dialogues, while they may represent substantially what Socrates said on this or that occasion, are put the way they are because Plato, for his own purposes, wished it so. In this light, the Socrates of the dialogues is a "structured" creation of Plato. If this is so, then it is of great importance to discover why Plato used Socrates in this way when he might just as readily have used any of many other persons who were around at the time or, still better, invented an imaginary person. Whatever the reason or reasons may have been, the fact that Plato did choose Socrates rather than invent an imaginary figure was of central importance in the evolution of the Platonic tradition in terms of which Plato, Socrates, and the city of Athens appear almost as the points of a philosophical triangle.

Plato was an aristocrat, who had received every advantage in education, social position, and the like; he was physically handsome, and was in every possible way an asset to Athens, where he had a promising future. Socrates was of lowly birth, was ugly, dressed badly, bathed infrequently, and was not too well educated by the standards of the time; in sum, he was everything that a right-thinking young aristocrat should shun. The third point of the triangle was Athens—a city in decline, whose elders saw that the young men who would one day rule the city were, for the most part, playboys ill-suited to accept and make good use of responsibility. It was by reason of this situation that the sophists had become powerful and wealthy, for they assured the elders that they would train the young in the things that were important. They would make the playboys virtuous. See SOPHISM.

To the sophists, generally, "virtue" consisted of whatever was most expedient. The "true" was whatever people at the moment thought true; so also with the "good" and the "beautiful." The playboys were generally quite happy to receive such lessons, for the sophistic attitude had actually been theirs all along, and from one's teachers one learned how to argue effectively, and how to manipulate the minds and actions of others. Since all the playboys were getting the same training it was all but inevitable that in a city whose people idolized physical beauty the choicest offices would fall to those who best embodied this quality.

In the Platonic dialogues, however, ugly Socrates is given all the best of it. This eccentric, comic figure, the butt of jokes in the market place, is made to defeat the "best minds" of Athens. The "best minds" profess, Socrates professes nothing. Certainly he does not

know the truth, he says, but that is not to say that there is no such thing. He knows only that within him there is a "daemon" that tells him nothing as to what the truth is, but warns him as to what the truth is not. "Virtue" can be taught, Socrates admits, but not a "virtue" comprising the clichés and truisms of the day, or the ideas and techniques for imparting them that happen to work at the moment; rather a "virtue" of humble searching for truth within oneself, and through intellectual intercourse ("Platonic love") with others similarly inclined. Through such dialectic, knowledge—that is, virtue—will emerge (see DIALECTIC). It is not known to what degree Socrates actually held this view; but it is certain that Plato wished his readers to think that he held it, for it was an essential part of the basic idea itself that it be advanced by someone who was not only not "of" the city of Athens, but was spiritually an outcast of the city—someone who was ugly, ridiculous, and dirty.

That Socrates was not "of" the city was made even more evident by the fact that he was convicted on charges of impiety (that is, on charges of having introduced a new, illegitimate god: his daemon) and virtually murdered, and to Plato, Socrates had indeed been "murdered," despite the fact that he was told he could go into exile and later, after he had refused this alternative, was given various chances to escape. It was in the very nature of a person such as Socrates—who was not of the city, who held the city in contempt, who knew that the laws by which he had been convicted had been weakened by reason of his having been convicted unjustly—that this man, and only this man, should in the end obey the law and submit to it. Socrates' daemon would not let him flee.

Thus, as structured by Plato, Socrates represented the antithesis to central attitudes prevailing in Athens. Athens worshiped outward beauty, but was heedless of inner things; Socrates was ugly in body but beautiful in mind. Athens had its many gods, local prejudices, approved modes of behavior; the eccentric Socrates acted in terms of his daemon—his individual conscience. While Athens could hypocritically destroy its own laws by knowingly convicting a man unjustly and then urging him to cheat the laws by escaping, Socrates chose at that moment to act, as ever, contrary to expediency: he chose to obey the laws and to accept death.

By insisting that the most beautiful and otherwise best man in Athens was the ugly scapegoat Socrates, Plato expressed in dramatic terms what was to prove the central principle of Platonism and the Platonic tradition in philosophy: *nothing is what it appears to be*. Moreover, in placing Socrates between himself and the city—that is, in showing that Socrates and his daemon were better than Athens (or any particular city or state)—Plato freed himself and, in principle, freed all subsequent thinkers from the dictatorship of local gods, local beliefs, local traditions that had been sovereign before; for the first time in this history of Western thought individual conscience and intellectual integrity were enthroned as against official doctrines. This was the founding principle of Plato's Academy and of all subsequent education not politically dominated. For Plato the city was that place where appearances reign—the Athens where Aristophanes considered Socrates just another *phronistes*; indeed, in the dialogue on the trial of Socrates, Plato has Socrates say: "Aristophanes has judged me and condemned me." But, according to Plato, appearances are *always* wrong. And the Academy was to be that place where things would be seen correctly—or where the attempt would be made to see them correctly.

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SODA, the salt, anhydrous sodium carbonate, Na_2CO_3 . This salt, known also as soda ash, is employed in large quantities in the manufacture of glass and soap. Washing soda or sal soda is the decahydrated carbonate, $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$, obtained by allowing a hot solution of sodium carbonate in water to cool. Baking soda is sodium bicarbonate, NaHCO_3 , and caustic soda is sodium hydroxide, NaOH .

SODALITE, a comparatively rare, usually blue, mineral containing sodium aluminum silicate. Sometimes cut as an ornamental stone, sodalite, $\text{Na}_4(\text{AlSi}_3\text{O}_7)_2\text{Cl}$, has a specific gravity of about 2.2 and a hardness of $5\frac{1}{2}$ to 6 (see **HARDNESS**). Blue sodalite can be distinguished from lazurite, or lapis lazuli, mainly by the presence of sulfur in the latter (see **LAZURITE**). However, sodalite may also be found in white, gray, green, or pink colors depending on the types of mineral impurities present. It is often found associated with syenite, a granular igneous rock containing potash feldspar and oligoclase (see **Rock, Igneous Rocks**). Most of the known deposits of sodalite are in the state of Maine, and in Ontario, Québec, and British Columbia in Canada.

SODA NITER, or sodium nitrate, a clear, transparent crystalline salt derived from the interaction of nitric acid and sodium carbonate and used industrially. The naturally occurring Chile saltpeter is an impure form of sodium nitrate, whose chemical formula is NaNO_3 . Soda niter is both colorless and odorless and has a slightly bitter taste. It is considerably heavier than water and melts at 203°F . Sodium nitrate is used in the manufacture of sulfuric acid, nitric acid, potassium nitrate, and of a number of explosives. It is also used as an oxidizing agent, in food preservation, as a fertilizer, and as a medicine.

SODA SPRINGS, city, SE Idaho, seat of Caribou County; on the Union Pacific Railroad and U.S. highway 30N; 145 miles ESE of Boise. The city is a trade and processing center in an area that produces grain, livestock, phosphate rock, and timber. Soda Springs is also a health resort. It was settled, 1863, by Marrisite dissenters from the Mormon church. Pop. (1960) 2,424.

SODA WATER. See **CARBONATED BEVERAGE**.

SODDY, FREDERICK, 1877–1956, Nobel prize-winning English chemist, was born in Eastbourne, Sussex, and studied at the University College of Wales and Merton College, Oxford, was a demonstrator in chemistry at McGill University, Montreal, 1900–02. While at McGill, he originated (with Ernest Rutherford) a theory having to do with atomic disintegration of radioactive elements. Later, in 1913, Soddy announced the displacement law of radioactivity: when a radioactive element emits charged particles, its position in the periodic table is shifted. This law served to explain the existence of "isotopes"—

Soddy's term for elements of identical chemical properties but different atomic weights—and led indirectly to the discovery of the radioactive element protactinium by Soddy and (working independently) his German colleagues, Otto Hahn and Lise Meitner. Soddy was professor of chemistry at Aberdeen University, 1914–19, and Lee professor of chemistry at Oxford University, 1919–36. He was awarded the 1921 Nobel prize in chemistry for his contributions to the knowledge of radioactive substances. He wrote *The Story of Atomic Energy* (1949) and other works.

SÖDERBLOM, NATHAN, 1866–1931, Nobel prize-winning Swedish Lutheran ecclesiastic, was born Lars Olaf Jonathan Söderblom in Trönö, studied at the universities of Uppsala and Paris, and was



Frederick Soddy

the major agricultural activity; coal, iron ore, and graphite are mined; and glass and textiles are manufactured at Liberec and Jablonec nad Nisou, the principal industrial cities. Large numbers of Germans began moving into the area during the twelfth century; by 1930 German-speaking people were a majority of the inhabitants. See **SUDETENLAND**.

SUDHOFF, KARL, 1853-1938, German medical historian, was born in Frankfurt am Main, studied medicine, was a general practitioner in various cities for many years until 1905, when he became the University of Leipzig's first professor of the history of medicine. He founded, 1908, the *Archiv für die Geschichte der Medizin* and the *Mitteilungen zur Geschichte der Medizin*. Sudhoff's researches led to several invaluable studies of Paracelsus' highly important contributions to medicine and to definitive editions of Paracelsus' works (1887-99; 1922-33); Sudhoff was responsible for correcting many prevalent misconceptions in regard to Paracelsus' doctrines and significance, and brought to light the astounding Valentinus forgery (see **VALENTINIUS**; **PARACELSI**). Sudhoff's important research into the origins and history of syphilis led him to conclude that the disease was European, rather than American, in origin. Sudhoff also made important studies of the medieval plagues of Europe, the history of the medical school of Salerno in the Middle Ages, and many other aspects of medieval medicine.

SUE, EUGÈNE, 1804-57, French novelist, was born Marie Joseph Sue in Paris. He studied painting and medicine, spent six years as a surgeon in the navy, and retired, 1829, to write novels based on his personal experiences, such as *Plick et Plack* (1831). At this time he adopted the nom de plume, Eugène Sue, choosing "Eugène," rather than some other name, in honor of his patron, Prince Eugène Beauharnais. Sue contributed to the vogue of the *roman de feuilleton* (newspaper serial) through his numerous lurid and vigorous popular novels, typically garish and coarse in style, and containing elements of the supernatural, social idealism, and anticlerical propaganda. He depicted vividly the Parisian underworld and its argot, and peopled it with bizarre characters. Sue's most famous works are the very popular *Les mystères de Paris*, 1842-43, (*The Mysteries of Paris*, 1844), his classic *Le juif errant*, 1844-45, (*The Wandering Jew*, 1845), and *Les Mystères du peuple*, (1849-56). He was elected to the Constituent Assembly as a radical, 1850, went into exile in 1852, and spent his later years at Annecy, Haute-Savoie.

SUETONIUS, full name Gaius Suetonius Tranquillus, A.D. 70?-116, Roman historian and biographer, and an advocate in the Roman courts of law, was an intimate friend of Pliny the Younger, through whose influence he was made a secretary to the Emperor Hadrian. While serving in this post, 119-121, Suetonius had access to official archives and used them in writing his most famous and only extant book *De vita Caesarum*. (*Lives of the Caesars*), 121, a group biography of Julius Caesar and the 11 emperors from Augustus to Domitian; of a number of English translations, that of Robert Graves is the most felicitous. While valuable historically, *De vita Caesarum* consists largely of malicious and prurient gossip concerning the emperors and their courts. Of Suetonius' other works, fragments of some are extant, others are known only by their titles as mentioned in the writings of other ancient writers. Among the former, is *De viris illustribus*, 106-113 (containing *De illustribus grammaticis* and *De claris rhetoribus*), a collection of the lives and an elucidation of the works of famous scholars and orators such as Terence, Horace, and Lucan.

SUEVI. See **SWABIA**.

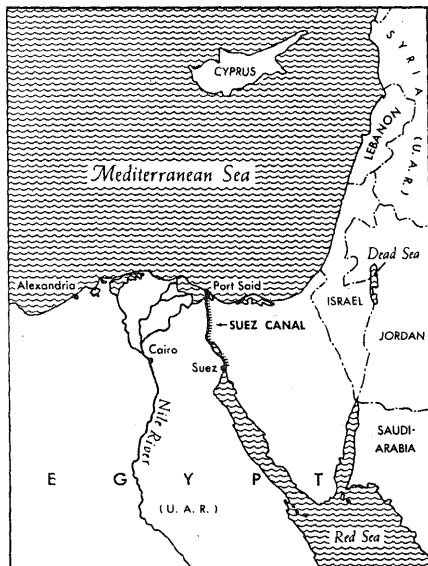
SUEZ, city, NE Egypt, United Arab Republic, seat of Suez Province; on the Gulf of Suez and at the S end of the Suez Canal; 80 miles E of Cairo. The city is a port and railroad terminus, and has shipyards, oil refineries, and chemical plants. It is built

on ground reclaimed from the gulf. Fresh water is supplied from the Nile River. Suez is a quarantine station for Moslem pilgrims returning from Mecca in Saudi Arabia. It is near the site of ancient Kolzum. Suez was an important port during the Fatimid, Ayubite, and Mamluke eras. The Ottomans used it as a naval base in the sixteenth century, and it was a transshipment point for goods from India. The building of the Suez Canal in the 1860's greatly stimulated the city's growth. Pop. (1959 est.) 156,300.

SUEZ CANAL, an international waterway across the Isthmus of Suez, connecting the Mediterranean Sea with the Gulf of Suez and the Red Sea. It is one of the world's most important and most heavily used shipping routes. The canal lies wholly within the United Arab Republic and is operated by the U.A.R.-owned Suez Canal Company.

The waterway, 105 miles long, is at sea level and there are no locks throughout its length. It stretches southward for about 50 miles from Port Said, its northern terminus on the Mediterranean, to Ismailia, the headquarters of the Suez Canal Company, on Lake Timsa; it then extends through Great Bitter and Little Bitter lakes to Port Taufiq, near Suez, its southern terminus, on the Red Sea. The canal is paralleled by a railroad, and it is spanned by the Cairo-Tel Aviv railroad at Qantara.

When the canal was first opened to traffic, 1869, it was about 200 feet wide at the surface and 72 feet wide at its maximum depth of 26 feet, although it was only 18 feet deep in some places. The increasing size and number of vessels using the waterway gave rise to a succession of modernization programs, and by the late 1950's, the main channel was more than 100 feet wide at the bottom with a minimum depth of 35 feet. The increased breadth of ships allows only for single passage through the canal, and in 1948 a convoy system was established to maintain a rapid flow of traffic. There are two bypasses, at Ballah and at Great Bitter Lake, which enable the convoys to pass each other. Transit of the waterway averages about 14 hours. Electric lighting installations, radar, and radio aids permit night use of the canal. The Egyptian government undertook a further series of im-



Location Map of Suez Canal

economic and social interest. In November, 1959, at Stockholm, Great Britain, Austria, Denmark, Norway, Portugal, and Switzerland formed the European Free Trade Association, of "Outer Seven," which was primarily a customs union intended to compete economically with the European Economic Community that had been formed earlier in 1959 by France, West Germany, Belgium, the Netherlands, and Luxembourg.

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✓ **SWEDENBORG, EMANUEL**, 1688–1772, Swedish scientist, anatomist, and theologian, was born Emanuel Svedberg in Stockholm, the son of Jesper Svedberg (or Svedberg), former chaplain of Charles XI. After graduating from the University of Uppsala, 1709, the younger Svedberg spent several years, 1701–13, in England, studying science under Isaac Newton, John Flamsteed, and Edmund Halley, and acquiring at the same time a practical knowledge of bookbinding, lens and instrument making, and other crafts. After brief stays in Holland and France, 1713–14, he returned to Sweden, 1715, and in the following year founded Sweden's first scientific journal, *Daedalus Hyperboreus* (The Northern Inventor), 1716–18, whose content was devoted to accounts of new discoveries in mechanics and mathematics. He served as counselor in the Royal College of Mines, 1716–47, and as a military engineer to Charles XII, 1716–18. Upon the coronation of Queen Ulrika Eleonora, 1719, the Svedberg family was ennobled and its name changed to Swedenborg. Upon receiving his new status as a nobleman, Swedenborg was entitled to a seat in the Swedish Riksdag, and for the rest of his life remained a member of that body.

His early writings in mechanics included plans for such sensational inventions as a glider airplane, a submarine, a machine gun, and a "universal musical instrument, by means of which one who is quite unacquainted with music may execute all kinds of airs. . . ." In 1721 he began his *Principia* (1734), a series of works in which he sought to explain the elementary mechanics of the world on a philosophical basis. Later he turned his attention to anatomy and physiology, and in his *Oeconomia regni animalis* (Economy of the Animal Kingdom), 1740–41, and *Regnum animale*, (The Animal Kingdom), 1744–45, he advanced theories that anticipated later views on the function of the brain, although his principal aim had been to demonstrate that the soul is located in the cerebral cortex.

In Holland, 1744, and again in England, 1745, Swedenborg experienced "spiritual visitations" of something "undoubtedly holy," which he interpreted as "the Son of God Himself." Thereafter he believed himself able to have direct contact with angels and to experience supernatural visions of the spiritual world. His true mission in life—to prove the divine authority of Scripture and to propound that which had been revealed to him by heavenly inspiration—now seemed clear to him. After a two-year initiation period of spiritual retreat, he abandoned his purely scientific work and dedicated the rest of his

life to expounding the mystic significance of the Scriptures and Christian doctrines. Among his theological works, which he claimed had been written with divine or angelic assistance, and all of which are available in English translation, are *Arcana coelestia* (1749–56); *De coelo et ejus mirabilibus, et de inferno*, 1758 (Heaven and Hell); *Apocalypsis explicata*, 1759 (The Apocalypse Explained); *Sapientia angelica de divino amore et de divina sapientia*, 1763 (Divine Love and Wisdom); *Sapientia angelica de divina providentia*, 1764 (Divine Providence); and *Vera christiana religio*, 1771 (The True Christian Religion). He died in London, where he had gone in connection with the publication of his works, and was buried in the Swedish church in Princes Square, London. The Swedish government had his remains removed to the cathedral at Uppsala, 1908.

Swedenborg's basic religious ideas, which became the doctrine of the Swedenborgian church, were as follows: The Trinity is not of God in three persons, but of Divine Love, Wisdom, and Proceeding in Jesus Christ, who is, therefore, the one and only God. Man, as an image and likeness of God, comprises the trinity of soul, body, and operation. Since Christ glorified and made divine His human nature, His second coming is the revelation of His Divine Nature; and "since the Lord cannot manifest Himself in person, and yet has foretold that He would come and establish a new church which is the New Jerusalem, it follows that He is to do it by means of a man, who is able not only to receive the doctrines of this church with his understanding, but also to publish them by the press."

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✓ **SWEDENBORGIAN CHURCH**, or Church of the New Jerusalem, is organized around the teachings of Emanuel Swedenborg (1688–1772)—Swedish scientist, scholar, and mystic. Although Swedenborg sought disciples for his doctrines, he made no effort to found a church, but wished, instead, to propagate his teachings in the existing churches. After his death, however, the study of his voluminous writings led to the organization of the New Church by five former Wesleyan preachers at London, England, in 1787. Its original purpose was to include under its fraternal shelter all who accepted Swedenborg's teachings, regardless of church affiliation. Soon, however, it became autonomous.

The church polity is a modified episcopate, and the liturgy resembles the Anglican book of prayer. Its theological tenets derive for the most part from Swedenborg's *Vera Christiana religio* (1771). Swedenborg interpreted the Scriptures as having given 1757 as the date of the Judgment, and to the effect that the other sects must eventually give way to the New Church and become instructed in God's truths. The first general conference of British Swedenborgians was held in 1789. The first organization of Swedenborgians in the United States was at Baltimore, Md., 1792. The General Conference of the New Jerusalem in the United States, with headquarters in Boston, Mass., had 54 churches with about 4,500 members at mid-twentieth century. The General Church of the New Jerusalem, a group that separated from the parent body, 1890, because of its desire for stricter adherence to the teachings of Swedenborg, had 25 churches and about 1,750 members at mid-twentieth century. In Great Britain, membership had grown to almost 7,000, but in Sweden membership remained under 500.

W. E. GARRISON
SWEDISH LANGUAGE AND LITERATURE, the language and literature of Sweden. The Swedish

Tillich studied at the universities of Berlin, Halle and Breslau, was ordained a minister of the Evangelical Lutheran church, 1912, and served as a chaplain in the German army, 1914-18. He taught at the University of Berlin, 1919-24, and while in Berlin was one of the founders of a group of religious socialists. He held chairs in theology at the universities of Marburg, 1924-25, Dresden, 1925-29, and Leipzig, 1928-29. He was appointed a professor of philosophy at the University of Frankfurt am Main, 1929, but lost this position, 1933, because of his anti-Nazi sentiments. Tillich emigrated to the United States in the same year, was appointed to the faculty of the Union Theological Seminary, New York, 1934, and remained there as professor of philosophical theology until 1954, when he became a professor in the divinity school at Yale.

In addition to teaching and lecturing, Tillich wrote numerous books, the most important of which is the projected three-volume *Systematic Theology* (Vol. I, 1950; Vol. II, 1957). Tillich sought to illuminate Christianity in light of the needs of modern man. To this end, he studied the relation of Protestant Christianity to art, politics, sociology, psychology, philosophy, and so forth, and asserted that Protestant theology could embody the ideas and methods of modern scientific, critical, and ethical thinking without betraying its Christian basis. Among Tillich's works in English are *The Interpretation of History* (1936), *The Protestant Era* (1948), *The Courage To Be* (1952), *The New Being* (1955), *Dynamics of Faith* (1957), and *Theology of Culture* (1959).

TILLMAN, BENJAMIN RYAN, 1847-1918, U.S. political leader, was born in Edgefield County, S.C. After several years as a farmer in South Carolina, Tillman became prominent in state politics when he agitated for state agricultural education, 1885, and organized the Farmers' Association in the same year. His election as governor of the state, 1890, brought to an end the old regime of aristocratic plantation owners, headed by Wade Hampton. As governor, 1890-94, Tillman led the movement which made it impossible for Negroes of the state to vote, and established a state monopoly in the sale of liquor. Elected to the U.S. Senate, 1895-1918, he became nationally known as a Southern Democrat of extreme views and violent expression, winning the name "Pitchfork Ben."

TILLSONBURG, town, Canada, SE Ontario; in Oxford County; on Big Otter Creek, the Canadian National, the Canadian Pacific, the New York Central, and the Wabash railroads; 25 miles SE of London. Founded in 1825, the town was known as Dereham Forge until 1836, when it was renamed for the first settler, George Tillson, who built the first sawmill and forge in the area. Tillsonburg is a market center for a dairying and fruit and tobacco-growing region. Shoe factories, foundries, tool factories, flour mills, creameries, and tobacco factories are the town's chief industries. Pop. (1956) 6,216.

TILLY, JOHAN TSEKLAES, COUNT OF, 1559-1632, Bavarian general, was born in the castle of Tilly in Brabant. After serving in the Austrian campaign against the Turks, Tilly became commander of the forces of the Catholic League of Germany under Maximilian I at the outbreak of the Thirty Years' War, 1618 (see THIRTY YEARS' WAR). Tilly defeated Frederick V, elector palatine, in the battle of the White Mountain near Prague, 1620, and recovered Bohemia for the emperor, Frederick II. He then overthrew Count Mansfeld, the Margrave of Braden, and Duke Christian of Brunswick, with the result that the emperor obtained possession of the Lower Palatinate, and the Catholic forces spread over the north of Germany. An attempt by Christian IV of Denmark to intervene on behalf of the Protestant cause was cut short at the battle of Lutter am Barenberge, Aug. 27, 1626. The entry of Gustavus Adolphus of Sweden into the war coincided with the dismissal of Wallenstein, and was followed by Protestant successes.

Historians dispute Tilly's responsibility for the merciless sack of Magdeburg, which took place on May 20, 1631, after his capture of the city. On Sept. 17, 1631, he was totally defeated by the Swedish king at Breitenfeld (Lutzen). Gustavus thereupon marched to South Germany. Here, he once again defeated, and also mortally wounded, Tilly in the Battle of the Lech in Bavaria, Apr. 5, 1632.

TILSIT. See SOVETSK.

TIMAEUS, 345?-250 B.C., Greek historian, was a native of Tauromenium in Sicily. He was banished by Agathocles of Syracuse, ?310 B.C., and lived the rest of his life in Athens. He wrote a voluminous history of Italy and Sicily from earliest times to 264 B.C. A history of Pyrrhus is sometimes thought to be a separate work, but it is probably an episode in the main work. His painstaking research is admitted by Polybius, and he paid great attention to exactness of chronology; in fact, Timaeus was the first writer to compute by Olympiads. Only fragments of his work are extant.

TIMAEUS, one of the last and greatest of the works of Plato, was certainly composed after 360 B.C., and perhaps as late as 347. It was to be part of a trilogy wherein the *Timaeus* was to deal with the generation of the cosmos and of man (see COSMOLOGY AND COSMOGONY); the *Critias* was to be an account of the "ancient" Athenians "before the great deluge" that swallowed up the island of Atlantis and its predatory inhabitants (see ATLANTIS); and the *Hermocrates* was probably to deal with some aspect of politics. Of this program, only the *Timaeus* was completed; the *Critias* was abandoned in the middle, perhaps to allow Plato to turn his attention to composing the *Laws*; and the *Hermocrates* was never begun, so that what its subject was to have been is not known with any certainty, although there are ample grounds for inferring that its subject was to be political.

Apart from the importance of its content, the *Timaeus* is of particular significance for the biography of Plato. In most of his works, Plato imputed his doctrine to his teacher, Socrates, thus giving rise to perpetual and necessarily inconclusive speculation as to which of the thoughts ascribed by Plato to Socrates actually were entertained by him. In the *Timaeus*, however, Socrates is a mere bystander, and seems to have been included only for old time's sake. If, as is held by most authorities, the "Timaeus" of the dialogue actually did not exist historically and the views ascribed to him are actually those of Plato, then the *Timaeus* is of tremendous importance in indicating what Plato thought, as distinct from what Socrates thought. It should be noted that some sources still speak of a "Timaeus of Locri," author of a treatise *On the Soul of the World and Nature*, but this work is generally held to be a forgery dating from the first century B.C. See PLATO; SOCRATES.

Organization. Insofar as the *Timaeus* must be regarded as a dramatic work, its characters are four: Socrates, Critias, Hermocrates, and a Pythagorean sage, Timaeus, who has 99 per cent of the "dialogue." The setting is Athens during one of those rare periods when the city was not at war or preparing for war; the time is probably during the 420's or before. The *Timaeus'* ultimate temporal perspective, however, extends some 8,000 or more years into the past, in contrast to the more limited backward temporal perspective of the *Republic*, which was back 150 years or so to ?500 B.C. The spatial perspective of these two works is also radically different: in the degree that the subject of each work is man, in the *Republic* man is depicted as the image-in-miniature of the Greek polis (city-church), while in the *Timaeus* man is understood in terms of the cosmos, in which each star is the soul of a human being. Apart from a short prologue setting the scene, a prayer that out of the discourse will come true understanding, and an epilogue at the end, the *Timaeus* is divided into two main sections. In each of these two sections the same subject matter

—the origin and constitution of the cosmos—is treated from a different point of view.

Theonemics. The first section, aptly called, by one authority, the "theonomical" (in terms of divine names) part of the dialogue, is for most modern readers the more difficult portion, for it deals with man's relation to a universe that is essentially alive and therefore alien to the usual post-Cartesian frame of reference. For Plato, and for the ancient Greeks generally, the *physis* was not the "dead world" of matter and motion studied by later physicists, but was quite literally a garden (this was the meaning of the word *physis* as such), of which God was the gardener, and in which man was spiritually at home. The degree to which this was for centuries forgotten or ignored is indicated by the fact that one of the best post-Enlightenment translations, that issued in 1804 by a famous Neo-Platonist, Thomas Taylor (1758-1835), could contain the following sentences, purportedly Plato's: "I denominate, therefore, this universe *heaven*, or *the world*, or by any other appellation in which it may particularly rejoice. Concerning which, let us . . . consider that which, in the proposed inquiry about the universe, ought in the very beginning to be investigated; whether it always was, having no principle of generation, or whether it was generated, commencing its generations from a certain cause." In rendering the same passage, another famous translator, Benjamin Jowett, puzzled by pronouns in the Greek that, to his mind, should have been "it" but were not, sought to avoid the pronouns, but failed in the end: "Was the heaven then or the world, whether called by this or by any other more appropriate name—assuming the name, I am asking a question which has to be asked at the beginning of an inquiry about anything—was the world, I say, always in existence and without beginning, or created, and had it a beginning." These and similar mistranslations in the two best English translations available at mid-twentieth century put additional obstacles in the way of readers seeking to understand one of Plato's most difficult dialogues. It should be noted carefully, therefore, that for Plato the *physis* was alive, a garden of living beings, and that the theonomical portion of the *Timaeus* is written throughout as though "they" (the living beings comprising the *physis*) were listening in. Depending upon his own personal preference, the translator may properly speak of the *physis* as being "he" or "she" but should never refer to the word as meaning "it"; Plato was more circumspect than his English translators.

The theonemics consists of an account of how the creator (apparently the Demiurge, although the supreme ruling power in the universe is Nous, the Word) imparts to the world its most perfect shape, the spherical; of how this world possesses a soul and an intelligence and exemplifies mathematical proportions and harmony in terms of which man, if properly attuned, participates in the cosmic dance; of how each man is a star, and each star (each man) moves and breathes under the aegis of the moving stars (the planets); a heliocentric view of the solar system is implicit throughout. Key words are *physis* (garden), dance, numbers, harmony (which meant, among the Greeks, "for the sake of attunement"), and, most fundamentally, time.

Auxiliary Aspects of the Cosmos. The second half of the *Timaeus* is a "scientific" account of precisely the same phenomena and beings that Plato has already accounted for theonemically. The scientific causes are spoken of as auxiliary, or secondary, but not with the intention of belittling them. Actually, as Plato points out explicitly, either the theonomical or the scientific explanation may be correct; or perhaps both or neither is correct. It is not for man to know such things with absolute certainty. In adopting this cautious attitude toward his own views Plato slated a principle that was to be of prime importance in the development of the scientific attitude in the Occident.

Also of far-reaching influence in the development of science was Plato's emphasis on the mathematical basis of much of the universe, and the fact that he attempted to describe as much as possible in terms of mathematics. There is something of a historical paradox in this influence, however, since it was Plato's judgment that much of the cosmos-qua-theonemics could be explained mathematically; the theonomical universe was, after all, alive and in motion, and numbers were alive and powerful too; the world of auxiliary causes, however, spatially rather than temporally oriented, and operating in terms of necessity rather than music, seemed essentially unmathematical to Plato. Yet in later centuries it was the dead world of extended volumes and brute fact that engaged the attention of physicists, most of whom, by early in the twentieth century, regarded as fundamental two assumptions that Plato would have found unthinkable and unspeakable: (1) the assumption that at bottom matter is dead and that life came into the picture eons ago as the result of an accidental physicochemical relationship between or among two or more globs of this dead matter—that is, that life proceeded, and proceeds, from death; and (2) the related assumption that time is no more than the fourth dimension of space.

TIMARU, city, New Zealand, E coast of South Island, 90 miles SW of Christchurch. The town is a port and railroad center. Chief industries are the processing of wool, flour, and meat. Pop. (1955 est.) 23,600.

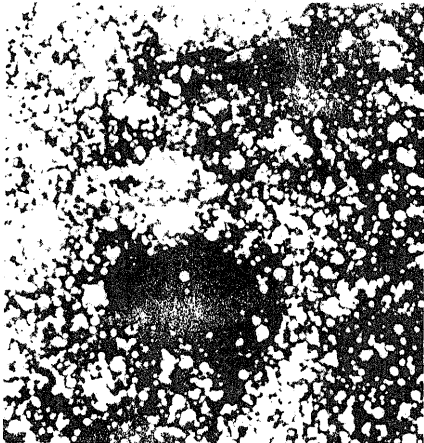
TIMBER. See FORESTRY; LUMBERING.

TIMBER LAKE, city, N South Dakota, seat of Dewey County, on the Milwaukee Railroad, 250 miles NW of Sioux Falls. The city is a marketing and processing center for grain, dairy products, and cattle produced in the area. It lies within the Cheyenne River Indian Reservation. Pop. (1960) 624.

TIMBUKTU, French Tombouctou, town, central Mali, in West Africa, 975 miles ENE of Dakar. The town is on channels that fill from the Niger River at flood time and empty into it in the dry season. One channel enters the Niger at Kabara, Timbuktu's river port. The town was once much larger, and extensive ruins lie to the north and west. The great mosque, with a high earth tower, stands in the western part of the present town. There are European-type streets, schools, churches, and other buildings. The chief industries are cotton weaving, leatherwork, the making of earthenware, and embroidery. Timbuktu is the great caravan center of the west central Sahara. Trade is carried on principally from March to June, at which time Timbuktu's population trebles. The chief articles of trade are salt, gums, rubber, gold, wax, ivory, and grain.

History. Timbuktu was an important trade center in the eleventh century, when the people of the Negro Songhai Empire to the south arranged to trade with the Tuaregs of the town. Its fame as a trade center spread to Europe. In 1469 the Moslem Songhai captured the town, and its university, Sankara, became the center of Moslem culture for the peoples of western Sudan. A Moroccan force captured Timbuktu, 1591, and succeeded in destroying much of the Songhai power. By the end of the eighteenth century Timbuktu was almost depopulated. In 1800 the Tuaregs captured the town, but were in turn driven out by the Fulahs, 1813, who in their turn lost Timbuktu to the Tukolor, 1840. In 1853 an attempt was made to bring the town under British influence, but nothing came of it. Between 1853 and the French occupation of 1893 only one white man visited the town, 1880. Tuareg marauders had made trade hazardous, and the townspeople welcomed the French, who controlled the area until 1960. Pop. (1957) 7,000.

TIME, one of the fundamental magnitudes of the physical universe. Since no tangible unit of time analogous to the standard meter and standard kilogram can be devised, it is necessary to define a unit of time



Dark areas appear among the star clouds of this system of galactic nebulae in the Milky Way. The picture was taken with a Bruce telescope by the astronomer, E. E. Barnard.

be applied to the observed apparent magnitudes. When this correction is applied, the simple linear relationship between velocity and distance no longer holds. The rate of expansion increases more and more rapidly with distance. In the past the rate of expansion has been faster than it is at present and therefore the derived time interval since the beginning of the expansion becomes unsatisfactorily short.

The second inconsistency refers to the observed numbers of galaxies. Without a correction applied for a true velocity of recession, the observed numbers are consistent with the conclusion that the galaxies are uniformly distributed throughout space. If, however, the correction for a true recession is applied to the apparent magnitudes, the number of galaxies per unit volume is found to increase with distance. This conclusion puts the observer in a unique position and is unsatisfactory for that reason. The alternative is that the universe is small, with a positive space curvature.

In other words, the theory of a truly expanding universe has led to an extremely small and very young universe. To avoid that conclusion it seems necessary to accept some unknown cause for the red shifts. It should, however, be pointed out that these conclusions are based on observed effects which are dangerously close to the limits of observation set by present telescopic equipment. The 200-inch telescope at the Mount Palomar section of the Mount Wilson and Palomar Observatories should be able to resolve some of the difficulties. Even according to a conservative estimate, it will double the distance that can be explored and will thus afford an eightfold increase in the volume. The observable universe will have expanded to a distance of 1 billion light-years.

Before the development of radio astronomy, the great 200-inch Hale reflector at Mount Palomar was believed to have delved, as far as would be humanly possible, into the far reaches of space, as far as 1,000 million light-years. This optical telescope has also measured radial velocities up to 60,000 miles per second, roughly one-third the speed of light. Radio telescopes have detected radio sources as far as 500 million light-years away. The intensity of these radio sources is sufficiently large that they would be detected even if they were 10 times as far away. In fact, they are so far away that even the great 200-inch optical telescope can not photograph them. It is presently hoped that such probings of space by radio

telescopes will furnish observational evidence to help decide which of the present conflicting cosmological models is consistent with the observations.

PRISCILLA F. BOK; THEODORE G. PHILLIPS

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UNIVERSITY, in modern times, an institution for higher education comprising several colleges and schools and granting advanced degrees as well as the baccalaureate. Although the ancient Greeks and Romans had extensive facilities for education, universities as such did not come into being until the Middle Ages in Western Europe, especially in the twelfth century and after.

History. In antiquity, higher education was carried on in academies, of which the Academy of Plato was the archetype. The academy was a place where only one point of view could be taught; doctrines inconsistent with the one prevailing in a particular academy might be mentioned, and even discussed, but only for purposes of refuting them. If a teacher's fundamental point of view came to conflict with that of the academy with which he had been associated, that teacher went elsewhere, often to found a new academy where only his doctrine would prevail. The classic illustration of this in antiquity involves Plato and Aristotle: having spent years at Plato's Academy, Aristotle eventually came to disagree with the master on certain fundamental points, whereupon he had no choice but to leave Plato and to found his own academy, the Lyceum. Had Plato's school been a university of the type that developed in the Middle Ages, however, Aristotle would not have been obliged to found his own school, for the university was, as its name implied, a place where at least two conflicting points of view on the same subject matter were taught by representatives of these points of view. That is, conflicting doctrines were not merely mentioned or discussed as examples of error or wrong-headedness; each doctrine was represented by persons convinced of its truth. The medieval method of disputation-and-concordance that was created by the universities was to be of prime importance in the subsequent intellectual and cultural history of Europe.

Many of the earliest universities were federations of students who employed scholars to teach them. In such a manner various cities grew to be centers of instruction in various subjects: Bologna, where one studied "both laws"—civil (Roman) law and canon law; Salerno where the base hospital of the Crusaders was located, and where one studied the conflicting medical doctrines of the Arabs and of the ancient Greeks; and Paris, where university (rather than academic) instruction in theology and philosophy developed in terms of the dispute between the Nominalists and the Realists (see ABÉLARD, PIERRE; CONCORDANCE; CONCEPTUALISM; NOMINALISM; REALISM).

By the thirteenth century the instructors, often allied with the church, had formed definite organizations to supervise instruction and the granting of degrees. From that time, governing authority of

universities was more and more held by the officers of instruction rather than by the students. By the eighteenth century, major universities had been established in all large countries of Europe and the Middle East. In the United States, Harvard College, founded in 1636, was offering what was essentially a university curriculum by the early nineteenth century. But by this time the earlier distinction between academy and university had long since disappeared: a university was any institution of higher education having a number of diverse departments, schools, colleges, and the like.

The Organization of a Modern U.S. University usually consists of the president or chancellor, who is the chief administrative officer; several vice-presidents in charge of faculty, finances, and other matters of importance; the deans of the various colleges and schools which make up the university; and all professors and certain other officers of instruction. A board of trustees, elected by the alumni or those responsible for the support of the institution, exercises certain broad powers of supervision. The president and the other officers are usually responsible to this board.

The physical plant of a university usually consists of one or more libraries, offices of the administration and faculty, laboratories, lecture halls, and classrooms for the various colleges and schools. There may be residential and recreational facilities for the students, an auditorium, a gymnasium, a hospital, museums, and institutes for advanced study and research.

A typical large university would consist of an undergraduate college of liberal arts and sciences, a graduate school, and colleges or schools for instruction in various professional fields, such as law, foreign service, public administration, library science, business administration, journalism, education, physical education, speech, divinity, music and fine arts, architecture, engineering, agriculture, home economics, forestry, veterinary medicine, nursing, pharmacy, medicine, and dentistry. At mid-twentieth century there were approximately 150 universities in the United States.

UNIVERSITY CITY, E. Missouri, St. Louis County; a residential suburb, 7 miles WNW of St. Louis. The city derives its name from Washington University, located at the city's southeastern border. University City's city hall occupies a unique eight-sided tower. The city was incorporated in 1906. Pop. (1960) 51,249.

UNIVERSITY HEIGHTS, city, NE Ohio, in Cuyahoga County, immediately E of Cleveland, of which it is a residential suburb. Pop. (1960) 16,641.

UNIVERSITY PARK, city, NE Texas, in Dallas County; within Dallas, of which it is a residential suburb. University Park is the seat of Southern Methodist University, which gave the city its name. Pop. (1960) 23,202.

UNKNOWN SOLDIER, the personification of all those soldiers who lost their lives in defense of their country. The idea originated in France after World War I; other nations, including the United States, soon followed the French example. On Sept. 9, 1921, in compliance with a joint resolution of Congress, the Secretary of War instructed the Quartermaster General of the Army to select, from unidentified U.S. dead overseas, the body of a member of the American Expeditionary Forces, and to return it to the United States. Eight unidentified bodies of U.S. soldier dead were exhumed, two from each of four different cemeteries: Meuse-Argonne, St. Mihiel, Somme, and Aisne-Marne. One of the bodies was left at each cemetery as an alternate; the other four were placed in specially made coffins and removed to the City Hall at Chalons-sur-Marne where, on Oct. 24, 1921, a ceremony was held in which a U.S. soldier placed a spray of white roses on one of the coffins of the unidentified bodies, thereby selecting which of them

was to become the Unknown Soldier. The other coffins were reburied in France, and the Unknown Soldier's remains were removed to the United States and interred at Arlington National Cemetery on Armistice Day, Nov. 11, 1921. The original cenotaph, never completed, was replaced, 1931, by the present tomb, which was designed by the sculptor Thomas Hudson Jones and the architect Lorimer Rich. The tombstone, of white and flawless Yule (Colorado) marble, is 16 feet long, 9 feet wide, and 11 feet high. The inscription reads: "Here rests in honored glory an American Soldier known but to God."

After World War II it was felt appropriate to enshrine an unidentified serviceman who would symbolize all the fallen dead of World War II. Early in 1950 the Department of Defense announced that six bodies of unidentified servicemen would be brought to Philadelphia, where one would be selected for enshrinement. The six bodies were to represent the five war theaters (Europe, Mediterranean, Africa, West Pacific, Mid-Pacific) and the Alaska Command; the one chosen by means of a lottery would then be interred in the same burial vault where rested the Unknown Soldier of World War I, and the inscription on the sarcophagus changed to read: "Here rest in honored glory members of the American armed forces of the World Wars known only to God."

The selection (to have been made on May 26, 1951, for enshrinement on Memorial Day, 1951) was postponed after the outbreak of the Korean conflict, 1950. The plans were subsequently changed, and on Memorial Day, 1958, two unidentified bodies, one from World War II and one from the Korean conflict, were buried near the tomb of the Unknown Soldier of World War I. Henceforth the burial site was known as the Tomb of the Unknowns.

UNTERMEYER, LOUIS, 1885–, U.S. poet, editor, and anthologist, was born in New York City. He left school at the age of 15, spent 21 years working in his father's jewelry business, subsequently devoted himself to literary work, and was poetry editor of the *American Mercury*, 1934–37. Besides original verse, he published parodies, translations, critical studies, and several anthologies. Among his works are *The Younger Quire* (1910), *The New Adam* (1920), *Roast Leviathan* (1923), *Burning Bush* (1928), *Moses* (1928), *Selected Poems and Parodies* (1935), *Heinrich Heine: Paradox and Poet* (1937), *From Another World* (autobiography, 1939), *French Fairy Tales* (1945), English versions of Perrault's stories. Among his anthologies are *New Modern American and British Poets* (1950, 2nd ed., 1955), *Treasury of Ribaldry* (1956), *Lives of the Poets* (1959). See AMERICAN LITERATURE, *Wars, Hard Times*.

UNTERWALDEN, canton, central Switzerland, divided unequally into the half-cantons of Obwalden (the W and larger part, which includes the detached SE corner called Engelberg District) and Nidwalden; bordered on the W and N by the canton of Luzern and Lake of Luzern, on the E by the canton of Uri, and on the S by the canton of Bern; total area 296 sq. mi. (Obwalden 190 sq. mi.; Nidwalden 106 sq. mi.); pop. (1950) 41,514 (Obwalden 22,125; Nidwalden 19,389). The Nidwalden capital is Stans; the Obwalden, Sarnen. Unterwalden is mountainous, a range effectively separating the half-cantons. The chief river is the Aa, and the largest lake is the Sarnen. Forest covers about a third of the area. A rail line runs north-south through each half-canton. Stock raising is more important than crop cultivation. The people are mostly German-speaking Roman Catholics.

Originally Unterwalden was included in the Zürich area. In 1291, Unterwalden, Uri, and Schwyz formed the so-called Everlasting League. Unterwalden resisted the Helvetic Republic, 1798, and subsequently was made a part of the canton of Waldstätten. Nidwalden rose in a revolt that was only contained by the coming of a force of 16,000 men. Nidwalden's independence was restored, 1803, but when the half-canton refused to accept the new constitution when

trifugal pumps, gear-pumps, rotary oil-sealed mechanical pumps, steam ejectors, oil or mercury vapor ejectors, molecular drag pumps, and mercury or oil diffusion pumps (see PUMP). Reciprocating, centrifugal, gear, and rotary pumps, and steam ejectors produce the moderately low pressures required for such applications as steam turbine exhaust, paper-making machinery, evaporating pans, stills, deodorizers, filters, and impregnators. Oil or mercury ejectors are used in series with rotary pumps and steam ejectors to increase effectiveness. The molecular drag pumps and the mercury or oil diffusion pumps produce the extremely high vacuums required to exhaust the bases from electronic tubes, cyclotrons, and vacuum bottles.

A typical combination of the rotary and steam ejection types of vacuum pumps for the exhaust of television tubes is shown in the illustration. Hot oil vapor in the diffusion pump rises to the nozzles and then issues downward at high velocity and returns to the boiler after condensing on the water-cooled casing. Gas molecules from above are carried by the stream to the space below. The rotary pump sweeps these molecules out to the atmosphere as the inner cylinder revolves the sliding vanes past the intake and exhaust ports. In other forms of rotary pumps a vane slides in the outer cylinder and rests against the inner cylinder, which revolves on an eccentric axis.

Other means of producing low pressures include water aspirators, active metals such as barium, absorbents such as outgassed charcoal, and traps cooled with dry ice or liquid air to condense residual vapors.

VACUUM TUBE, a type of electron tube which has been highly evacuated so that the motion of electrons through it occurs with the minimum number of collisions with the remaining gas molecules. Such tubes make use of the thermionic effect to produce an electron flow which can be controlled by connecting the tube to electronic circuits. A single form of vacuum tube is the two-element diode or thermionic valve. More complex vacuum tubes include the triode, tetrode, pentode, and multigrad tubes.

VAFFHRUDNI, in Scandinavian mythology, one of the wisest of the giants. One day Odin visited him in disguise and proposed a contest in wisdom. Vaffhrudni agreed to the contest, but was at last defeated when asked what Odin had whispered in the ear of his dead son Balder, when he laid him on his funeral pyre.

VAGA, PERINO DEL, real name Pietro Buonacorsi, 1500-47, Italian painter, was born in Florence. He assisted Raphael in the decoration of the loggia in the Vatican. His works deal primarily with historical and mythological subjects.

VAGRANCY, the act of going about from place to place, committed by a person who although being able to work, refuses to do so. A single act, such as begging, may be considered vagrancy, but the condition is usually applied to a way of life.

Anti-vagrancy statutes were first passed in England in the seventh century. Idleness was considered to be a voluntary state, and in law it was held an offense against the public economy. Over the course of years, punishment for vagrancy varied, at times consisting of branding, whipping, commission to slavery, and even execution. With a change in public attitudes toward idleness, punishment changed and vagrants were most frequently jailed for a short time, or fined a small amount.

By mid-twentieth century, most states and municipalities had passed anti-vagrancy laws. Vagrants can be arrested without a warrant, and committed to jail by a police magistrate without a trial by jury. Police are thus legally able to detain criminal suspects on vagrancy charges until proof of other illegal actions can be obtained. In many states, the term vagrancy legally refers to specific acts such as loitering or wandering, and certain people such as prostitutes,

gamblers, drunkards, and their various associates as well may be considered in such cases to be vagrants.

The handling of vagrants is recognized by many experts as an important social problem. The law frequently merely orders the offender to leave the community, and thus the responsibility for the vagrant's actions are merely shifted to another community. A distinction, however, is usually made between persons who are unemployed but willing to work and those who choose not to work. Many social agencies, particularly during the depression years of the 1930's, were active in rehabilitating and relocating vagrants willing to accept such aid.

VAHLEN, JOHANNES, 1830-1911, German philologist, was born in Bonn, at whose university he studied. Because he concentrated all his efforts on the understanding of the Graeco-Roman classical texts, and avoided all of the mental fashions and sensational side ways that tempted and seduced most other philologists (many of whom were overly pre-occupied with the supposed significance of new archaeological excavations, political analogies, new civilizations, religious or philosophical predilections, and so forth), Vahlen came to represent the best achievement of nineteenth century classical philology in Germany. In his academic associations, he taught in Breslau, in Freiburg, in Vienna, and from 1874 in Berlin; thus, the geography of his career encompassed the whole of greater Germany, with its highly varied university traditions. At Berlin, his monographs, written in immaculate Latin, were used to adorn the Lectures Catalogue, which also was printed in Latin in those days; each of these programs was used to restore an ancient mutilated or otherwise "ununderstandable" text to its full splendor and original integrity. A maximum of such restorative skill was shown in Vahlen's interpretations of three important classical writers: the poet Ennius, Aristotle as the author of the *Poetics*, and Cicero on the laws. The three monographs were so admired that, despite their remoteness, they went through several editions. He earned and deserved the title, *Princeps Philologiae* (Prince of Philology).

VAIHINGER, HANS, 1852-1933, German philosopher, was born in Nehren, Württemberg, and died in Halle, of whose university he had been professor of philosophy from 1884. Of all German thinkers, Vaihinger came closest to espousing the pragmatism of the U.S. philosopher John Dewey, but during much of his career he concealed his own viewpoint of pure sensualism and scientism (we "think" only as means of survival, and can know nothing of the truth) and first established himself as the adroit organizer of the systematic study of the philosophy of Immanuel Kant. Vaihinger founded a series of monographs, the *Kant-Studien*, 1896, and the *Kant-Gesellschaft* (Kant Society), 1904; and he composed a meticulous, but never completed, *Kommentar zu Kants Kritik der reinen Vernunft* (Commentary on Kant's Critique of Pure Reason), 2 vols. 1881-92; ed. 1922. He wrote works on Friedrich Nietzsche (1902) and other thinkers, and he presented a monograph on his own philosophy to the Gesellschaft in 1921. A *Festschrift* for his eightieth birthday showed him that his organizational labors had not been in vain.

As to Vaihinger's own philosophy, he conceived it as early as 1876, but did not dare to publish it until much later, in *Die Philosophie des Als ob, System der theoretischen, praktischen und religiösen Fiktionen der Menschheit auf Grund eines idealistischen Positivismus* (1911; 2nd ed. 1913). In this work, Vaihinger insisted that we cannot really know anything, but must rest content with "fictions" that help bridge the gaps of human sense perceptions; one's awareness of cause-and-effect, for example, is merely a fictitious mental combination of separate experiences. In all the sciences, and in religion and law as well, we act or judge "as if" these or those hypotheses are true; hence, he dubbed his method the "als ob" (as if) philosophy. While it is

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VAGA, FERINO DEL, real name Pietro Buonacorsi, 1500-47, Italian painter, was born in Florence. He assisted Raphael in the decoration of the loggia in the Vatican. His works deal primarily with historical and mythological subjects.

VAGRANCY, the act of going about from place to place, committed by a person who although being able to work, refuses to do so. A single act, such as begging, may be considered vagrancy, but the condition is usually applied to a way of life.

Anti-vagrancy statutes were first passed in England in the seventh century. Idleness was considered to be a voluntary state, and in law it was held an offense against the public economy. Over the course of years, punishment for vagrancy varied, at times consisting of branding, whipping, commission to slavery, and even execution. With a change in public attitudes toward idleness, punishment changed and vagrants were most frequently jailed for a short time, or fined a small amount.

By mid-twentieth century, most states and municipalities had passed anti-vagrancy laws. Vagrants can be arrested without a warrant, and committed to jail by a police magistrate without a trial by jury. Police are thus legally able to detain criminal suspects on vagrancy charges until proof of other illegal actions can be obtained. In many states, the term vagrancy legally refers to specific acts such as loitering or wandering, and certain people such as prostitutes,

gamblers, drunkards, and their various associates as well may be considered in such cases to be vagrants.

The handling of vagrants is recognized by many experts as an important social problem. The law frequently merely orders the offender to leave the community, and thus the responsibility for the vagrant's actions are merely shifted to another community. A distinction, however, is usually made between persons who are unemployed but willing to work and those who choose not to work. Many social agencies, particularly during the depression years of the 1930's, were active in rehabilitating and relocating vagrants willing to accept such aid.

VAHLEN, JOHANNES, 1830-1911, German philologist, was born in Bonn, at whose university he studied. Because he concentrated all his efforts on the understanding of the Graeco-Roman classical texts, and avoided all of the mental fashions and sensational side ways that tempted and seduced most other philologists (many of whom were overly pre-occupied with the supposed significance of new archaeological excavations, political analogies, new civilizations, religious or philosophical predilections, and so forth), Vahlen came to represent the best achievement of nineteenth century classical philology in Germany. In his academic associations, he taught in Breslau, in Freiburg, in Vienna, and from 1874 in Berlin; thus, the geography of his career encompassed the whole of greater Germany, with its highly varied university traditions. At Berlin, his monographs, written in immaculate Latin, were used to adorn the Lectures Catalogue, which also was printed in Latin in those days; each of these programs was used to restore an ancient mutilated or otherwise "ununderstandable" text to its full splendor and original integrity. A maximum of such restorative skill was shown in Vahlen's interpretations of three important classical writers: the poet Ennius, Aristotle as the author of the *Poetics*, and Cicero on the laws. The three monographs were so admired that, despite their remoteness, they went through several editions. He earned and deserved the title, *Princeps Philologiae* (Prince of Philology).

VAIHINGER, HANS, 1852-1933, German philosopher, was born in Nehren, Württemberg, and died in Halle, of whose university he had been professor of philosophy from 1884. Of all German thinkers, Vaihinger came closest to espousing the pragmatism of the U.S. philosopher John Dewey, but during much of his career he concealed his own viewpoint of pure sensualism and scientism (we "think" only as means of survival, and can know nothing of the truth) and first established himself as the adroit organizer of the systematic study of the philosophy of Immanuel Kant. Vaihinger founded a series of monographs, the *Kant-Studien*, 1896, and the *Kant-Gesellschaft* (Kant Society), 1904; and he composed a meticulous, but never completed, *Kommentar zu Kants Kritik der reinen Vernunft* (Commentary on Kant's Critique of Pure Reason), 2 vols. 1881-92; ed. 1922. He wrote works on Friedrich Nietzsche (1902) and other thinkers, and he presented a monograph on his own philosophy to the *Gesellschaft* in 1921. A *Festschrift* for his eightieth birthday showed him that his organizational labors had not been in vain.

As to Vaihinger's own philosophy, he conceived it as early as 1876, but did not dare to publish it until much later, in *Die Philosophie des Als ob, System der theoretischen, praktischen und religiösen Fiktionen der Menschheit auf Grund eines idealistischen Positivismus* (1911; 2nd ed. 1913). In this work, Vaihinger insisted that we cannot really know anything, but must rest content with "fictions" that help bridge the gaps of human sense perceptions; one's awareness of cause-and-effect, for example, is merely a fictitious mental combination of separate experiences. In all the sciences, and in religion and law as well, we act or judge "as if" these or those hypotheses are true; hence, he dubbed his method the "als ob" (as if) philosophy. While it is

quite satisfactory as an attitude in many aspects of pure research and technology, the *als ob* method is all but useless in matters of life and death where one cannot afford to live by fictions—in matters in which, so to speak, man is not the experimenter, but is the subject of God's Holy Experiment. Although his role paralleled that of John Dewey in many respects, Vaihinger had little influence on education.

EUGEN ROSENSTOCK-HUESSY

VAIL, ALFRED, 1807–59, U.S. inventor, was born in Morristown, N.J. After graduation from the University of the City of New York, 1836, he became a partner of Samuel F. B. Morse in the development of the telegraph, furnished financial assistance for the construction of a complete set of instruments, 1837–38, and assisted in the technical work which was involved in return for a share in the U.S. and foreign rights. As Morse's chief assistant in constructing the experimental Washington-Baltimore telegraph line for the U.S. government, 1843–44, Vail received the monumental first test message, which was "What hath God wrought?"

VAIL, THEODORE NEWTON, 1845–1920, U.S. communications executive, cousin of Alfred Vail, was born near Minerva, Ohio. As general manager of the Bell Telephone Company, 1878–87, Vail consolidated local exchanges; established practical financial, scientific, and manufacturing systems; and helped found the American Telephone and Telegraph Company, 1885. After a period working to promote industrial development in Argentina, 1894–1907, Vail returned to the United States as president of the American Telephone and Telegraph Company, 1907–19. During World War I, he assisted with government control of communications and became chairman of the board of directors of the American Telephone and Telegraph Company when private ownership was resumed after the war.

VAITARANI, in Hindu mythology, the river of death flowing between the land of the living and the land of the dead, sometimes identified with the Vaitarani River in northeast India. One could cross Vaitarani, which was filled with filth, blood, and hair, only by holding on to the tail of a cow. The Hindu hell for destroyers of beehives, and pillagers, was also called Vaitarani.

VALAIS, canton, S Switzerland, bounded by France on the W, by Italy on the S, and the cantons of Ticino and Uri on the NE, Oberland on the N, and Vaud on the NW; area 2,021 sq. mi.; pop. (1950) 159,178. The canton encloses virtually all the upper valley of the Rhône River; to the north are the Bernese Alps, to the south are the Perrine Alps. In the extreme northwest the canton extends to Lake Geneva. Some of the highest peaks in Switzerland rise on the borders of Valais. They include Jungfrau (13,668 ft.); Matterhorn (14,685 ft.) and Monte Rosa (15,200 ft.). The mountains are breached by spectacular passes and important tunnels. Great St. Bernard Pass, in the southwest, and Simplon Pass, in the southeast, have roadways into Italy, and under Simplon is bored one of the world's longest railroad tunnels, 12.3 miles in length; the Lötschberg Tunnel bores under the Bernese Alps for 9 miles to give rail access to Bern. Wheat and grapes and other fruit are grown in the valleys; stock raising is important. There are many winter sport centers. Sion is the capital.

History. Valais was won by the Romans as a result of their victory at Martigny in 57 B.C. In the ninth century Valais became a part of the Transjurane Burgundy kingdom. After 999 the bishop of Sion ruled the canton as the Count of Valais. In 1798 Valais became part of the newly formed Helvetic Republic. Napoleon I incorporated Valais into France, 1810, but the canton was freed from French rule by an Austrian force, 1813, and became a part of the Swiss Federation, 1815. During the Civil War of 1844, Valais became a member of the Sonderbund; it was the last canton to join the nation in 1847.

VALDAY HILLS, U.S.S.R., in the Kalinin and Novgorod regions of the Russian Soviet Federated Socialist Republic, NW of Moscow. The Valdys are low, morainic hills, ranging in height from 300 to 1,000 feet above sea level. They extend about 200 miles north-south. To the east and west the Valdys are bordered by swamps and lakes such as Lake Seliger, one of the largest. The hills form a low watershed separating the headwaters of the Volga and Dvina rivers on the south from the rivers flowing to the Gulf of Finland on the north.

VALDÉS, JUAN DE, 1500?–41, Spanish Humanist, was born in Cuenca, studied at Alcalá, and soon was in contact with such notable Humanists as Erasmus, with whom he corresponded (see ERASMUS, DESIDERIUS; HUMANISM). Valdés' *Doctrina cristiana* (1529), a kind of Erasmian catechism, was denounced as heterodox and the author, to avoid the persecution of the Inquisition, went to Italy, where he addressed himself to a select group of thinkers. Although he did not preach to the masses, Valdés became one of the principal forces for reform in Italy. In the dialogue *Alfabeto cristiano* (1546), he affirmed the doctrine of justification by faith alone. In the *Ziento i diez consideraciones divinas*, 1550 (*The Hundred and Ten Considerations Treating of Those Most Profitable in Our Christian Profession*, 1638), Valdés expounded the idea of salvation through "interior illumination." His most important literary work, however, is the *Diálogo de la lengua* (written, 1533; first published, 1737), which displays his typical Renaissance sympathy for the "neo-Latin" (that is, Romance) languages, and which is one of the capital books on the history of Spanish philology.

ANTHONY KERRIGAN

VALDEZ, town, S Alaska, on an arm of Prince William Sound of the Gulf of Alaska; 115 miles E of Anchorage. The town is connected by the Richardson Highway to the Chugach Mountains to Fairbanks. It is a supply center for gold mines, a shipping point for fur, and an outfitting point for game hunting. Valdez was founded late in the 1890's. Pop. (1960) 555.

VALDIVIA, PEDRO DE, 1498?–21553, Spanish conquistador of Chile, was born near La Serena, Estremadura. Arriving in the New World, 1534, he joined Hernando Cortés in Mexico; assisted Francisco Pizarro in Peru, 1535–40; and, as Pizarro's lieutenant invaded Chile with 200 Spanish troops and 1,000 Indians, 1540, and for more than two decades enjoyed the success in Chile that had eluded a previous Spanish would-be conqueror, Diego de Almagro, who had tried and failed to subdue that area in 1535. Valdivia founded Santiago, 1541, and when this was attacked by the Araucanian natives, established a second capital, La Serena, on the northern coast. After helping to found Valparaiso, 1544, Valdivia went southward as far as the Bio-Bio River, 1546. He returned to Peru, 1547, to help suppress the revolt of Gonzalo Pizarro, and then returned to Chile as governor. He founded Concepción, 1550, Imperial, 1551, and Valdivia, 1552. Late in 1553 he was captured in a native uprising and put to death by the Araucanians near Tucapel in southern Chile.

VALDIVIA, province, S central Chile; bounded by the provinces of Cautín on the N and Osorno on the S, by Argentina on the E, and by the Pacific Ocean on the W; area 7,723 sq. mi.; pop. (1958 est.) 288,780. The western section of the province lies in the Central Valley. To the east, in the foothills of the Andes Mountains, are several large lakes, which are popular vacation spots. Wheat, oats, potatoes, and apples are grown in the valleys, and cattle raising is important. Lumbering is significant in the south. Valdivia is the capital.

VALDIVIA, city, S central Chile, capital of the province of Valdivia; near the Pacific Ocean, 450 miles SSW of Santiago. The city is a port for the crop-growing and stock-raising region to the east. The chief industrial plants are shipyards, lumber

the Alameda, a fashionable, tree-lined promenade. The city was founded, 138 B.C., by Decimus Brutus, a Roman consul. It was taken and partly destroyed by Pompey the Great, the Roman general, in 75 B.C. Valencia was captured by the Visigoths, A.D. 413; was taken by the Moors, 714, who made it their capital, 1021; and became part of the Kingdom of Aragon, 1298, and of the kingdom of Spain, 1479. Pop. (1958) 521,721.

VALENCIA, historic region and former kingdom of Spain, lying along the Mediterranean Coast, and corresponding in area to the modern provinces of Valencia, Castellón de la Plana, and Alicante. The interior is mountainous, but the coastal plain, aided by irrigation, is very fertile, and has been aptly called the garden of Spain. The chief rivers are the Júcar and the Turia. The region was conquered by the Moors, 714; for a time Valencia was part of the Caliphate of Córdoba (see CALIPHATE), but early in the eleventh century it became an independent Moslem kingdom. James I of Aragon conquered it, 1238, and added it to his kingdom. Under the sovereignty of Aragon and, later, the kingdom of Spain, Valencia enjoyed local autonomy. After the expulsion of the Moors, 1609, Valencia suffered an economic and cultural decline; and during the reigns of Philip V of Spain, 1700-24, and 1724-46, it ceased to be politically important.

VALENCIA, city, NW Venezuela, capital of the state of Carabobo; 10 miles W of Lake Valencia and 80 miles W of Caracas. Valencia is an important commercial city and market for cotton, coffee, and sugar grown in the area. Textiles, sugar, iron goods, leather goods, tires, and foodstuffs are manufactured. Founded by the Spanish, 1555. Valencia retains much of its colonial atmosphere. The city has many fine residences owned by wealthy landowners, whose income comes from estates in the Valencia basin. Pop. (1950) 88,701.

VALENCIENNES, city, N France, Nord Department; in Flanders; on the Escaut (Schelde) River, 18 miles NE of Cambrai and 6 miles from the Belgian border. Valenciennes lies in the center of the Anzin coal fields, and is a manufacturing center. Iron and steel products, machinery, beet sugar, spirits, glass, soap, chemicals, hosiery, and cotton textiles are produced. During the seventeenth and eighteenth centuries Valenciennes was famous for the lace produced there. Valenciennes is reputed to have been founded by one of the three Roman emperors named Valentinian. In the sixteenth century the town was a center of Protestantism. Valenciennes became the capital of Hainaut, 1628. Pop. (1954) 43,434.

VALENS, FLAVIUS, A.D. 328?-378, Roman emperor, was born in Pannonia, and became Roman Emperor of the East, 364, ruling with his older brother Valentinian I, who was Emperor of the West. He successfully fought the Visigoths north of the Danube, 367-69; waged an inconclusive war with the Persians, 373-75; and was again involved in a war with the Visigoths, 377-78, after having allowed them to settle south of the Danube in Thrace to escape Hun persecution. He was defeated and killed by Visigoths, under Frigirern at Adrianople, during the worst defeat suffered by a Roman army since Cannae. Flavius Vallens was an Arian and persecuted orthodox Christians during his reign.

VALENTINE, SAINT, a Roman priest, possibly identical with Valentine, bishop of Spoleto, who was martyred Feb. 14, A.D. 271. He is regarded as the patron saint of lovers and his day is celebrated as a lovers' feast. The custom of sending "valentines," missives or tokens of an amatory nature on February 14, probably originated from a pagan ritual celebrating the goddess Juno; some connect it with the medieval belief that birds begin to mate on this day.

VALENTINE, died 827, pope from late August or early September to October in 827, was born in Rome. He became a cleric while still a young man,

and his piety won him the favor of Paschal I, 817-24, who eventually ordained him subdeacon and deacon, and made him archdeacon of Rome. Valentine remained archdeacon during the reign of his predecessor, Eugene II, 824-27.

VALENTINE, city, N Nebraska, seat of Cherry County; on the Niobrara River, the North Western Railway, and U.S. highways 20 and 83; 265 miles NW of Omaha. The city is a trade center for an area in which livestock and grain are raised. Valentine was settled in 1882. Pop. (1960) 2,875.

VALENTINE AND ORSON, a famous romance of the Charlemagne cycle, composed during the reign of King Charles VIII of France, was first printed at Lyons in 1495. Valentine and Orson, twin brothers, are carried off—Orson by a bear, to be reared amid savage surroundings; Valentine by his uncle, King Pepin, who brings him up as a courtier. Many years after their separation, Orson, the epitome of uncouthness, and Valentine, with his courtly good manners and *noblesse oblige*, meet in a forest, and recognize each other despite their apparent differences, whose superficiality is thus demonstrated by the story.

VALENTINIAN I, Latin name Flavius Valentinianus, A.D. 321-375, Roman emperor, was born of humble parentage in Pannonia. Having risen in fame and status through his service in the imperial guard, he was proclaimed emperor, 364; as co-emperor he chose his brother Valens. As Emperor in the West, Valentinian spent much of his time in Gaul, guarding the Rhine defenses against invasions by the Alemanni, who were finally brought to terms, 374. He also sent Theodosius the Elder to put down a Saxon invasion of Britain and a Moorish rebellion in Africa. Valentinian, a Christian, maintained a policy of religious toleration throughout his empire.

VALENTINIAN II, A.D. 371-392, Roman emperor, the younger brother of Gratianus, with whom he shared the succession to the western part of the Roman Empire upon the death of their father, Valentinian I, A.D. 375. Valentinian II's portion of the western empire, including Italy, Illyricum, and Africa, was administered by his mother Justina until 387, when both mother and son were driven from Milan by the threats of Maximus, and sought protection from the eastern emperor, Theodosius. Supported by Theodosius, Valentinian returned to the West, 388, but he was assassinated in Gaul a few years later, apparently by Arbogast, a Frankish general in the Roman army.

VALENTINIAN III, full Latin name Flavius Placidius Valentinianus, A.D. 419-55, Roman emperor, son of Constantius III, was named Emperor of the West, 425, but his mother, Placidia, daughter of Theodosius I, ruled for him, 425-440. During his reign, Roman Africa, Britain, and parts of Spain, Italy and Sicily were lost to the Suevo, Visigoths and Vandals, 439-40. A Roman victory was won by the general, Aetius, over Attila and the Huns at Châlons, 451; but Attila invaded northern Italy, 452. Valentinian was murdered by followers of Aetius, of whom Valentinian had been jealous and had had assassinated, 454.

VALENTINIUS, in full Basilus Valentinus, Anglicized as Basil Valentine, the purported author of works that were of great importance in the history of chemistry in that they represented a transition from mere alchemy, the attempt to make gold from base metals, to iatrochemistry, the planned production of drugs. To the seven metals known to the ancients—gold, silver, iron, lead, copper, tin, quicksilver—Valentinus added antimony (whose toxic quality he recognized), bismuth, and manganese; he was able to produce sulfuric acid and to open the path to the very difficult production of pure zinc; he also worked with arsenical compounds. To him, the philosopher's stone that the alchemists had sought was not a chemical, but the spiritual experience of

Nature's "inside." This experience was to be reached by a total immobilization of the inner man, an immobility analogous to that of rocks and the like. Valentinus' writings are usually ascribed to the fifteenth century and it has been asserted that he was a Benedictine monk in Saxony who used the admitted pseudonym, Basilius Valentinus. But neither this nor his true name can be proved, and close students of the history of science in this period doubt that Valentinus actually existed. The suspicion is that a chamberlain of the Thuringian town of Frankenhäusen, Johannes Thölde, actually composed Valentinus' writings, especially the *Currus triumphalis antimonii*, some time after 1600. The fact that the names Basilius and Valentinus seem to have been chosen arbitrarily from the catalogue of famous second century Christian Gnostics, makes some intentional hoax seem the more probable; such a hoax would have well served the purposes of those who sought to discredit Paracelsus (1493-1541) by suggesting that he had derived many of his more important discoveries and insights from Valentinus' work. See PARACELUS, *Controversial Figure*; SUDHOFF, KARL.

EUGEN ROSENSTOCK-HUSSEY
VALENTINUS, died A.D. ?160, heretical theologian, was born in Egypt. He gained a great reputation as a philosopher in Rome 140?-160, entering into controversy with Justin Martyr. The heterodoxy of his teachings led eventually to Valentinus' excommunication, and he retired to Cyprus, ?160. His views were characteristically Gnostic, and his doctrines have been regarded by some as the high-water mark of Gnosticism. Valentinus' followers split into two schools: the Italian, to which Ptolemy and Heracleon belonged; and the Anatolian, which included Bardesanes.

VALERA Y ALCALÁ-GALIANO, JUAN, 1824-1905, Spanish writer, was born in Cabrá, Córdoba Province, studied law at the universities of Granada and Madrid, and by the age of 22 had already made a name for himself in Madrid as a poet, ladies' man, and man of the world. Beginning in the next year he served as a diplomat in Naples, where he read widely, learned Greek, and formed an influential liaison with an Italian marchioness. His first work of literary criticism was *Sobre los cuentos de Leopardi e del romanticismo en España*. He continued his diplomatic career, which was brilliant in itself, and also served as an excuse for his studies: he cultivated Portuguese while serving in Lisbon, for example. He was elected to the Spanish academy, 1861; and was a deputy in the Cortes from 1863, and a senator with tenure for life from 1881. In 1873 he wrote his first and most famous novel, *Pepita Jiménez* (1874). In later life he went blind, but had works in a variety of languages read to him, and wrote until the end. The most European of contemporary Spanish writers, he distinguished himself principally as a novelist, but also wrote excellent poetry, criticism, and historical studies. Among his other novels are *Doña Luz* (1879), *Genio y figura* (1897), and *Morsamor* (1899). In writing his novels he strove only for aesthetic values.

ANTHONY KERRIGAN
VALERIAN, full Latin name Publius Licinius Valerianus, A.D. 193?-269, emperor of Rome, 253-260. He became princeps senatus, 238, and censor, 251. After the death of Gallus, and the short reign of Aemilianus, the Roman soldiers elected Valerian emperor. With his son Gallienus, he undertook to resist the barbarians who were then threatening the frontiers of the disordered Roman Empire. He recovered Antioch from the Persian, Shapur I, in 257, and drove the Persians back beyond the Euphrates; but, pressing on too fast, he was taken prisoner by Shapur I at Edessa, 260, kept in captivity in Persia for a time, and then put to death.

VALERIUS FLACCUS, GAIUS, died 92?, Roman poet, apparently influenced by Vergil and Ovid, was the author of an epic, *Argonautica*, a retelling,

based on the work of Apollonius Rhodius, of the quest for the Golden Fleece. The *Argonautica*, thought to have been begun in the year ?80, was lost from ancient times until early in the fifteenth century, when a manuscript containing three books and a portion of a fourth were discovered.

VALERIUS MAXIMUS, Roman public official and writer during the first century of the Christian Era, went to Asia, A.D. 27, as a member of the retinue of Sextus Pompeius, and later became proconsul of Asia. Utilizing the works of Cicero, Livy, Sallust, Trogus, and others, he compiled a collection of historical anecdotes. The work was apparently intended as a textbook in rhetoric.

VALÉRY, PAUL, 1871-1945, French poet, was born in Sète of a French father and an Italian mother. Much of his youth was spent in Montpellier, where he attended the lycée and the law school, and became an intimate friend of Pierre Louÿs and André Gide. Having completed his studies he went to Paris where he worked in the ministry of war and, later, in the Havas News Agency. After a brief period of literary fertility, during which he wrote a few poems, examined the problem of creativity and responsibility in his *Introduction à la méthode de Léonard de Vinci* (1895), and wrote a novel, *La Soive avec Monsieur Teste* (1906), Valéry came to the conclusion that mere literary production, however exalted, was superfluous and, in fact, a betrayal of one's intellectual integrity. For almost 20 years he devoted himself to the study of architecture, mathematics, and psychology. In 1913, however, he reluctantly allowed Gide to publish a collection of his verse and set about composing a poem that would serve as his farewell to writing. Again he found himself fascinated by the problem of the mathematical construction of poetry, as conceived by Edgar Allan Poe and practiced by Stéphane Mallarmé. For four years he worked on the construction and polishing of *La jeune Parque* (1917). *Le cimetière marin*, generally acknowledged to be his masterpiece, appeared in 1920. Nearly all of his poems deal with consciousness, its awakening to an awareness of itself and of the world. Valéry believed with his literary mentors, Poe and Mallarmé, that the real value of pure poetry lies not in the content but in the architectural and musical harmony of its form and in the precision of its style. Even his dialogues, modeled after Plato's, and his essays, were constructed according to the same rigorous technique. Valéry was elected to the French Academy in 1925.

C. W. COLMAN

VALETTA. See VALLETTA.

VALHALLA, a building situated seven miles east of Regensburg, Bavaria, that was erected, 1830-42, by Ludwig I of Bavaria, according to the designs of Franz Karl Leo von Klenze, in honor of German patriotism and liberty. It is of gray marble and is approached by 250 marble steps. It constitutes a German hall of fame.

VALHALLA, or Valhalla, in Teutonic mythology, the great golden hall of the gods, the abode of warriors slain in battle. It had 540 doors, through each of which 800 warriors could march abreast. For sport, the heroes engaged daily in fierce warfare with one another, but each day their wounds were miraculously healed before they sat down to feast with Odin.

VALI, one of the Aesir, gods of Scandinavian mythology, was the son of Odin and a giantess, Rinda. When he was only one night old, he killed his brother Hoth (or Höthir, or Hodur), thus avenging the death of another brother, Balder. The slaying of Balder began Ragnarök, the cataclysmic battle between the gods and the forces of evil; Vali is sometimes named as one of the survivors of Ragnarök.

VALINE. See AMINO ACIDS.

VALKA, city, U.S.S.R., in the Estonian Soviet Socialist Republic, on the Gauja River, on the border of the Latvian S.S.R.; 125 miles SSE of Tal-

to the empirical study of government, psychology, economics, and "humanity itself" in their effort to define value.

German Theories. Immanuel Kant excluded the question of value from scientific study (the domain of pure reason), but retained the idea as religiously significant (practical reason). G. W. F. Hegel identified reality and rationality and regarded value as objective and as in the process of being "realized" as part of reality's own self-realization. Ludwig Feuerbach and E. K. Dühring identified the supreme value as human rationality, and demanded that "obscurantist" religious sanctions be ruled out of order. Later studies of consciousness and its relations to reality led Alexis Meinong, Martin Heidegger and Nicolai Hartmann to hold that value is inherent in reality, although science cannot see it.

Value Theory in the United States. Ralph Barton Perry defined value as any object of any interest, thus raising the purely empirical question of what men do desire in fact. More theoretically, John Dewey posited the supreme value of "growth," both social and individual. At mid-twentieth century, perhaps the most active trends in value centered around C. I. Lewis' pragmatic-empirical study of the *act* of valuation; empirical attempts to apply concepts borrowed from economics and sociology; and the logical-positivistic analysis of language.

EDWARD B. COSTELLO

VALUE IN ECONOMICS

In commerce and industry, value is the quantity of one commodity that will be given in exchange for a specified amount of another commodity or service, or for a specified amount of money. The early Greeks believed that the degree to which a commodity contributes to man's needs will determine the price of the commodity, but this idea was eventually discarded by classical economists (see *ECONOMICS, Classical School*), on the objection that many plentiful and useful commodities, such as water or air, do not command a fraction of the price that is commanded by many scarce and often useless commodities, such as diamonds. The eighteenth century economist Adam Smith, in explaining value in terms of the relation between labor and cost, held that the amount of labor involved in its production determines the value of an economic good. Early in the nineteenth century, David Ricardo concluded that the value of an article depends not only on the amount of labor involved in producing it, but also on the amount of time involved.

The neoclassical theory of value, as expounded in the works of the British economist Alfred Marshall, considers the cost of producing an article in terms of the alternate uses that could have been made of the productive facilities involved (see *PRODUCTION*). In the long run, these alternate uses are determined by demand operating through the price mechanism. See *SUPPLY AND DEMAND*.

Marginal utility economists of the late nineteenth century, the most notable among whom were Karl Menger, W. Stanley Jevons, and Léon Walras, related value to price and quantity purchased, by assuming a law of satiable wants, or diminishing utility (see *MARGINAL UTILITY*). According to this law, the satisfaction yielded by each additional unit of a commodity consumed or acquired is less than that yielded by the previous unit acquired. The last unit that an individual can be induced to buy at a given price equates his desire (the value that he ascribes to the commodity) and the price, and is termed the marginal purchase. This concept isolates a given want and its satisfaction from all others. Later economists, however, approached the neoclassical interpretation of value by considering the value of a given good to the individual as relative to the values of all other goods that he might have acquired instead. Thus, value becomes an aspect of choice, and the valuation of one good is a comparison of

the values of all goods. This doctrine holds that demand for one commodity is a function of demands for all other commodities and that the individual spends his income in such a way that the last unit purchased of each commodity yields equal satisfaction.

VALVE. See *LOCOMOTIVE, Steam Locomotive*.

VALVERDE, BATTLE OF, an engagement of the U.S. Civil War that was fought Feb. 21, 1862, at Valverde, a crossing of the Rio Grande in eastern New Mexico Territory, between an invading Confederate force of about 2,600 under Gen. Henry Hopkins Sibley and 3,810 Union troops under Col. Edward Richard Sprigg Canby. Canby's troops were forced to withdraw, with a loss of 68 killed and 160 wounded; the Confederates lost 36 killed and nearly 200 wounded. The invading force went on to capture Albuquerque and Santa Fe, but was forced to withdraw from New Mexico Territory after the Battle of Glorieta, Mar. 27-28, 1862.

VAMPIRE, any being, whether animal or ghost, who actually or allegedly sucks the blood of living beings, man or beast. This habit was first ascribed to the "undead"—dead persons who rise from their tombs at night and drink the blood of young children, supposedly for the purpose of drinking themselves back into existence. The belief in, and fear of, such vampires, was said still to exist even in the 1960's in parts of eastern Europe, where the peasants believe that one can rid oneself of such undead only by unearthing the corpse, impaling it on a stick cut from a tree in full sap, burning its heart, and cutting off its head. The name vampire is of Magyar origin, and the belief in vampires was, and perhaps still is, especially strong in Hungary. In the sixteenth century, the European discoverers of South America rather unfairly applied the appellation *vampirus* to useful and essentially harmless "blood-sucking" bats. In modern American literature, the vampire (and vampirism) was introduced by Edgar Allan Poe. European writers have also written of blood-sucking in a symbolic sense—of people who can only live on the energy or life of others. Hence "vampirism" is often used as a general term for the amoral exploitation of the affection of others.

EUGEN ROSENSTOCK-HUESSY

VAMPIRE BAT, a small tailless blood-feeding animal that has pointed ears and a naked body about four inches long. Belonging to the family *Desmodontidae*, it is represented by two species, *Desmodus rotundus*, which is abundant, and *Diphylla ecaudata*, which is the vampire found in Central and South America. The upper incisors of the vampire are large and sharp and make a painless wound in the skin of an animal from which the blood is taken with the tongue. Vampires prey on livestock, dogs, chickens, and human beings, causing death in some cases by transmitting paralytic rabies. Vampires live in colonies in caves and in old uninhabited houses.

COLIN CAMPBELL SANBORN

VAN, province, SE Turkey, in Armenia; bounded by the provinces of Agri on the N, Bitlis on the W, Siirt on the SW, and Hakâri on the S, and by Iran on the E; pop. (1955) 176,203. The province lies in an area of high plateaus, generally more than 6,000 feet above sea level, and rises to nearly 12,600 feet in the southeast. Most of the province drains to Lake Van, which forms much of the western border. Wheat, barley, and rye are grown. The capital and principal city is Van. The population is mainly Kurdish, with large Turkish and Armenian minorities. Roads connect the province with western Turkey, and with Khoi in Iran.

VAN, city, SE Turkey, capital of the province of Van, on Lake Van; 450 miles ESE of Ankara, and about 60 miles W of the Iranian border. The city is characterized by flat-roofed mud houses and narrow, winding streets. Water is obtained through ancient underground ducts leading from the nearby mountains. The city is a trading center for the grain, sheep, and cattle raised in the area. Van came into

he defeated at the Cilician Gates, Mount Amanus, 39 B.C., and Gindarus, 38 B.C.

VENTILATION. See AIR CONDITIONING; HEATING.

VENTIMIGLIA, town, NW Italy, in Liguria Region, Imperia Province; on the Ligurian Sea; 5 miles E of the French frontier and 8 miles SW of San Remo. Ventimiglia is on the Italian Riviera. Its twelfth century Gothic cathedral and the church of San Michele are in the old town, built on a hill above the newer section on the coast. The ruins of Album Intemelum, an ancient town about three miles to the east, include a Roman theater and a number of tombs. The Balzi Rossi grottos, at nearby Grimaldi, and the museum containing prehistoric antiquities uncovered there, were partially destroyed during World War II. Pop. (1958) 21,278.

VENTNOR, city, SE New Jersey, Atlantic County; on Absecon Beach and the Atlantic Ocean; a suburb, 3 miles WSW of Atlantic City. Ventnor is a noted summer resort. It was incorporated early in the 1900's. Pop. (1960) 8,688.

VENTRILOQUISM, the trick of using the voice in such fashion that the sound appears to proceed from a source other than the speaker's mouth. This is done by taking a deep inhalation of breath, and then allowing it to escape slowly, allowing the sounds of the voice to be modified by the muscles of the throat and palate. The illusion is heightened by immobility of the visible muscles usually employed in speech, as well as by gestures and glances that suggest to the onlooker a false source of the sound (misdirection, so-called). Few ventriloquists can deceive in the dark, and most depend upon marionettes with movable lips, to which the attention of the audience is directed. The art owes its name to the erroneous idea of the ancient Romans that the performer produced the voice in the stomach or abdomen (Latin *ventralis*, pertaining to the belly, whence medieval Latin *ventriculus*, "little belly" or ventricle).

VENTRIS, MICHAEL GEORGE FRANCIS, called "The Conqueror of the Mount Everest of Greek History," 1922-56, British architect and linguistic detective, was the scion of an old military British family. He was educated in Switzerland from an early age, where his remarkable talent for languages manifested itself in such feats as teaching himself Polish at the age of six. In England, later, he was a scholarship student at Stowe School. World War II interrupted his studies at the Architectural Association School, London; after war service as navigator in an R.A.F. bomber squadron, he resumed the study of architecture and was graduated with honors, 1948. His subsequent work as an architect showed great promise, but it was for a rather eccentric hobby that he became famous. As a boy of 14, Ventris had attended a lecture by the archaeologist Sir Arthur Evans, the famous excavator of Knossos, on Crete, where a large number of clay tablets bearing inscriptions in two previously unknown Minoan-Mycenaean scripts (Linear A and Linear B) were unearthed, 1900-08; there and then Ventris decided to devote himself to the decipherment of Linear B—also found on many tablets unearthed in Peloponnesian Pílos—and thus discover the key to Mycenaean history. See **AGEAN CIVILIZATION**; **ARCHAEOLOGY**, *Crete and the Aegean Sea*; **MINOAN CIVILIZATION**; **MYCENAE**; **PÍLOS**.

The task of decipherment seemed almost hopeless, since the language behind the 85 or more semipictorial signs might be any Semitic, Caucasian, or unknown idiom, and there was no Rosetta Stone, or the like, by which the unknown could be linked to the known. About all that the experts agreed on was that the mystery script could not be Greek, for which the earliest testimonies were not older than ?700 B.C.—about seven centuries later than the Linear B script. Using his wartime training as a decoder, and working with a Committee of Correspondents—an international group of scholars who were kept regularly

informed of his tentative steps—Ventrism eventually realized his boyhood ambition when, against all expectations (including his own) he found that the mystery language was Greek. Ventrism had constructed a grid for a tentative syllabarium, and in terms of it identified three Cretan place names—*Amnisos*, *Knossos* (Knossus), *Tylissos*; he then identified, with the help of added pictograms, the spice *koriander*. Greek phonetic values now imposed themselves: *tripod*, *four*, *two*, "so many," the divine names of *Poseidon*, *Paian*, *Athene*, *Zeus*, and *Hera*, and heroic names like *Eleocles* or *Achilles*—such were legible. Thus was it demonstrated that at least 500 years before Homer the complete Greek world had existed; and thus was refuted a century or more of "Higher Criticism" with its assertions that Homer's works had not been written until the time of Pisistratus (600?-527) and that the traditional date of the first Olympics, 776 B.C., could not be trusted. As a result of Ventrism's discovery, much so-called prehistory, the centuries before 776 B.C., was now articulate history, and the problem of the place of Homer in human history, the famous Homeric Question, had to be reinterpreted.

Ventrism vs. the Higher Criticism. Ever since 1795, when Friedrich August Wolf had proclaimed the *Iliad* and *Odyssey* to be no more than a potpourri of independent chansons, the very existence of a poet named Homer had been more often denied than believed, and Homer as a power over history had thereby been eliminated. This was not an accident, but a symptom of the rise of the bourgeois class. In France, this had led to violent revolution. In Germany, however, where neither nobility nor clergy were beheaded, the bourgeois Higher Criticism waged instead a symbolic war against the aristocratic Homer's works and the traditional Bible by asserting that they were composed of meaningless fragments—by asserting that they were as "false" and as "artificial" as the manners and pretensions of French nobles and clergymen. For many decades in Germany, no scholar was considered serious unless he held (1) that the gospel of Mark was older than the "patchwork" of Matthew; and (2) that Homer's works were patchwork. See **WOLF, FRIEDRICH AUGUST**.

Ventrism's discovery did away with the only one of Wolf's arguments that seemed to have a demonstrable character—that Homer could not write—and has changed our whole approach to the place of script in history, since it proves that the ancients experimented with different scripts at various times. Administrative needs apparently caused a change in scripts (Linear A to Linear B), 21400 B.C.; later in Greece, 2800, the Phoenician alphabet, comprising only consonants, was radically changed by the addition of vowels. As to what could have made such an innovation indispensable, it seems likely that the requirements of the new hexameter verse, with its insistence on treating short and long vowels differently, necessitated the changes in lettering. Prior to Ventrism, the addition of the vowels to Greek script had never aroused particular admiration; after Ventrism, however, the Homeric Question and the problem of the change in the Greek script became one and the same thing. As one classicist has suggested (H. T. Wade-Gery, *Poet of The Iliad*, 1952): the need for a new alphabet and the desire to write down an epic in Greek hexameter were not two different problems, but were one and the same.

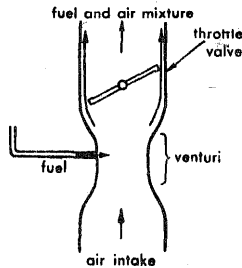
The Significance of Homer in Greek History. If this were true, Homer could not be dismissed as "just a poem" or just folk songs, for he would have to be recognized again as having occupied a central place in the organization of Greek expression. That is, if Homer's 30,000 verses of poetry and the Greek script came into being at the same time, the place of Homer in Greek history would be of prime importance: "Greece" would mean no more and no less than those places where Homer was recited from manuscript—just as the Greeks themselves had believed. In

fact, during the last upheaval of Hellenism against Rome, under King Mithridates of Pontus (120?-63 B.C.), the Greeks of Asia Minor demonstrated against Rome by reciting Homer in their theaters. In the light of Ventris' discovery, the argument-from-script that had been used to "prove" the Homeric poems a late patchwork would seem actually to support the earlier Greek tradition of Homer's genius. Before 1200 B.C., before the Trojan War, the Greeks had already used script in organizing the religion of their Gods as we know them from Homer. The Trojan War, then, was undoubtedly a historic event that was transfigured into a truly humanistic experience by Homer. Since he could make use of the new medium of a vocalizing script, his songs could become a continuing element in the establishment of Greek unity. The political and religious power of Homer's poems, from the very first, depended on public recitations at great festivals of several days' duration—three days at the least. It was the gradual conquest of audience after audience by such liturgical recitations that constituted the history of Homer. From the beginning, Homer was not recited in a parlor or in one city, but at public and common gatherings, such as those of the Ionians in Asia Minor. Evidence for this exists in the Homeric hymns, which formed the overtures to ceremonies in the different temples. The Homeric Hymn to Apollo, for example, precluded the recitation on Delos. When Pisistratus enlarged the Panathenaeon Festival to a Panhellenic one, he had the Homeric poems recited and by this alone transformed the merely Athenian celebration into an all-Greek one. In this way, Homer became the means of adding the universal touch to anything merely local. For this reason, as early as 300 B.C., Homer appeared in sculpture as the universalist, the Lord of Chronos and Ekumene—of Time as well as of Space. The Homeric Question, for more than 100 years the Germanic expression of bourgeois revolution, was again at mid-twentieth century the beacon of the universal contribution of the Greeks to humanity. And thanks to Ventris' genius, what before had been somewhat conjectural, was at last demonstrable.

Ventris' Death and Subsequent Controversy. Ventris' life was cut short by a senseless automobile accident just a few days before the publication of his and John Chadwick's *Documents in Mycenaean Greek* (1956). The fine character of Ventris appears at its best in the title of his first revolutionary announcement: "Evidence for Greek Dialect in the Mycenaean Archives" (*Journal of Hellenic Studies*, 1953), a title that has been called "the greatest understatement of all times." Ventris had been wise in forming his Committee of Correspondents, for its members became the phalanx of valiant defenders that was much needed after his death, when his discovery was furiously but unconvincingly attacked as a mirage or a fraud. A summary of the principal aspects of the controversy and an effective refutation of Ventris' critics appears in John Chadwick's *The Decipherment of Linear B* (1958; edit. 1959).

EUGEN ROSENSTOCK-HUESSY
VENTURA, or San Buenaventura, city, SW California, shat of Ventura County; on Santa Barbara Channel of the Pacific Ocean, on the Southern Pacific Railroad and U.S. highways 101 and 399; 60 miles WNW of Los Angeles. The city is a trade and processing center for an area in which citrus fruit, walnuts, vegetables, poultry, and dairy cattle are raised. It is a supply center for a petroleum-producing area. Clothing and concrete pipe are manufactured, and petroleum is refined. Ventura is a resort center. A notable point of interest is the San Buenaventura Mission (1782). Little of the original building remains, due to the incidence of a fire in 1792, and an earthquake in 1812, but the mission was restored and opened as a museum. Ventura was founded around the mission early in the 1860's and incorporated in 1866. Pop. (1960) 29,114.

VENTURI TUBE, a smooth constriction in a pipeline for the purpose of increasing the velocity of



The principle of the Venturi Tube is used in automobile carburetors where the high velocity and the reduced pressure of the intake draws in fuel at a rate that effects the proper fuel-air mixture.

flow of fluid, thereby causing a decrease in the pressure. The internal surface of a venturi (see diagram) consists roughly of two truncated cones connected at their smaller extremities by a very short cylinder, the venturi throat. In accordance with the principle developed by Daniel Bernoulli, when fluids at high velocity move past the surface of a horizontal pipe or tube, the pressure against that surface is lowered. As the velocity of the fluid increases, the pressure decreases in

a manner which can be determined by using Bernoulli's principle and the equation of continuity. The application of Bernoulli's principle to the steady incompressible flow of a fluid in a horizontal pipe leads to the statement that pressure is lowest where speed is highest, and conversely.

The venturi tube has many applications in engineering. It is the basis of the venturi meter, used to measure rates of flow. It is used to regulate fuel-air mixtures in the carburetors of internal combustion engines. A small branch tube leading from the fuel chamber is introduced into the air intake at the venturi throat, and fuel is drawn into the fuel line by the suction effect set up by reduced pressures against the throat surface. The accompanying diagram illustrates this action, in the case of the carburetor. The same principle is employed in other devices, including air-speed indicators in aircraft, atomizers, sprayers for paints, suction pumps, and devices for determining the rate of gas and liquid flow.

VENUE. The place in which a suit may properly be brought to trial. A personal action, as for breach of contract or tort, is normally held wherever a proper service of summons is made upon the defendant. In general, actions involving the title to real estate must be tried in the county in which the property is situated.

Venue differs from jurisdiction in that the latter connotes the power to decide a case and the former connotes only the place where the suit should be heard. In beginning an action, the plaintiff names the venue. A request for a change of venue may be made on various grounds, as, for example, that the place where the suit was filed is not the proper place to try the case; that a change would be more convenient for the majority of the witnesses; that the judge who would preside in the venue in which the action was begun is not qualified to hear the case; or that a fair and impartial trial cannot be had because of general bias and prejudice against the defendant in that venue.

In most states either party to a civil case may apply for a change in venue. In criminal cases it is usually the defense, and only rarely the prosecution, that requests a change in venue. The court itself may occasionally order a change of venue, and in several states the threat of mob violence is reason for automatic change.

VENUS, the second planet in order of increasing distance from the sun, was known to the ancients under two aspects: as Phosphorus or Lucifer, the morning star, visible in the east shortly before sunrise; and as Hesperus or Vesper, the evening star, visible in the west shortly after sunset. Venus is the brightest of the planets and, except for the sun and moon, brighter than any other object in the sky. At its

VENUS, ancient Latin *Uenus*, Medieval Latin *Venus*, was originally the Latin goddess of prosperity, but later became the Roman goddess of love, equivalent to the Greek Aphrodite, and analogous to Astarte in the Orient and to the Germanic goddess Freya and the Old Norse Frigg (compare English *Friday*, Old High German *Friatag*, and modern Italian *Venerdi*).

Venus' original sanctuary was in Ardea, Latium, where she was the goddess of fruits and gardens, and of the charm of prosperous growth. The flower season of spring and the season of maturity were both suitable for her cult. Later, when the Romans clashed with the Carthaginians on Sicily, the sanctuary of the female goddess of Mount Eryx made a profound impression on the Latin soldiers, and from this world famous temple they took home, 217 b.c., an enlarged conception of the goddess of Love. The Venus of Rome became much more than the Latin Venus had been and the verb *venerari* (to venerate) and its extensions came to signify all worship and reverence. When Lucius Cornelius Sulla, surnamed Felix, made himself dictator of Rome, 82 b.c., he linked his *felicitas* (luck) to the worship of this more comprehensive goddess, Venus. Sulla's political imitator, Gaius Julius Caesar, declared Venus to be the genitrix (ancestor) of the Julii family; and all of Caesar's descendants claimed to be *progenies veneris* (offspring of Venus). And sometime before 55 a.c. the poet-philosopher Lucretius opened his cosmic poem on *The Nature of Things* (*De rerum natura*) with a wonderful description of Mars and Venus; Mars, the main god of the Latins, and Venus were already, it would seem, the great gods of Roman prosperity.

In her proud new position, the Latin Venus soon came to be identified with the Greek Aphrodite. This identification had vast political consequences, for it enabled the Romans to connect their city with the pre-Greek city of Troy. Aphrodite's mortal lover was the Trojan Anchises; her heavenly lover was Ares, the God of War; and her legitimate Olympic husband was the lame Hephaestus—he of the fiery techniques. Once identified with Aphrodite, the Roman Venus, whose priests were of the Julii family, could be believed to connect Troy with Rome since Venus had also, it seems, associated with Anchises, and as a result had given birth to Aeneas, the hero of Vergil's *Aeneid* (see VERGIL, *The Aeneid*). The learned men of Rome soon found for Venus a celestial husband in Vulcanus (analogous to Hephaestus), and also a companion who could compare to the Greek Eros—Cupid became her child. Further, since the meaning of the term *venus* closely compares with the Greek *charis* (graciousness), the Greek Charites could plausibly be made into Venus' companions as the Latin Graces. Among her

other companions were the Horae—the Hours of Opportunity. Also from Aphrodite, Venus received the dove as the animal symbolic of her tenderness. In antiquity Venus lent her name to individual diseases spread by sexual intercourse; and sometime before 1550 the French physician James of Bethencourt classified all these diseases as "venereal" diseases.

The blessings of Venus are celebrated in the charming poem, *Pervigilium veneris* (The Wake of Venus), of which little is known except that it must have been written between A.D. 100 and 400 (C. Clementi, *Studies on the Pervigilium Veneris*, 1913). It contains the comforting line, *Cras amet qui nunquam amavit; quique amavit, cras amet* (Tomorrow shall love who never has loved; and who has loved, tomorrow shall love).

The common man in Rome probably did not share in the movement of the Roman educated class in its identification of their Latin goddess into the Greek and Asiatic goddess, and so the process of identification remained unfinished. The New Testament furnishes a proof of this lost fact. In the Book of Acts, the Apostle Paul is attacked by the worshippers of the goddess "with the thousand breasts." In Acts, she is called Artemis (Latin Diana), but the goddess referred to was clearly the same as the Sicilian Venus on Eryx.

Among extant examples of ancient sculpture, coinage, and painting there are few genuinely Latin depictions of Venus, and it would seem that the Greek Aphrodite was preferred by artists and artisans. Indeed, the two most famous statues of Venus, the Venus de' Medici and the Venus de Milo (Milos, or Melos), are typical specimens of the Aphroditic artistic tradition.

VENUS DE' MEDICI, a well known statue in the Uffizi Gallery, Florence, found during the sixteenth century in Rome. On its base was the name of Cleomanes, son of Apollodoros of Athens, presumably the name of the sculptor, but this is generally thought to be a forgery. Venus is represented entirely nude, with a beautiful face and form, but with so much self-consciousness as to detract from her charm. The figure is probably copied from the Aphrodite of Praxiteles but is much inferior in conception. On its transportation to Florence the statue was broken into 11 fragments. Its restoration was undertaken after 1667, by Ercole Ferrata, but his modeling of the lower arms, hands, and fingers is not in keeping with the original.

VENUS DE MILO, a famous statue, one of the treasures of the Louvre, considered by some the most beautiful example of ancient sculpture. It was discovered by a peasant farmer in a grotto on the isle of Milos, in May, 1820, and was purchased by the Marquis de Rivière, French ambassador to Turkey, who presented it to Louis XVIII, who in turn gave it to the Louvre. The statue, which is of heroic size, represents a woman, nude from the waist up, but draped from the hips to the feet. Both arms are missing. With the figure was found an illegibly inscribed fragment bearing a name ending in "sander, of Antioch on the Meander." The character of the writing suggests that its author lived about 100 b.c. This fragment was lost and there has been much controversy as to whether or not it was a part of the original statue. The position of the arms and the date of the masterpiece are also subjects of debate. It is thought that the arms were broken off and lost in the Bay of Milos at the time of the statue's removal from the island. Undersea exploration for the arms was undertaken as late as 1961, by Myron Kyritsis, a native of Milos who had made his fortune in America.

VENUS'S-FLYTRAP, a perennial insectivorous plant, *Dionaea muscipula*, belonging to the family *Droseraceae*. It grows wild in a small area in the moist, sandy soil near Wilmington, N.C. It bears short flower clusters in June, but is most remarkable for its hairy leaves, the halves of which are hinged and fold together when the hairs are excited by contact



THE VENUS DE MILO

EWING GALLOWAY

Picture Story (1947); Earle W. Newton, *Vermont Story: A History of the People of the Green Mountain State* (1949); Wallace Nutting, *Vermont Beautiful* (1936); Vrest Orton, ed., *And So Goes Vermont: A Picture Book of Vermont As It Is* (1937); Lewis D. Stillwell, *Migration from Vermont* (1948); Charles M. Thompson, *Independent Vermont 1724-1791* (1941); Frederic F. Van de Water, *Reluctant Republic, Vermont 1724-1791* (1941); *Vermont Life* (Periodical), *Treasury of Vermont Life* (1956); Viola C. White, *Vermont Diary* (1956); James B. Wilber, *Ira Allen, Founder of Vermont, 1731-1814*, 2 vols. (1928); William J. Wilgus, *Role of Transportation in the Development of Vermont* (1945); Chilton Williamson, *Vermont in Quandary: 1763-1825* (1949).

VERMONT, UNIVERSITY OF AND STATE AGRICULTURAL COLLEGE, a public, coeducational institution of higher learning located in Burlington, Vt. The university was formed, 1865, through the amalgamation of the University of Vermont, a private institution chartered in 1791, and the Vermont Agricultural College, a state institution chartered in 1864.

The school comprises the following divisions: arts and sciences, technology, civil engineering, medicine, education and nursing, and dental hygiene. Selected premedical students, after completing their junior year, are offered a two-year integrated program of courses in both the college of medicine and the college of arts and sciences, before entering their second year of medical study. The university summer program includes an economics course given in the financial district of New York City, the Warren R. Austin Institute in World Understanding, and the Summer Music Institute for high school students.

Among the library's special collections are the George P. Marsh Humanities Library, the Howard-Hawkins Civil War Collection, materials on Vermont, and materials and works of Dorothy Canfield Fisher. Experiment station bulletins are issued periodically, and an alumni magazine is issued quarterly. See **COLLEGES AND UNIVERSITIES**.

VERMOUTH, a fortified white wine infused with flavoring ingredients such as herbs, barks, roots, seeds, and spices. The two major types of vermouth are French and Italian. French vermouth, produced in the area around Marseilles, is lighter in color, longer aged, and drier than the Italian. Italian vermouth, prepared chiefly in the area around Turin, in northern Italy, usually has a base of muscatel, and is a sweet wine with a musky aroma. Both may be drunk without any additives as an aperitif, but in the United States are more commonly mixed with other beverages to form such cocktails as the Martini and the Manhattan.

VERNAL, city, NE Utah, seat of Uintah County; near the Green River; on U.S. highway 40, 130 miles E of Salt Lake City. The city is a trade and processing center for an area in which there are livestock ranches, coal mines, and oil wells. Leather goods, dairy products, lumber products, and flour are manufactured. Vernal was settled late in the 1870's, and was known as Ashley Center until the 1890's. Pop. (1960) 3,655.

VERNE, JULES, 1828-1905, French novelist, was born in Nantes, studied law in Paris, but began writing for the stage late in the 1840's. In conjunction with Michel Carré, he wrote librettos for two operettas but his work in this vein attained little note. In time, however, he began writing scientific romances (see **SCIENCE FICTION**), in which his remarkable insight into the trend of current scientific invention was well displayed. The enormously successful, *Five Weeks in a Balloon* (1863), was the first of a long series of imaginative tales exploiting popular interest in the actual and potential achievements of modern science. Many of his imaginary creations, such as the submarine, were later realized. Among Verne's best-known works are *A Voyage to the Center of the Earth* (1864); *From the Earth to the Moon* (1865); *Twenty Thousand Leagues Under the Sea* (1869); *The Mysterious Island* (1872); *Around the World in Eighty Days* (1873),

and *Michael Strogoff* (1876). The adaptations of *Around the World in Eighty Days* and *Michael Strogoff* proved the most successful of Verne's dramas. Verne was a member of the Legion of Honor and several of his works were noted by the French Academy.

VERNER, KARL ADOLPH, 1846-96, Danish philologist, the discoverer of Verner's Law, was born in Aarhus, Jutland. After finishing his studies in Copenhagen, he spent seven years in his father's native country, Germany, as a librarian in Halle. From 1883, however, he lived in Denmark as a teacher of the Slavic languages at the University of Copenhagen. Shy by nature, Verner published little, and made known his discoveries almost accidentally during conversations with other scholars. He did, however, publish an article (*Eine Ausnahme der ersten Lautverschiebung*, 1875) that was to immortalize his name, since it contained Verner's Law, the purpose of which was to account for certain apparent exceptions to Grimm's law. Verner's law says that the position of an accent in pre-Germanic Indo-European influenced the later transformation of consonants as described in Grimm's law. Verner's discovery strengthened the position of a new school of linguistics which proclaimed that linguistic "laws" brook no exceptions. See **GRIMM'S LAW**. EUGEN ROSENSTOCK-HUESSY

VERNET, JOSEPH, 1714-1789, French landscape and seascape painter, was born in Avignon, and studied under his father, a coach painter. Impressed by the sea at Marseilles, Joseph studied marine painting under Fergioni in Rome and lived in that city for 20 years, painting unpretentious scenes such as *The Ponto Rotte*, distinguished for its rendering of southern light. The French director of public buildings commissioned him, 1758, to paint a series of views of principal French seaports; it is for the resulting skillfully rendered harbor views that Vernet is principally known. Vernet took 10 years to make wash drawings and take notes for the project, and the paintings suffer from this over-attention to detail, which served to diminish the paintings' quality of immediacy.

Antoine Charles Vernet, called Carle, 1758-1836, French painter and lithographer, studied first with his father Joseph Vernet, winning important honors at an early age. He then went to Rome where, after a period of youthful dissipation, he threatened to reform and become a monk; the father hastily recalled him to France. Carle Vernet's first important work, *The Triumph of Paulus Emilius*, broke with reigning tradition, but won him admission to the academy. After a period of inactivity caused by the French Revolution he turned to painting heroic military subjects such as the *Battle of Marengo* and *Morning at Austerlitz*, for which Napoleon I awarded him the Legion of Honor. But posterity most honors Carle Vernet as a lithographer: his lithographed hunting scenes, race pictures, and caricatures were very popular in their own time and paved the way for future masters of the art.

Emile Jean Horace Vernet, known as Horace, 1789-1863, was born in Paris, the son of Carle Vernet, under whose tutelage he developed his remarkable talent for drawing at an early age. As was his father, Horace was an ardent Bonapartist, and after Napoleon I's downfall, father and son found it expedient to leave France. Soon after returning to Paris from Rome, Horace Vernet sent *Defence of the Barrier of Clichy* to the Salon, where it was rejected, 1822; in defiance, he gave his own exhibition, which proved a great success. He was commissioned, 1824, to paint the portrait of Charles X, and was head of the French Academy in Rome, 1828-33, resigning to go to Algiers with the French army to paint. Visiting Russia, 1842, he painted the Czar and Czarina. In 1855 the French Exhibition devoted an entire gallery to Horace Vernet's famous works. Viewed in retrospect, Vernet's paintings were admirable in their size, their scope, and their dashing execution.

MARTIN GROZ

VICO, GIOVANNI BATTISTA, 1668–1744, Italian historian and philosopher, father of the philosophy of history, was born and lived all his life in Naples, then a city of more than 200,000 inhabitants, and the capital of the Kingdom of the Two Sicilies. Vico is as remarkable for the conduct of his life as he is for the development of his thought. In both, he was unusually slow. Not until he was 55 years of age did he begin to formulate his own insights, and only after his 64th year did he attain even a moderate amount of social security. It may have been, however, that this tardiness was a condition for his achievement, for a whole mountain of prejudices in Vico's own mind had to be overcome; and, as it happened, there was little need for him to hurry forth with new insights, for almost a century elapsed after his death before the world was prepared to listen to him.

Scienza Nuova. In his enthusiasm, Vico spoke and wrote of his insights as a "new science"; this did not make him popular, and the first version of his major work ran into significant trouble. In Vico's day, it was customary for an author to dedicate his new book to some powerful patron, who would, in turn, pay the printer. When Vico first conceived of his New Science, he had only a short time before endured a humiliation so crushing that later he never could speak of it without weeping: having studied law, philosophy, and history deeply, and finding little opportunity to put this knowledge to the best use as a professor of rhetoric, he had asked for a chair of law at the University of Naples and had been turned down for reasons having nothing to do with the relative abilities of the several candidates. Poverty and drudgery seemed destined to remain his lot. Hence, it required almost a supernatural effort of his whole being for him to concentrate on writing the first exposition of his New Science. But at the very least, Vico assumed, he could count on his sponsor, Cardinal Lorenzo Corsini for expense money. In due course, the cardinal—who later became pope as Clement XII, 1730—proved to be quite willing to accept the dedication, but the money was another matter: he soon sent a note to the effect that "other expenses" prevented his discharging the money for Vico. Whereupon Vico rewrote the long volume (perhaps volumes) into 12 pages, sold a ring from his finger for just the money needed to print that number of pages, and published the pamphlet "complete" with its dedication to his "patron."

Rationalism Versus Marriage. From the vantage point of Vico's plight in his middle fifties, the significant data of his early life can be selected. Son of the poorest bookseller in town, he was nonetheless a cheerful child; but a fall left him weak and saddened, and his phthisic coughing caused his schoolmates to bestow on him the cruel nickname Master Tiscuzzo. Humiliated, he ran from school and subsequently became one of the most persevering of self-taught students. As a tutor on the country estate of the Rocca family at Vatolla, in remote Cilento, Vico kept up this habit until the age of 27, acquiring a fine knowledge of Greek, a good command of Hebrew, Greek philosophy, and so forth. He frequented some of the literary circles (*salotti*, academies) of this period in Italian intellectual and spiritual history, and obviously he shared for a time all the mental fashions of the Cartesian enlightenment (see DESCARTES, RENÉ), for in 1693 he printed a poem, *Affetti d'un Disperato* (Sentiments of a Desperado), of unmitigated gloom. Some 30 years later, however, he was to place himself in precisely the opposite, anti-Cartesian camp. Perhaps the first step beyond the despair that Rationalism engendered was his marriage, 1699, to a brave and illiterate woman, Caterina Destito, who gave birth to eight children and died, 1735, after an exemplary life.

Religious, Heroic, and Human Phases of History. Gradually, as he moved away from the fads of eclectic rationalism, Vico discovered the immense role played

in human society by such forces as legislators, cult, poetry, sacrifice, reverence. Gradually, he freed his poetical faculty from subservience to reason's logical concepts. As a result, he immediately saw history in a new way. He could now perceive, for example, that Homer, Shakespeare, Dante, although they lived centuries apart, had served essentially the same poetic function, for each helped enact the "heroic" epoch in the history of Greece, England, and Italy, respectively. Vico taught that history occurs in three successive phases: religious, heroic, human. Without the first two, the third is impossible in any line of achievement. How may science (whether "rational," "experimental," or both) deny the valid reality of faith and heroism, when science itself, to exist fully and historically, must pass through its own religious and heroic phases? By mid-twentieth century, these and others among Vico's insights were to be rather commonplace—except in the United States and the Soviet Union. But in his own day Vico's ideas were unfashionable everywhere and he suffered greatly from the deafness of his contemporaries to his discoveries.

It was the crowning effort of his soul that Vico finally was able to include this very neglect as a part of his conception of history. He came to understand that in his own time he could be tolerated only as a man of exemplary character, as a great Latinist, as a devoted teacher, but that only people of another century would accept his heritage. Having achieved this most difficult of insights, Vico was able to overcome his violent self-criticism and self-distrust sufficiently to undertake to enlarge the first 12 pages of his *Scienza nuova prima* to the *Scienza nuova secunda* in, as he wrote, "a nearly fatal oestrus of passion."

Works. The earliest version of the *Scienza nuova*, as conceived immediately after Vico's rebuff at the hands of the university authorities, was to have been entitled *Dubbi e desideri intorno alla teologia dei gentili*, but was redesignated *Scienza nuova in forma negativa*; soon, however, Vico chose to recast the entire "demonstration" in a more positive way, and in less than a month he rewrote the work as *Principj di una scienza nuova d'intorno alla natura delle nazione per la quale si ritrovano i principj di altro sistema del diritto naturale delle genti* (1725); this was the *Scienza nuova prima*—the First New Science. The Second New Science was published in December, 1730, as *Cinque libri de Giambattista Vico de' principj d'una scienza nuova d'intorno alla comune natura delle nazioni*. By spring, 1731, it is said, Vico was already revising the book again, actually for the fourth time. The result, larger by some 15 chapters and with hardly a page of the 1730 version left unchanged, was issued in July, 1744, six months after Vico's death, as *Principj di scienza nuova di Giambattista Vico d'intorno alla comune natura delle nazioni*. Among Vico's other writings, the following deserve mention: *De ratione studiorum* (1708), *De antiquissima italorum sapientia* (1710), *De universi juris uno principio et fine uno* (1720), and *De constantia jurisprudentis* (1721).

Vico was first resuscitated by Giuseppe Ferrari (1811–76) in an annotated edition of 1837. The complete works, including the autobiography and with the Latin works translated into Italian, were issued at Naples in seven volumes (1858–69). The first German translation of the *Scienza nuova* in its final form was issued in Leipzig, 1822; it, and a French translation (1827), introduced Vico to a Europe that had hardly heard of him before. Not until mid-twentieth century was there an acceptable English translation: *The New Science of Giambattista Vico* (Tr. from the edition of 1744 by T. G. Bergin and M. H. Fisch, 1948).

VICTOR I, SAINT, died ?198, pope from ?190 until his death, was born in Africa. He is remembered for his dispute with the bishops of Asia Minor over the celebration of Easter. The Roman Christians celebrated the holy day on Easter Sunday, while the Asian church followed the custom of marking the

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of brasses and monuments; and almshouses founded in the sixteenth century. William Morris, the poet and artist, was born there, 1834. Pop. (1951) 121,069.

WALTHER VON DER VOGELWEIDE, 1170?-1230, greatest of the German minnesingers, was born probably in the Austrian Tirol, of noble but impeccable parents. His early years were spent at the Viennese court of Duke Leopold V, where he came under the influence of the well known minnesinger, Reinmar von Hagenau, who initiated him into the techniques of the poetic art. Upon the death of his patron, 1198, Walther became a wandering minstrel, moving from one German and Austrian court to another. During this long period of his life, his poetic productions consisted largely of lyrics celebrating courtly love, nature, social idealism, and the like. Gradually, however, in order to gain the favor of certain of his patrons, he forged his poetry into a political instrument. This instrument—sharp, stinging, often two-edged—was first put into the service of Duke Philip, a Swabian pretender to the imperial Roman throne, and later into the service of two emperors, Otto IV and Frederick II. The latter, in gratitude, gave Walther a small estate near Würzburg, 1216, and there the great minnesinger spent his last years, without political or financial cares, devoting himself once more to the love lyric. The productions of his later lyric, including the immortal lyric, *Unter den linden*, took as subject matter the lives and passions of the people, rather than those of the aristocracy, thus transforming the *Minnesang* into a national, rather than a merely aristocratic, possession. Walther is considered by many the greatest German lyric poet before Johann Wolfgang von Goethe. His work had a decisive and lastingly beneficent effect upon the subsequent course of German poetry. See CHIVALRY; MINNESINGER; PROVENÇAL LANGUAGE AND LITERATURE, Literature, *Courtly Love*.

WALTON, BRIAN, or Bryan, 1600?-61, English divine and biblical scholar, was born in Scymour, Yorkshire, and studied at Cambridge. He served as a curate in Suffolk, 1623, and was rector of St. Martin's Orgar in London, 1628-41. Removed from his post on a charge of ritualism, 1641, he was imprisoned for a time, 1642, retired to Oxford, studied Oriental languages, and returned to London, 1647. There he organized a subscription, 1652, for a polyglot Bible. Walton enlisted the aid of several scholars and within a few years published the work: the *London [or Walton's] Polyglot Bible* (6 vols. 1654-57). Walton was made bishop of Chester, 1660.

WALTON, ERNEST THOMAS SINTON, 1903-, Nobel, prize-winning Irish physicist, was born in Dungarvan, the son of a Methodist minister. He was educated at Methodist College, Belfast; Trinity College, Dublin, and Cambridge University; and in 1927-34 did research in nuclear physics at Oxford University under the direction of Ernest Lord Rutherford. Walton and Sir John Cockcroft collaborated in building one of the first atom-smashing machines, 1932. With it, they accelerated protons to high speed and bombarded atoms of lithium-7 with them, thereby producing alpha particles, or helium nuclei, and energy. By this process they verified Einstein's equation $E=mc^2$ (see ATOMIC ENERGY). Walton joined the faculty of Trinity College, 1934, and became Erasmus Smith professor of natural and experimental philosophy, 1946. He and Cockcroft won the Hughes Medal of the Royal Society of London, 1938, and shared the 1951 Nobel prize in physics for their "pioneer work in the transmutation of atomic nuclei by artificially accelerated atomic particles." Walton wrote many papers on nuclear physics, hydrodynamics, and micro-waves. See PHYSICS.

WALTON, GEORGE, 1741-1804, Colonial American lawyer and U.S. political figure, was born near Farmville, Va. He was a member of the Second Continental Congress, 1776-81, and was one of the signers of the Declaration of Independence (1776) and of the

Articles of Confederation (1777). He was governor of Georgia, 1779-80 and 1789, and chief justice of Georgia, 1783-89. Three times he served as a judge of the superior court of Georgia, and represented Georgia in the U.S. Senate, 1795-96.

WALTON, IZAAK, 1593-1683, English writer famous for his *The Compleat Angler*, was born Isaac Walton in Stafford. Walton was baptized "Isaac," yet his first name appears as "Isaack" on his marriage license with Rachel Floud, 1626, and he signed the document "Isaak"; the inscription over his grave, in the cathedral at Winchester, gives the first name as "Isaac." From 1614, Walton was probably an iron-monger—or perhaps, as some authorities insist, a haberdasher—in Fleet Street, London. This was in the parish of John Donne, and Walton struck up a friendship with Donne, and with other men of literary attainments, such as Michael Drayton and Sir Henry Wotton. After the defeat of the Royalists at Marston Moor, 1644, Walton retired from business, lived for a time in the country near Stafford, moved back to London, left it again, and finally lived his last 30 years as the guest of the clergy who were stationed in Winchester (Bishop George Morley and Prebend W. Hawkins).

The Compleat Angler, upon which Walton's fame is based, first appeared in May, 1653. He kept working at it, however, and for the fifth edition, that of 1676, had his friend Charles Cotton—younger than Walton by half a century—contribute some "Instructions how to angle for Trout or Grayling in a Clear Stream." Unique in many ways, *The Compleat Angler* remains not merely the best book on fishing, but also a classic of English literature as (in the judgment of many) the best book on any technical subject. The story is laid in Hertfordshire between Ware and Waltham. Dialogue, verses, song, and discussion alternate in such a way as to make the work a miracle of "contentation" in times of trouble, for the author's gracious prose oozes the inner freedom of an independent man in the stormy days of Oliver Cromwell; significantly, the subtitle of the work is . . . *the Contemplative Man's Recreation*.

After Walton's death the book was largely forgotten until early in the 1750's, when it was revived by the Rev. Moses Browne; subsequently the book was much reprinted, and more than 200 editions are known to exist. A. C. Black published, 1928, a facsimile of the first edition, and an attractive Tricentennial Edition was issued, 1953, under the sponsorship of the Isaac Walton League.

Walton's genius for friendship animates his biographies of Donne (1640), Wotton (1652), Richard Hooker (1662), George Herbert (1670), and Robert Sanderson (1678), which remain models of personal intimacy, simplicity, and sympathy. First collected in 1670, they were reprinted frequently even into the twentieth century. Walton's own life is best told by H. Nicolas, in his 1836 edition of *The Compleat Angler*.

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WALTON, SIR WILLIAM TURNER, 1902-, English composer, was born in Oldham, Lancashire. He was educated at Christ Church Cathedral Choir School and at Christ Church, Oxford, but musically he was virtually self-taught. The two works that first made him well known are a string quartet (1922), which was played at Salzburg, 1923; and *Façade* (1922), a musical accompaniment to 26 (later revised to 21) poems by Edith Sitwell. Among Walton's other compositions are the overture *Portsmouth Road* (1925); *Sinfonia concertante* (1927), for piano and orchestra; the oratorio *Belshazzar's Feast* (1931); a symphony (1934-35); the coronation marches *Crown Imperial* (1937) and *Orb and Sceptre* (1953); a violin concerto (1939); scores for motion picture productions of Shakespeare's *Henry V* (1945), *Hamlet* (1948), and *Richard III* (1955); *Te Deum* (1953); the opera *Troilus and Cressida* (1954); a cello concerto (1956); and Symphony No. 2 (1960). He was knighted in 1951.

hand by means of a cord attached to a box, or trough. Each jerk of the cord, which was placed at each end of the shuttle race, impelled the shuttle to and fro.

Joseph Jacquard of Lyons, in 1801, invented an apparatus by which the most intricate patterns could be woven as readily as plain cloth. This is accomplished by an ingenious arrangement of hooks and wires, by means of which the warp threads are lifted in any order and to any extent necessary to make one shedding required by the pattern. The order in which these hooks and wires are successively lifted and lowered is determined by means of a series of pasteboard cards punctured with holes; the holes correspond to a certain pattern and, as the cards pass successively over a cylinder or drum, the hooked wires pass through the holes and lift the warp threads in an order that insures the arranged pattern being woven into the fabric. When the pattern is extensive, the machine may be provided with as many as 1,000 hooks and wires.

The Power Loom. Another development was made in the art of weaving by the invention, 1784, of the power loom by the Rev. Edmund Cartwright. In the power loom, which was gradually improved and eventually adapted to electric power, the principal motions of the old method of weaving, such as shedding the warp threads, throwing the shuttle, and beating up the thread, are still retained. Although the principle of the loom is the same in all kinds of weaving, there are numberless modifications for the production of special fabrics. The lappet loom is one suitable for weaving either plain or gauze cloths, and also for putting in representations of flowers, birds, or the like.

Types of Weave. Cross weaving is a process in which, as in gauze weaving, the warp threads, instead of lying constantly parallel, cross over or twist around one another, thus forming a plexus or interlacing independent of that produced by the weft. Double weaving consists in weaving two webs simultaneously one above the other, and interweaving the two at intervals so as to form a double cloth. Kidderminster or Scotch carpeting is the chief example of this process. Pile weaving is the process by which fabrics such as velvets and corduroys are produced. In the weaving of these fabrics, besides the ordinary warp and weft, there is what is called the pile warp, the threads of which are left in loops above the surface until cut, and the cutting of which constitutes the pile. See TEXTILES; INDUSTRIAL REVOLUTION; LOOM.

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WEBB, ALEXANDER STEWART, 1835–1911, U.S. soldier and educator, son of James Watson Webb, was born in New York City. He was graduated from the U.S. Military Academy, 1855, served

against the Seminoles in Florida, 1856, and was assistant professor of mathematics at West Point, 1857–61. He served in the Civil War, and was brevetted major general in the regular army, 1865, for his services. He resigned from the service, 1870, and was president of the College of the City of New York, 1869–1902. He wrote *The Peninsula: McClellan's Campaign of 1862* (1881).

WEBB, SIR ASTON, 1849–1930, English architect, was born in London. He designed many notable buildings, among them the Britannia Royal Naval College, Dartmouth, the architectural surroundings for the Victoria Memorial, and the French Protestant church, Soho; with D. Ingress as a partner he supplied the designs for the Royal United Service Institution, the new Christ's Hospital, and Birmingham University. He was knighted, 1904, was royal gold medalist (architecture), England, 1905, and received the gold medal of the American Institute of Architects, 1907. In 1912 his design was chosen for the new front of Buckingham Palace. He was president of the Royal Academy, 1919–25.

WEBB, BEATRICE, 1858–1943, British Socialist writer, wife and collaborator of Sidney Webb, was born Beatrice Potter in Gloucester, of a wealthy timber-merchant family, and was privately educated. At the age of 25 she was, as she put it, "a rather hard and learned woman with a clear and analytical mind," yet deep and pervasive religious feeling led her to take part in Charles Booth's colossal 17-volume *Life and Labour of the People in London*, to which she made her first contribution in 1887. By 1890, when her *The Lords and the Sweating System* appeared, she had outgrown the current economic slogans and "was confirmed in her faith in the application of the scientific method to social organization." She met Sidney Webb, 1890, and after finishing her book on *The Co-operative Movement in Great Britain* (1891), was married to him, 1892. From that time on, their work became one, and most of her subsequent publications were in collaboration with her husband. Two major works she wrote herself: the reminiscences, *My Apprenticeship* (1926), dedicated to "The Other One"; and *Men's and Women's Wages: Should They Be Equal?* (1919). Beatrice Webb never used her title, Lady Passfield. She died in Passfield Corner, Liphook, Hampshire.

WEBB, CHARLES HENRY, pseudonym John Paul, 1834–1905, U.S. journalist, was born in Raikes Point, N.Y. Inspired by the newly published *Moby-Dick*, he shipped aboard a whaler at the age of 17. Subsequently, after working at a variety of occupations, he founded the *Californian*, 1864, in which he printed early works by Bret Harte and Mark Twain. He returned to New York, 1866, where he published Mark Twain's first book, *The Celebrated Jumping Frog of Calaveras County* (1867). He is most famous for his *John Paul's Book* (1874), a collection of letters first written for the *New York Tribune*. He also wrote the parodies *St. Luc's Mo, or the Cuneiform Cyclopaedist of Chattanooga* (1868), a satire on the pompously moralistic romance *St. Elmo* (1867), by Augusta Jane Evans, and *Sea-Weed and What We Seed* (1876); and *Vagrom Verses* (1889).

WEBB, JAMES WATSON, 1802–84, U.S. editor and diplomat, was born in Claverack, N.Y. He served as an officer in the U.S. Army, 1819–27, founded the *New York Morning Courier*, 1827, and two years later merged it with the *Enquirer*. He was U.S. minister to Brazil, 1861–69. In 1865 he arranged by secret treaty with Napoleon III for the withdrawal of French troops from Mexico.

WEBB, PHILIP SPEAKMAN, 1831–1915, English architect, was born in Oxford, and studied at Aynho, Northamptonshire. He entered the architectural office of G. E. Street, where he met William Morris and became an enthusiastic supporter of Morris' arts and crafts movement. Morris' famous Red House, Upton (1859), was designed by Webb as

his first commission, and two years later he became a member of Morris' decorating firm. He was the creator, with R. N. Shaw, of the so-called Queen Anne style. With Morris, Webb founded the Society for the Protection of Ancient Buildings, 1877, in which work use was made of a method, invented by Webb, for strengthening the walls of old buildings by filling in with new material.

WEBB, SIDNEY JAMES, 1st BARON PASSFIELD, 1859-1947, British political leader, founder of the Fabian Society, and partner in a famous marriage (see **WEBB, BEATRICE**), was born in London, received the most significant part of his education in Switzerland and Germany, and then entered the British civil service, 1878. He left the civil service, 1891, and subsequently stood for the London County Council in the elections of 1892, 1895, 1898, 1901 and 1905; served on the Royal Commission on Trade Union Law, 1903-06; and was a professor of political economy in the School of Economics of the University of London (the London School of Economics), from 1913. A member of the executive committee of the Labour party from 1915, Webb was elected to Parliament, 1922; was president of the Board of Trade in Ramsay MacDonald's first cabinet, 1922-1923, and secretary of the colonies and dominions in his second; and was created Baron Passfield, 1929. Later, however, when MacDonald formed his Union cabinet in August, 1931, Webb opposed him. Webb wrote *Socialism in England* (1890), *London Education: Grants in Aid* (1920), and many other works, most of them, as the following, with his wife Beatrice: *The History of Trade Unionism* (1894); *Industrial Democracy* (1897); *Problems of Modern Industry* (1898); *English Local Government* (10 vols., 1906-29); *The Break-up of the Poor Law* (1920); *The State and the Doctor* (1910); *A Constitution for the Socialist Commonwealth of Great Britain* (1920); *The Consumer's Co-operative Movement* (1920); *Methods of Social Study*, (1932), which contains an exposition of the methods of investigation used by the authors and an examination of the place of sociology among the sciences; and *Soviet Communism, A New Civilization?* (2 vols., 1936), called by the Webb's a "work of Supererogation."

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WEBB CITY, city, SW Missouri, in Jasper County; on the Missouri Pacific and the Frisco railroads, and U.S. highways 66 and 71; 160 miles SW of Jefferson City. It is in the Tri-State lead- and zinc-mining region. The city is a processing center for an area of dairy farms. Shoes, clothing and explosives are manufactured. The quarrying of sand and gravel pits in the vicinity is important, but lead and zinc deposits are nearly exhausted. Webb City was platted in 1875, at the beginning of the greatest mining era in the history of Missouri. Pop. (1960) 6,740.

WEBER, KARL MARIA FRIEDRICH ERNST VON, 1786-1826, German composer, founder of the Romantic opera in Germany, was born in Eutin, near Lübeck, the son of a theatrical impresario. He studied under Abbé Georg Joseph Vogler, through whom he became *Kapellmeister* of the Breslau municipal theater, 1804-06. After leaving Breslau he served for a time as musical director to Duke Eugen of Württemberg, and was in Stuttgart, 1807-10, as private secretary to Duke Ludwig, brother of the king of Württemberg. He became involved in the corrupt court life of Stuttgart, however, was accused of embezzlement, and was banished from the city. Subsequently he was director of the opera in Prague, 1813-16, and director of the German opera in Dresden from 1817 until his death. He died in



CULVER SERVICE
Karl Maria von Weber

London, where he had gone to direct the production of *Oberon*. His first success was the Romantic opera, *Der Freischütz* (1820), probably the earliest example of German musical nationalism. Among his other dramatic works, are *Euryanthe* (1823), *Oberon* (1826), and incidental music for Wolff's *Preciosa* (1821). Von Weber's other productions comprise choral and symphonic works, concertos, songs, and many compositions for the piano, including the popular rondo, *Invitation to the Dance* (1819). His exoticism, purposeful exaggeration, and brilliant orchestral coloring strongly influenced the art of Hector Berlioz and Richard Wagner.

WEBER. MAX, 1864-1920, German sociologist, was born in Erfurt. After studying the history of law under the famous Levin Goldschmidt in Berlin, he broadened his interests to include agrarian history (*Romanische Agrargeschichte*, 1891), and began to teach economics in Freiburg, 1894. Called to the more comprehensive chair of political economy in Heidelberg University, 1897, he became a leader of the Neo-Kantian school there and for the first time applied the principles of this school of thought to the social sciences. Taking his cue from the natural sciences, Weber accepted the rigid methodological limitations inherent in atheism; that is, the scientist and his objects are held to be totally separated, and the values of human beings are assumed to have no power over the scientist's mind. He differed from the natural scientists, however, in stressing the uniqueness of each social fact—a uniqueness that renders the usual quantitative methods of physics inapplicable to the social sciences.

Using this method, Weber wrote the essay on *The Protestant Ethic and the Spirit of Capitalism* (Eng. Tr. by Talcott Parsons, 1930), which made him famous and which was never to be long out of print. The essay had a significant influence on many scholars, notably Richard H. Tawney, who built on Weber's thesis in his *Religion and the Rise of Capitalism* (2nd ed. 1929). The thesis is important in the fact that it seeks to explain modern capitalism and technological production without recourse to the materialistic tenets of liberalism and of Marxism. Thus, he held that the Calvinistic laity, in a parallel to the medieval asceticism of the body, trained their minds to an "inner-worldly asceticism" and recognized their "calling" for developing wealth, not for selfish enjoyment, but for its own sake and according to its own laws of accumulation. Weber taught that everyone chooses his own value arbitrarily from among a multitude of possible and available values, and that the social world is governed by "chance" (one of Weber's most frequently used terms); and that in fulfilling one's own value one becomes the ideal "type" of this chosen path—as, for instance, "religious man," "economic man," "patriotic man," and so forth. Even Jesus himself was generalized by Weber into the "charismatic type," and Weber's close friend, Ernst Troeltsch, in regard to "this solution of heroic despair," called him the "modern Machiavelli." Weber saw his own calling in the austere service of his "valued," the Nation; that is, his ultimate value was the survival of the nation of which, quite by chance, he happened to be born a citizen. Weber embodied the end of the era of Darwinian nationalism which led to two World Wars; his was an immense intellect incapable or unwilling in its intellectualizing to grant the slightest concession to any future of mankind to the faith that enables an individual to escape from the bonds of his "type" and to change and be changed creatively.

In 1900 Weber suffered what was reported to be a "nervous breakdown." Still seriously ill in 1903, he resigned his professorship. A year or two later his condition was improved, but not sufficiently for him to resume an official university position. Thus for more than a decade he lived in Heidelberg as a private scholar. When the German Empire collapsed

his first commission, and two years later he became a member of Morris' decorating firm. He was the creator, with R. N. Shaw, of the so-called Queen Anne style. With Morris, Webb founded the Society for the Protection of Ancient Buildings, 1877, in which work use was made of a method, invented by Webb, for strengthening the walls of old buildings by filling in with new material.

WEBB, SIDNEY JAMES, 1st BARON PASSFIELD, 1859-1947, British political leader, founder of the Fabian Society, and partner in a famous marriage (see **WEBB, BEATRICE**), was born in London, received the most significant part of his education in Switzerland and Germany, and then entered the British civil service, 1878. He left the civil service, 1891, and subsequently stood for the London County Council in the elections of 1892, 1895, 1898, 1901 and 1905; served on the Royal Commission on Trade Union Law, 1903-06; and was a professor of political economy in the School of Economics of the University of London (the London School of Economics), from 1913. A member of the executive committee of the Labour party from 1915, Webb was elected to Parliament, 1922; was president of the Board of Trade in Ramsay MacDonald's first cabinet, 1922-1923, and secretary of the colonies and dominions in his second; and was created Baron Passfield, 1929. Later, however, when MacDonald formed his Union cabinet in August, 1931, Webb opposed him. Webb wrote *Socialism in England* (1890), *London Education; Grants in Aid* (1920), and many other works, most of them, as the following, with his wife Beatrice: *The History of Trade Unionism* (1894); *Industrial Democracy* (1897); *Problems of Modern Industry* (1898); *English Local Government* (10 vols., 1906-29); *The Break-up of the Poor Law* (1920); *The State and the Doctor* (1910); *A Constitution for the Socialist Commonwealth of Great Britain* (1920); *The Consumer's Co-operative Movement* (1920); *Methods of Social Study*, (1932), which contains an exposition of the methods of investigation used by the authors and an examination of the place of sociology among the sciences; and *Soviet Communism, A New Civilization?* (2 vols., 1936), called by the Webb's a "work of Supererogation."

EUGEN ROSENSTOCK-HUESSY
WEBB CITY, city, SW Missouri, in Jasper County, on the Missouri Pacific and the Frisco railroads, and U.S. highways 66 and 71; 160 miles SW of Jefferson City. It is in the Tri-State lead- and zinc-mining region. The city is a processing center for an area of dairy farms. Shoes, clothing and explosives are manufactured. The quarrying of sand and gravel pits in the vicinity is important, but lead and zinc deposits are nearly exhausted. Webb City was platted in 1875, at the beginning of the greatest mining era in the history of Missouri. Pop. (1960) 6,740.

WEBER, KARL MARIA FRIEDRICH ERNST VON, 1786-1826, German composer, founder of the Romantic opera in Germany, was born in Eutin, near Lübeck, the son of a theatrical impresario. He studied under Abbé Georg Joseph Vogler, through whom he became *Kapellmeister* of the Breslau municipal theater, 1804-06. After leaving Breslau he served for a time as musical director to Duke Eugen of Württemberg, and was in Stuttgart, 1807-10, as private secretary to Duke Ludwig, brother of the king of Württemberg. He became involved in the corrupt court life of Stuttgart, however, was accused of embezzlement, and was banished from the city. Subsequently he was director of the opera in Prague, 1813-16, and director of the German opera in Dresden from 1817 until his death. He died in



CULVER SERVICE
Karl Maria von Weber

London, where he had gone to direct the production of *Oberon*. His first success was the Romantic opera, *Der Freischütz* (1820), probably the earliest example of German musical nationalism. Among his other dramatic works, are *Euryanthe* (1823), *Oberon* (1826), and incidental music for Wolff's *Preciosa* (1821). Von Weber's other productions comprise choral and symphonic works, concertos, songs, and many compositions for the piano, including the popular rondo, *Invitation to the Dance* (1819). His exoticism, purposeful exaggeration, and brilliant orchestral coloring strongly influenced the art of Hector Berlioz and Richard Wagner.

WEBER, MAX, 1864-1920, German sociologist, was born in Erfurt. After studying the history of law under the famous Levin Goldschmidt in Berlin, he broadened his interests to include agrarian history (*Romanische Agrargeschichte*, 1891), and began to teach economics in Freiburg, 1894. Called to the more comprehensive chair of political economy in Heidelberg University, 1897, he became a leader of the Neo-Kantian school there and for the first time applied the principles of this school of thought to the social sciences. Taking his cue from the natural sciences, Weber accepted the rigid methodological limitations inherent in atheism; that is, the scientist and his objects are held to be totally separated, and the values of human beings are assumed to have no power over the scientist's mind. He differed from the natural scientists, however, in stressing the uniqueness of each social fact—a uniqueness that renders the usual quantitative methods of physics inapplicable to the social sciences.

Using this method, Weber wrote the essay on *The Protestant Ethic and the Spirit of Capitalism* (Eng. Tr. by Talcott Parsons, 1930), which made him famous and which was never to be long out of print. The essay had a significant influence on many scholars, notably Richard H. Tawney, who built on Weber's thesis in his *Religion and the Rise of Capitalism* (2nd ed. 1929). The thesis is important in the fact that it seeks to explain modern capitalism and technological production without recourse to the materialistic tenets of liberalism and of Marxism. Thus, he held that the Calvinistic laity, in a parallel to the medieval asceticism of the body, trained their minds to an "inner-worldly asceticism" and recognized their "calling" for developing wealth, not for selfish enjoyment, but for its own sake and according to its own laws of accumulation. Weber taught that everyone chooses his own value arbitrarily from among a multitude of possible and available values, and that the social world is governed by "chance" (one of Weber's most frequently used terms); and that in fulfilling one's own value one becomes the ideal "type" of this chosen path—as, for instance, "religious man," "economic man," "patriotic man," and so forth. Even Jesus himself was generalized by Weber into the "charismatic type," and Weber's close friend, Ernst Troeltsch, in regard to "this solution of heroic despair," called him the "modern Machiavelli." Weber saw his own calling in the austere service of his "value-god," the Nation; that is, his ultimate value was the survival of the nation of which, quite by chance, he happened to be born a citizen. Weber embodied the end of the era of Darwinian nationalism which led to two World Wars; his was an immense intellect incapable or unwilling in its intellectualizing to grant the slightest concession to any future of mankind to the faith that enables an individual to escape from the bonds of his "type" and to change and be changed creatively.

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financial hardship for the father, although Daniel's four years at Dartmouth cost less than \$200 out-of-pocket.) Having been graduated, 1801, young Webster taught for a short time in



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the courage to rise in class for declamation exercises, now rose to unequalled fame with three resounding orations: that on the "Pilgrim Fathers and the Settlement of New England" (Dec. 22, 1820); that delivered at the laying of the cornerstone of the Bunker Hill Monument (1825); and that eulogizing John Adams and Thomas Jefferson (1826), who had both passed away on the fiftieth anniversary of the Declaration of Independence. "Godlike Webster," as he came to be called, had a voice of extraordinary volume, flexibility, and musicality; this, and his strict subordination of rhetoric to content, and his great effervescence of good will and humor, combined to attract vast crowds. In 1840, before radio and television, 15,000 persons climbed lonely Mount Stratton, Vt., for the privilege of hearing him; the same privilege at his last speech in New York, 1852, cost everyone in the audience \$100 hard money.

Return to Politics. By 1822 Webster could afford to re-enter politics and promptly did so, first as a representative from Massachusetts, 1823-27, and then as a senator, 1827-41 and 1845-50. The Crimes Act of 1825 was largely Webster's work and bears his name. With Henry Clay and John C. Calhoun, Webster formed a great triumvirate. Embracing the industrial interests of the North, he turned against the threats of Southerners who wished to invalidate the high duties of the new tariff. In his famous "Reply to Hayne" (Jan. 26 and 27, 1830) Webster convinced responsible men throughout the nation that the states form a true Union, and thereby made it certain that when South Carolina came out, 1832, for the alleged right of nullification, this was recognized for what it was—a sectarian doctrine and nothing more. Much later, in the Civil War, Webster's vision of the great destiny of a united country was shown to have captured the whole nation. See CALHOUN, JOHN CALDWELL, *States' Rights; NULLIFICATION.*

Ambition. The remainder of Webster's life was dominated by an unceasing and never successful quest for the presidency. His parliamentary triumphs stood in his way in a country that had never given its highest office to an athlete of eloquence. Webster joined the Whigs, but in 1833, in 1836, and in 1840, he failed to become their candidate. In 1840, President Harrison appointed him secretary of state. After one month, Harrison died and the new President Tyler received the dutiful resignations of Harrison's cabinet members, with the exception of Webster's, for he claimed to be indispensable in the negotiations with England over the Maine boundary. After the Webster-Ashburton Treaty (1842) was signed—he had used secret service money to put it over—Webster tried to heal the breach with his party by resigning, May, 8, 1843.

Back in the Senate from 1845, he supported ("not as a Massachusetts man, nor as a Northern man, but as an American") Clay's Compromise of 1850 and scolded the North for its resistance to the claims of the South to win back their fugitive slaves. This speech, delivered Mar. 7, 1850, filled the Rotunda of the Capitol and the avenues of the city with crowds waiting "for the only man who could draw such an assembly." Of this speech, in which Webster sought "to beat down the Northern and the Southern follies, now raging in equal extremes," it may be said to have prolonged the peace for 10 years, but it also earned him the vitriolic attack *Ichabod* from the pen of the abolitionist poet John Greenleaf Whittier, who wrote that "The glory has departed from Israel."

Becoming secretary of state once more, July 22, 1850, in the cabinet of Pres. Millard Fillmore, Webster entered, December 20, upon the famous Hülsemann correspondence with the Austrian charge d'affaires which sounds as if written in the 1960's. In it, Webster vindicated the right of the United States to sympathize with, and to recognize, revolutionary governments (specifically, at that time, the Hun-

garian). Webster saved the Hapsburg refugees in Turkey and also invited the Hungarian revolutionary hero Lajos Kossuth to America.

In 1852, as in previous presidential election years, Webster tried again for the Whig nomination to the presidency. When he failed, he repudiated the Whig choice, Gen. Winfield Scott, and sided with Pierce, the man agreeable to the South.

Significance. Despite such lapses, despite his dogged chase after the presidency, despite the financial chaos of his affairs and his dependence on "loans" and gifts from the manufacturers, the Christian enthusiasm of Webster-the-man was certainly genuine, and as a patriot he cemented the nation with his large vision of its great future-in-unity as very few had done before or were to do later. Upon his death, in his "ocean-mansion" at Marshfield, Mass., there was an outburst of deep mourning throughout the country that was to remain virtually unique in its scope and in its intensity. The various eulogies of the day, by Rufus Choate, Edward Everett, and others, are an important source for gauging Webster's position in the hearts of the people.

Webster's Works were edited and published in his lifetime by Edward Everett (6 vols. 1851); more complete is the National Edition, edited by J. W. McIntyre: *The Writings and Speeches of Daniel Webster* (18 vols. 1903). The best bibliography of Websteriana is in Volume II of the *Cambridge History of American Literature* (1918). There are extensive biographies by George C. Curtis (1870) and Claude M. Fuess (1930), and short ones by A. L. Benson (1929), S. H. Adams (1930), G. W. Johnson (1939), J. B. McMaster (1939), and M. T. Carroll (1945). New documents appear in H. A. Bradley and J. A. Winans, *Daniel Webster and the Salem Murder Case* (1956). Nathaniel Hawthorne's *The Great Stone Face* and Stephen Vincent Benét's *The Devil and Daniel Webster* are notable among the various poetical evocations of Webster. In the latter he takes on the Devil himself in a property case tried before a judge and jury of traitors, pirates, and murderers all prejudiced in the Devil's favor—and wins the case.

EUGEN ROSENSTOCK-HUESSY

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WEBSTER, JOHN, 1580?–?1625, English dramatist, born probably in London, was the son of a tailor and was himself a member of the Merchant Taylors' company. Practically nothing is known of his life. His first plays were written in collaboration with other dramatists, particularly Thomas Dekker. *The Famous History of Sir Thomas Wyatt* and the comedies *West-Ward Hoe* and *North-Ward Hoe* were published in 1607 under Webster's and Dekker's names. Webster's two great tragedies *The White Devil* (produced ?1611, published 1612) and *The Dutchesse of Malfy* (produced ?1614, published 1623) are both memorable for their grim terror and their vivid characterizations. Among his later works are *The Devils Law-case* (published 1623), *Appius and Virginia* (produced ?1639, published 1654), and *A Cure for a Cuckold* (produced ?1625, published 1661).

WEBSTER, NOAH, 1758–1843, U.S. lexicographer, was born in West Hartford, Conn., and was educated at Yale College. He was admitted to the bar, 1781, but did not take up the practice of law, turning instead to teaching and writing. In 1783 he began publishing *A Grammatical Institute of the English*

Freiburg. He taught at the University of Manchester 1904-16, and became a naturalized Briton, 1910. During World War I he was director of the Admiralty Laboratories, 1916-19. Weizmann became active in the World Zionist Organization, and was its president 1920-31. At the same time he served as president of the Jewish Agency for Palestine, 1929-31 and 1935-46. He became chairman of the board of governors of the Hebrew University, Jerusalem, and director of the Daniel Sieff Research Institute, Palestine, 1932. When the new Jewish state of Israel was set up, 1948, Weizmann was elected its first president. His *Trial and Error*, (1949) is autobiographical. See ACETONE.



Chaim Weizmann

WEIZSÄCKER, FREIHERR VIKTOR VON, 1886-1957, pioneer German physician and psychiatrist, was born in Stuttgart, but lived most of his life in Heidelberg, 1910-41 (except for the period of his World War I service), and from 1945 until his death. Members of the family distinguished themselves in various ways: His father, many years prime minister of Württemberg, was made a baron (*Freiherr*); his grandfather, Karl Heinrich von Weizsäcker (1822-99), produced a translation of the New Testament that was still well known at mid-twentieth century; his brother, Freiherr Ernst von Weizsäcker (1882-1951), was a diplomat from 1920, and during the Nazi period after 1933, and was convicted and sent to prison by the Nürnberg Tribunal after World War II; and his nephew, Karl Friedrich von Weizsäcker (1912-), became one of Germany's most important physicists and "historians of nature" (*Die Geschichte der Natur*, 1949; rev. ed. 1956).

Viktor von Weizsäcker studied under the physiologist Johannes von Kries (1853-1928) and the biologist Ludolf von Krehl (1861-1937) investigating the heart as a "heat-producing machine," and for 10 years his researches were largely oriented to their strictly mechanistic point of view. In the meantime, however, Weizsäcker's own life experience gradually forced him to modify his scientific tenets radically. Among the experiences that contributed to this transformation were his service in a field hospital during World War II; his friendship with members of the Patmos Group—scholars, of diverse backgrounds, who from 1915 or before shared the conviction that the war represented an all-but-total breakdown of prewar standards and attitudes, and that new ways of life and thought would have to be discovered if the lessons of the war were to be learned and acted upon fully; and, most significantly, the impression made upon Weizsäcker by Sigmund Freud. Thus, although he seriously damaged his standing among physicians who practiced medicine according to abstractions in school books, and later endangered his very existence after the Nazis took power, 1932, Weizsäcker chivalrously recognized and acknowledged Freud as the great ram against the walls of stultifying verbal and conceptual abstractions of the prevailing mechanistic Cartesian medicine, according to which body and mind are totally separate. See DESCARTES, RENÉ.

Fundamental among the abstractions opposed by Weizsäcker were those of the "case," and of "illness per se," according to which (1) any given disease is assumed to be an independent entity that is essentially the same in its every occurrence and, therefore, (2) anyone with the disease is not a person but a "case" to be "handled." For Weizsäcker, however, the discoveries of Freud and others demonstrated that each person's way of being healthy or sick is original and unique, and must be responded to accordingly by the

physician, who must acknowledge that the body has its wisdom, that arbitrary conceptual judgments lead to folly, and that the physician is as mortal as his patient. In his *Soziale Krankheit und soziale Gesundheit* (1930), Weizsäcker attacked socialistic sickness insurance on the ground that so long as socialism simply takes over the principles of liberal mechanistic medicine, neuroses are bound to breed whose very bases are the insurance payments themselves. Mechanistic science-medicine and capitalism are two sides of one coin, Weizsäcker believed; and the Soviets, by seeking to retain mechanistic science, are obliged for this very reason also to uphold capitalism, although in the degenerated form of "state-capitalism."

In reality, according to the viewpoint of Weizsäcker and others of his school (see UNCONSCIOUS, TIME, *Existentialism and Existential Psychoanalysis*), the sick person cannot be met by the scientist as an object, but must be approached biographically. The physician must in some way identify his own life-and-death with that of the person and with the person's hopes and fears for the future; thus may the physician hope to assist the person's *own* strategy for overcoming sickness and regaining health. Much of Weizsäcker's doctrine anticipated many later developments in psychosomatic medicine, but most psychosomaticists, while recognizing the interplay of mind and body in the patient, generally fail in practice to enter the decisive crisis of their "patients." They practice "medicine before the crisis," as Weizsäcker put it, rather than a "medicine after the crisis," a truly biographical medicine such as that espoused by Weizsäcker. This biographical medicine Weizsäcker taught to a group of devoted friends, among whom Wilhelm Käte Meyer was most important, and later made the guiding principle of the Otfried Förster Institute, Breslau, which he headed during four years of World War II.

During most of his career, Weizsäcker was barely tolerated by the powerful leaders of "official" medicine. Deprived of speech and motion for the last years of his life, he was, for the sake of reconciling the profession, bowdlerized as just another philosopher and physician as, for instance, in the misleading posthumous volume, Weizsäcker-Wyss, *Zur Medizin und Philosophie*. Weizsäcker's remarkable *Hippokrates und Paracelsus, Helfen und Heilen, in Die Schildgenossen* (1926), the clearest statement of his position, seemed to have been forgotten or suppressed making it all the more difficult to see that Weizsäcker represented a complete rejection of centuries of Cartesian science. He was an original thinker, a founder of a new scientific attitude in which the Cartesian concept of "objective" Nature is replaced by awareness of Reality as "Creation" such that the scientist himself can no longer try to stand outside of, and aloof from, his "subject," but must return into the common fold as a creature, listening to and speaking with other "creatures." In this light, Weizsäcker is best understood in the context of his editorship of *Die Kreatur* (1926-30), with Joseph Wittig and Martin Buber. An incomplete bibliography of Weizsäcker's many writings appears in the *Festschrift, Freundesgabe für Viktor von Weizsäcker* (1956). His *Körpergeschehen und Neurose* (1933), *Menschenführung* (1955), and *Pathosophie* (1956) are fundamental works.

EUGEN ROSENSTOCK-HUESSY
WELCH, WILLIAM HENRY, 1850-1934, U.S. pathologist, was born in Norfolk, Conn., and studied at Yale University; at the College of Physicians and Surgeons, Columbia University; and abroad. He introduced European pathology techniques at Bellevue Hospital Medical College, 1878-83. He was professor of pathology at Johns Hopkins University, 1884-1916, director of Johns Hopkins School of Hygiene and Public Health, 1916-26, and professor of the history of medicine there, 1926-31. Welch did research in animal diseases, and in diphtheria and pneumonia, and discovered the bacillus that causes

Bremerhaven. The Weser River is navigable throughout its length, and it is connected with the Elbe River by the Weser and Mittelland canals. The flow of water in the river is controlled by a system of dams on its tributaries.

WESLACO, city, extreme S Texas, in Hidalgo County; on the Missouri Pacific Railroad and U.S. highway 83; 230 miles ESE of San Antonio. The city is a shipping and processing center for an area in which citrus fruit, vegetables, and cotton are grown by irrigation. The processing of feed, fertilizer, and the production of boxes are leading industries. Weslaco was incorporated in 1921, and requires that all new buildings be in the Spanish style of architecture. Pop. (1960) 15,649.

WESLEY, CHARLES, 1707-88, English Methodist clergyman and hymn writer, was born in Epworth, Lincolnshire. While at Christ Church College, Oxford, 1726-32, he and his brother, John Wesley, were leaders of the Holy Club, whose members were derisively dubbed Methodists because of their emphasis on method in conduct. After serving briefly and not very successfully as a missionary in Georgia, 1735-36, and as an unlicensed curate at Saint Mary's, Islington, 1738-39, he spent 17 years traveling extensively as an itinerant preacher. In 1756 he settled in Bristol to continue his work, but in 1771 he moved to London. He was always closely associated with his brother John, although the two differed on certain doctrinal points. Charles Wesley's hymns—it is said he wrote over 6,500 songs—played an important role in the Methodist movement; some attained a wide and lasting popularity, especially *Jesus, Lover of My Soul; O for a Thousand Tongues to Sing; Hark, the Herald Angels Sing!* and *Love Divine, All Loves Excelling*. See **METHODISM**.

WESLEY, JOHN, 1705?-91 English evangelist, founder of Christian Methodism, but not of the Methodist church, was born in the Manse of Epworth, England, the fifteenth child of Samuel and Susannah Wesley, both of whom took a formative hand in his religious upbringing. He was educated in Charter House School, London, and in Oxford at Christ Church College and Lincoln College (M.A. 1727). After the first of what was to be a series of many unfinished courtships—under the classic name "Cyrus" he corresponded with "Varanese," who, in plain English, was Sarah Kirkham—he was ordained deacon and made a fellow of Lincoln. In Lincoln, he formed the Holy Club, so called, whose strict rules and schedules for pieties and readings procured for its members the nickname of "methodists," and thus the Father of Methodism was christened with a Platonic and Aristotelian, and totally nonscriptural name. Later, regular visits to prisoners and to sick enlarged their "method."

When James Edward Oglethorpe needed two clergymen for his North American venture, John and his younger brother Charles Wesley (1707-88) were sent to Oglethorpe's new colony of Georgia, 1735, and the life-long partnership of the two brothers began in earnest. John's most significant positive experience in America, the Georgia ministry having proved a failure, was meeting the Moravian Brethren of Count Nikolaus Ludwig von Zinzendorf and being told, to his surprise, that Christ could not be found "in general."

Conversion. Landing in England, 1738, Wesley again met a legate of Count Zinzendorf, Peter Böhler, and once more was asked if he knew that no ecclesiastical grandeur or sacraments would help him unless he realized that Christ had died for him. Wesley's idea of religion had previously been dominated by the social and historical setting of his life; family, university, and country had seen to that: you were a visible Christian in a visible church or you were not a Christian at all. Wesley's "Aldersgate Street Experience"—during his attendance of a meeting of Moravian Brethren—at 8:45 P.M. on May 24, 1738,

changed all this. Wesley now acknowledged that God cannot create a free soul unless this soul faces God's death as a personal communication to her (the soul) made for her sake, creating a bond that remains forever invisible to everybody else in the world, and only shines forth into the visible world through this soul's perpetual witness in the form of new and resourceful acts inspired by this invisible source.

The experience of May 24, called "conversion" by Wesley, helped him later to discover his future, original path. But before this, he went to Zinzendorf's estate and Moravian center at Herrnhut itself. Finding the group there not active enough to suit him, Wesley decided to steer an independent course and responded to his own conversion by adopting the open field and the open road under the open sky as his invisible church in the midst of the visible Established Church of England. Yet, as he wrote in his *Journal*, "I hardly could reconcile myself to this baroque way of preaching because I so firmly was attached to every point of ecclesiastical observance and ritual that I nearly deemed it a sacrilege to save souls except inside a church-building."

For some 50 years, then, Wesley persisted in this conservative policy of not actually breaking away from the visible church, but of planting within it centers of sanctifying spiritual revival. In fanning the fires of living faith in the masses—masses much abused by the brazen and impudent victors of the Glorious Revolution, the British gentry, in England, Ireland, and in the colonies—Wesley markedly changed the moral temper of these territories and made over their inhabitants. For more than 50 years he rode annually from about 5,000 to 8,000 miles, with Bristol, London, Newcastle, and Dublin (Ireland) his starting points; he crossed the Irish Channel no less than 42 times. Those patrons of the Established church who acceded to his preaching, themselves were to receive the benefits of this revival; but, through no fault of Wesley, most patrons of the Established church frustrated, ridiculed, and hated his method.

Throughout his life, Wesley remained satisfied with the barest minimum of an organization. In 1744, however, he called a conference of his ministers for the first time; their subsequent annual meetings remained the one formal aspect of the Methodist movement. Otherwise, for 45 years, the saintliness, magnetism, and incisive good judgment and common sense of Wesley had to suffice and did suffice in supplementing the thousands of letters and the hundred thousands of miles. By 1784, however, the changed status of the North American lands made it imperative to act across the ocean independently from the Anglican church, which had forfeited its established hold on the new United States. Wesley accordingly appointed a superintendent, Francis Asbury, and gave him the competence of ordaining bishops in America. Thus, after years of infinite patience with the Established church, and infinite perseverance in his circuit-rider mission, it was the pressure of new conditions that made Wesley act with the incisiveness of a statesman. Subsequently the logic of events led to the independence of the Methodists as a church visible around the invisible church that had gathered during John Wesley's apostolic pilgrimage. See **METHODISM**.

Personal Life. In his private affairs, Wesley fared unluckily. He definitely tried to marry a Miss Grace Murray, but brother Charles made this impossible by a rudeness and meanness of action that one can only excuse by assuming it to have resulted from some unconscious jealousy: he could not forgive John that he, Charles, had not been taken into his confidence. The detestable result was that Grace married somebody else, and John rushed in to such an ill-chosen marriage that the wife soon became his mortal enemy and they separated. The religious division of labor of the two brothers, in which Charles had cultivated their ties with the official church, thereafter

was seriously impaired; thus did the personal life do harm to the work. In retrospect, it is important to remember that "methodism" was not a term chosen for the final traits of the Aldersgate Street experience, but a purely accidental nickname dating from the adolescence of John Wesley before his conversion. Wesley's saintliness alone tied the two periods of his life together.

Works. John Wesley personally edited his *Works*, which appeared in Bristol (32 vols. 1771-74); later editions were issued in London, 1829-31 and 1868-72. The famous *Journals* edited by N. Curnock (8 vols. 1909-10), cover the years 1743-90. Wesley's *Letters* (8 vols. 1931) were edited by J. Telford. The *Works* include, among other things, histories of Rome and England; an ecclesiastical history; educational treatises; biblical commentaries; many hymns; and translations from several languages.

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WESLEYAN COLLEGE, a private institution of higher learning for women, associated with the Methodist church, and located at Macon, Ga. Men are admitted on a limited basis. Established as the Georgia Female College, 1836, the school offered its first liberal arts instruction in 1839. The name was changed to Wesleyan Female College, 1843, and to Wesleyan College, 1919. The school of fine arts was added in 1924.

The college sponsors an internship program for teachers, a master's program in music, a junior year of study at selected universities abroad, and the Junaluska Summer Music School. Among the college library's special collections are the McGregor Collection of rare Americana, the Park Collection of rare Georgiana, art books, musical recordings. See COLLEGES AND UNIVERSITIES.

WESLEYAN METHODIST CHURCH. See METHODISM.

WESLEYAN UNIVERSITY, a private, non-sectarian institution of higher learning for men, located at Middletown, Conn. The school was founded as a college of liberal arts, 1831, under the auspices of the Methodist Episcopal Church, and offered its first instruction the same year.

Programs of graduate study leading to a master's degree are offered in most departments; women are

admitted to the graduate school. The university conducts an honors college for superior students in their junior and senior year, and a co-operative study program with California Institute of Technology and Columbia University's School of Engineering. Courses designed to increase reading comprehension and speed are offered. The school also maintains an electronics laboratory for special development in language ability.

Among the special collections in the university library are the Davison Collection of rare books, the Johnston Collection of early Atlases, and the Barney Collection of poetry works. The Department of School Services and Publications issues the *Weekly Reader*, *Our Times*, and *Current Events*, all of which are used by students in elementary and secondary schools. See COLLEGES AND UNIVERSITIES.

WESSEL, JOHANN, sometimes called Gansfort or Goesvort, 1420?-1489, Dutch theologian and reformer, was born in Groningen, and brought up by the Brethren of the Common Life in Zwolle. He was educated at Cologne, Heidelberg, and Paris and spent a short time in Rome. He spent the latter part of his life mostly in retirement in the place of his birth. He was called Lux Mundi (Light of the World) by his friends, but because of his strenuous opposition to the prevalent Scholastic philosophy his enemies dubbed him *Magister Contradictionum* (Master of Contradictions). He regarded Christianity as entirely spiritual and denied that indulgences could apply to other than ecclesiastical penalties.

WESSELY, NAPHTALI HERZ, 1725-1805, German Hebrew poet and essayist, was born in Hamburg. He studied at Copenhagen and participated in the Jewish Enlightenment movement which, under the leadership of Moses Mendelssohn, was designed to bring Jews into closer harmony with European intellectual and cultural affairs. He devoted the last 20 years of his life to completing an epic poem about the prophet Moses, *Shire Lif'ereth* (published in six parts, 1789-1829). He also wrote on ethics and on Hebrew grammar, and composed a commentary on Leviticus.

WESSEX, an Anglo-Saxon kingdom in southern Britain. In 494, Cerdic (died 534) landed on Southampton Water, and after years of warfare became king of the West Saxons (Old English *West seaxe*), 519. Following the Battle of Deorham, 577, the West Saxons secured access to the Bristol Channel, and won Cirencester, Gloucester, and Bath. The Welsh of Wales were thus cut off from the Welsh in Somerset, Devon, and Cornwall. As Northumbria, Mercia, and Wessex struggled for supremacy, 613-825, Cenwealh (643-72) and his successors, Caedwalla and Ine, gradually extended the borders of Wessex. Somerset was conquered; London recognized the West Saxon power; and laws were issued. Wessex was Christianized, nominally at least, in the seventh century. It was not, however, until the time of Egbert (802-39), whose youth had been spent in the court of Charlemagne, that the supremacy of Wessex over Northumbria and Mercia was in any sense assured. The union of England under Egbert was premature, however, and it required the later Danish invasion to force the men of Northumbria and Mercia to recognize the overlordship of Wessex.

It was not till after the Treaty of Wedmore (878), between the Danish king Guthrum and Alfred the Great (849-901), that the latter was able to begin his great work of reconquering England from the Danes. Alfred's successors, Edward the Elder, Athelstan, Edmund, Edred, and Edgar, continued this endeavor, and in Edgar "the royal power reached its highest point," as it has been said. The shire system originated in Wessex. From the death of Edgar, 975, to the accession of Canute, 1016, Wessex passed through evil days owing to the attacks of the Danes, who succeeded in placing a Danish dynasty on the throne. For 800 years following the Norman Conquest, 1066, Wessex did not exist even as an informal geographical term.



The whitefish, which is valued as a food fish, inhabits the lakes and rivers of North America. It is a dusky-blue color on its back and a silvery white on sides and belly.

pounds in weight, and nearly two feet in length. It is shaped much like a salmon, has rather large scales, and is dusky bluish on the back and silvery white on the sides and belly. There is an adipose fin behind the dorsal one, and the tail is deeply forked. It is a powerful swimmer and lives most of the time in deep water, eating crustaceans, mollusks, and insects. It spawns during the fall in deep water.

WHITEFISH BAY, village, SE Wisconsin, in Milwaukee County; on Lake Michigan; 7 miles N of Milwaukee. Whitefish Bay, established, 1892, is located between the villages of Shorewood and Fox Point; all three are residential suburbs of Milwaukee. Pop. (1960) 18,390.

WHITEHALL, town, E New York, in Washington County; at the S end of Lake Champlain and the N terminus of the Champlain Canal; on the Delaware and Hudson Railroad and U.S. highway 4; 65 miles NE of Albany, near the Vermont border. Whitehall has silk mills. The town was founded in 1759 by Maj. Philip Skene of the British army. During the Revolutionary War, this settlement, then called Skenesborough, gave aid to General Burgoyne during his invasion of New York. Pop. (1960) 4,757.

WHITEHALL, city, W Wisconsin, seat of Trempealeau County, on the Trempealeau River, on the Green Bay and Western Railroad, and U.S. highway 53; 128 miles NW of Madison. Whitehall is a trade and processing center for an area in which dairy cattle, poultry, and grain are raised. The city has grain elevators, meat-packing plants, and a factory manufacturing barrels. Whitehall was settled in 1855, and was incorporated in 1941. Pop. (1960) 1,446.

WHITEHEAD, ALFRED NORTH, 1861-1947, British mathematician and philosopher; was born in Ramsgate, and was educated at Sherborne School and in Trinity College, Cambridge. He became a lecturer in mathematics at his college, 1885, and probably would have remained there, publishing professional books, such as *A Treatise on Universal Algebra* (1898), had it not been for his famous collaboration with his former pupil Bertrand Russell. In their *Principia Mathematica* (3 vols., 1910-13) they developed Leibniz' ideas of a universalized logic and of a single vocabulary for all mankind (see LEIBNIZ, GOTTFRIED EPHRAIM VON; UNIVERSAL LANGUAGE). Whitehead now was called to the University of London, where he taught at University College, 1911-14, and then at the Imperial College of Science, 1914-24. He was president of the Mathematical Association, 1915-16, and the Turner Lecturer at Cambridge, 1919. Having already taken the first steps toward assuming a responsibility for a much wider field of knowledge than mere mathematics, Whitehead accepted a call, 1924, from Harvard University. Although nominally a professor in Harvard's philosophy department, Whitehead in fact exercised a wide and pervasive influence that prefigured the type of "general chair" that he later helped to establish formally, 1935; he was truly a "universal" university professor in both interests and influence. He was made an emeritus, 1937, but remained at Harvard as Senior Fellow.

On his eightieth birthday Whitehead honored Harvard by a unique lecture whose genuinely Platonic title, *Mathematics and the Good*, well expressed the

fullness in which the Greek world of thought was represented in him. Yet it is misleading to identify him with any Greek system, as is the habit of most interpreters, for this serves to make him seem irrelevant to twentieth century philosophical concerns. Whitehead was no mere philologist regurgitating the words of the ancients; he philosophized at the end of a period of some 400 years of modern scientific specialization, at a time when, in Whitehead's view, too many scientists had become narrowly dogmatic not only with respect to their specialties, but also in their evaluation of the relation of their specialties to science in general, and of the ways of science among other paths of human experience.

When Whitehead was going through school, and even more later, there was great optimism and pride among scientists (see POSITIVISM). The discoveries and concepts of the various special sciences were so numerous, so imposing, so persuasive and exciting, that specialists were prone to forget—if they had ever known—the philosophical premises and the historical matrix that had made the discoveries and concepts of the sciences possible. Thus, many physicists, for example, fell into the error of thinking of such concepts of physics as "molecule" and "atom" as though they were the result of the science of physics itself. Whitehead demonstrated, however, that "molecule," "atom," "electron," "proton," and so forth presuppose a more fundamental concept, that of "organism", which itself is not the concern of physics, but without which the concepts of physics would be meaningless. So, too, with most other concepts of the many sciences, whose specialists naively believed that their concepts were of their own making and were self-sustaining and self-justifying, and that mathematics and physics are the arch-sciences from which all the others must take their orders.

Acknowledged to have mastered the most profound foundations of the supposed queen of the natural sciences, mathematics, Whitehead was better authorized than anyone else to refute such myths of scientism. This he sought to do by calling upon scientists to recognize that such concepts as "thing," "object," and "matter," and other relics of the static Cartesian and Newtonian natural philosophy, with its "bifurcation of nature" (see DESCARTES, RENÉ, NEWTON, SIR ISAAC; PHILOSOPHY, History of Philosophy, *Descartes and the Mind-Body Problem*, Philosophy and Modern Science are and must be inadequate for coming to grips with the totality of any experience whenever this is investigated solely in terms of such concepts. Whitehead taught that only half of any experience can be appreciated as "object," and that the other half must be acknowledged in some other way. Whitehead proposed that it be done under the term "event." That is, any "object" is also, and more importantly, an "event." As events—that is, as spatial-temporal unities—all objects form parts of progressively more comprehensive events. Thus durations, or "slabs of nature," connect the concrete moments with each other into a structure or network that is an "ether of events" (not to be confused with the material "ether" of nineteenth century physics).

Because he shunned theological and poetical language, preferring to express himself in the vocabulary of the natural sciences plus common English, Whitehead ran into trouble in writing directly of God, Man, Soul, and the like, all of whom appear as little better than marginal notations in his works. Yet he filled the hollow shell of the Positivistic concept of Nature to the very brim with such living experiences as Love, Adventure, Goodness, Wisdom, Rhythm, and other basic elements in Whitehead's Cosmos. The spirits that Plato and Aristotle had expelled from their universe of discourse returned in Whitehead's, as even the titles of most of his works suggest: *The Concept of Nature* (1920), *The Principle of Relativity* (1922), *Science and the Modern World* (1925), *Religion in the Making* (1926), *Symbolism* (1927), *The Aims of*

Education (1928), *The Function of Reason* (1929), *Process and Reality, an Essay in Cosmology* (1929), *Nature and Life* (1934), and particularly, *Adventures of Ideas* (1933).

Whitehead did not restore Greek philosophy; instead he led modern man back to the wealth of the living Cosmos from which the Greek thinkers had drawn their abstractions. He showed that atoms and electrons do not "belong" to physics, since physics inherited them from the universe of discourse within which such entities or concepts already owed their existence to the higher concept of "organism," and that physicists who failed to recognize that "organism" was a necessary presupposition of his concepts of electrons, protons, waves, and so forth, were simply and naively oblivious to their own role in human society, past, present, and future. In fact, Whitehead recognized, physicists and other specialists were taking, and would continue to take, their orders from 2,000 or more years of human intellectual and spiritual endeavor, during most of which time there had been no such thing as "natural science." Indeed, science itself was a human creation with a background of 15 or more centuries during which, largely those in parts of the world where Christianity was more or less dominant, a consensus was reached respecting the meaning of God and Man. Those who had studied mere things and objects before had been belittled or feared as sages, wizards, sorcerers, magicians, astrologers, demons; once there was a consensus as to God and Man, however, a person who studied mere things could call himself by the honorable name "scientist" and be acknowledged as such by laymen.

Although he was handicapped by his naturalistic vocabulary, Whitehead's wisdom and his profound humanity were such that much of his Christian heritage informed his allegedly "pure" cosmology. This remained a source of embarrassment to those among his grudging admirers who persisted in the notion that from the time of Jesus Christ all was darkness and superstition for 16 centuries. For others, however, including a number of important scientists, Whitehead's thought remained in the 1960's an indispensable bridge for the scientific specialists into the wider realities of God and Man. See COSMOLOGY AND COSMOGONY; IDEALISM. EUGEN ROSENSTOCK-HUESSY

WHITEHEAD, CHARLES, 1804-62, English author, was born in London. His first book of poems, *The Solitary* (1831), brought him critical recognition. He then wrote the celebrated *Autobiography of Jack Ketch: Lives of an English Highwayman* (1834). He was a friend of Charles Dickens and William M. Thackeray. He moved to Australia in 1857.

WHITEHEAD, ROBERT, 1823-1905, English inventor, was born in Bolton-le-Moors, Lancashire, and became an engineer, working on the Continent 1844-1905. At Fiume he invented the Whitehead torpedo, 1866, a self-propelling cylindrical projectile (see TORPEDO). His eldest son, John (died 1902), worked with him in improving the weapon.

WHITEHORSE, city, Canada, S Yukon Territory; on the Yukon River and the Alaska Highway; the northern terminus of the White Pass and Yukon Railway from Skagway, Alaska. Whitehorse was made the capital of the Yukon Territory in 1951, replacing Dawson which had been the territorial capital since its establishment in 1898. Whitehorse is the import and export center of the Yukon Territory. It was an important trading center during the Klondike Gold Rush of 1898, and became a tourist center with the completion of the Alaska Highway in 1946. The city was named for the Whitehorse Rapids of the Yukon River. Pop. (1956) 2,570.

WHITE HOUSE, 1600 Pennsylvania Avenue, Washington, D.C., is the official residence of the President of the United States. It is the oldest public building in the national capital. Among the world's great residences of state it is surpassed by none in simple charm and dignity. Designed during the first

administration of George Washington, the White House is an epitome of the history of the Republic and a symbol of the traditions of the nation.

The building was originally called the President's Palace, but during the period of Jeffersonian simplicity was referred to as the President's House. The origin of the name White House is uncertain. It was formerly supposed that the name was applied after the War of 1812 because of the white paint that was used to cover up smoke marks on the reconstructed building; later research revealed, however, that the name had been used informally in 1813 and perhaps before. The house was officially designated the Executive Mansion, 1818, but the popular name White House was more commonly used. At the suggestion of Pres. Theodore Roosevelt, Congress made the name White House official in 1902.

Early History. The White House was designed, 1792, by James Hoban (1762? 1831) who planned it a gentleman's house in the late eighteenth century Renaissance style, to be built at a cost of \$400,000—a figure considered exorbitant by many at the time. The subsequent cumulative investment of public money in the building amounted to more than \$16 million by 1960. The cornerstone was laid on Oct. 16, 1792, at the place selected by Maj. Pierre Charles L'Enfant and Pres. George Washington. The 18-acre site, purchased for \$1,212.70 (1960 value was about \$20 million), was an eminence facing the Potomac, and about a mile and a half from the eminence selected for the capitol. The building was first occupied late in November, 1800, but it was still far from finished. During the War of 1812 the British captured the capital and destroyed the White House, Aug. 24, 1814. After the war, Hoban superintended the reconstruction, making use of the original sandstone walls and adhering to his original plans. The house was reoccupied by Pres. James Monroe in the fall of 1817, but the work was not completed until 1829. Water was piped into the building from a spring, replacing the old pumps, 1833; water from the city system was introduced in 1853. Gas lighting, installed in 1848, was replaced by electricity during Pres. Benjamin Harrison's administration, 1889-93. Central heating was added in 1853. Bathrooms were introduced during the administration of Rutherford B. Hayes, 1877-81, and the first telephone line was brought into the building at about the same time. During the first Administration of Pres. Franklin D. Roosevelt a swimming pool was added beneath the west terrace.

Additions and Repairs. By 1900 the combination of executive offices and family residence had made living conditions almost intolerable for the members of the president's household. When Pres. Theodore Roosevelt moved his family of growing children into the White House a drastic alteration of the interior seemed imperative. The interior was completely rebuilt, 1902, but the architecture of the original building was reverently preserved. Two wings were added: the Executive Office Building at the end of the west terrace and a building at the end of the east terrace to provide an entrance to the White House for the general public. These wings were enlarged several times, and extensive repairs were made on the main building, especially in 1927, 1935, and 1949-52.

In 1948 it was reported that the White House was in danger of collapse. In 1949 it was closed for occupancy and Congress voted \$5.4 million to pay for interior rebuilding and refurbishment—earlier proposals that the White House be replaced having been rejected in the face of public horror at such a prospect; ultimately the renovation cost about \$6.5 million. The original design and exterior were retained, but several new features were added, among them an impressive state stairway in the entrance hall to replace the old, half-hidden staircase, and a two-story basement. The hipped roof was elimi-

breast. A yellow patch occurs anterior to the eye. The bird usually builds its nest on or near the ground. It breeds in eastern North America from Canada southward to Massachusetts and westward to Montana. It winters in southern Texas and Florida.

WHITEVILLE, town, SE North Carolina; seat of Columbus County; on the Atlantic Coast Line Railroad and U.S. highways 74, 76, and 701; 14 miles NE of the South Carolina border, and 95 miles S of Raleigh. Whiteville is a trade and processing center for an area in which tobacco and corn are grown. Textiles, wood products, and fertilizer are manufactured. Pop. (1960) 4,683.

WHITEWATER, city, SE Wisconsin, in Walworth County; on Whitewater Creek, the Milwaukee Railroad, and U.S. highway 12; about 45 miles WSW of Milwaukee, in a region in which vegetable farming and dairying are leading activities. Hardware specialties, farm equipment, and fences are the principal manufactured products. The city grew up around a mill built there in 1839. Whitewater is the site of a state teachers college. Pop. (1960) 6,380.

WHITE WHALE. See **BELUGA**.

WHITGIFT, JOHN, 1530?-1604, English prelate, was born in Great Grimsby, Lincolnshire. He became Lady Margaret professor of divinity, 1563; master of Pembroke College, Cambridge; a queen's chaplain; regius professor of divinity, and master of Trinity, 1567; dean of Lincoln, 1571; bishop of Worcester, 1577; archbishop of Canterbury, 1583; and a privy counselor, 1586. He enjoyed the favor of Queen Elizabeth I, who upheld him in the severity of his policy toward the Puritans and Roman Catholics.

WHITING, WILLIAM FAIRFIELD, 1864-1936, U.S. cabinet member and industrialist, was born in Holyoke, Mass. He was U.S. secretary of commerce in the cabinet of Pres. Calvin Coolidge, 1928-29.

WHITING, city, NW Indiana, in Lake County; on Lake Michigan, the Baltimore and Ohio, the Baltimore and Ohio Chicago Terminal, the Chicago Short Line, the Elgin, Joliet and Eastern, the Indiana Harbor Belt, the New York Central, and the Pennsylvania railroads, and U.S. highways 12 and 20; 17 miles SE of Chicago, of which it is an industrial suburb. The city formed as the result of the building of oil-refining plants there in 1889. In addition to oil products, chemicals, metals, and roofing materials are manufactured. Pop. (1960) 8,137.

WHITING. See **CHALK**.

WHITLEY CITY, town, S Kentucky, seat of McCreary County; on U.S. highway 27 and the Southern Railway; 90 miles S of Lexington, and 9 miles N of the Tennessee border. Whitley City is a coal-mining center in the Cumberland Mountains. Cumberland Falls State Park is near the town. Pop. (1960) 1,034.

WHITLOCK, BRAND, 1869-1934, U.S. author and diplomat, was born in Urbana, Ohio. He worked as a reporter and correspondent for the *Toledo Blade*, 1887-90, and the *Chicago Herald*, 1890-93, was admitted to the bar, clerked in the office of the Illinois secretary of state 1893-97, practiced law in Toledo, and was mayor of Toledo, 1905-13, declining a fifth term to become U.S. minister to Belgium. As a writer Whitlock was best known for his realistic novels of crime and machine politics, such as *The Thirteenth District* (1902), *The Turn of the Balance* (1907), and *Big Matt* (1928). Among his other works are an autobiography, *Forty Years of It* (1914), *Belgium: A Personal Record* (1919), *La Fayette* (1929), and *The Stranger on the Island* (1933).



LYNWOOD M. CHACE
The Whitethroat, a Sparrow.

WHITMAN, MARCUS, 1802-47, U.S. missionary and pioneer responsible for creating the interest that led to early settlement of the Pacific Northwest, was born in Rushville, N.Y. He was graduated from the Berkshire Medical Institute, Pittsfield, Mass., and practiced medicine in Canada and in Wheeler, N.Y. In 1834 he offered himself to the American Board of Commissioners for Foreign Missions, and was assigned to the Oregon Territory. He, his wife, and three other missionaries traveled to the West, taking with them the first wagon ever to cross the Rocky Mountains. They reached Fort Walla Walla, an English trading post, Sept. 1, 1836, and soon established a mission about 25 miles from the fort. Whitman paid a visit to Washington, D.C., 1843, and, according to some historians, interviewed Pres. John Tyler and other government officials in an effort to prevent the cession to England of the Oregon claim (see **NORTHWEST BOUNDARY DISPUTE**). Other scholars believe that the visit was made in order to dissuade the Board of Commissioners from abolishing his mission. On Nov. 29, 1847, his mission was attacked by Cayuse Indians, and Whitman, his wife, and 12 others were killed; the rest were taken prisoner.

WHITMAN, SARAH HELEN POWER, 1803-78, U.S. poetess, was born Sarah Helen Power in Providence, R.I. In 1828 she married John W. Whitman, a lawyer of Boston. After his death, 1838, she returned to Providence and engaged in literary pursuits. She entered into a conditional engagement with Edgar Allan Poe, 1848, and after his death she published a work defending his character: *Edgar Poe and His Critics* (1860). Her collected poems were published in 1879.

WHITMAN, WALT, 1819-92, U.S. poet known for such unforgettable poems as *Pioneers O Pioneers*, *Drumbeats*, and *Come Lovely and Soothing Death*, was born Walter Whitman in Pausanok (now West Hills), Long Island, N.Y. Many of the facts of his ancestry and much of his own life remain obscured by legends, mostly of Whitman's own making. Thus the father, a carpenter of small means, had come from English stock, but the family had not, as the poet later claimed, been in the New World from the days of the Pilgrim Fathers. The mother, Louisa van Velsor, of Dutch and Welsh extraction, was the one great and enduring



CHICAGO HIST. SOC.
Walt Whitman

power over the son's soul, and he was later to write such sentences as "The best of every man is his mother"—a striking contradiction to his otherwise individualistic teachings. His greatest work, *Leaves of Grass* (seven distinctly different editions in Whitman's lifetime: 1855, 1856, 1860, 1867, 1871, 1881, 1891)—significantly not called blooms or fruits, but leaves—Whitman described as the activated flowering of his mother's temperament. With this mother-worship was coupled a definite hostility toward the father. Beyond anyone else, however, Whitman loved himself. There is not the slightest evidence that he ever loved, or even associated intimately with a woman, although a year before his death he suddenly and irrelevantly claimed to have had seven illegitimate children; yet in the Calamus poems of the 1860 edition of *Leaves of Grass*, later suppressed, he had demanded in no uncertain terms that the physical love between males should be recognized as the normal thing. See **CARPENTER, EDWARD**.

Of his childhood, Whitman remembered having once heard the Quaker preacher Elias Hicks; from this he deduced his alleged spiritual heritage from Quakerism. In May, 1923, the family moved to Brooklyn. The very next year a hero of the Revolu-

Walt Whitman is pictured as he looked in 1855, when the first edition of *Leaves of Grass* was published. In the background are depicted Brooklyn in the 1850's, when he edited the *Freeman*, and Jamaica, one of the Long Island towns in which he taught school.



REPRODUCED BY PERMISSION FROM "THE LITERATURE OF THE UNITED STATES," BY BLAIR, HORNBERGER, AND STEWART; ILLUS. BY ORLOFF, NOEL, AND TURKEL. SCOTT, FORDSMAN & CO., CHICAGO

tion, Lafayette, came through town and, in passing, is said to have kissed the young Whitman; in telling this story later, Whitman asserted that he had thus undergone a spiritual baptism as the singer of American liberty. Genuine poet that he was, Whitman may well be believed that the waves of the ocean taught him "always to see beyond the things on hand as the ocean always points beyond the waves of the moment."

Three Main Periods are discernible in Whitman's life. During the first, up to about 1850, he developed as a journeyman of letters—a man whose livelihood depended upon the skill with which he manipulated the written word. After 1850 and into the 1870's, however, he lived the life of the poet who saw himself as the Bard of America, and was so viewed by some, at least, of his contemporaries. During the third phase of his life, from 1873, he lived in retrospect, cultivating the legend of his ancestry and of his own past life, and ultimately building, in Camden, N.J., a granite tomb for himself, designed after a sketch of William Blake and fit for a hero.

The First Phase of Whitman's Life. His adolescence was trivial and hard. After a few years of schooling, he went to work at the age of 11, began learning the printing trade at 13, and by his late teens had already done a considerable amount of writing for various newspapers, and had taught school in seven different towns on Long Island. His was a rather bohemian existence, and when at 19 he boldly founded a magazine, *The Long Islander*, its publication was so irregular that it soon expired. His first book, *Franklin Evans; or The Inebriate* (1842), a sentimental prohibitionist novel, paid him well, and Whitman was encouraged in the idea of making writing his profession. A year later, in an antislavery text, he used for the first time the *vers libre*, the free rhythm, for which most of his later work was to be known. His free versification was later glorified as an emancipation from "feudal poetry"; at the time, however, it was chosen because it was easy (see **FREE VERSE; PROSODY**). Apart from this technical feature, nothing of the Whitman who was to be called the Bard of America and The Good Gray Poet was evident in his early articles and verses. His own way of life as the easy comrade of the "Open Road" was not evinced in these texts: he had not yet begun to live it. Indeed, it took a road block to develop in Whitman the admirable singleness of purpose that led him to mold his life uniquely: from 1846 he had been editor of the *Brooklyn Eagle*, but antislavery views such as Whitman's were unpopular in New York, and he was fired, 1848.

Second Phase of Whitman's Life. He now decided to travel. That he was in a mental and spiritual turmoil may be inferred from his choice of destination: the city of New Orleans, in the heart of the slave country. He later spoke of having done some literary work there (as a newspaper writer), and of a mysterious love affair, but he cannot have worked for more than two months in New Orleans, and in terms of his later development the more fruitful part of the trip was his return journey to New York by way of Wisconsin's new pioneer settlements and Niagara Falls. For now he saw his country, "America the beautiful," for the first time.

The journey resulted in a real change: the earning of his livelihood and his future as a poet parted company. While earning bread and butter by working with his father helping build cheap houses in Brooklyn, the future poet joined the literary clique who met at Pfaff's Beer Cellar on Broadway, and read voraciously in the models whose work he was sure to surpass: Homer, the Bible, Shakespeare, Heine, Scott, and Ossian, and the up-to-date French literature of social reform and social revolution. In one such French book, George Sand's *Duchess of Rudolstadt*, Whitman found the "singer of democracy" eloquently described and predicted. It is not known whether this prescription—which he tried so hard to conceal that it was not discovered for decades after his death—determined his subsequent development, or if he already had decided on his new course before stumbling on the French inspiration. What can be said with certainty is that after 1850 he ceased to be the journeyman of letters. From 1850 until 1873, he was the self-styled Bard of America.

The author of the *Leaves of Grass*, who personally set the type of the first edition of about 800 copies, 1855, sang of himself as the representative of America; and his "Song of Myself" is the first poem that comes to mind when one wishes to envisage the poet's new note: "Myself I sing." The tone was too new to be listened to by many in America, but the Sage of Concord, Ralph Waldo Emerson, recognized Whitman's discipleship, and wrote a fateful letter without which Whitman might never have become known. Part of it was printed in the second, enlarged edition of *Leaves of Grass* (1856). "I greet you at the beginning of a great career," Emerson wrote. "I find it [*Leaves of Grass*] the most extraordinary piece of wit and wisdom that America has yet produced. I find incomparable things, said incomparably well, as they must be." Emerson went on to praise the book as a compound of the Hindu Bhagavadgita and the New York *Herald*. In a letter to a friend he said that "Americans who are abroad, can now return: unto us a man is born." Americanism was the magic of these poems to such a degree that foreigners extolled it before the people back home took much notice; as someone said, "it was unnecessary to be so American in America." Many Europeans, however, anxious to throw off their romantic and feudal sentimentalities, were obliged to make a clear-cut decision between a volume on their own poet Nikolaus Lenau, *Tired of America* (1855) by Ferdinand Kürnberger, and the *Leaves of Grass*.

The first country to decide in favor of Whitman was England. Whitman's "These States conceal an enormous beauty, which native bards, not rhymer manipulators syllables and emotions imported from Europe, should justify by their songs, tallying themselves to the immensity of the continent, to the fecundity of its people, to the appetite of a proud race fluent and free," was echoed when W. M. Rossetti brought him before the British, 1868; two years later Anne Gilchrist came forward for the women. On the Continent itself the Socialist workers took up Whitman's songs as songs of their own liberation: "Comrades, unite and liberate yourself of everything that

hinders the human spirit," Whitman cried. Willingly did they admire "Not a dilettante democrat, [but] a man who adores streets, loves docks, loves to talk with free men, loves to be called by his given name and does not care that any one calls him Mister." They could appreciate the fact that he "would quit no matter what time a party of elegant people to find the people who love noise, vagrants, to receive their caresses and their welcome, listen to their rows, their oaths, their ribaldry, their loquacity, their laughing, their replies—and knows perfectly how to preserve his personality among them and those of his kind."

Before these new sounds could make headway in the still-colonial soil of the United States, the spiritual desert of the Civil War decade had to be crossed. This conflict took all intellectual America by surprise. Whitman, too, had still actually to live belatedly the kind of life that would authorize him to sing his song of the common man. The common man, after all, was no bohemian loafer, especially in wartime. While Whitman did not enlist, his brother George did, and late in 1862 lingered wounded in a hospital. News of this set the poet moving: and after visiting with his brother and other wounded in a field hospital in Virginia, he went on to Washington and there, most of the time until 1873, held jobs in various departments of the government. He was fired from one of them, however, for having written "an immoral book,"—the 1860 edition of *Leaves of Grass*—whereupon William Douglas O'Connor denounced Interior Secretary James Harlan in a pamphlet, *The Good Gray Poet: A Vindication* (1866). Apart from all this, Whitman's heart was with the wounded and suffering youngsters in the hospitals, and he went to them often—entertaining, caressing, assisting them; in telling of it later, promoting his own legend, he claimed to have nursed 80,000 or more patients.

Whitman suffered a serious illness in 1864; and a paralytic stroke, 1873, made him look 20 years older than his actual age, and forced him to leave his government clerkship and to go to his brother's house in Camden. But he had already achieved the task of translating the *Leaves of Grass* message into prose in his *Democratic Vistas* (1871). Emerson, by this time, was repelled by Whitman's coarse catalogue style, and Whitman, for his part, bluntly denied any debt to Emerson; in this very work, however, he used Emerson's essay form, just as Friedrich Nietzsche was doing in Europe (see EMERSON, RALPH WALDO, *Incoherence Made a Virtue*). In restating his egalitarian creed, Whitman now made room, in hours of peril, for the poet-prophet—that is, for the Bard himself—who alone would retain the right to have personality while others would be absorbed into the solidarity of the mass of men. For Whitman, Solidarity and Personality were to be the eternal dual of the social order.

Third Phase of Whitman's Life. In his own physical breakdown, Whitman shared something of the death of his mother; it was like a double death. The remaining decades were lived in retrospect. The letters to his mother were published as a part of *Specimen Days and Collect* (1882). He remained most of the time in his brother's house, but partial recoveries of his health enabled him to travel, 1879 and 1880. A trickle of visitors, most of them from England but others from elsewhere in the United States, entertained the cripple. Again, as in 1848, seeming misfortune helped him, for when the Society for the Suppression of Vice attacked his verses as immoral, sales soared; a house could be bought, 1884, and some earthly riches collected, so that his visiting benefactors were amazed. In his last years he wrote some serene poems about death and continued his never-ending revisions of *Leaves of Grass*, producing the so called Deathbed Edition of 1891. Publication of a 13-volume definitive edition of Whitman's complete works was begun early in the 1960's with volume one of his *Letters* (Edit. by Edwin H. Miller, 1961). To be included in the project was the first variorum edition of

Leaves of Grass, edited by Sculley Bradley and Harold W. Blodgett, and to include the variations in the extant manuscript sources, as well as those in published editions. See AMERICAN LITERATURE, *Transcendentalism*.

EUGEN ROSENSTOCK-HUESSY

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WHITMAN, town, SE Massachusetts, in Plymouth County, on the New Haven Railroad; about 15 miles SSE of Boston. It is located in a poultry-raising district. The manufacturing of shoes is the leading industry. The area was settled about 1670; in 1875 the town was separated from Abington and East Bridgewater and was known as South Abington until 1886, when the present name was assumed. Pop. (1960) 10,485.

WHITMAN COLLEGE, a private, nonsectarian, coeducational college of liberal arts located at Walla Walla, Wash. The school was established in 1859, and offered its first college-level instruction in 1882. Whitman sponsors co-operative study programs in engineering with Columbia University and California Institute of Technology, and in medical technology with St. Luke's School of Medical Technology, Spokane, Wash., and the School of Medical Technology at the Children's Orthopedic Hospital, Seattle, Wash. The college library contains the Eells collection of materials on the history of the Northwest. The *Whitman Alumnus* is published four times a year. See COLLEGES AND UNIVERSITIES.

WHITMAN NATIONAL MONUMENT, SE Washington; on the Walla Walla River and U.S. highway 410; near Walla Walla. The monument commemorates a landmark on the Oregon Trail where, in 1836, Marcus and Narissa Whitman established the Wailatpu Mission for religious work among the Indians. In 1847, the Whitmans and other white settlers were massacred by the Indians. The 96-acre monument was established in 1936.

WHITNEY, ELI, 1765-1825, U.S. inventor, was born in Westboro, Mass., and worked his way through Yale, from which he was graduated in 1792. Going to Georgia as a teacher, he found a generous patron in Gen. Nathanael Greene's widow, on whose estate he resided, and studied law. His patron and a group of cotton planters suggested that he devise a machine that would separate the seeds from short strand cotton more quickly than this could be done by hand, and thus make green seed cotton a profitable crop. He obligingly invented the cotton gin, which increased production two hundredfold, made the South rich, and roused a storm of unprincipled greed in its beneficiaries. His shop was rifled, and the machinery stolen and pirated. Two states confiscated the process

undersecretary of agriculture and later the same year secretary of agriculture in the cabinet of Franklin D. Roosevelt. During World War II he had a major role in the national food program and in the lend-lease shipment of food abroad. Under Pres. Harry S. Truman, 1945–53, he served as director of the Rural Electrification Administration. He was elected to the U.S. Senate, 1956.

WICKERSHAM, GEORGE WOODWARD, 1858–1936, U.S. lawyer and public official, was born in Pittsburgh, Pa., and studied at Lehigh University and at the University of Pennsylvania law school, graduating in 1880. He went to New York, 1882, where he soon acquired an extensive practice, especially in corporation cases. He was attorney general in Pres. William Howard Taft's cabinet, 1909–13, chairman of the National Commission of Law Observation and Enforcement, 1929–32, and president of the International Arbitral Tribunal under the Young Plan treaties, 1932–36.

WICKHAM, ANNA, 1884–, English poetess, was born in Wimbledon, Surrey, lived and studied in Australia from the age of six, then returned to England, 1905. Among her volumes of poetry are *Songs of John Oland* (1918), *Contemplative Quarry* (1920), *The Man with a Hammer* (1921), and *The Little Old House* (1922).

WICKLIFFE, CHARLES ANDERSON, 1788–1869, U.S. political figure, was born in Springfield, Ky., studied law at Bardstown, Ky., and was admitted to the bar, 1809. He was a U.S. congressman, 1823–33; became lieutenant governor, 1836, and governor, 1839, of Kentucky; and served as U.S. postmaster general in the cabinet of Pres. John Tyler, 1841–45.

WICKLIFFE, city, NW Kentucky, seat of Ballard County; on the Mississippi River, four miles south of its junction with the Ohio River; on the Gulf, Mobile and Ohio and the Illinois Central railroads, and U.S. highways 51 and 60; 205 miles SW of Louisville. Wickliffe is a shipping point for an area in which tobacco, corn, and potatoes are grown. Pottery is manufactured. A buried Indian village in the vicinity has yielded valuable archaeological artifacts. Pop. (1960) 917.

WICKLOW, county, SE Ireland, in Leinster Province; bounded by St. George's Channel on the E, and by the counties of Dublin on the N, Wexford on the S, and Carlow and Kildare on the W; area 781 sq. mi.; pop. (1956) 59,906. The center of the county is traversed north to south by the Wicklow Mountains, the highest point being Lugnaquilla (3,039 ft.) in the central part. Principal streams are the Slaney, which rises in the west and flows south into Carlow; the Avoca, which rises in the north central part and enters the sea at Arklow. Considerable stock raising and some farming are practiced. Lead, copper, and sulfur are mined and some stone is quarried. The capital and chief port is Wicklow, which has only a small harbor.

WICKRAM, JÖRG, died ?1562, German novelist, called the father of the German novel, and prose writer, was probably born in Colmar. He became town clerk of Burghim in 1555. His novels include *Rittes Galmy* (1539), *Der Knabenspiegel* (1554), and *Der Goldfaden* (1557). Of several plays, the most popular is *Der verlorne Sohn* (1540). His *Das Rollwagenbüchlein* (1555) is a collection of witty tales.

WIDENER, PETER ARRELL BROWN, 1834–1915, U.S. financier and philanthropist, was born in Philadelphia. He was in the meat business many years, became a power in local Republican politics, and with the profits made on a government meat contract during the Civil War, invested in Philadelphia street railways and helped organize the United States Steel Corporation.

WIDGEON, any duck measuring 8 to 21 inches in length and belonging to the genus *Marca*. The European widgeon, *M. penelope*, has a cinnamon-red head

and neck, white coloration at the top of its head, brownish-gray upper plumage, and brownish-red and white undersides. It makes its nest on marshy ground and lays from 8 to 18 pale-buff eggs. It occurs in the northern regions of the Eastern Hemisphere. The baldpate or American widgeon, *M. americana*, is similar to its European counterpart except that its head has a patch of green running from its eyes to the base of its neck. The rest of its neck is white with intermingled dark spots.

WIDNES, municipal borough, NW England, in SW Lancashire, on the Mersey River and the Manchester Ship Canal, 11 miles ESE of Liverpool. Chemicals, pharmaceuticals, grease, paint, and copper and steel products are manufactured. Widnes developed as an industrial center in the nineteenth century and was incorporated in 1892. Pop. (1951) 48,795.

WIECHERT, ERNST EMIL, 1887–1950, German novelist, was born in Kleinorth, East Prussia, went to school at Königsberg, and taught in secondary schools. The Nazi government imprisoned him for a time, 1938, but he was allowed to continue his work during World War II; his *Der Totenwald*, 1945 (*The Forest of the Dead*, 1947), deals with life in a concentration camp. Among other works are *Die Flucht* (*The Escape*), 1916, *Jedermann* (*Everyman*), 1931, *Die Majorin*, 1934 (*The Baroness*, 1936), and *Missa sine nomine* (*Mass Without a Name*), 1950.

WIELAND, CHRISTOPHER MARTIN, 1733–1813, German man of letters was born near the Free Imperial City of Biberach, Suevia, the son of a pastor, and was brought up in Kloster Bergen (Elbe), Tübingen, and Switzerland. From 1760 he served as a counselor in Biberach, and the Count Stadion became the patron under whose guidance the "naturally benevolent" (Madame de Staël), Wieland put aside the pietism and Platonism that had dominated him before and gave free reign to the admirable fairness and joy-in-others that enabled him to create in the *Der teutsche Mercur* (1733–1810), which he founded (after the model of the *Mercur de France*) and edited until 1789 as a forum for all German literature and poetry. His *Der goldene Spiegel* (*The Golden Mirror*), 1772, so impressed the widowed Duchess Amalia that she had him come to Weimar as educator of the princes, and became his lifelong friend. At Weimar, he welcomed Johann Wolfgang von Goethe, 1775, in some immortal verses that are perhaps, Wieland's best claim to fame. Also much reprinted is his *Augustus and Horace*, originally written as an introduction to his translation of Horace. Attracted to the plays of Shakespeare by their romantic and fairyland qualities, Wieland translated 22 of the plays into German prose. His own masterpiece is *Oberon* (1780), a long poem whose subject matter is taken from *Huon de Bordeaux*, an old French tale. That Wieland produced a tremendous quantity of writing is evident in the fact that when the first collection of his complete works was issued, under his own supervision, 1794–1805, it filled 43 large volumes. As to Wieland's significance, Goethe wrote: "The German nation owes Wieland her style. From him, she has learned to express herself adequately, and this is not a small matter."

WIELAND, HEINRICH OTTO, 1877–1957, Nobel prize-winning German chemist, was born in Pforzheim, and was educated at the universities of Berlin, Munich, and Stuttgart. After teaching at various universities in Germany, he served as professor of chemistry at the University of Munich, 1925–52. Wieland was awarded a 1927 Nobel prize "for his research on bile acids and analogous substances." He also did research on the organic nitrogen compounds and the alkaloids.

WIEN, WILHELM, 1864–1928, Nobel prize-winning German physicist, was born in Gaffken, East Prussia. He studied at the universities of Göttingen, Heidelberg, and Berlin. He was professor of physics

Wilhelm II, Last Emperor of Germany (1955); Emil Ludwig, *Wilhelm, Hohenzollern, Kaiser Wilhelm II* (1934); Karl F. Novak, *Kaiser and the Chancellor: The Opening Years of the Reign of Kaiser Wilhelm II, Germany's Road to Ruin: The Middle Years of the Reign of the Emperor Wilhelm II* (1932); George S. Viereck (George F. Corners, pseud.), *Kaiser on Trial* (1937); René Viviani, *As We See It* (1923); Wallscourt H. H. Waters, *Potsdam and Doorn* (1935); Robert Graf von Zedlitz-Trützschler, *Twelve Years of the Imperial German Court* (1924).

WILLIAM I, Willem Frederik, 1772-1843, king of the Netherlands, was born in The Hague, the son of William V, the last hereditary stadholder of Holland. He commanded the Dutch army against France, 1793-95. Defeated, he joined the Prussian army and served as general until captured by the French at Jena, 1806. Released, he joined the Austrian army and served with distinction at the Battle of Wagram, 1809. After the fall of Napoleon I, the Congress of Vienna created the new Kingdom of the Netherlands out of Belgium and Holland, and elected William as its first king. His years on the throne, 1815-40, were troubled by Belgium's desire for independence, a desire fulfilled in 1839. He abdicated in 1840.

WILLIAM II, Willem Frederik George Lodewijk, 1792-1849, king of the Netherlands, was the son of William I. He fought with the Duke of Wellington in Spain during the Napoleonic Wars, and commanded the Dutch army at the Battle of Waterloo. He was caught between the Belgian desire for independence from the Netherlands and his father's desire to maintain unity. He approved of the Belgian revolt, 1830, but fought against them, 1832, only to be defeated by French forces. Becoming king after his father's abdication, 1840, William instituted financial improvements, granted a constitution to his subjects, and created a bicameral Parliament. He was succeeded by his son William III.

WILLIAM III, Willem Alexander Paul Frederik Lodewijk, 1817-90, king of the Netherlands, the son of William II, succeeded his father in 1849 and ruled until 1890. Although opposed to political liberalism, he was a constitutional monarch and, in the main, on good terms with the Netherlands Parliament. He gave a parliamentary constitution to his Luxembourg subjects, and used his large personal fortune to further social reform. He was married to Princess Sophia of Württemberg, 1839, and to Princess Emma of Waldeck-Pyrmont, 1879. The sons of his first marriage died unmarried, and his throne passed to the daughter of his second marriage, Wilhelmina I.

WILLIAM II, 1154-89, king of Sicily, was the son of Margaret of Navarre and of William I the Bad of Sicily. Ascending the throne, 1166, he ruled nominally for several years under the regency of his mother. As king, William supported the papacy and leagued with the Lombard cities. He was constantly on bad terms with Emperor Frederick I, and engaged in an unsuccessful war against Egypt. Sympathetic to the motives of the Third Crusade, he permitted the Crusaders to pass through his territory and forced the Egyptian Sultan Saladin to retreat from a position before Tripoli.

WILLIAM II, PRINCE OF ORANGE, 1626-50, Dutch stadholder, was the son of Frederik Henry and the grandson of William the Silent. At the age of 14, he was married to Princess Mary, the eldest daughter of Charles I of England. Upon his accession to power, 1647, he opposed ratification of the newly signed Treaty of Münster between Spain and the United Netherlands because he hoped for the further enlargement of Dutch territory. To the same end he negotiated a military-aid treaty with France. The states of Holland, however, were opposed to further conflict. William triumphed in the ensuing struggle for power, but only after imprisoning the leading members of his opposition. Shortly after resumption of negotiations with France, William succumbed suddenly to the pox. His posthumously born son became William III of England.

WILLIAM AND MARY, COLLEGE OF, a public, coeducational institution of higher learning, located in Williamsburg, Va. Affiliate institutions are the Richmond Professional Institute, at Richmond, Va., and the Norfolk Division, at Norfolk, Va.

The College of William and Mary is the second oldest college in the United States. It received its name from the English monarchs who signed its first charter. In 1617 an institution, to be known as the University of Henrico, was about to be founded at Williamsburg, but was not because of an Indian massacre. Through the efforts of the Rev. James Blair, the Bishop of London's commissary in Virginia, a royal charter was obtained, 1691, the royal grant including the quitrents from 20,000 acres of land in Virginia. For these concessions, the college was to pay two books of Latin verse annually as rent. The Rev. James Blair also raised £3,000 for the college through pledges by London merchants, and an additional £300 from pirates whom he had aided in obtaining pardons.

The college conducts a co-operative program with various higher educational institutions throughout the state, leading to a master's degree in education. It also offers masters' degrees in aquatic biology, education, English, history, law and taxation, physical education, psychology, and physics. The school library has collections of materials on Virginia, early American history, dogs and hunting, horticulture and early gardening, and the history of war. Publications include the *Alumni Gazette*, and *William and Mary Quarterly*.

Among the notable buildings on the campus are the Sir Christopher Wren building (1697), which was used as a hospital by the French army during the Yorktown campaign; the Baffertown Building (1723), the college's original Indian school; and the President's House (1732), which was occupied by Lord Cornwallis, 1781, and, after the Battle of Yorktown, by French soldiers who accidentally burned it—after which it was restored by King Louis XVI of France. See COLLEGES AND UNIVERSITIES.

WILLIAM JEWELL COLLEGE, a private, co-educational, liberal arts college, affiliated with the Baptist Church, and located at Liberty, Mo. The school offered its first instruction in 1850 and was chartered nine years later. The school's departments are ancient languages, modern languages, economics, business administration, chemistry, education, English, history, mathematics, astronomy, music, philosophy, physical education, physics, political science, psychology, religion, and sociology. See COLLEGES AND UNIVERSITIES.

WILLIAM OCKAM, not William "of" Ockam, 1285?-1349, radical English Franciscan thinker, was born probably in Ockam (Ockham, or Occam), south of London, and became a Franciscan monk, and a student and then a magister in theology in Oxford. By 1322 he had been advanced to the position of inceptor; this meant that he had already taught for a number of years and had seemingly fulfilled the requirements for the doctorate up to the ceremony of promotion. In any case, he and his party were strong enough to remove from office the chancellor of the university, John Lutterell (died 1335). As it happened, this event became the turning point in William's life, for Lutterell went immediately to Avignon, France, and there sought to convince the Papal Court that William was a heretic. William was summoned to Avignon, 1323, and had to remain during the examination of this question, which lasted until 1328. Finally, some 51 articles in William's works on logic, physics, and the Eucharist were declared "pestilential" and heretical; in large measure this finding was based on hearsay in the lecture notes of William's students. In the spring of 1328, William fled from Avignon, via Aignes Mortes and Genoa, to the Holy Roman emperor's camp near Pisa, and to Ludwig [Louis] IV the Bavarian: "Sire, defend me with thy sword: I shall

defend thee with my pen." William kept his word on this score to the end of his life.

Together with two other Franciscan fugitives, William was excommunicated, June 8, 1328, and stayed so, but in the Franciscan Order he never lost his standing; he was its vicar from 1342, and he retained the Great Seal of the Order until just before his death. The Franciscans, in William's days, were trying to save their ideal of poverty in the face of papal opposition; there is extant one eloquent letter by William to his Order on this problem; others among his pamphlets attack the popes as having fallen into heresy themselves. William followed the emperor to Munich, 1330, and later he took a hand in the election of Ludwig's successor, Charles IV, 1348. At this time, his Order tried to reconcile him with the church; the outcome of their effort is unknown. April 10 is given as the day of William's death, but the year—probably 1349 or 1350—remains uncertain; the cause was the Black Plague.

Up to the time of his trial in Avignon, William tried, as a good Franciscan, to prevent the intrusion of pagan philosophical doctrines into Christian theology, and stressed the omnipotence and lasting freedom of the living God against the naive Greek systematization of God's qualities. Thus he wrote that "God can change sin into virtue. Now, he asks us to praise his name; but tomorrow he may command us to hate his name." William's character is further revealed by this proud declaration: "I never want to be defeated by the mass. The talk of so many that one never should oppose the mass, I consider rank heresy. The multitude, as a rule, is in error; and very often the solitary man may put all the rest to flight. This is what Biblical tradition teaches."

On the other hand, modern scholars have probably attributed too much to William in suggesting that Copernicus, Luther, and Descartes (among others) were all his direct descendants. In the main, William was a medieval logician who identified soul with mind, defended Aristotle insofar as he understood him, and protected God's Trinity against rationalists. In a negative sense, however, he did open the gates to later scientific investigation by his radical "Nominalism," for which he soon became so famous that his title, the Venerable Inceptor, was often misconstrued to "Inceptor [that is, Founder] of Nominalism." In the centennial debate over the Universals, William taught that man's general concepts are purely cerebral ("nominal") and have no external reality; only the particular and individual has concrete existence. To illustrate the distinction: since antiquity respect for the heavens had led to the assumption that the stars must be composed of a special matter qualitatively different from that of which the earth is composed. William was first to teach that there is no reason to assume such a heavenly matter in general, as this is an unnecessary and arbitrary general concept. William's sentence "*entia non multiplicanda sunt praeter necessitatem*" (Entities should not be multiplied beyond necessity) became famous as "Ockam's Razor," the law of parsimony by which all unnecessary whiskers of thought are to be shaved off. As applied to Movement, Time, and Space, it meant that William denied the "thingness" of all three. With respect to movement, it is enough, he wrote, to say that something moves from one place to another. Time is nothing by itself. When we perceive change or movement from one place to another, we call this Time. In this belittling of Time as a mere by-product, William was indeed the ancestor of Descartes. See ABÉLARD, PIERRE; CONCEPTUALISM; CONCORDANCE; DESCARTES, RENÉ; NOMINALISM; REALISM, *In Philosophy and Theology*; UNIVERSAL.

In his polemics against the papacy, William, as a true Franciscan, was not so much concerned with furthering the interests of the secular state as he was in purging the church of her depraved practices. It is in this connection that his highly important doctrine

of popular sovereignty of the church must be understood. In a civil emergency, William taught, a people, a community, a body of men can legislate for themselves; hence the church, too, with a recalcitrant leadership at the top, might be reformed from the bottom up. To this end, he proposed, all believers in each parish should choose delegates to an electoral assembly of their diocese, principality, or kingdom. By these assemblies, the delegates to a universal council could be chosen. And in such a council, even though no pope had convened it or presided over it, the church could be embodied. This doctrine, heeded more or less by the more conciliatory churchmen of the next centuries, and later applied by the North American colonists in their revolution, reveals the radical "spatialisation" engendered by Nominalism. God now was separated from His church, for the church now had been moved over to the realm of Space; therefore the church could be organized from the bottom upward.

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the manufacturing of children's clothing, seed harvesters, bricks, lumber, and beverages are the leading industries. Winchester, which was named for Winchester, Va., was founded in 1792 and incorporated in 1793. Pop. (1960) 10,187.

WINCHESTER, town, NE Massachusetts, in Middlesex County; on the Boston and Maine Railroad; eight miles NNW of Boston, of which it is a residential and industrial suburb. Watch hands, felt, leather goods, and chemicals are manufactured. The site was settled in 1638, and was called successively Woburn Gates, South Woburn, and Black Horse Village; when separately incorporated with parts of Lexington, Cambridge, Medford, and Stoncham in 1850, it was renamed Winchester. Pop. (1960) 19,376.

WINCHESTER, town, S Tennessee, seat of Franklin County; near the Elk River, on the Louisville and Nashville Railroad and U.S. highways 41 and 64; 45 miles SE of Nashville. The town is a trade center for an area producing livestock, dairy cattle, poultry, potatoes, hay, and tobacco. Winchester's principal commodities are dairy products, clothing, rayon goods, silk straw hats, wood products, and medicines. The town was founded in 1814. Pop. (1960) 4,760.

WINCHESTER, independent city, N Virginia, seat of Frederick County; near the N entrance to the Shenandoah Valley; on the Baltimore and Ohio, the Pennsylvania, and the Winchester and Western railroads, and U.S. highways 11, 50, 340, and 522; about 70 miles WNW of Washington, D.C., in an important apple-growing region. Large warehouses for apples are there and apple products, fruit-grading equipment, barrels, textiles, rubber soles and heels, flour, and dairy products are manufactured. The city is the site of Shenandoah Valley Military Academy (1764). An Apple Blossom Festival is held there annually in May. Originally known as Fredericktown, the city was laid out in 1744; it was enlarged in 1752 and named for Winchester, England. Winchester was incorporated as a town in 1779 and chartered as a city in 1874. Fort Loudoun, an outpost of the French and Indian War, was built there in 1756 by George Washington. Pop. (1960) 15,110.

WINCHESTER, city and municipal borough, S England, seat of Hampshire; 12 miles NNE of Southampton and 60 miles SW of London. Winchester is a market town for a large region of diversified farms. Aircraft and pharmaceutical products are manufactured. The city was significant in the early development of the country. It was known as Caer Gwent by the ancient Britons, and Venta Belgarum by the Romans. The city became capital of the Kingdom of Wessex in 519, and during the last three Saxon and the first two Norman centuries it disputed London's claim as the capital of England. Winchester was made the seat of a bishop in the seventh century. The city has many important historic buildings. Winchester Cathedral, founded in the eleventh century, is one of the largest in England. Hyde Abbey was the burial place of King Alfred and several Saxon kings. Winchester Castle was built by the Normans, and was the birthplace of Henry III. Winchester College, founded in 1387 by William of Wykeham, is one of the earliest English schools. Pop. (1951) 25,710.

WINCKELMANN, JOHANN JOACHIM, 1717-68, German archaeologist, founder of the history of art as an independent discipline, was born in Stendal, in the Altmark of Brandenburg. Although his family was poor, Winckelmann had from early youth a rare singleness of purpose: he was going to study the art of the ancients and all the handicaps of his origin were not going to stop him. Lacking adequate schooling, he overcame this by hard study; lacking social contacts, he found his way into the house of the Count Bünau, as the count's librarian, 1748-54, and there met influential people. Although born a Protestant, he became a Roman Catholic, 1754, on the advice of the papal nuncio in nearby Dresden, who said that as

a Catholic, Winckelmann would meet with fewer obstacles in Italy. In 1755, Winckelmann's preparations bore fruit and he made Rome his home, where Cardinal Albani became his protector, 1758, the painter Raffaello Mengs, his friend. From 1763 he was inspector of antiquities in Rome. His first book (1760), published in French, is a description of a private collection in precious gems, done in the traditional manner, in which art was treated as the amusement of collectors and art "history" as a series of anecdotes or, at best, brief biographies of artists. With his *Geschichte der Kunst des Altertums* (1764), however, Winckelmann treated art on a level with great poetry, as one of the necessities of the human spirit: art unfolds historically in a lawful order and triumphs over human whims or wishes; civilizations "speak" in the terms of art as much as they speak through their religion or literature. By setting this new standard for the study of antiquity, Winckelmann also set the pace for other branches of the history of art (medieval, comparative, modern, and so forth), but he himself was not to be able to apply the new method to all periods of art: on a journey to Vienna, 1768, he was honored by the Empress Maria Theresa and then, while on his return journey to Rome, he was murdered by a burglar in a Trieste inn. News of his premature death was received with mourning throughout Europe; the Winckelmann-Programs of the German Archaeological Society are an attempt to perpetuate his spirit.

English translations of his history appeared in London (1850) and in Boston (1872); the collected works were published in Donaueschingen (12 vols. 1825-29), and his letters were published in Berlin (4 vols. 1952-57). The definitive study of Winckelmann is K. Justi's *Winckelmann und seine Zeitgenossen* (3 vols. 1866-72; 5th ed. 1956). EUGEN ROSENSTOCK-HUESSY

WIND, natural motion of the air in relation to the earth's surface without regard to direction or velocity. In meteorology wind is the component of air motion parallel to the surface of the earth, the direction being determined by a wind cone or weather vane. An anemometer registers the speed. Any other component of air motion than that parallel to the earth's surface is termed an air current. See ANEMOMETER; ANTICYCLONE; ATMOSPHERE; BEAUFORT SCALE; CHINOOK; CYCLONE; GALE; HURRICANE; METEOROLOGY; MONSOON; TRADE WIND; TORNADO; TYPHOON; WEATHER FORECASTING; WHIRLWIND.

WINDAUS, ADOLF, 1876-1959, German chemist, was born in Berlin, and educated in medicine and chemistry at Berlin and Freiburg. He was professor at the University of Innsbruck, 1913-15, and became professor and head of the Chemical Institute at the University of Göttingen, 1915. He received the 1928 Nobel prize for chemistry "for his studies on the constitution of the sterols and their connection with the vitamins." In 1931 he extracted crystalline Vitamin D by irradiating ergosterol; this was the first vitamin to be extracted in its pure form.

WINDBER, borough, SW Pennsylvania, in Somerset County; on the Pennsylvania Railroad; in a bituminous coal-mining region in the Allegheny Mountains; 73 miles SE of Pittsburgh. The Berwind-White Coal Company developed the borough as a residential area for its employees in 1897, inverting the syllables of the company name for the town's name. Pop. (1960) 6,994.

WIND CAVE NATIONAL PARK, an area of about 27,000 acres in the Black Hills of SW South Dakota; about 10 miles N of Hot Springs. The feature is Wind Cave, which is noted for its many limestone formations, resembling large honeycombs. The cave was discovered in 1881 by Tom Bingham, a Black Hills pioneer, who was attracted by a strange whistling sound that was caused by a strong draft of air rushing from a 10-inch opening in a rock. This is the only natural opening ever discovered; the present manmade opening was accomplished by digging

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WOLF, FRIEDRICH AUGUST, 1759-1824, German philologist, was born in Hagenrode, near Nordhausen, was a schoolmaster, 1779-83, and then served as professor of classical philology in Halle from

1783 until 1806, when he fled from the French occupation to Berlin. He became a member of the Academy of the Sciences, 1807, and in 1810 a professor in the newly-founded University of Berlin. Advised later to go to the south of France for his health, he did so, but died along the way at Marsailles.

Wolff's fame, as "destroyer" of Homer as a poet, rests on his *Prolegomena ad Homerum* (1795), the thesis of which is that the ancient epic poems of Homer, the *Iliad* and the *Odyssey*, are not what they seem, but a series of independent chansons that were thrown together in Athens not before 555 B.C. (see GREEK ALPHABET; GREEK LANGUAGE AND LITERATURE, Literature; HOMER). This thesis gave impetus to the many applications of the Higher Criticism, as it was called, to the Bible, the Avesta, the Nibelungen, and other ancient works. The bardic theory of James MacPherson (1736-96), supported by the Ossianic poems forged by MacPherson himself, lent plausibility to the rampant skepticism.

The Homeric Question, as the dispute over the authenticity of Homer's works came to be called, was of more than merely literary significance, for Homer had been of prime importance for the whole of the Greek tradition, and thus of the Western tradition generally, one of whose prime fundaments was rejected by Wolff and others who denied the integrity of the *Iliad* and the *Odyssey* and even the actual existence of any poet named Homer. It was of more than antiquarian interest, therefore, that in the period after World War I many students of the matter—beginning outside of Germany with John A. Scott (*The Unity of Homer*, 1921)—challenged Wolff's thesis. Yet Wolff's principal argument—that Homer could not read or write since there had been no written Greek language in his time—remained; and it seemed almost unthinkable that poems of such great length could have been composed without the use of pen and ink. Finally, however, this most telling of anti-Homer arguments was deprived of all force by the discovery, 1952, that the Greeks had had a written language no less than 500 years before Homer lived. For an account of this, see VENTRIS, MICHAEL GEORGE FRANCIS.

WOLF, HUGO, 1860-1903, Austrian composer, was born in Windischgraz, Styria (later Slovenj Gradec, Yugoslavia), the fourth son of Philipp Wolf, a leather merchant. He attended various schools in Graz, St. Paul in the Lavant-Tal, and Marburg on the Drave, 1865-75, and studied music at the Vienna Conservatory, 1875-77. After 1877 he continued his musical education by self-instruction and in order to earn a living gave piano lessons and was a music critic for the Vienna journal *Wiener Salonblatt*, 1884-87. From 1888 he worked exclusively at musical compositions, writing instrumental, choral, and stage works and over 250 songs. In 1898, however, he was committed to the Lower Austrian Asylum in Vienna. Among his works are the songs *Die Spinnerin* (1878), *Zur Ruh, zur Ruh* (1883), *Eichendorff-Lieder* (1880-88), *Mönche-Lieder* (1888-89), *Goethe Lieder* (1888-90), *Spanisches Liederbuch* (1889-90), and *Italiensches Liederbuch* (Vol. II, 1896); the instrumental work, *Penthesilea* (1883); and the unfinished opera *Manuel Venegas* (begun 1897).

WOLF, any of the wild, carnivorous mammals belonging to the family *Canidae*. The European wolf, *Canis lupus lupus*, is about three and a half feet long, excluding the tail. The color is generally yellowish gray above, with some black, and the underparts whitish; wholly black races occur in some localities. The wolf has long legs, a lank body, erect ears, and a bushy tail which hangs downward between the haunches. Twenty-four subspecies occur in North America, including the Great Plains wolf, *C. lupus nubilus*, predominantly gray, over five feet long; the Alaskan tundra wolf, *C. lupus tundrarum*; the Eastern wolf, *C. lupus lycaon*. The Texan red wolf, *C. niger rufus*, is found in the southern United States.



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The timber wolf, a large wolf found in the eastern and northern parts of the North American continent, ranges in color from black to white, but is most commonly gray.

Wolves are usually nocturnal in their habits, spending the day in the den, which may be a cave, a hollow tree, or even a burrow. Wolves usually live in small packs. The pack is normally composed of parent wolves, pups, and relatives. Almost any kind of animal food, fresh or in state of carrion, is eaten. The wolf's intelligence and power of learning by experience are great. The young, born in the spring, number from 3 to 13 in a litter. The wolf's howl is long and loud, but captured wolves soon learn to bark.

WOLFE, JAMES, 1727-59, English general, was born in Westerham, Kent, England. He entered the British army as a second lieutenant, 1741, and served in Flanders, Germany, and Scotland, 1742-53, and was quartermaster general in Ireland, 1757-58, and at Rochefort, 1758. During the French and Indian War he commanded a brigade at Louisbourg, 1758, where he gave brilliant support to Jeffrey Amherst in the siege and capture of the fort. He was made major general and commander of the British expedition sent to Canada to wrest the power from the French, 1759.

After months of futile attempts to dislodge the forces of the Marquis de Montcalm from the well fortified city of Québec, Wolfe landed his army at night on the Heights of Abraham above the city, Sept. 12 13, 1759, and engaged the French in the battle which gave the English supremacy in Canada. Wolfe and Montcalm were both killed in the battle.

WOLFE, THOMAS CLAYTON, 1900-38, U.S. novelist, was born in Asheville, N.C., son of a stone-cutter addicted to poetry, in which he instructed the son. His mother, by her own admission, tended to baby Wolfe as the youngest of her eight children; all biographers agree that her pathological possessiveness and domination had a profound effect on Wolfe's life, but there is no complete agreement as to the precise nature of the effect. In any event, just before his sixteenth birthday, Wolfe matriculated in the University of North Carolina, Chapel Hill; while there he began writing plays, the first of which, *The Return of Buck Gavin*, was performed by the Carolina Players, with Wolfe himself in the title role. Accepted at Harvard University, 1920, Wolfe enrolled in



CULVER SERVICE
James Wolfe

George Pierce Baker's famous 47 Workshop and continued trying to become a playwright. Upon leaving Harvard, 1924, Wolfe accepted a teaching position at New York University's Washington Square College, in which he continued off and on during the next six years. He returned, 1925, from the first of several European journeys, with the script of a play, *Mannerhouse*; after a year of unsuccessful efforts to get it produced, Wolfe concluded that he was not to be a dramatist. Through his efforts to sell the play, however, he met Aline Bernstein, a stage designer; their relationship was an important factor in Wolfe's life for a number of years.

Wolfe established a reputation as a serious writer with the publication of *Look Homeward, Angel* (1929). The book was obviously autobiographical—as his later works were to be—and created something of a scandal in his home town of Asheville; but Wolfe was in New York. It was through this work that Wolfe first became associated with Scribner's great editor, Maxwell Perkins, who was to guide not only Wolfe's literary efforts but nearly every aspect of his life. His sensitive appreciation of Wolfe's work and his ability to transform huge masses of uncontrolled prose into somewhat more readable form led some critics to look upon him as virtually co-author of Wolfe's novels.

Wolfe resigned his teaching post, 1930, and returned to Europe armed with a Guggenheim Fellowship. Except for the *Portrait of Bascombe Hauke* (1932), Wolfe published no significant work until 1935, when *Of Time and the River* and a collection of shorter pieces, *From Death to Morning*, appeared.

Wolfe continued to be strongly rebuked by many critics for the verbosity of his style and for the apparent formlessness of his work; such criticism, whether justified or not, pained Wolfe deeply, and his admirers even more. The vividness of his imagery, the intensity of his feeling, and the commanding, Whitmanesque sweep of his prose are among the undeniable virtues of his work, and helped to establish him as a major writer whose work continued to be cherished by many and remained an influence in American letters. His *The Story of a Novel* (1936) gives an account of Wolfe's literary methods as understood by Wolfe himself.

Already weakened by overwork and dissipation, Wolfe contracted pneumonia, 1938, and within the year died of "cerebral complications." His "editor," however, had more than one million words of unpublished manuscript on hand, and set himself to the task of editing the legacy. *The Web and the Rock* (1939), *You Can't Go Home Again* (1940) and *The Hills Beyond* (1941), the last a collection of shorter pieces and chapters of an unfinished novel, were the result. They were followed by Wolfe's *Letters to his Mother* (1943) and *Selected Letters* (1956).

WOLFF, CHRISTIAN, BARON VON, 1679–1754, German philosopher, was born in Breslau, educated at the University of Jena, and on the recommendation of his friend and mentor, G. W. Leibniz (1646–1716), was appointed professor of mathematics and natural philosophy at Halle, 1706. Wolff's system, derived in large part from Leibniz, constitutes an extension of that thinker's extreme rationalism to all departments of thought. Wolff believed that reason, subject only to limitations imposed by the laws of logical thought, is capable of encompassing all Reality, even including the Divine. Building a system on the foundation of his faith in the efficacy of mind, Wolff elaborated its principles in a dozen large tomes covering ontology, cosmology, logic, ethics, and rational theology. They enjoyed a wide circulation, and his reputation outside of Halle grew rapidly. Inside it was another matter, however, for Halle at that time was dominated by an anti-intellectual clergy who considered no one entitled to speak of truth who had not experienced a religious conversion. Having been expelled from Halle, 1731, the apostle of reason took refuge at Marburg, where

he found a sympathetic audience for his viewpoint, and soon all Germany was debating his philosophy. Cognizant of this fame, and determined to make amends for the action of his predecessor, Frederick II of Prussia recalled Wolff to Halle in triumph, 1740. Elected chancellor, 1743, and ennobled, Wolff lived to see his system adopted throughout the state; he died not knowing that his system would be annihilated a generation later by Immanuel Kant (1724–1804).

ROBERT WHITTEMORE WOLF-FERRARI, ERMANNO, 1876–1948, Italian operatic composer, was born in Venice, the son of the German painter, August Wolf, and Emilia Ferrari. He studied under Joseph Gabriel von Rheinberger in Munich, 1893–95, remained in Germany until 1899, and was director of the Liceo Benedetto Marcello in Venice, 1901–07. His most popular works were *Il segreto di Susanna* (The Secret of Suzanne), 1909, a comic opera about a young wife whose attempt to conceal her innocent vice of smoking cigarettes leads her husband to think she has a lover; and the tragic *I gioielli della Madonna* (The Jewels of the Madonna), 1911, whose fickle heroine, Maliella, tempts a would-be suitor to steal the gems from a sacred image. Among his other works are *Cenerentola* (1900); *Idomeneo* (1931), a revision of an opera by Wolfgang Amadeus Mozart; and *Le dama boba* (1939).

WOLF POINT, city, NE Montana, seat of Roosevelt County; on the Missouri River, the Great Northern Railway, and U.S. highway 2; scheduled airline stop; 270 miles ENE of Great Falls. It is situated in a region in which there are diversified farms, coal mines, and oil wells. Wolf Point is an important wheat-shipping center. The city has a flour mill and a creamery. Settlement began in 1878 and the city was incorporated in 1915. Pop. (1960) 3,585.

WOLFRAM. See TUNGSTEN.

WOLFRAMITE, a mineral composed of ferrous manganous tungstate, (Fe, Mn)WO₄, usually found in quartz veins and pegmatite dikes, and often associated with pyrite, sphalerite, galena, scheelite, and other minerals. Wolframite is the principal ore of tungsten. Its color and streak are black to brown, the luster is submetallic to resinous, and the crystals are prismatic. It has a specific gravity of 7 to 7½, and a hardness of 4 to 4½ (see HARDNESS). China furnishes nearly one half of the world's supply of wolframite. Other important deposits are in Bolivia, England; New South Wales, Burma, and in the United States in the Black Hills, South Dakota.

WOLFRAM VON ESCHENBACH, 1170?–1219 or 1225, the most prominent German minnesinger, hailed from Franconia, and had a small fief near Ansbach (name changed, 1917, to Wolframs-Eschenbach). As an impeccable knight, Wolfram lived (as depicted in Richard Wagner's opera *Tannhäuser*) at the court of the landgrave of Thuringia, 1203–16. Wolfram wrote the *Parzival* (16 books; 24,810 lines in rhymed couplets), which Richard Wagner used for his opera of this name; a fragmentary epic, *Titarel*; and the *Willehalm* (9 books; 13,988 lines in rhymed couplets). In each case, he borrowed his themes from French models, especially Chrétien de Troyes, but Wolfram's strong religious temper led him to change the material in a very free way; his sense of one humanity made him so stress catholicity that in one work even a Moslem is made the Christian hero's brother under God. In his passionate search for the meaning of life, Wolfram transcended the social limitations of the courtier's existence. Of his lyrics, the *Tagelieder* rank with the finest poems of German literature. There are many complete or partial editions of his works in German, but no adequate English translations except for one of the *Parzival* (Tr. by Helen M. Mustard and Charles E. Passage, 1961). See CHRÉTIEN DE TROYES; MINNESINGER; PERCEVAL; ROMANCE.

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WOLFSBANE. See ACONITE.

Until 1930, wrought iron was produced almost entirely by hand in puddling furnaces. Molten pig iron was stirred with a long-handled tool, a rabble, to refine it by oxidation and other chemical reaction of carbon, silicon, sulfur, phosphorus, and manganese. As the metal became purified in the presence of the refining slag, the mixture became spongy and plastic. Masses of this conglomeration, weighing between 200 and 300 pounds, were removed from the furnace and squeezed into sections known as blooms.

Under a process developed in 1927, molten refined iron is poured in a thin stream into a ladle filled with molten slag. As the iron plunges into the cooler slag, gases trapped in the liquid iron are liberated with such force that the metal particles are shattered. Each particle of iron picks up some of the silica slag and settles to the bottom, collecting together to form a "sponge" weighing about 8,000 pounds. The sponge is pressed into a bloom and later rolled into desired shapes and sections.

WRYNECK, an Old World bird related to the woodpeckers, but differing from them in the soft tail that does not have spiny shafts, and the absence of bristles round the nostrils, which are partially covered by a membrane. The plumage is curiously mottled with black, brown, gray, and white. The common wryneck, *Fynx torquilla*, is found in England during the summer, but it does not usually extend to the north. This species is widely spread over Europe and Asia, while the other three species are African.

WRYNECK. See TORTICOLLIS.

WUCHANG, city, central China, capital of Hupei Province; on the S bank of the Yangtze River; opposite the cities of Hankow and Hanyang, which are separated by the Han River; 290 miles W of Nanking and 420 miles SW of Shanghai. Wuchang, Hankow, and Hanyang are called the Han cities and form the joint tri-city municipality of Wuhan. Wuchang is primarily the administrative and cultural center of the municipality. It is the seat of the Hupei provincial government, has a mint, and is the seat of Wuhan University. Residential and business sections are situated within the old city wall. Industrial plants and the water front are outside the city walls. Industrial establishments include cotton, silk, and paper mills; railroad repair shops; and a shipyard. Fishing is important, especially for the kweiyu (mandarin fish). Wuchang is the north terminus of a trunk railroad, which connects the city with Hengyang and Canton in the south. The city is connected by ferry to a railroad linking Hankow with Peking in the north. Among the points of interest is the noted seven-story pagoda of the ancient Pautung Temple. Wuchang is an ancient city. It is known to have been the seat of the San-miao aborigines, and under the Chow Dynasty belonged to the Kingchow and Chu states. In the Three Kingdoms era (third century), it was the capital of Wu. The city maintained its importance through the Tang, Mongol, Ming, and Manchu eras, and was held by the Taiping rebels in the nineteenth century. In 1911, Wuchang was the scene of the military revolt that overthrew the Manchu Empire. It was occupied by the Japanese, 1937-45. Pop. (1955 est.) 400,000.

WUCHOW, or Tsangwu, city, S China, in Kwangsi Province; on the Hsi River; 115 miles W of Canton. Wuchow is a river port, which handles most of the Hsi Basin's products, primarily tung oil and timber. Industries are shipbuilding, glass manufacturing, cotton spinning, and weaving. Pop. (1955 est.) 207,000.

WUHAN. See HANKOW; HANYANG; WUCHANG.

WUHU, city, E China, in Anhwei Province; on the Yangtze River; 55 miles SSW of Nanking. Wuhu is a distributing center for rice, wheat, cotton, tea, and silk. Traffic on the Yangtze River is supplemented by canals and highways. There are power and light plants and cotton-spinning factories. The Fanchang iron-ore deposits are in the vicinity. The Japanese

took Wuhu in 1937 to exploit its coal and iron-ore deposits. Pop. (1959 est.) 204,000.

WULFENITE, a lead molybdate found in oxidized portions of lead veins as a secondary mineral. Wulfenite has the chemical composition, $PbMoO_4$. In some deposits calcium may replace some of the lead. Wulfenite has a tetragonal crystalline structure (see CRYSTALLOGRAPHY), a specific gravity of approximately 6.8, and a hardness of 3 (see HARDNESS). It is usually orange-red in color, with a vitreous to adamantine luster. It is a minor source of molybdenum, and is found principally in Arizona, Utah, and New Mexico.

WULFSTAN, SAINT, or Wolstan, or Wulstan, 1010?-95, English ecclesiastic, was born in Long Itchington, Warwickshire. After receiving Holy Orders, he spent 25 years in a Benedictine monastery, where he was esteemed for his piety, humility, and ascetic way of life. He accepted the bishopric of Worcester reluctantly, 1062, but proved to be an efficient administrator. Upon William the Conqueror's triumph, 1066, Wulfstan submitted to Norman authority and was allowed to retain his see; in return, he helped William subjugate the powerful English barons. Wulfstan helped to stop slave trade between England and Ireland. He was canonized in 1203. His feast day is January 19.

WULFSTAN, died 1023, English prelate, was Archbishop of York, 1003-23, and Bishop of Worcester, 1003-16. Wulfstan's alliterative prose homily, *Sermo ad Anglos*, dealing with the ruinous Danish raids on England, 1010-11, combines excellent descriptive passages with polished moral discourse. Of more than 50 works once ascribed to Wulfstan, only 4 or 5 are considered authentic by scholars.

WUNDT, WILHELM MAX, 1832-1920, German physiologist, encyclopedic thinker, and father of experimental psychology, was born in Neckarsau,



WILHELM WUNDT
CULVER SERVICE

Baden, near Heidelberg, at whose university he studied and taught physiology from 1857, having earlier studied in Tübingen and Berlin. He taught in Zürich for one year, 1874, then was called to the chair of philosophy in Leipzig, 1875, at a time when philosophy was in such disrepute that there seemed nothing improper in appointing a physiologist to the chair in that subject. Wundt, however, did not disparage philosophy, and he continued its systematic teaching throughout his life; yet his fame is based on his having started, 1879, the first Institute of Experimental Psychology, a field in which his *Grundzüge* (Principles) were to be dominant for 30 years or more; a whole school published in the Institute's volumes.

In the study of *Volkerpsychologie* (Psychology of Nations), however, Wundt's achievement was distinctly more personal. With incredible energy he examined customs, myths, and languages, in order to discover the laws of their hold on man. His most important discovery, one whose implications had not yet been fully explored in the early 1960's, has to do with the relation of word and sentence; logically and historically, he found, sentences precede words, which means that a complete spiritual act is presupposed by all its parts. Wundt acknowledged the need for myth; even scientists need their myth, he admitted, as do capitalists and families, because they all must be steeped in some vital identification with previous lives and generations. At this point, however, Wundt failed to recognize that a man's foreknowledge of his mortality makes him into a spiritual, "unnatural" being. That is, Wundt restricted his philosophy to the natural world view and to an ethics that abstracts from man's foreknowledge of death, and thus deprives

man of its full impact and significance. Hence, he was seemingly content to leave the future of groups and peoples to accident. Indeed, his astounding work *Logik* (1880-83; 3rd ed. 1906-08) omits all consideration of any aims of mankind, or of individual men. In this work, which is a unique embodiment of the scientific mind, the methods of physics, chemistry, biology, psychology, history, social science, political science, jurisprudence, economics, demography, anthropology, and philology are all digested and embodied as the living logic of the giant "Science." Truly, scientific positivism, in its replacing the future of nations by the future of science, had its most thorough representative in Wundt.

Wundt's bibliography is very large, but relatively few works are available in English translation. His *Völkerpsychologie* (2 vols. 1900; 1905-06) was translated under the misleading title, *Folk-psychology* (1916). His *Grundzüge der physiologischen Psychologie* (1874) became *Principles of Physiological Psychology* (1904); and his *Grundriss der Psychologie* (1896) became *Outlines of Psychology* (1907). These and the few other English translations do not, of course, take into account revisions in later editions of the German works.

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WUPATKI NATIONAL MONUMENT, N central Arizona, in Coconino County, about 28 miles NE of Flagstaff, on the west bank of the Little Colorado River; area 35,693 acres. The park is composed chiefly of a group of pueblo ruins probably built and inhabited in the twelfth century by the ancestors of the modern Hopi. Architectural features utilized by these farming Indians include T-shaped doors, employment of outside wall ventilators, an inexplicable circular pit topped by high walls and a surrounding bench, and the clever adaptation of the natural red sandstone walls to the structure. The Museum of Northern Arizona undertook the excavation of five rooms of the Nalakihi ruins and the restoration of two of them in 1933. The park was established in 1924.

WUPPERTAL, city, W Germany, in the West German state of North Rhine-Westphalia, on the Wupper River, a tributary of the Rhine; 16 miles SSE of Essen. Wuppertal incorporates the former cities of Barmen, Elberfeld, and four smaller towns, and extends for 8 miles along the narrow valley of the Wupper. The city is an important manufacturing center producing steel goods, textiles, lace, chemicals, buttons, organs, pianos, paper, and canned foods. Barmen, mentioned in various chronicles as early as the eleventh century, was not incorporated until 1808. Elberfeld assumed importance as a manufacturing center in the nineteenth century. Wuppertal has a number of technical and other schools. The city is served by a pioneer monorail, rapid-transit system. Pop. (1958 est.) 416,050.

WU RIVER, or Wu Kiang, S central China, in Kweichow and Szechwan provinces, a tributary of the Yangtze River. It rises in two branches, the Liuchung and Sancho in western Kweichow, and flows about 500 miles NE, N, and NW through Szechwan to the Yangtze River about 50 miles below Chungking. The river descends some 3,000 feet in its course, and is navigable only in its lower reaches. There are rice fields in the lower valley.

WÜRTTEMBERG, historical region and former kingdom, republic, and state, S Germany; bounded on the NE and E by Bavaria, on the SW by Hohenzollern, on the W and NW by Baden, and on the SE by Switzerland; area 7,530 sq. mi. Until the thirteenth century the history of Württemberg was that of Swabia, of which Württemberg formed the north central part. Upon the division of Swabia into several small states, 1254, the territory came under the counts of Württemberg, owing allegiance to the House of Hapsburg—later to rule Austria and dominate the Holy Roman Empire—and was made a duchy, 1495. Württemberg was a Protestant stronghold early in the Reformation, and as a result was

at odds with the Holy Roman Emperors during the religious wars of the sixteenth and seventeenth centuries. As an ally of France against Austria during the Napoleonic Wars, Württemberg was rewarded with cessions of Hapsburg territory and was made a kingdom, 1805. It became a member of Napoleon I's Confederation of the Rhine, 1806, but supported the Allies (Austria, Great Britain, Prussia, and Russia) against France in the Waterloo Campaign, 1815. Württemberg joined the Zollverein, 1834, a German customs union headed by Prussia. It sided with Austria against Prussia in the Seven Weeks' War, 1866, in which Prussia proved herself to be the most powerful state of Germany. Although not a member of Prussia's North German Confederation, Württemberg was allied with Prussia by secret treaty, sided with Prussia in war with France, 1870-71, and was admitted to the German Empire, 1871. See NORTH GERMAN CONFEDERATION.

After World War I, Württemberg became a republic of the German Weimar Republic, 1918, but under the National Socialist (Nazi) government, 1933-45, it was reduced to an administrative unit. At the end of World War II, 1945, Württemberg was divided between the U.S. and French zones of occupation. The northern halves of Württemberg and Baden were later combined to form the state (*Land*) of Württemberg-Baden with Stuttgart as capital, 1946, and southern Württemberg was merged with the former Prussian district of Hohenzollern to form the state of Württemberg-Hohenzollern, with Tübingen as capital. Both states joined the West German Republic, 1949, and both merged with what remained of Baden to form the new state, Baden-Württemberg, 1952.

WURTZ, CHARLES ADOLPHE, 1817-84, French chemist, was born in Wolfisheim, near Strasbourg. He became professor of chemistry at the Sorbonne, 1853, and was dean of the Sorbonne medical faculty, 1866-75. Wurtz discovered the methyl and ethyl amines, as well as the synthesis of hydrocarbons from alkyl iodides and sodium. He also did valuable research on the oxidation products of the glycols. He was the author of the monumental *Dictionnaire de chimie pure et appliquée*, first published in 1869.

WÜRZBURG, city, S central Germany, in the West German state of Bavaria; on the Main River; 60 miles SE of Frankfurt-am-Main. The city is a railroad junction and an industrial center. Tobacco products, pianos, furniture, precision instruments, machinery, railroad cars, bricks, sugar, malt, beer, wine, vinegar, and chocolate are manufactured there. The Romanesque cathedral was founded in the ninth century. The Marienberg Fortress, long the residence of a bishop, stands on a hill overlooking the Main River. A new episcopal palace was built between 1719 and 1744. Leading educational institutions include Würzburg University (1403) and a music school. In 1859 Würzburg was the scene of a meeting to promote the union of small German states. Pop. (1958 est.) 111,246.

WYANDOT, a North American Indian tribe, of Iroquoian linguistic stock, comprising the remnants of several independent tribes, which were broken up by the Iroquois tribes south of the St. Lawrence River in the seventeenth century (see HURON). The Wyandot were found in Ontario, western New York, Pennsylvania, southern Michigan, and northern Ohio. They lived in bark lodges, and subsisted chiefly by agriculture. Most of them sold their Ohio lands and moved to Kansas, 1842, from where they were removed to Indian Territory (Oklahoma), 1867. In 1950 there were about 900 Wyandot Indians on a reservation in Oklahoma.

WYANDOTTE, city, SE Michigan, in Wayne County; on the Detroit River, the Detroit and Toledo Shore Line, the Detroit, Toledo, and Ironton, the New York Central, the Wyandotte Terminal, and the Wyandotte Southern railroads; 12 miles SW of

Detroit. The chemicals, compression, and dairy products and incorporated into the United States had the United States saltworks.

WYANT, U.S. landowner, Tuscarawas for their descendants. *Looking*.

WYATT, colonial governor, the poet Sir George Yeats, and was chief of the George Yeats, October, 1670. When the U.S. was appointed, 1626, when again, 1639.

WYATT, was born in 1760, returned success as a later was a tious restora his nicknam.

WYATT, English architect, professor of architecture. He assisted the best known *Geometric Mean* *Arts of the United Kingdom*.

WYATT, and diplomat, studied missions, privy council, the lover of a few weeks exact reason release he and was known the Italian, is credited, introducing Among Wyatt, *Queen* of the seven and the son were first (1557).

Sir Thorpe, the poet known as prevent the Spain. He don, and the queen's streets of executed.

WYCHE, dramatist, was educated Roman Catholic, disembrace was educated began to stamined malicious person than in law a Wood (w

Detroit. The chief manufactures of Wyandotte are chemicals, soda, metal toys and novelties, trunks, compression gaskets, brass pipe fittings, beverages, and dairy products. Wyandotte was settled in 1818 and incorporated as a city in 1867. By 1862 Wyandotte had the first steel-analysis laboratory in the United States, and in 1864 the first Bessemer steel in the United States was manufactured there. In 1891 a saltworks was established. Pop. (1960) 43,519.

WYANT, ALEXANDER HELWIG, 1836-92, U.S. landscape painter, was born in Evans Creek, Tuscarawas County, Ohio. His paintings are notable for their delicacy and refinement. Among his works are *Looking Toward the Sea and Broad, Silent Valley*.

WYATT, SIR FRANCIS, 1575?-1644, British colonial governor in America, was the grandson of the poet Sir Thomas Wyatt. He was knighted, 1603, and was chosen governor of Virginia to succeed Sir George Yeardley, 1620. He arrived in the colony in October, 1621, bringing with him a new constitution. When the Virginia Company was dissolved, 1624, he was appointed royal governor, a post he held until 1626, when he returned to England. He was governor again, 1639-42.

WYATT, JAMES, 1746-1813, English architect, was born in Staffordshire. He went to Rome to study, 1760, returned to England, 1766, and soon attained success as a designer in the Greco-Italian style. He later was a leader of the Gothic revival. His infelicitous restorations of cathedrals earned and justified his nickname—The Destroyer.

WYATT, SIR MATTHEW DIGBY, 1820-77, English architect and art critic, was the first Slade professor of fine arts at Cambridge University, 1869. He assisted in designing the Crystal Palace and was architect for the East India Company, 1855, but is best known for his writings on art, among which are *Geometric Mosaics of the Middle Ages* (1848), *Industrial Arts of the 19th Century* (1851), and *Art Treasures of the United Kingdom* (1857).

WYATT, SIR THOMAS, 1503?-42, English poet and diplomat, was born in Allington Castle, Kent, and studied at Cambridge. He took part in diplomatic missions to France and Italy, and was appointed privy councillor, 1533. He was believed to have been the lover of Anne Boleyn and was imprisoned for a few weeks at the time of her disgrace, 1536, but the exact reason for this action is uncertain. After his release he helped suppress a Lincolnshire uprising and was knighted, 1537. He was an ardent student of the Italian popularizer of the sonnet, Petrarch, and is credited, with Henry Howard, earl of Surrey, with introducing the sonnet into English literature. Among Wyatt's works are a translation from Plutarch, *Quyeté of the Mynde* (1528); a metric translation of the seven penitential Psalms, *Certayen Psalmes* (1549); and the sonnets, rondeaux, and satiric couplets that were first published in Richard Tottel's *Miscellany* (1557).

Sir Thomas Wyatt, the Younger, 1521?-54, son of the poet Sir Thomas Wyatt, led the insurrection known as Wyatt's Rebellion, 1554, in an effort to prevent the marriage of Queen Mary to Philip of Spain. He gained some initial victories outside London, and his own followers were joined by many of the queen's. His force was stopped, however, in the streets of London, and Wyatt was captured and executed.

WYCHERLEY, WILLIAM, 1640?-1716, English dramatist, was born in Clive, near Shrewsbury, and was educated in France, where he was converted to Roman Catholicism—a faith he later embraced or disembraced as the political weather changed. He was educated at Queen's College, Oxford, and then began to study law in the Inner Temple, but he remained more interested in literature and in the licentious pleasures offered by Restoration social life than in law. After the success of his first play *Love in a Wood* (written ?1659; produced 1671), he became

a favorite of the Duchess of Cleveland, mistress of Charles II. *Love in a Wood*, a frivolous, lively, witty comedy in the style of Sir George Etherege, was followed by *The Gentleman Dancing-Master* (produced ?1672; published 1673), based on Pedro Calderón de la Barca's *El maestro de danzar* (the Dancing Master), and *The Country Wife* (produced ?1673; published 1675). In title, theme, and dialogue, *The Country Wife* ranks as one of the coarsest and most indecent plays in the English language, but Wycherley's satiric characterizations may indicate a tendency (perhaps intentional) to criticize the ambiguous moral standards of the period. *The Plain Dealer* (produced ?1674; published 1677), borrowed in part from Molière's *Le misanthrope*, is also marked by obscenity, but seems in effect a bold, powerful satire of vice and hypocrisy, a masterpiece of an authentic moralist, or of an ambitious playwright who wanted both to please his fellow libertines and to pacify the increasingly numerous critics of theatrical bawdiness. Among Wycherley's other works are *Hero and Leander*, in *Burlesque* (1669), *Epistles to the King and Duke* (1683), *Miscellany Poems* (1704), *The Illness of Business: A Satyr* (1705), and *On His Grace the Duke of Marlborough* (1707). His marriage to the Countess of Drogheda lost him his favor at court and a post as royal tutor. After her death he was bankrupted by the expense of litigation to secure her estate, and spent seven years in debtors' prison. James II, who admired *The Plain Dealer*, finally released him and gave him an annual pension of £200.

WYCLIFFE, JOHN, surname also spelled Wyclif, Wyclif, and Wickhiffe (among other variants), 1330?-84, English ecclesiastical reformer, was born in the hamlet of Ipreswell (later Hipswell), Yorkshire, into a family whose name derived from that of the nearby village of Wycliffe-on-Tees. His birth may have occurred as early as 1320. In any case, he was educated at Balliol College, Oxford, where he became a Master, ?1360 and a Doctor of Divinity, 1370 or before. During these university years he also held several positions as parish priest, the last of which was in Lutterworth, Leicestershire, 1374-84.

Church and State. Wycliffe early accepted the teachings of the archbishop of Armagh, Richard Fitz Ralph (died 1360), on the relation between Church and State—a relation that was becoming ever more ambiguous in the course of the Avignon Captivity, 1309-77, when the popes resided in Avignon, and papal and French interest became too closely identified for British tastes. The British Parliament secured Wycliffe's services after 1366, when he endorsed its effort to abolish the tribute to the papacy. In his books on "Dominion," of which one of the first was perhaps *Determinatio quaedam de dominio* (?1366, but more probably in the early 1370's), Wycliffe made his own Fitz Ralph's doctrines on God's overlordship over Church as well as State. Against the papal domination of Church and State, which had been claimed by Boniface VIII, 1302, Wycliffe assumed God's dominion over all men, laity as well as clergy, thereby stressing the priesthood of all the believers; he considered all men equal in holding service of God. "The faithful man hath the whole world of riches, but the unfaithful hath not even a farthing," he wrote in *De civili dominio* (I, 7, 12). "Sin is nothing, and men when they sin, become nothing. If, then, sinners are nothing, it is evident that they can possess nothing."

Popularization of Doctrine. In line with his emphasis on the priesthood of all believers, Wycliffe took part in the efforts of the English to replace Latin and French by their native tongue in the affairs of church and state. Thus, the Latin Bible was translated into English 1360?-82—partly by Wycliffe, partly by his disciples, especially Nicholas of Hereford—not, as was to be the case 150 years later, in an attempt to refute the scholastic interpretation of Scripture by going back to the Hebrew and Greek original, but

for the purpose of popularizing religious knowledge among the laity. These translations were passionately suppressed by the authorities; a measure of their popularity, however, is the fact that more than 150 manuscripts are extant, despite the destruction of many. An original organization was set up for spreading this religious education. So-called Poor Preachers—"poor" only in the sense that they held no church offices—carried manuscripts of the text through the country and read them to the laity. Thus they anticipated by 400 years something of the technique of John Wesley and created a disquiet among the regular clergy just as later Methodism was to do—for the mass of the people now took an immediate part in the movement of ideas at Oxford. As the suspicions of the episcopate grew, 18 conclusions drawn from Wycliffe's writings were declared to be wrong, May, 1377, but Parliament and Lancastrians stood by "their" theologian, and the proceedings against Wycliffe were stopped. Later, at a meeting in Lambeth Palace, London, 1378, the citizenry even rioted to protect Wycliffe from being convicted and sentenced as a heretic.

Crisis. Later in 1378 there began the Great Schism that was to divide the Papacy for decades to come, 1378-1408. This event seems to have impressed Wycliffe as a premonition of a world crisis; at least, his teachings soon became far more radical than Fitz Ralph's. Wycliffe now attacked the clerical privilege connected with the Eucharist, ?1381. In particular, he took offense to the then routine expression to the effect that the priest, at Mass, was "making the Lord's Body." If the priest by himself could work the miracle, Wycliffe reasoned, then the equality of layman and cleric was not genuine. In so attacking the doctrine, he it noted, Wycliffe did not deny the miraculous and true presence of God in the Host. Yet by applying his leveling doctrines not merely to the fringe (the earthly possessions of the church) but to the very center of the Visible Church, Wycliffe lost the active support of his Lancastrian patrons, and the Begging Monks—Dominicans and Franciscans—became the irreconcilable opponents of Wycliffe and his rank here. They succeeded in silencing his four foremost disciples at Oxford, but Wycliffe himself, stricken by a series of strokes, was not molested while he lingered on at Lutterworth. When he died on St. Sylvester's Day, Dec. 31, 1384, his enemies exultantly saw in this date of his death the revenge of Sylvester I, the pope who was then believed to have received the worldly possessions of the Roman Catholic Church from the Emperor Constantine the Great, 314. See DONATION OF CONSTANTINE.

Influence. Since Wycliffe's Poor Preachers, together with Gerhard Groot's Brethren of the Common Life, formed the visible soldiery of the Movement for Reform, Wycliffe's fate did not end with his death. His manuscripts were carried off to Bohemia where they impressed John Huss. Hence, Wycliffe's good name, unsullied officially in his lifetime, was attacked at the Council of Constance, 1415, by which he was named a heretic; and in 1428 the Church felt strong enough to order his bones unearthed, burned, and the ashes strewn into the River Swift, a contributory of the Avon. Yet the Church was not always to be so secure, for ultimately Wycliffe was to be called the Morning Star of the Reformation. See LOLLARDS.

Wycliffe's many works are available in the publications of the British Wyclif Society (1883 and after). Wycliffe's basic convictions are summarized in his *Triologus* (after 1382).

EUGEN ROSENSTOCK-HUESSY
WYETH, NATHANIEL JARVIS, 1802-56, U.S. trader and promoter, was born in Cambridge, Mass. He led settlers to Oregon, 1832 and 1834, and stimulated popular and official interest in Oregon long before it definitely became U.S. territory. Wyeth established what later became the famous Fort Hall on the Oregon-California Trail, 1834.

FREDERICK E. VOELKER

WYKEHAM, WILLIAM OF, 1324-1404, Eng-lish prelate and political figure, was born in Wykeham, Hampshire. Edward III appointed him guardian of several of his manors and clerk of the works at Henley, 1348. He was next created surveyor of the king's works at Windsor, 1356, and erected the great quadrangle to the east of the keep, 1359-69. In 1364, he was appointed keeper of the privy seal, and, soon after, principal secretary of state. He was consecrated Bishop of Winchester, 1367, and a year later became chancellor of England, an office he held until 1371. He was thereafter chiefly occupied in founding New College, Oxford, 1386, and Winchester College, 1394.

At the instigation of John of Gaunt, Wykeham was accused of misuse of public funds and was deprived of his offices. He was tried, 1376, convicted, and his revenues seized, but received a full pardon when Richard II acceded to the throne, 1377. When Richard declared himself of age, May, 1389, he appointed Wykeham chancellor of England, but Wykeham resigned, 1391, and did not thereafter take an active part in politics.

WYLIE, ELINOR MORTON, 1885-1928, U.S. poet and novelist, was born Elinor Hoyt in Somerville, N.J., and was educated at private schools in Bryn Mawr, Pa., and Washington, D.C. She deserted her first husband, Philip Hichborn, to run off to England with Horace Wylie, 1910; three years after Hichborn's suicide, 1912, she and Wylie returned to the United States and were married; they were divorced, 1921, and she married the poet and editor William Rose Benét, 1923. Her poems in such collections as *Net to Catch the Wind* (1921), *Black Armour* (1923), and *Trivial Breath* (1928), reflect her interest in the work of John Donne and Percy B. Shelley. Among her novels are "a sedate extravaganza" written in the style of the eighteenth century, *Jennifer Lorn* (1923); a metaphysical tale, *The Venetian Glass Nephew* (1925); an extravagant fantasy in which the poet Shelley figures as an adventurer in the North American West, *The Orphan Angel* (1927); and *Mr. Hodge and Mr. Hazard* (1928) in which Shelley appears in the guise of a Mr. Hazard.

WYLIE, PHILIP GORDON, 1902-, U.S. writer most famous for his notion that most of the psychological ills that plague the typical American male are the result of "momism"—the excessive love of many American mothers for their sons and the unconscious desire of such mothers to keep their sons from truly growing up and leaving home, was born in Beverly, Mass., the son of a Presbyterian minister, Edmund Melville Wylie. Young Wylie studied science at Princeton University, 1920-23, but left school to work in publicity and advertising. He later became an editor of the *New Yorker* magazine, was a Hollywood screen writer, and eventually settled in Miami Beach, Fla., where he wrote short stories and novels about deep-sea fishing. *Gladiator* (1930), a story of a modern superman, was followed by a number of fantasies and science-fiction stories, pseudo-philosophical novels, and petulant, sophomoric essays on the allegedly God-induced ills of modern society—ills that can only be cured, in Wylie's opinion, by replacing neurotic conceptions of God by a new world-view based on quantum physics and the theories of Carl Gustav Jung. Among Wylie's other works are *Finnley Wren* (1934), *Generation of Vipers* (1942), *Night Unto Night* (1944), *Essay on Morals* (1947), *The Disappearance* (1951), *Tomorrow!* (1954), *The Best of Crunch and Des* (1955), *The Answer* (1956), and *The Innocent Ambassadors* (1957), a fulmination against the U.S. foreign service.

WYNANTS, JAN, 1625?-84, Dutch landscape painter, was born in Haarlem. Little is known of his life. Wynants' (or Wijnants') pictures are notable for their minuteness of detail, delicacy of aerial perspective, and silvery backgrounds.

WYNKYN DE WORDE, real name Jan van Wynkyn, died ?1534, English printer, was born at



X, the 24th letter of the modern English alphabet. Its form is that of the Greek χ , but its sound value in the English alphabet is not the same. The Greek χ signified the sound "ch," while the English x usually represents the sound "ks" which, in Eastern Greek script, was expressed by the three horizontal lines \equiv , the letter *ksi*, which was probably related to the Semitic letter *samech*.

The pronunciation of the letter x in English words ranges from "ks" as in *ax* and "gz" as in *example*. The variations in French are larger still, and at the end of a word it remains silent, as in *cheveux*, and *chevaux*. The letter x is not included in the Italian alphabet. In modern Spanish, *j* is written where x formerly was used; thus, for example, *Ximenes* became *Jimenes*.

In Latin, x was the 21st letter of the alphabet, but the sign **X** also figured in Roman numerals as the number 10. This numerical value originated from the Etruscan duplication of **V**, which meant 5—the 5 fingers of the hand; hence, **X** as the number 10 literally meant "two hands." The letter was also used in Latin as the abbreviation for the *denarius*, a coin meaning "ten asses"; and as the abbreviation for the given name *Decimus*. In Roman Catholic canon law, **X** signifies the *Liber Extra*, written (E)**X**(TRA); these are the *Decretals* (1234) of Pope Gregory IX, the first addition to canon law outside (hence "extra") the Decree of Gratian. In Christian inscriptions **X**, **XI**, **XO** are used for "Christ, Christi, Christo." In Cartesian analysis (analytical geometry), the horizontal in a system of coordinates is called x , the vertical is y . In algebra, x signifies any first unknown. In chemistry, x stands for the element Xenon.

EUGEN ROSENSTOCK-HUENY

XANTHI, province, NE Greece, in Thrace; bounded by Bulgaria on the N, the Aegean Sea on the S, and by the provinces of Kavála and Dráma on the W and Rhodope on the E; area 676 sq. mi.; pop. (1951) 89,891. The province has mountains in the north and a coastal plain in the south. Elevation increases to more than 3,000 feet in the northwest. Tobacco and cotton are the chief crops. The Xánthi area was part of the ancient Kingdom of Thrace. The Romans placed it in the Diocese of Thrace and the Byzantines in the Theme of Macedonia. Greece gained control of the area in 1829.

XANTHOMATOSIS, a condition usually caused by a malfunction of lipid metabolism, forming fatty deposits in tissues accompanied by excessive lipid concentration in the blood (see **LIPID**). The condition is shown by deposits over different areas of the body and can involve several organic fats, so that although differing names are given to specific fatty tumors they all refer to the same general condition.

When abnormally high concentrations of cholesterol are found in the blood, the condition is called hypercholesterolemia. (See **CHOLESTEROL**.) Hypercholesterolemia has been noted in some families as a genetic trait and is usually associated with atherosclerosis and heart disease (see **ATHEROSCLEROSIS**). The condition may also be acquired as the consequence of gall bladder disease, diabetes, and nephrosis. Lipid deposits in tissue near the skin take the shape of small, rounded, yellow elevations.

Excessive amounts of neutral fats, which are compounds of fatty acids and glycerin, when found in the blood are called hyperlipemia. This condition may also be an inherited familial trait but is most often acquired from diabetes, pancreatitis, and nephrosis. This disorder does not usually interfere with normal health over long periods of time. The fats are usually deposited in the tendon sheaths in the limbs.

Xanthomatosis is most pronounced in familial hypercholesterolemia but it has been noted in other forms of the disorder. Accumulations of fat and cholesterol in the eyelids is called xanthelasma. Lipid deposits in the creases and folds of the elbows and palms are called xanthoma planum. When they occur in nodules in the skin the condition is known as xanthoma tuberosum. A serious form of xanthomatosis appears when cholesterol is deposited in the tissue of blood vessels and beneath the endocardium in the region of the heart. When this is encountered in young people the aortic and pulmonary valves may be hampered and the heart muscles scarred.

The control of cholesterol content in the diet seems to have little effect in remedying hypercholesterolemia. Insulin has been used effectively when the xanthomatous condition arises from diabetes. Hyperlipemia has been modified considerably by diet control. Spacings of 24 hours between fat ingestion has reduced fat content in the blood in this form of xanthomatosis.

XANTHOPHYLL. See **COLORATION OF PLANTS**.

XANTHORRHOEA. See **GRASS TREE**.

XANTHOS AND BALIOS, in Greek mythology, two immortal horses that Poseidon gave to Pelus, the father of Achilles. In Homer's *Iliad* they appear as chariot horses for Achilles, who rebuked them for not preventing the death of his friend Patroclus. Xanthos told Achilles that Patroclus' death was caused by a god, and that Achilles would meet the same fate. For that prophecy Xanthos was struck dumb by the Eumenides (or Furies).

XANTHUS, ancient city, SW Turkey, about 8 miles from the mouth of the Koka River, 190 miles SSE of Izmir. When the Persians under Harpagus besieged the city, 7546 B.C., it was destroyed by fire. Rebuilt, it was destroyed by the Romans, 742 B.C. First excavated, 1838, by the British archaeologist Sir Charles Fellows (1799–1860), the ruins reveal the plan of the city, the theater still in good condition, part of the Harpy Monument, and walls of the acropolis. See **LYCIA**.

XANTIPPE, the wife of the Greek philosopher Socrates, was notorious for her quarrelsome temper and shrewish scolding.

XAVIER UNIVERSITY, a private institution of higher learning, associated with the Roman Catholic church, and located in Cincinnati, Ohio. The university's liberal arts college admits male students only; the graduate school, evening college, and summer session are coeducational. Established as The Athenaeum, 1831, its first instruction was offered the same year. The name was changed to St. Xavier College, 1840, and to Xavier University, 1930. See **COLLEGES AND UNIVERSITIES**.

XENIA, city, SW Ohio, seat of Greene County; on the Baltimore and Ohio and the Pennsylvania railroads, and U.S. highways 35, 42, and 68; 16 miles ESE of Dayton. The chief manufactures are rope, twine and cordage, furniture, boats, shoes, and advertising novelties. Xenia was laid out in 1803, incorporated in 1808, and chartered as a city in 1870. The city is the site of Wilberforce University (1856) and of a state institution for orphans. Pop. (1960) 20,445.

XENOCRATES, 396–314 B.C., Greek philosopher, the third *scholararch* (head) of the Platonic Academy, was born in Chalcedon. Like his master Plato, Xenocrates equated the Real with the realm of Forms (Ideas or Essences) which, following Pythagoras, Xenocrates identified as numbers. Thus he thought of God as One and all subsequent existences as numbers more than one. Having defined the soul as self-moving number, he made numerology the basis of his mystical theology. Among his contemporaries, Xenocrates

was more renowned for his personal integrity than for his philosophy; so great was his reputation for virtue that he was exempted from taking the oath when testifying in court. He was thrice ambassador to Macedonia, and after the Macedonian conquest of Athens was offered citizenship, but refused it.

ROBERT WHITTEMORE
XENOPHANES, 569?–7480 B.C., Greek philosopher, the first Western thinker known to have challenged the notion that God is properly described in terms appropriate to man, and the first to proclaim the absolute One as God, was born at Colophon in Asia Minor. Of his life little is known save that he traveled widely and lived to a great age. According to tradition, he spent his later years at Elea in southern Italy; this fact and his monism have led some to credit him with being the master of Parmenides and the true author of the Eleatic philosophy. All that is certain, however, is that he taught that there is but "one god, among gods and men the greatest, not at all like mortals in body or in mind." As he put it, "if oxen and horses and lions had hands or could draw with hands and create works of art like those made by men, horses would draw pictures of gods like horses, and oxen of gods like oxen, and they would make the bodies [of their gods] in accordance with the form that each species itself possesses."

ROBERT WHITTEMORE
XENOPHON, 431?–355 B.C., popular Greek author, was born probably in Erchia, in Attica, but may have been born in Athens, in which city he certainly grew up and received his education, and where he came to know Socrates. The first action of his which is certain, was his taking part in the so-called *anabasis* ("March Up") of Cyrus the Younger against King Artaxerxes II of Persia and, after Cyrus' death at Cunaxa, 401 B.C., in the *catabasis* ("March Down") to the Black Sea and along the coast. Sometimes in charge, sometimes as an adviser, Xenophon served with distinction on this difficult, 15-month march, and his report in seven books, *Anabasis*, established his fame as a writer and, by reason of its stylistic simplicity, remained in the twentieth century a much used textbook for beginners in Greek.

After the *catabasis*, Xenophon joined the Spartans under King Agesilaus and thereby lost his rights as an Athenian citizen, 394. He was compensated, however, when the Spartans gave him an estate in Scillus, halfway between Sparta and Olympia; there he lived as lord of the manor until 370, when he was driven out and forced to move on to Corinth. From there he may or may not eventually have returned to Athens some time after 371, when Sparta and Athens became allies; but certainly he tried to regain favor in his old city by writing the *Poroi* (Revenues), a plan for the economic prosperity of Athens. The spiritual side of his reconciliation with Athens may be recognized in his four books on Socrates—*Memorabilia* (393?–390), *Apologia*, *Symposion*, *Oeconomicus*—which are an echo to Plato's writings, but omit all strictly philosophical discussion; instead, the conservative gentleman Xenophon, in a generally pedestrian manner, has Socrates discuss the social ethics. In this respect, the *Oeconomicus*, which opened a then new area of discussion—the orderly management of the household and the agricultural basis of society—is furthest removed from the Platonic traditions. The value of Xenophon's writings for the reconstruction of the historical Socrates has been debated time and again, but without final result.

Less disputed is Xenophon as a writer on themes not treated by rival authors (so far as can be judged by extant works). Thus, he wrote a history of a period, 411–362, not covered by the great Thucydides, and as it stands now Xenophon's *Hellenica* begins where Thucydides ends. Yet of the six books, the third and fourth were probably written first as a parallel to the *Anabasis*, while the first and second, which provide the unity with Thucydides, were written merely as an

afterthought. This is but one example of Xenophon's pragmatic and unartistic approach to literary production. He wrote in a similar vein in *On the Chase* and *On Horsemanship*, both for officers. Not any inner spiritual universalism, but the unforeseen cosmopolitan experiences of his life induced Xenophon to enter these new fields of literature. His greatest success with posterity in this line was the educational novel, *Cyropaedia*, dealing with the education of Cyrus the Elder. An ideal ruler and an ideal education are depicted; and for its long series of "Mirrors for Princes," Xenophon always found admirers during the next 2,000 years. Werner Jaeger's *Paideia* (vol. 3, 1943), includes a detailed analysis of Xenophon's views on education. Xenophon's works, in parallel Greek and English, are available in seven volumes of the Loeb Classical Library.

EUGEN ROSENSTOCK-HUESSEY
XERXES I, called the Great, 519?–465 B.C., king of Persia from 485 until his death, was the son of Darius (Darcios) I, whom he succeeded. His name Xerxes, as that of his father, stems from the religious vocabulary of Zarathustra. He subjugated Egypt, 485–484, and prepared for the invasion of Greece by cutting a canal through the Isthmus of Mount Athos and constructing a bridge of boats across the Hellespont. In 480 Xerxes accompanied his forces on their march through Thrace, Thessaly, and Locris, witnessed the Battle of Thermopylae, then advanced through Phocis and Boeotia into Attica, and from the Attic coast beheld the destruction of the Persian fleet at Salamis. He then retired with great speed into Asia Minor, leaving his army in Greece under Mardonius, who was defeated by the Greeks at Plataea in the following year, 479. Xerxes was murdered by his captain of the guards, Artabanus, and was succeeded by his son Artaxerxes I. See ZOROASTRIANISM.

XIMENEZ DE CISNEROS, FRANCISCO, 1436?–1517, Spanish cardinal and political figure was born in Torrelaguna, New Castile, and was educated at Salamanca. He traveled to Rome, 1459, where he was consistorial advocate, 1464–72. He entered the Franciscan order, 1484, and was appointed confessor to Queen Isabella, 1492. He became provincial of the Franciscan order in Castile, 1494, and primate of Spain, 1495. As inquisitor general of Castile and León, Ximénez was responsible for the establishment of the Spanish Inquisition as a political force. He was created a cardinal, 1507, led an expedition to Africa for Ferdinand V, King of Castile and León, 1509, and was regent of Castile for Charles I of Spain (Charles V, Holy Roman Emperor), 1516. He founded the University of Alcalá de Henares, 1504, and published the Complutensian Polyglot Bible (1502–17).

XINGU RIVER, Brazil, rises in central Mato Grosso (Serrado Roncados), and flows N for 1,230 miles, enters the Amazon River at the head of its delta below Pôrto de Moz. The upper course of the Xingú is interrupted by waterfalls; it lower course is navigable for about 100 miles, and the towns of Altamira and Vitória are the major ports.

XOCHIMILCO, town, Federal District, central Mexico, about 14 miles SE of Mexico City. The town is a residential suburb which is noted for its canals and floating gardens. Fruits, vegetables, and flowers are grown. The name is derived from an Aztec word meaning flower gardens, and refers to the town's location on small manmade islands, once rafts covered with soil which later became rooted to the lake bottom. In pre-Columbian days, the town was the home of Aztec nobles. The beautiful flower gardens, which can be visited in flat-bottomed gondolas, and the sixteenth century church of San Bernardino are of particular interest. Pop. (1959 est.) 20,687.

X RAY, an electromagnetic radiation of short wave length produced when a stream of highly accelerated electrons strikes a hard target, causing waves of energy to be emitted from the electrons. The radiations were first observed by the German physicist Wilhelm Röntgen in 1895, when as a result of experi-



Y, the 25th letter of the English alphabet, in which it is pronounced "wi." As upsilon or ypsilon, Υ is the fifth from the last letter of the Greek alphabet, in which the sign originally expressed both the sound of the "digamma" Υ , and the vowel sound \bar{u} (as in modern German); the addition *-psilon* (bare) pointed to the second pronunciation, as a vowel. As a Greek numeral, Υ stood for 400 or 4,000. In the days of Cicero, when many Greek words were being absorbed into the Latin language, the Romans adopted the letter for the sound \bar{u} , and put it after the letter x in their alphabet; in Latin, words that include a y in the spelling are generally of Greek origin. In French, the sound is consonantal when it precedes vowels; otherwise, the rule is too complex for brief description. In Anglo-Saxon (Old and Middle English), the sound of modern y , as in words such as *yes*, was formerly written with a letter that fell into disuse toward the end of the fourteenth century; subsequently this sound value in such words became that which formerly was expressed by *G* (old French *Gui*)—hence "wi" rather than "ypsilon" in later usage. Before 1800, in such English words as *ye*, y signified the sound "th"; thus, "ye" in "Ye Olde this or that" was pronounced "the" as in modern usage.

In chemistry, Y stands for the element yttrium, Yb for the element ytterbium. In analytical geometry (Cartesian analysis), y is the vertical in a system of coordinates. In algebra, y signifies the second unknown. In the Middle Ages, Y sometimes stood for 150, and Y with a horizontal line over it for 150,000. Romanesque designs attributed the vertical line to Christ, the left stroke to the Prophets, the right to the Apostles.

YUEN ROSENSTOCK-HUESY
YAAN, city, central China, in Szechwan Province in the foothills of an eastern extension of the Kunlun Mountains; 200 miles W of Chungking. Yaan is the tea-growing center of western Szechwan and lies on the Tibetan Highway, which enables the city to ship pressed tea to eastern Tibet. Yaan was the capital of the former Sikang Province before the latter was incorporated into Szechwan in 1955. Pop. (1955) 70,000.

YABLONOVY MOUNTAINS, U.S.S.R., in the Buryat-Mongol Autonomous Soviet Socialist Republic. The mountains are among the several short but rugged ranges which form part of the watershed between Arctic and Pacific oceans, and which enclose the Central Siberian Plateau lying north of Baykal Lake. The Yablonovy Mountains, which are formed from crystalline and metamorphic rocks, average 5,000 feet in elevation. The Trans-Siberian Railroad ascends the mountains at Chita.

YACHT, any of various types of water craft which are usually used for pleasure, and which are relatively small, and characterized by their graceful lines and sharp prow. Yachts may be powered by steam, or internal-combustion engines; or be propelled by sail. A yacht is usually regarded as a luxury vessel, with accommodations for eating and sleeping aboard. Some of the most famous yachts have been racing craft. With but few exceptions, such as the royal and presidential yachts, these ships are privately owned. Since early in the twentieth century, yachting grew in popularity, both as a form of recreation and as a competitive sport, until, by mid-century, yacht clubs existed in nearly every area located on an inland or coastal waterway.

YACHTING. See SAILING.

YACHTING, ICE. See ICEBOATING.

YADKINVILLE, town, NW North Carolina; seat of Yadkin County; on U.S. highways 421 and 601; 22 miles W of Winston-Salem. The town has a

number of lumber and grain mills, and baskets manufactured. Pop. (1960) 1,644.

YAHWEH, or Yahwe, Yahve, or any of these names with a J rather than a Y , the English transliteration of the Hebrew tetragrammaton (JHVH) that is commonly used by scholars in opposition to "Jehovah" and its variants (in all of which the J is to be pronounced as Y), which was recognized as linguistically erroneous at least as early as 1567, but which continued to be used popularly. The pronunciation *yahwé* is attested by inscriptional materials dating from the first and second millennia B.C. In the Hebrew language, the sacred and magic name of the deity of the Jews, and also the essence of this deity was at first signified by the consonants only, usually JHVH; in later periods vowel points were used, but the actual pronunciation of the name remained secret known only to the favored few, and was sparingly even by them. At least as early as 7450 B.C. when the Scriptures were read in religious services or on other occasions, the words *Adonai* (Lord) *Elohim* (God)—indicated by vowel points affixed to JHVH—were substituted according to which Yahweh's manifold qualities were stressed in particular text. Later English translation of Yahweh as "Lord" was apparently sanctioned by the authority of Philo of Alexandria, who is thought to have been the first to translate Yahweh into the Greek word *Kurios* (Lord).

Both the etymology and the original meanings of Yahweh remain matters of heated dispute among scholars. As to the etymology, Yahweh was originally, most scholars agree, a finite verb derived from the Northwest Semitic root *hwy*, which meant to be, itself, but coming into existence. This has led many scholars to doubt that the answer to Moses' famous question in Exodus 3:14 should be translated "I AM THAT I AM" ("*Ehyeh asher ehyeh*"), since the answer would seem to amount to little more than an assertion by God of His existence as such, a matter that was never in doubt. While most scholars doubt that the familiar I AM THAT I AM is correct, there is less agreement as to what the correct translation might be. Most authorities agree that the divine name Yahweh connotes a progressive self-revelation of God as the prime force in nature, society, and history. If Yahweh is so interpreted, *Ehyeh asher ehyeh* would seem to mean something like "I who manifest [reveal] myself." In his unique and influential work *Moses: The Revelation and the Covenant* (1946), the German-Israeli theologian Martin Buber rejects the "I AM THAT I AM" translation, holding that in Biblical Hebrew *ehyeh* means no less than "shall be present." Thus, "by a daring linguistic device," Moses tells the people " '*Ehyeh*, I shall be present, or I am present, sends me to you,' and immediately afterward: 'YHVH the God of your fathers sends me to you.'" On the basis of Buber's subtle analysis, it would seem that the religious meaning of JHVH to the Jews is conditioned by the progressive implication of the verb *ehyeh* and other factors such that a profound ambiguity is imparted to JHVH which is and also will be present. According to Buber and others, the power of JHVH as a fact in the consciousness of the people derives in large measure from His being not merely a, or the Being who is—that is, a metaphysical abstraction; He is more important as a vital and continuing force in the affairs of the cosmos and her creatures. See GOD; JEHOVAH; NAME, OF THEOLOGY AND PHILOSOPHY.

YAK, an oxlike animal found on the high plateau of Tibet, and in the neighboring parts of Central Asia, where it occurs in both the wild and domesticated state. The wild yak, *Bos grunniens*, is the largest native animal of Tibet, and is found only near the



Z, the last and most rarely used letter of the English alphabet. It corresponds to the sixth letter, *zeta*, of the classical Greek alphabet (not the seventh letter as some sources insist) which also signified the number seven in the classical Greek numerical system (see ALPHABET; GREEK ALPHABET; NUMERALS, *Greek Numerals*). Because the Romans did not use this letter until the time of Cicero, and even then only in words borrowed from the Greeks (see X), it was placed at the end of the alphabet—hence its terminal position in the alphabets of modern European languages, in which the *zeta* form is rather well preserved, except that in cursive writing a small *z* sometimes has a “tail” added at the end. The original Semitic letter, whence *zeta* derived, was the *zayin*, which was little more than a single vertical line similar to the English capital I.

The Greek *zeta* generally signified the sound *ds* or, less frequently, *ts*. In modern languages the pronunciation varies considerably: voiced *s* in Latinized Slavic alphabets, in Hungarian, and in French; *ts* in German; *th* in Castilian Spanish (“*th*” as in English *thanks*); and *ts* or *dz* in Italian. As in French, *z* in English is used to convey the voiced *s* sound in such words as *breeze* and *sneeze*, but the same sound is also conveyed by the letter *s* itself, in such words as *praise* and *surmise*, and in some instances, as in the word *azure*, *z* is pronounced as a French *j*—a sound for which the Czech and Croatian alphabets have a special sign: *ž*. In pronouncing the letter *z* by itself, the English generally say *zet*, but many say *izzard*; this variation may have come into use from Old French *et zed*, meaning “and zet,” but there is no real proof for this derivation. In the United States, *zet* is replaced by *zee*. See PHONETICS.

In Shakespeare's *King Lear* (Act II, Scene 2, Line 69) the Earl of Kent, in his anger at the “whoreson zed!” (Oswald), scolds *z* as the “unnecessary letter.” It does have its uses, however. In Cartesian analysis (analytic geometry), for example, *z* figures in any three-dimensional system of coordinates (*x*, *y*, and *z*). In algebra, *z* stands for the third variable. *Z* is the abbreviation for either one-half ounce or one ounce and a half, while *oz.* is the abbreviation for ounce or ounces. In medicine, *zz.* stands for tincture of myrrh.

EUGEN ROSENSTOCK-HUESBY
ZAANDAM, town, Netherlands, in the province of North Holland; six miles NW of Amsterdam. Grain mills and sawmills are there, and paper, cement, oil colors, dyes, and tobacco products are manufactured. Other industries include fishing and shipbuilding. Peter I of Russia studied shipbuilding at Zaandam in 1697. Pop. (1954) 45,265.

ZABRZE, formerly Hindenburg, city, SE Poland, Katowice Province, in Silesia; about 50 miles NW of Kraków, and 175 miles SSW of Warsaw. Zabrze is a railroad junction and an important industrial center, which is located on a coalfield. Steel, machinery, benzine and oil, glass, chemicals, wire, and tiles are manufactured. Zabrze was founded in the thirteenth century. The city came under Prussian control in 1745, and in 1915 its name was changed to Hindenburg. In 1945 the city was returned to Polish control and renamed Zabrze.

ZACATECAS, state, central Mexico; bounded on the N by Coahuila, E by San Luis Potosí, S by Aguascalientes, S and SW by Jalisco, and NW by Durango; area 28,125 sq. mi. Pop. (1957 est.) 744,626. The state occupies a highland zone, which reaches 10,000 feet above sea level in the southern part along the Sierra Madre Occidental. The Aguanaval River drains the state northward, and the

Juchipila River flows southward. The state is noted for its mineral deposits; silver, gold, and copper are the principal minerals exploited. The major crops are wheat, corn, barley, chick-peas, chili, sugar cane, citrus fruits, and bananas. The raising of cattle, sheep, horses, and mules is, in addition, an important aspect of the economy. There are food-processing plants at Zacatecas, the capital, Ciudad Garcia, Fresnillo, and Concepción del Oro. Spanish colonization of the area began in 1546, following the discovery of gold.

ZACCHAEUS, in the New Testament, a chief publican or tax collector of Jericho. He climbed up into a sycamore tree in order that he might see Jesus over the heads of the crowd. Jesus called him down, lodged with him for the day, and so impressed him that Zacchaeus offered to bestow half of his great possessions on the poor and repay fourfold if he had “wrongfully exacted aught of any man.” For his story see Luke 19:1-10.

ZACHARIAS, SAINT, 690?-752, pope from 741 until his death, was a Calabrian of Greek descent. Zacharias (or Zachary) was a learned man and greatly increased the temporal power of the church through his diplomatic treatment of the Franks and Lombards. He was directly responsible for the elevation of Pepin III to the Frankish throne.

ZADAR, or Zara, city, W Yugoslavia, in Croatia; on the Dalmatian Coast of the Adriatic Sea; 125 miles SE of Trieste. Zadar is a shipping port and the principal industries are the manufacturing of glass and cordials and the processing of flour. A first century Roman forum; a museum that was originally the Byzantine Church of St. Donat, 800; and a twelfth century castle are located in the city. Zadar was founded by the Illyrians in the fourth century B.C. and became the capital of Dalmatia. It was made part of the Byzantine Empire during the sixth century, and was destroyed by the Crusaders in 1202. The city was captured by Austria, 1797, Italy, 1918, and by Yugoslavia, 1945. Zadar suffered heavy damage during World War II. Pop. (1959 est.) 14,847.

ZADOK, in the Old Testament, a high priest appointed by King Solomon in place of the disloyal Abiathar. Zadok earned the lifelong gratitude of his friend King David by remaining loyal to him during Absalom's rebellion. The priestly descendants of Zadok were the Sadducees. In the Douay Version of the Bible his name is spelled Sadoc.

ZADOKITE FRAGMENTS, otherwise called the Damascus Document or the Cairo-Damascus Covenant, are parts of two Hebrew manuscripts discovered, 1897, by Solomon Schechter in the genizah of the synagogue of Fostat near Cairo, and first published as the *Documents of Jewish Secretaries* (1910). The Zadokite Fragments, along with hundreds of others found by Schechter, were eventually deposited in the Cambridge University Library.

Scholars generally agree that the fragments were written before 170 B.C., but have not determined how the manuscript was copied. The manuscript preserves parts of two works. One is a collection of sectarian laws and rules that stress moral and ceremonial purity. The other part of the manuscript is a sermon on the history of mankind and of the sect. In addition, the fragments discuss Divine election, duties and influences of angels, and the coming of a Messiah.

Scholars disagree as to the implications of the Zadokite Fragments. Fragments of other copies of the same manuscript were found in the Qumran Caves near Khirbet Qumran, 1952 (see DEAD SEA SCROLLS), and some scholars maintain that the Zadokite Frag-

hye is the site of Dnepr Dam and Dneproges Power Station. The city produces steel, steel alloys, aluminum, tractors, ball bearings, machine tools, agricultural machinery, and chemicals. The Donets Coal Basin and iron deposits are nearby. The city was founded, 1770, as a fort named Aleksandrovsk. It was renamed Zaporozhye, 1921. During World War II, the Germans ravaged the city and destroyed much of its industry but, by the middle of 1948, Zaporozhye was almost completely rebuilt. The area is famed as one of the homes of the Zaporozhye Cossacks. Pop. (1959) 435,000.

ZAPOTEC, a group of Indian tribes in southern Mexico. The principal tribes of the Zapotecan linguistic family are the Zapotec, the Mazatec, and the Mixtec, most of whom live in Oaxaca and neighboring states. The Zapotec Indians were neighbors of the Aztec and their predecessors, the Toltec, in the development of Mexican civilization, and intermediaries between the Maya culture and that of the Aztec (see AZTEC; MAYA; TOLTEC). They were conquered by the Spanish under Hernán Cortés in the 1520's. The ancient Zapotec center of influence seems to have been the ruined city of Mitla in Oaxaca, where there are remains of temples of carved stone, almost equaling those of the Peruvian Inca in grandeur, some finely wrought gold artifacts, and a form of writing. Zapotecan pottery, of good quality, is seldom painted.

CLARK WISLER

ZARAGOZA, or Saragossa, province, NE Spain; bounded by the provinces of Huesca on the NE, Lérida and Tarragona on the E, Teruel and Guadalajara on the S, Soria and Logroño on the W, and Navarre on the NW; area 6,611 sq. mi.; pop. (1959 est.) 609,393. The province encloses the dry, barren plain of the Ebro River, which is flanked to the north and south by sloping plateau surfaces. The climate is characterized by extreme temperature changes and scarce rainfall. Agriculture, the major occupation, is restricted to several fertile oases in the river valley. Cereals, olives, and fruit are grown, and sheep are raised on the uplands. The province is Spain's leading producer of sugar beets. Lignite, iron ore, and manganese mining, and marble and limestone quarrying are important. The capital and major commercial center is Zaragoza.

ZARAGOZA, or Saragossa, city, capital of Zaragoza Province, NE Spain; on the Ebro River; 160 miles W of Barcelona. The city is a communications, trading, and manufacturing center for an irrigated, agricultural area in which grapes, sugar beets, cereals, and fruit are grown. The production of textiles, paper, cement, electrical equipment and processed foods are major industries. Zaragoza, an early Roman military colony, was held by the Moors from 714 to 1118, when it was captured by the King of Aragon, Alfonso I, who made it his capital. The



SPANISH NATL. TOURIST OFFICE
The church of San Juan de los Penates, built 1720, is in Zaragoza, one of the greatest Moorish cities of medieval Spain. It was called Caesaraugusta by the ancient Romans.

city achieved fame by its resistance to the French armies during the Peninsula War (1808-14). Zaragoza is the site of a university, 1474, a leaning clock tower, a seven-arched bridge over the Ebro River, 1437, and the Lonja, or exchange, 1551. Pop. (1959 est.) 244,015.

ZARATHUSTRA, or Zarathushtra, in the later Greek sources Zoroaster, 569? 2500 B.C., Persian (Iranian) religious innovator and reformer whose precise role in religious and political history was long obscured by legend and bias. Two centuries after his death, for example, the Greeks were saying that Zoroaster, as one of the Magi, had lived 6,000 years before Plato, and that Plato had come as a "second Zoroaster." Many centuries later, anti-Semites who wished to have it thought that the Jews, during their Babylonian Exile, could have had no opportunity to be in touch with Zarathustra, removed him from his rightful time and place to 1000 B.C. and the regions south of Lake Aral (see ZOROASTRIANISM). Thanks in largest measure to the penetrating research of Ernst Herzfeld, whose *Zoroaster and his World* (2 vols., 1947) is virtually indispensable to the serious student of the subject, many such myths can definitely be dismissed. At mid-twentieth century, however, scholars continued to disagree about many questions of fact and interpretation. Of Zarathustra's own writings, only the Gathas (hymns) are extant; these constitute part of the sacred book of Zoroastrianism, the Avesta.

The German religious reformer, Friedrich Nietzsche, identified himself with Zarathustra in entitling what was to be his most popular work, *Thus Spoke Zarathustra: A Book for All and None* (Eng. Tr. by Walter Kaufmann in *The Portable Nietzsche*, 1954). Important though Nietzsche's work is, it should not be mistaken as a guide to Zarathustra's thought; the book's message is Nietzsche's not Zarathustra's. See PERSIAN LANGUAGE AND LITERATURE.

Zarathustra belonged to the Spitama, a wealthy landowner family in Media, where his home town, Ragay (Rhagae), was the forerunner of modern Tehran. His adolescence coincided with the remarkable career of Cyrus the Great (600? 529), of Pasargidae in southern Persia, who began merely as the ruler of three Persian tribes, but in 30 years conquered 127 nations. This empire, the first of its kind, lacked a spiritual underpinning. Cyrus' son Cambyses II did not provide it; he simply conquered more territory (Egypt), and finally ended his life by suicide, 522. But after the younger, rival line of Cyrus' family (the Achaemenids, Achaemenians, Achaemenidae, or Achaemelides) came to the throne, 522 B.C., the spiritual basis for the political empire was soon provided, for the first three kings of this line were Zoroastrians, and even assumed throne names expressing their adherence to Zarathustra's teachings. The first, for example, Spandata, son of Vistaspa (Hystaspes) became Darcios (Darius), meaning "My own Will I Controlled Severely" (see DARIUS I; XERXES I; ARTAXERXES I). Because Zarathustra's religious teachings ran counter to the prevailing cults, he probably suffered persecution and exile from Ragay, 539? Later, however, he married into the Haugavi family, and through this powerful connection was introduced to Vistaspa. By 527, a Zarathustrian prayer meeting of several hundred high-born persons, 10 per cent of them women, was gathering regularly evidence of the growing influence of Zarathustra's teachings.

Zarathustra was the first religious leader in history to offer to the rulers a world religion. Thus, while the Jewish religious innovator Moses had led the children of Israel out of a polytheistic empire into the desert, leaving Pharaoh to his idols, Zarathustra's political task (if this may be distinguished from his purely religious role) was exactly the opposite; he taught the emperors, who were rulers-of-rulers, to invoke a

God-of-gods, Ahura Mazda (later abbreviated as Ormuzd, Ormazd, or Ormizd), meaning the One-in-All. As Ahura Mazda towered above the other and various gods of Persia (even Mithra and Varuna were to be rejected), and above the Divine Names of the conquered nations as well, so did the emperor tower above and supersede earlier political entities and persons. The other gods were to be regarded as merely partial deities who might, at best, be allowed to linger as "members," or aspects, of Ahura Mazda's new multiplicity. The Christian poet Dante, in the *Divine Comedy*, says of God that Wisdom, Love, Authority, and Justice make Him act (*Inferno* III:4). Similarly, Ahura Mazda was said to hear, speak, and act through the hosts of his members. Ingeniously, Zarathustra even wrote of these serving members of his God-of-gods in the grammatical case of the instrumental, as Ahura Mazda's "tools," for it is by means of these, his qualifications, that Ahura Mazda is realized, as God the Father is realized in the New Testament.

Zarathustra's need to reject many former deities, stripping them of their sacred names and lumping them together as *devas* or *davas* ("have been" deities, or demons), ultimately gave rise to the "dualism" in terms of which his religion is usually described. In rejecting the polytheism of Egypt, the Jews simply left that country and went elsewhere. Zarathustra's emperors of the world could hardly do this, yet all the places under their rule were already filled with a multiplicity of divine spirits, many of them identified with pre-imperial political forms and persons. Zarathustra had to reject these "drugs," and declared them to be wicked, though still temporarily powerful. In saying that half of the world was ruled by evil, Zarathustra became the founder of all dualistic doctrines (see DUALISM; MANICHAISM) in which evil is independent from good and is equally original. The dualism as experienced by Zarathustra was only one of "before" and "after," however, and he fully expected ultimately to exorcise the evil *devas* by his method of excluding and down-grading them. But Zarathustra and the rulers who embraced his faith could not foresee how strong would be the resistance of the older religions. Ultimately, after Zarathustra's death, many older gods, such as Mithra, were readmitted to the Zoroastrian pantheon, and the independence of evil was accordingly increased and deified as Ahriman (Angra-Mainyus).

EUGEN ROSENSTOCK-HUESSY

ZARZUELA, a type of Spanish theatrical work usually humorous, combining elements of both opera and drama—that is, declaimed passages alternate with song. It is analogous to French *opéra comique*, Italian *operata*, British music hall entertainment, and U.S. musical comedy. Zarzuelas are of two classes: *genero chico*, generally one act; and the more fully developed *genero grande*, usually in three or more acts. Prefigurative elements of the zarzuela can be seen in the pastoral-religious plays (*eglogas*) of Juan del Encina (1468?-1529), but the emergence of the zarzuela as a distinct form dates from Lope de Vega's *La selva sin amor* (1629). The form reached its height in the works of such famous dramatists as Calderón and Bances Candamo. In later, less substantial zarzuelas, the traditional dances were often omitted, the librettos were often frivolous in the extreme, and the performers would often abandon the libretto altogether to engage in repartee with members of the audience.

ANTHONY KERRIGAN

ZATURENSKA, MARYA, 1902- , U.S. Pulitzer prize-winning poet, was born in Kiev, Russia. She came to the United States with her family, 1909, and was educated at Valparaiso University and at the University of Wisconsin. Her verse is rich, lucid, and elegant, although some critics have found it excessively literary and allusive. Among her works are *Threshold and Hearth* (1934), *Cold Morning Sky* (1937; Pulitzer prize), *Listening Landscape* (1941), and *The*

Golden Mirror (1944), and *Terraces of Light* (1960). With her husband, the poet Horace Gregory, she wrote *A History of American Poetry, 1900-1940* (1946).

ZEA. See CORN.

ZEALOTS, or *Zelotes*, a party of Jewish patriots that originated during the reign of Herod the Great. The historian Josephus calls it the fourth party (besides the Pharisees, Sadducees, and Essenes), and that of the nationalists who revived the Maccabean movement. Their headquarters were the Galilean highlands. A strong faction in the Sanhedrin was in sympathy with their aspirations. The Zealots' lawlessness and fanaticism was one of the causes of war with Rome, A.D. 66-70. Eventually, according to Josephus, the Zealots degenerated into a gang of mere assassins, the Sicarii. See JEWS.

ZEBRA, a striped horselike animal peculiar to the African continent. Zebras resemble the asses more nearly than the true horses; but they differ from the asses in the extensive striping of the head and body. The true or mountain zebra, *Equus zebra*, is now confined to certain protected districts in the eastern part of Cape of Good Hope Province. It stands three and a half feet at the shoulder, and is striped over head, legs, tail, and body, with the exception of the under surface and the inner side of the thighs. The stripes are broad and are black on a white ground.

Burchell's zebra, *E. burchelli*, erroneously called the quagga, is a plains animal, found to the north of the Orange River. In Ethiopia and Somalia occurs a third species, *E. grevyi*, formerly confused with the mountain zebra, from which it differs in being taller, (four and one-half feet), and having narrower stripes.

Zebras have been domesticated, though with considerable difficulty. They will interbreed alike with the horse and the ass, and in habits are much the same as the wild varieties of those animals. Their flesh is used for food, and their hides for leather. Zebra hunting has greatly decreased the species.

ZEBU, the domesticated ox of India, *Bos indicus*, which differs from the European ox by having a large hump on the withers, the large drooping ears, the enormous dewlap, as well as in coloration and habits. It is usually ashy gray, but cream, white, and even black varieties occur, as well as forms showing reddish tints. The disposition is gentle, and in India the animals are used for draft purposes. The sacred bulls of India, known as Brahman oxen, which are allowed to wander freely about the bazaars, belong to this species.

ZECHARIAH, eleventh of the minor Prophets in the Old Testament, was a son of Berechiah and a grandson of Iddo. During the period following the Jews' return from exile, Zechariah and the prophet Haggai were associated in the rebuilding of the Temple, completed 516 B.C. (Ezra 4,5). Having called on his people to repent of their sins, Zechariah recorded a series of visions expressive of his hope of a glorious future for Jerusalem—its enemies overcome, its exiles returned, its sins forgiven, its priesthood spiritually revitalized, and its Davidic line of kings restored. According to some critics, chapters 9-14 of the Book of Zechariah were written by a later writer, or by several later writers. These chapters promise that doom shall befall Israel's enemies, that the scattered Jewish people shall be reunited, and that a Messianic king will surely appear. See BIBLE; OLD TESTAMENT.

ZEDEKIAH, reign name of Mattaniah, the last king of Judah, was placed on the throne, 597 B.C., by his uncle, the Babylonian king Nebuchadnezzar II, after an unsuccessful Jewish revolt. Disregarding the advice of the prophet Jeremiah, Zedekiah allied himself with Egypt and revolted against Babylonian rule, 588 B.C. Jerusalem was besieged and destroyed, 586 B.C., and Zedekiah was captured, blinded, and taken to Babylon.

ZEELAND, province, SW Netherlands; bounded by the province of South Holland on the N, North

Brabant on the E, Belgium on the S, and the North Sea on the W; area 651 sq. mi.; pop. (1958) 283,356. Zeeland consists of the islands of Schouwen, Tholen, North Beveland, and Walcheren, at the mouths of the Maas, Waal, and Schelde Rivers, together with the South Beveland Peninsula, and a section of the mainland to the south of the Wester Schelde estuary of the Schelde River. Much of the area lies below sea level, and is protected by dikes and embankments. Wheat, rye, barley, fruit, and beets are grown in the unusually fertile soil, and there is considerable commerce in dairying products and cattle. Fishing and oyster breeding are also important. The capital, Middelburg, is on the island of Walcheren.

ZEEMAN, PIETER, 1865-1943. Dutch physicist, was born in Zonnemaire, and educated at Leiden University, where he worked in research with his teacher, Hendrik A. Lorentz, 1890-97. He became a lecturer in physics at the University of Amsterdam, 1897, a professor of physics there, 1900, and director of the Amsterdam Physical Institute, 1908. His discovery of the Zeeman Effect, 1896, proved one of Lorentz's predictions and supplied a proof for the electromagnetic theory of light. Zeeman and Lorentz won the 1902 Nobel prize for physics "for their investigations concerning the influence of magnetism upon the phenomena of radiation."

ZEEMAN EFFECT, a phenomenon discovered by Pieter Zeeman in 1896. He observed that the two yellow D-lines of sodium are split into a number of components when the sodium flame is placed between the poles of a strong magnet. This discovery made it clear that the process of emission can be influenced by strong magnetic fields. The Zeeman effect can also be observed in absorption, as well as emission. The effect observed in absorption, however, is known as the inverse Zeeman effect, and on the basis of it, can be concluded the fact that absorption processes are also influenced by magnetic fields. Studies based on the number, spacing, intensity, and polarization of the lines of Zeeman patterns give information about the energy levels from which these lines resulted. For this discovery, Zeeman shared the 1902 Nobel prize in physics with Hendrik Lorentz.

ZEISBERGER, DAVID, 1721-1808, missionary for the Moravian church in America, was born in Moravia, emigrated to the Moravian colony in Georgia, 1738, and moved to Pennsylvania, 1739. He associated for several years with the Iroquois on the Eastern frontier, became a missionary to the Delaware Indians, 1763, founded a Christian Delaware colony in the Tuscarawas Valley, Ohio, 1771, and after its dissolution during the American Revolution, spent the remainder of his life in founding new Moravian colonies among the Indians in the West and in Canada. Zeisberger wrote a number of religious works in the Delaware Indian language.

ZEISS, CARL, 1816-88, German optical manufacturer, was born in Weimar, and studied for the medical profession. The Carl Zeiss factory, founded in Jena, 1846, became noted for excellent optical instruments. The physicist Ernst Abbe became associated with Zeiss, 1866, and his optical research made the firm world famous. The two formed a partnership in 1875.

ZEITZ, city, E Germany, in the East German district of Halle, on the Weisse Elster River; 23 miles SSW of Leipzig. Zeitz has manufactures of textiles, machinery, musical instruments and tobacco products. Coal and mineral oil are produced in the vicinity. During parts of the tenth and eleventh centuries the city was the seat of a bishop, which later was moved to Naumberg. Zeitz remained under the control of a bishop until 1564, when it came under the administration of the princes of Saxony. From 1653 to 1718 it was the capital of the Duchy of Saxe-Zeitz; in 1815 it was annexed by Prussia. Pop. (1958) 45,000.

ZELAYA, JOSÉ SANTOS, 1853-1919, Nicaraguan statesman, was born in Managua. Zelaya be-

came president of Nicaragua following the overthrow of Roberto Sacasa, 1893, and ruled dictatorially until overthrown, 1909. In an effort to re-establish the Central American Federation he seized the autonomous Mosquito Coast, 1904, and fomented revolution in neighboring countries, 1907-08. Latin American and U.S. opposition to Zelaya's ambitions ultimately resulted in his downfall.

ZELÉNODOLSK, city, U.S.S.R.; W Tatar Autonomous Soviet Socialist Republic, within the Russian Soviet Federated Socialist Republic; on the Volga River; 25 miles W of Kazan. The city is an important river port, a rail junction, and an industrial center. Food processing, shipbuilding, and wood-working are the major industries. Shoes, knitwear, porcelain, bricks, plywood, and agricultural machinery are manufactured. Zelenodolsk was made a city in 1932. Prior to 1940, the city was called Zeleny Dol. Pop. (1959 est.) 57,000.

ZEN, one of the many Buddhist sects of Japan, probably did not appear before the seventh century of the Christian Era, but by 1394 it was so highly respected that the Shogun Yohimitsu willed to it his golden palace in Kyoto. After 1927, when D. T. Suzuki began to write on Zen in English, Zen came to represent the application of Buddhism to an individual's inner life, as distinct from other more social aspects of Buddhism, whose older schools had focused on the needs of life at court, in the cities, or in the aristocracy. Zen, instead, concentrated on the needs of the individual soldier—hence, perhaps, its more ready applicability to rootless individuals of the Western world, for many of whom Zen has a considerable appeal.

Although the word *Zen* is of Indo-European origin, there is no exact equivalent for it in English or in any European language. Japanese *zen* comes from Chinese *Ch'an*, *Ch'anna*, which in turn derives from Sanskrit *dhyāna*. This Indo-European root points to a state of "astonishment," or "the sense of wonder," and it is better for the uninitiated Westerner to seek in this direction for an understanding of *Zen*, than to translate the term as "enlightenment" or "meditation," two common translations that actually will handicap a Westerner who seeks to understand Zen.

The Westerner, persuaded by Plato and subsequent tradition that mind and body, and object and subject, are separate, considers "consciousness," as such, a blessing. A result of this is that terms that describe or suggest a human state of being—such as "enlightenment," "meditation," or the stronger term, "illumination"—are unconsciously taken to mean states of *consciousness*; that is, they are taken to be exclusively mental states in which the body is an irrelevancy at best. For the exemplar of Zen, however, *Consciousness* is a danger sign and *Will* is a sickness, and the presence of either proves that a man has fallen from grace. *Zen* is a way for one to come into harmony with the universal, all-permeating rhythm of the cosmos. When *Zen* operates successfully, the symptoms of disharmony, *Consciousness* and *Will* (and the resulting bifurcation of one's being into *Body* and *Mind*) disappear so that one is left in a condition of quiet "elation." The famous case history of a European student of *Zen* archery serves to illustrate much of this. For six years, 1929-35, the German philosopher Eugen Herrigel studied the art of shooting with bow and arrow with a *Zen* master. Too much *Consciousness* and *Will* were the prime and continuing obstacles to Herrigel's progress. In every single phase of the study—tightening the bow, taking aim, letting go—the painful process was the same: As a European, Herrigel would try hard to will his actions and to remain conscious of them—to master them. But in each phase the "I" of Herrigel had to give way to the "It" of "It tightens," "It aims," "It shoots." The goal, as Herrigel put it, was to realize that "Tightening, Shooting, Aiming are taking place in the target, in the bow, in the arrow, and in myself." Bow,

arrow, the shot, the arrow passing through the air—all belong to one continuous rhythm.

The Zen adept participates best when he is simply breathing, aware of nothing but of the fact that he is breathing. While Will and Consciousness set one against the objective world, mere breathing immerses one into the universe in such a manner that it is impossible for one to distinguish the flow of life in oneself from the flow of life in others. Thus, the main Zen experience may perhaps best be termed "immersion," rather than elation, if immersion is understood to mean being caught by the rhythm that permeates reality to such a degree that it is impossible to decide who moves whom and who is moved by whom. In Zen, the fighter with the sword, the gardener arranging flowers, the painter with his brush, must forget "themselves." A lesson in such forgetting of self, the first step in the training of a Zen monk, is called *ko-an*, while the state of being aimed at is called *Satori*, but the Zen nomenclature is infinite and no one terminology has absolute validity. The dignity of the Zen teacher is truly remarkable: he does not "teach" in the Occidental manner by rational analysis, for his *doing* is his teaching. The pupil, for his part, cannot learn unless he first has made all his own mistakes (which Western teachers try to spare him); until the pupil has come to his own wit's end, he cannot even begin to understand the teacher. On the other hand, when the pupil outgrows his self, his identification with the teacher is more complete than any known in the West. As Zen wins one who had defected back into membership inside the cosmos, the pupil loses interest in stressing his own achievements.

The twentieth century Western interest in Zen may be regarded as a phase in the response of the West to its own scientific, technological, and military victories over Asia: the conquered, as so often happens, have inoculated the conquerors with some of their own spirit. After 200 years of Western conquest, the new interest in Zen is, at the very least, a worthy attempt to save one of the finest achievements of the East. By his English writings—especially three series of *Essays in Zen* (1927-34) and a *Manual of Zen Buddhism* (1935)—D. T. Suzuki of Kyoto made Zen an article of export. Among other exporters and importers are Alan Watts, in *Spirit of Zen* (1936) and other works, T. Christmas Humphreys in *Zen Buddhism* (1949), Sohaku Ogata in *Zen for the West* (1959), and Paul Reps in *Zen Telegrams* (1959).

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ZEND-AVESTA, the sacred books of the Zoroastrian religion. The Zend-Avesta contains treatises on astronomy, medicine, botany, agriculture, and philosophy, as well as religious myth, prayers, and moral precepts. The original work, consisting of 21 books, was supposedly destroyed either during the invasion of Persia by Alexander the Great or after the Arab Conquest. One book and a few fragments survived. See **ZARATHUSTRA**; **ZOROASTRIANISM**.

ZENGER, JOHN PETER, 1697-1746, colonial American publisher, was born in Germany, and was brought to New York in 1710. After serving an apprenticeship under William Bradford in the printing trade, 1711-19, he started in business for himself as founder of the *New-York Weekly Journal*, 1733. Because of its virulent criticism of the government, probably written by some of his backers, he was arrested, imprisoned, and tried for criminal libel. The authorities were determined to secure a conviction, and it soon became evident that the judges were similarly disposed. Andrew Hamilton, Zenger's lawyer, argued

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The zeolites have the important property of exchanging their alkali metal content (sodium) for calcium and magnesium when hard water is passed over them. Artificially prepared substances similar in composition to natural zeolites are employed as water softeners. They are double silicates of sodium and aluminum (with an approximate chemical formula of $\text{Na}_2\text{Al}_2\text{Si}_5\text{O}_{10} \cdot 2\text{H}_2\text{O}$) and are prepared by melting together kaolin, quartz, and sodium carbonate, and washing with water. After a period of use for softening of water the zeolite is regenerated by passing through it a 10 per cent solution of common salt, NaCl.

ZEPHANIAH, ninth of the minor Old Testament prophets, who lived and labored during the reign of Josiah, 638?-608. Prior to 621, and probably during the period 630-624, Zephaniah condemned his people for their sins; foretold a universal and wrathful judgment of God on the nations, from which only the godly remnant of Judah would escape; and described the glory that would be the Jews' after their delivery from captivity. See BIBLE; OLD TESTAMENT.

ZEPHYRINUS, SAINT, died 217, pope from 198 until his death, was described by early historians as a simple, uneducated man. During his reign controversies as to the nature of the Trinity raged and were the cause of several schisms. The pope seems to have been out of his element in dealing with doctrinal matters, in which he was completely overshadowed by Hippolytus, who was the most important theologian of the era, and himself the leader of a schismatic faction.

ZEPHYRUS, in Greek mythology, a gentle breeze from the west that gives life to plants. Zephyrus was a son of Astraeus and Eos, and brother of Boreas, the north wind.

ZEPPELIN, COUNT FERDINAND VON, 1838-1917, German army officer and airship designer, was born in Constance, Baden, and studied at the University of Tübingen. Zeppelin joined the army, 1858, served as German attaché to the Union army in the U.S. Civil War, and fought in both the Austro-Prussian and Franco-Prussian wars, retiring as general of cavalry, 1891. Becoming a designer of airships, Zeppelin introduced the principle of the rigid airship, later called the Zeppelin or dirigible, 1898, and built the first successful one, 1906. Zeppelin established a factory at Friedrichshafen for the manufacture of Zeppelins, 1908, but a series of disasters limited his financial success. See BALLOON, History of Ballooning, *Airships*.

ZERAUSHAN RIVER, U.S.S.R., rises in the Pamir in E Tadzhik Soviet Socialist Republic; flows generally W past Samarkand, turns SW past Bukhara, and dries up in the sand NE of the Amu Darya. Water from the Zeravshan is used to irrigate almost one million acres. The valley is fertile and well cultivated; rice, peaches, grapes, millet, apricots, and barley are grown.

ZERKA RIVER, or Jabbok River, tributary of the Jordan River, N Jordan; rises in the hill country

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The zeolites have the important property of exchanging their alkali metal content (sodium) for calcium and magnesium when hard water is passed over them. Artificially prepared substances similar in composition to natural zeolites are employed as water softeners. They are double silicates of sodium and aluminum (with an approximate chemical formula of $\text{Na}_2\text{Al}_2\text{Si}_5\text{O}_{10} \cdot 2\text{H}_2\text{O}$) and are prepared by melting together kaolin, quartz, and sodium carbonate, and washing with water. After a period of use for softening of water the zeolite is regenerated by passing through it a 10 per cent solution of common salt, NaCl.

ZEPHANIAH, ninth of the minor Old Testament prophets, who lived and labored during the reign of Josiah, 638?-608. Prior to 621, and probably during the period 630-624, Zephaniah condemned his people for their sins; foretold a universal and wrathful judgment of God on the nations, from which only the godly remnant of Judah would escape; and described the glory that would be the Jews' after their delivery from captivity. See BIBLE; OLD TESTAMENT.

ZEPHYRINUS, SAINT, died 217, pope from 198 until his death, was described by early historians as a simple, uneducated man. During his reign controversies as to the nature of the Trinity raged and were the cause of several schisms. The pope seems to have been out of his element in dealing with doctrinal matters, in which he was completely overshadowed by Hippolytus, who was the most important theologian of the era, and himself the leader of a schismatic faction.

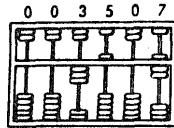
ZEPHYRUS, in Greek mythology, a gentle breeze from the west that gives life to plants. Zephyrus was a son of Astraeus and Eos, and brother of Boreas, the north wind.

ZEPPELIN, COUNT FERDINAND VON, 1838-1917, German army officer and airship designer, was born in Constance, Baden, and studied at the University of Tübingen. Zeppelin joined the army, 1858, served as German attaché to the Union army in the U.S. Civil War, and fought in both the Austro-Prussian and Franco-Prussian wars, retiring as general of cavalry, 1891. Becoming a designer of airships, Zeppelin introduced the principle of the rigid airship, later called the Zeppelin or dirigible, 1898, and built the first successful one, 1906. Zeppelin established a factory at Friedrichshafen for the manufacture of Zeppelins, 1908, but a series of disasters limited his financial success. See BALLOON, History of Ballooning, *Airships*.

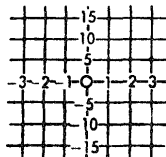
ZERAVSHAN RIVER, U.S.S.R., rises in the Pamir in E Tadzhik Soviet Socialist Republic; flows generally W past Samarkand, turns SW past Bukhara, and dries up in the sand NE of the Amu Darya. Water from the Zeravshan is used to irrigate almost one million acres. The valley is fertile and well cultivated; rice, peaches, grapes, millet, apricots, and barley are grown.

ZERKA RIVER, or Jabbok River, tributary of the Jordan River, N Jordan; rises in the hill country

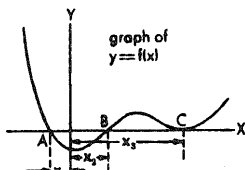
near Amman, flows NE and then W to enter the Jordan River near Damiya. The river has a total length of 80 miles.



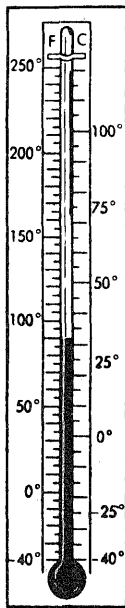
Beads on three wires of this abacus indicate zeros. The set of five beads on a wire is used to count ones, and the set of two, to count fives



The zero point of the horizontal and vertical scales is the origin O of these rectangular coordinates



The X—coordinates of points A, B, and C are the zeros of the function represented by the curve



0° F, temperature of a snow and salt mixture; 0° C, temperature of a mixture of water and finely pulverized ice

ZERO, both a symbol that denotes the absence of number, and also a number. In the former sense it is the empty column of a counting board or abacus, the absence of a unit in its place, ten's place, and so on, that makes possible the distinction between such numbers as 23, 203, and 2003. (See **ABACUS**; **NUMBER**.) As an ordinal number, zero is the origin of both the positive and the negative sets of numbers.

The properties of the number zero in arithmetical procedure are: $a+0=a-0=a$, and $0-a=-a$; $0 \times a=0$; $0 \div a = \frac{0}{a}$, provided a is not 0; $\frac{a}{0}$ is an operation that is meaningless; and $a^0=1$.

To see why, in the fourth category above, division by zero is meaningless, assume momentarily that b is the quotient when any number a , that is not zero, is divided by zero, or $\frac{a}{0}=b$. Multiplying both sides of the equation by the denominator gives $a=0 \times b=0$; but this cannot be true since a was specified as not 0; moreover, there is no number b such that the product of $0 \times b$ is different from zero. Thus division by zero is an operation that cannot be defined, is therefore meaningless, and not a permissible operation.

Occasionally the quotient of dividing one function of a variable by another function, such as one polynomial by another, takes the form of $\frac{0}{0}$ for some particular value of the variable. The evaluation of this so-called indeterminate form is discussed in the article bearing that title. See **FUNCTION**; **POLYNOMIAL**; **INDETERMINATE FORM**.

In the last of the categories, the reason that a value of the number one is assigned as the value of any expression that has zero for an exponent, is given in the article **EXPONENT**. Thus, $a^0=1$, $27^0=1$, $(x+Y)^0=1$. It is also possible to assign a meaning to the quantity called factorial zero, namely $0!=1$. See **FACTOR**.

The zero of a polynomial or a function in the variable of x , is the value of x for which the polynomial or function is zero. At this value of x , the curve of the polynomial or function crosses the X axis.

ZERRAHN, CARL, 1826–1909, U.S. musician, was born in Malchow, Mecklenburg. He emigrated to the United States in 1848, and there exerted a powerful influence as a conductor of important concert series and musical festivals.

ZEUS, the highest god of ancient Greece, called by Homer "the Father of Gods and Men." Before being brought to the Aegean Peninsula from the



CHICAGO ART INSTITUTE
Zeus

East, his name was *Dyau-h*, or *Dyaus* (compare Germanic *Tiu*, which survives in *Tuesday*, in Latin *Jupiter* and *Juno*, and also in Lithuanian). As such, he was the God of Daylight worshiped by the Greeks before they became Greeks—that is, before they came into what is now Greece, ?1800 B.C. In one of their first halts, in Dodona, Epirus (near modern Dhódhoni), the Indo-European name for his consort was still preserved as "Dione" (Latin *Juno*). During the early period he was worshiped in an oak grove; and the Oriental and Mediterranean form of worship in temples did not

make itself felt until the Greeks had entered Thessaly, where Mount Olympus, 9,730 feet high and obviously unclimbable, seemed to form the link between heaven and earth and seemed a proper abode for the light-and-sky god Zeus. The history of the religion of Zeus centers on this fusion of Zeus (*Dyau-h*) as the moving spirit of light of migrating tribes and Zeus conceived as having a fixed residence on one definite mountain peak. Greek religion became Zeus-religion. In every corner of the multipartite peninsula, on every island, and in the Greek colonies of Asia Minor, a sanctuary of Zeus was to be found. For Homer, Zeus also resided on Mount Ida above Troy, and on Mount Ida on Crete, but his central palace was Mount Olympus. The name of Olympus was transferred to Olympia, in the deep south of Greece, when games that united the Greeks every four years were instituted in honor of Zeus and named the Olympics.

In all areas over which this Olympian Zeus came to rule, Hera was declared to be his sister and consort. This name, which replaced the "Dione" of the migration, also superseded the names of many Pelasgian and Oriental goddesses, such as Demeter, who before had been the guarantors of fertility. Zeus, similarly, displaced Poseidon and other prince-consorts in the rituals of the fertility goddesses. By calling his wife Hera, the followers of Zeus secured for themselves a lasting role during the new period of permanent settlement in Greece—for the words *Hera* and *hero* are not accidentally of the same root. Thus, the heroes of the cities and explorers of the sea from island to island, claiming to be "Zeus-born" (*diogenes*), endowed Hera locally and gave her an economy, a domestic dowry; the name of their archetype Herakles, or Heracles, which means "He who makes Hera famous," expressed this relation (see **HERCULES**). Such a creative relation of men and gods was the new and unique feature of the religion of Zeus. Correspondingly, there developed the cult of

a Zeus-Agamemnon in Sparta, where god and hero formed an indivisible unity; that is, the living king was considered to be Zeus incarnate.

Zeus' Conquest of all the scattered landscapes was no simple matter, of course, for in antiquity no former god ever was allowed to vanish; hence, in each of the various localities the pre-Zeus deity survived under a thin disguise. On Crete, for example, the youthful god of spring, Linus-Attis, died every year and had to be lamented by wailers; instead of dislodging Linus-Attis, the Cretans declared that Father Zeus, when a baby, had been nursed on their island, and they showed the cave around which the noisy worshipers had danced. Later, a "little Zeus," Dionysos (Dionysos), was introduced as his heroic son (see Diony). In arcadia, a pre-Greek wolf-god continued to demand human sacrifices, although the name of Zeus was bestowed on this man-eater. The solution found by the Zeus religion for the sanctification of lands under the plow was more than merely acceptable to the earlier inhabitants of Greece, whose former ritual, imported from the Orient, had never quite suited Greece either climatically or astronomically. But Zeus, as the god of lightning, thunder, and rain, offered the same advantages as Noah's unpredictable rainbow in the Bible—Zeus was simply incalculable, and faith in him freed the Greeks from the astrology of the Oriental Zodiac and constellations in the sky. Homer, to be sure, still spoke of an annual sacred union of sky and earth, but did so in humanistic terms. That Zeus was "human" during all of antiquity is illustrated in the New Testament (Acts 14), where Barnabas is mistakenly thought to be Zeus (Jupiter), and the priest of the next Temple of Zeus hurries to slaughter bulls in honor of this god Zeus in human shape.

Theogony. A theological pedigree for the sky-god was the work of many generations of theogonists, men who preceded the philosophers of a later age in unending efforts to systematize religion. Athena, or Athene, became Zeus' motherless daughter—motherless because before Athena's birth Zeus had transformed Metis into a fly and swallowed her, so that Athena had later to spring full-grown from Zeus' head. With Hera, Zeus begot Hebe, whose name means "eternal youth." The deities Apollo, Artemis, Aphrodite, Ares, Hephaestus, and Hermes were among those who were called Zeus' children. Rhea and Kronos (Cronus) were named as his parents, and "Heaven" and "Earth," Ouranos (Uranus) and Gaia (Ge), were recognized as the grandparents. The older deities Poseidon and Hades, whose roles on sea and underground Zeus often took onto himself, were eventually admitted to the pantheon as his brothers. The oldest reported wooden statue of Zeus, about which scholars have long debated, should probably be ascribed to the period before the admission of Hades and Poseidon, for it is said to have depicted Zeus as three-eyed—most probably because he required an eye for each of his roles as master in the sky, below the earth, and on the sea.

The memory of his having come as a new and controversial god apparently was never lost. Zeus had to fight against the past, against his contemporaries, and against new upstarts, and the glamour of his Olympian government was a thin sheen below which immense dangers collected. But with overwhelming power Zeus slew the older Gods, even his father, Kronos (Cronus), after whom he was often addressed as "Kronion." Zeus also slew the rebellious Titans, the insurgents of his own generation, and the Giants, rebels of later times. Prometheus, bound to the Caucasian Rock, fell under the cruel visitation by the Eagle of Zeus. And his shieldlike weapon, the *egis*, (shake), caused heaven and earth to tremble. Zeus' good grace, however, fell upon the daughters of men who, in parallel to the heroes in Hera's service, were pressed by Zeus into service for some specific task. To Alkmene he appeared as Amphitryon, and

Herakles sprang from the union. Europa bore him Minos; Leda bore him Helena; Danaë bore him Perseus; and Semele bore Dionysos. In a queer parallel to Athena's motherless birth from Zeus' forehead, Dionysos (Little Zeus), having lost his mother Semele by lightning as a result of Hera's jealousy, perfected his prenatal growth in the thigh of Zeus, his father.

Artistic Representations. Except for the one reported three-eyed statue, Zeus was apparently always depicted in perfect human form, as a fatherly and majestic deity; sometimes standing, sometimes seated; nearly always bearded; and usually half-clad. The most famous statue, inspired by Homer's *Iliad* (Book I, lines 528 to the end), was the Zeus of Olympia, erected by the Athenian Phidias (Phidias) after A.D. 450. It was 15 yards high, and made of gold and ivory, and showed Zeus carrying a Goddess of Victory, a "Nike," in his hand. See MYTHOLOGY, Origins and Implications of Myths, *Rationalization, Myth and Ritual, The Psychology of Myth, The Principal Pantheons, Greek.*

EUGEN ROSENSTOCK-HUESBY
ZHDANOV, ANDREI ALEKSANDROVICH
1896-1948, Soviet official, was born in Mariupol (later Zhdanov), Ukraine. He joined the Bolshevik party at the age of 19, and after the Revolution of 1917 served as a Communist party official in the Urals, Central Russia, and Leningrad. He became secretary of the Central Committee of the Communist party, 1934, a member of the Politburo, 1935, and chairman of the Supreme Soviet of the Russian Soviet Federated Socialist Republic Union, 1938. Zhdanov was a general in the war with Finland, 1939-40, and during World War II distinguished himself in the defense of Leningrad, which was besieged but never captured by the Germans. After the surrender of Finland, September, 1944, Zhdanov was appointed to head the Soviet-British control commission supervising Finnish armistice conditions. He played a key role in the organization, 1947, of the Communist Information Bureau, successor to the Communist International.

ZHDANOV, formerly Mariupol, city, U.S.S.R., Ukrainian Soviet Socialist Republic, S Stalino Region; on the Sea of Azov at the mouth of the Kalmius River; 60 miles SSW of Stalino. The city is a major industrial and metallurgical center, bordering and drawing important natural resources from the Donets Coal Basin, just to the north. Graphite deposits also are found in the vicinity. Steel, machinery, chemicals, fish netting, and clothing are manufactured; fish canning and shipbuilding are other important industries. Zhdanov is an exporting center for coal, salt, and grain; the major import is iron ore from Kerch in the Crimea. A metallurgical institute, an early Greek cathedral, and a regional museum are located in the city. Zhdanov was founded by Crimean Greeks in the 1880's, and its population was originally predominantly Jewish and Greek. The city was called Mariupol until 1948, when it was renamed Zhdanov after a Soviet statesman who was born in the city. Pop. (1959 est.) 273,000.

ZHITOMIR, region, U.S.S.R., N Ukrainian Soviet Socialist Republic; bounded N by Gomel Region of the Byelorussian Soviet Socialist Republic; and E by Kiev, S by Vinnitsa, SW by Kamnec-Podolskiy, and W by Rovno regions of the Ukraine; area 11,600 sq. mi.; pop. (1959) 1,603,000. The Terev, a tributary of the Dnepr, drains most of the region. Zhitomir is a stock-raising area and buckwheat is an important crop. The area has deposits of quartz, sand, and kaolin, which supply glassware and pottery plants. Lumbering is important in forested northern Zhitomir. The capital is Zhitomir.

ZHITOMIR, city, U.S.S.R., N Ukrainian Soviet Socialist Republic, capital of Zhitomir Region; on the Terev River, a tributary of the Dnepr River; 77 miles W of Kiev. Zhitomir's principal industries are furniture and footwear manufacturing, and distilling. Granite and ironstone deposits are nearby.

in Mora. After graduation from the Stockholm Art Academy, where he had studied sculpture and water-color painting, Zorn traveled in Europe, North Africa, and the Near East before settling in London, 1882, where he studied etching and produced the first of his highly successful oil paintings. He went to Paris, 1888, and there became interested in the work of the early Impressionists, Pierre Degas and Edouard Manet. In 1895 he made the first of many trips to the United States as Swedish Art Commissioner for the World's Columbian Exposition. From 1905 he spent most of his time in Mora, where he dedicated himself to the painting of the Nordic countryside and its inhabitants.

In addition to his depiction of the simple, rustic scenes of his Swedish homeland, Zorn painted many nudes and portraits of fashionable persons, and became one of the most popular painters of his day. Notable among his paintings are *King Oskar II and Prince Charles of Sweden*, *Maja*, *Movement of Waves*, and *Girls Bathing*. Zorn's paintings, however, were overshadowed by his etchings. His fine line and his interplay of light and dark mark him as one of the few modern masters of this technique. Of particular interest among his etchings are *Mona Lieberman*, and *Self-Portrait*. Among his sculptures are *Fawn* and *Nymph*, and a bronze relief, *Head of Gustav Masas*.

MARTIN GROSZ

ZOROASTRIANISM, the religion of the Persian (Iranian) prophet and founder Zarathustra and his followers (see ZARATHUSTRA; PERSIAN LANGUAGE AND LITERATURE). By all rights the religion should be called "Zarathustrianism" or some such thing, but the ancient Greeks transliterated Zarathustra's name as "Zoroaster," and the name "Zoroastrianism" for the religion, sanctioned by long and customary usage, endured even after Zarathustra's true name became known to scholars during the eighteenth century. It was principally through the efforts of the French scholar Abraham Hyacinthe Anquetil-Duperron (1751-1805) that the genuine Persian texts of Zarathustra's religion were rediscovered and published as *Zend Avesta* (3 vols., 1771). It was only in the twentieth century, thanks to the researches of Ernst Herzfeld and others, that the full significance of Zarathustra and Zoroastrianism could be appreciated. Zoroastrianism was of vital importance in the history of the Persian Empire, and, still more significantly, in the transition from the polytheism of antiquity to the monotheism of the Christian Era.

The Parsees. The religion is still practiced by about 100,000 worshippers, the Parsees, most of whom live in or near Bombay, India, whither their ancestors came, carrying their sacred books, following the conquest of Persia by Islam (see PARSEE). Those who adhere most faithfully to Zarathustra's original teachings still live by four tenets stressed in Zoroastrianism from its earliest period: (1) In every moment of his life, the believer should feel the presence of the one God-of-gods, Ahura Mazda, and should think, speak, and act as if he were under His immediate guidance; (2) he should be generous and charitable; (3) he should be obedient—children to parents, wife to husband, pupil to teacher; and (4) he should till the soil himself.

Zoroastrianism and Judaism. In everyday affairs the Parsees speak the language of the area in which they live, but their prayers are uttered in an ancient language of Persia. Some of the Parsees have as poor an understanding of these prayers as do many Roman Catholics of prayers in Latin and modern Jews of prayers in Hebrew, with the harmful result that the research of Western scholars has advanced independently from Zoroastrian religious practice. Many scholars, not sufficiently acquainted with such practice, have seriously misinterpreted the religion. Most secular scholars and most Christian theologians seem unable, for example, to understand that Zoroastrianism has no "theology" as such. This religion,

like Judaism, totally excludes from consciousness the Greek manner of "objective" reasoning.

It is no accident that the Parsees are commonly called the "Jews of India"; and, though few in number, as well known in India as the Jews are in the West; and are, like the Jews, admired for their courage, wisdom, their liberality, and their personal integrity, honesty, and reliability. Both Jews and Parsees have a special daily ritual that has a purpose unknown in Christianity, with its inherited monotheism. For Parsees, as for Jews, ritual is meant to train them in a daily attitude against their ever-present foe, polytheistic Zoroastrianism is not a collection of systematic abstractions about God (theology) or "Reality" (philosophy); it is rather the perpetual affirmation of faith in One God by means of the daily exposure of, and resistance to, the "cheat" by which many dominions ("gods") may alternately overwhelm a man, asking his whole allegiance. Thus, such "gods" as victory in war, bountiful harvest, peace of mind, storm, earthquake, flood, famine, sex passion, and so forth, may at times seem ultimate and all-important. Zoroastrianism, as religious endeavor, concentrates on the effort to generate in believers those actions by which they may prove to themselves, and to the world, that God actually is One, despite deceptive appearances to the contrary. Christians, on the other hand, knowing from the outset that God is One, are the more prone to succumb to the temptation of calling Him an "Idea," or a "Concept," as is done in much (perhaps most) theological activity.

The earliest rulers of the Achaemenid Dynasty of the Persian Empire, Cyrus I and his son, Cambyses II, adhered to the ancient polytheistic Indo-European religion, but Cyrus' cousin, Vistasp (Hystaspes) and the latter's son Spandata, who was given a Zarathustrian name—(Dareios, or Darius), convinced themselves of the Oneness of the Creator not solely of their own land but also of the many lands subjugated by them. Since, on their inscriptions, Darius I listed 25 large countries as having been conquered by him, and his son Xerxes listed 29, the Zoroastrian monotheism was obviously of great political importance. Zarathustra's prayers, the Gathas, on the other hand, seem totally lacking in any purely practical motivation. Zoroastrianism was, therefore, the free gift of a pure and truly inspired seer to the house of Vistasp. It is not known whether Zarathustra ever came in contact with any Jews or whether he had heard of Jewish monotheism, but it would seem rather likely that Deutero-Isaiah 45:7 (Isaiah 45:7) influenced Zarathustra's Yasna 44, or vice versa, since both specifically exult in the Oneness of the God who created Light as well as Darkness, Good as well as Evil, Sleep as well as Wakening.

Divine Names. Zoroastrianism is the invocation of the One and Only God, against the many, by an unmistakable name, Ahura Mazda. That divine names are of the essence in any religion is well illustrated in this instance. The name Ahura Mazda reveals, with great precision, the new level reached by Zoroastrianism over the previous levels of the Iranian tribes, with their cults of the grave (one might visit the spirits of one's ancestors at their graves), and of such neighboring "temple states" as Sumer and Babylon whose gods, such as Varuna, Mithra, and Indra, had shone "outside"—were cosmically "visible." By invoking the divine name Ahura Mazda (later Ormuzd), Zarathustra rejected such external manifestations of the divinity, both uprooting the tribal cults and downgrading the shining gods. In the name Ahura Mazda, he invoked that divine spirit *astun* us who makes us speak; to the believer, the name Ahura Mazda expresses the meeting of the believer's loving mind and the Creator's truthful spirit. This meeting is the meaning of the name Ahura Mazda. This name, as the revelation of Zarathustra, is similar to that of the name Jahve (Yahweh) as the revelation of Moses. See NAME.

Inner and Outer Divinity. By this name, Ahura Mazda, the *inner* team of God and soul is exalted above and beyond any of the cosmic apparitions in the external world. The daily application of this new revelation was in the constant warfare against the "drugas," the lies, the cheat—the temporary devils that may subdue us and lure us to their service—devils that were once the legitimate gods. To Zoroastrianism, Judeo-Christian religion owes much, at least, of its clear conception of the existence of powers who resist the one and only true God. Old and partial gods are imperishable; they never vanish without a trace because they have been glimpses of the eternal—but only glimpses. The Old Testament and the New Testament probably owe to Zoroastrianism not only their doctrines of the angels and archangels, but also their awareness of the Devil—the Father of Lies, "Angry Mind," Ahriman, whose name is legion. The invocation of Ahura Mazda was to steel the worshiper so that he might rise above petty self-interest, routine, custom, sloth, resentment, fear, vengeance, and all the other devilish things that govern most human responses or reactions to daily circumstances. The One was invoked to subdue these little devils by creating in the worshiper a sense of teamship with his creator.

In awakening in the believer this source of spiritual strength, Zarathustra reversed the meanings of earlier expressions for the outer and inner movements of the divinity. The term *Deus*, the Indo-European word for "the mighty gods" (and the source for the Iranian *dēva*, or *daevas*) was degraded to mean the merely first (and therefore false) impressions; while *ahura*, previously a relatively unimportant term for the "inner cravings," was exalted. The reversal may well be realized in the prayer *Ahunaavaiti* (Yasna 29:4): "Ahura Mazda will store in his memory all the invocations of the *daevas* (the passing Gods) and of the passing mortals, which any one of both groups may have uttered in the most remote past or will utter in the most distant future."

Qua. The immense distance between the One God and the little man or fleeting moment, keenly felt once one is emancipated from the ancestral spirit and the gods of the visible world, is filled by the angels and archangels, Amesa Spentas—"the heavenly hosts," according to the Bible. In Zoroastrianism, the wealth of grammatical forms was drawn upon for the task of filling the void between God's majesty and man's lack of it. Zoroastrianism distinguished God "in so far as He is justice," "in so far as He is wisdom," "in so far as he is harmony," and so forth. Indeed, there are six and more such "arch-qualifications" of Ahura Mazda, all put in the instrumental or ablative case. The use of the word *qua* by modern philosophers and theologians echoes the Zoroastrian "in so far as." A philosopher, for example, would be comfortable saying "The President *qua* commander-in-chief," *qua* this, or *qua* that. And when theologians speak of "Jesus *qua* man," and "*qua* God," they follow Zoroastrian example. Thus, when the Parsees cremate their dead, it is not to worship fire *qua* fire (as some have mistakenly thought), but fire *qua* Ahura Mazda—fire as a symbol of the divine, purifying almightiness of the One God, who will now receive the believer untaunted.

This innovation, the "in so far as," apart from its other results, enabled Zoroastrianism to purge the State Calendar of Greater Persia of astrological features that for 2,000 years or more had fettered the agricultural civilizations. In these sacred calendars of antiquity, the natural event or process (flood, sowing time, harvest, ploughing, and so forth) was deified. King Xerxes, as a good Zoroastrian, changed this, 480 B.C., in terms of Ahura Mazda's qualifications. Only two pre-Zoroastrian months kept their names, and these understandably so: the brightest of stars, Sirius, who sets the date for the rise of the Nile waters, and the Fertile Waters—each of these

agricultural deities remained at the head of a month (much as the names Easter and Whitsunday, both of pre-Christian origin, are retained in the modern calendar). But the 10 other months were given to such "instruments" of Ahura Mazda as Harmony, Dedication, Justice, Integrity, the Longed-For Empire (in Christian language, "the Kingdom"), the Loving Mind, and the Purifying Fire. It was in the sweep of this political-religious reformation that the Temple of Jerusalem was rebuilt (Esra 4-6). Truly had the greatest Greek thinker, Herakleitos (Heraclitus) of Ephesus exclaimed, in 500 B.C.: "For those who have been awakened, the world is one community."

Division of Labor in the History of Religion. Although Zoroastrianism, as a political force, did not survive the decline and fall of the Persian Empire, Zarathustra's religion must be recognized as having been a major factor in the history of man's faith. It was an indispensable halfway house between Moses and Constantine the Great—between Yahve and Jesus Christ. Three stages may be recognized.

(1) In 1290 or 1280 B.C. Moses goes into the desert so that the local polytheistic agricultural religion can be replaced by the worship of One God. Pharaoh continues to rule but one country (Egypt) until the temple of the Golden Calf in Alexandria is closed, A.D. 394.

(2) In 530 B.C. Zarathustra convinces the younger Achaemenians that the many countries under their scepter were created, and are sustained, by One God who towers over all temporary and local divinities. Except for the Jewish Exodus into the desert and its consequences for Judaism, Zarathustra's accomplishment was akin to the Mosaic conversion, and it may be said that it required the combined efforts of Moses and Zarathustra to melt down the polytheism of the tribes and the countries.

(3) In the period A.D. 325-336, the heir to all the pharaohs, Emperor Constantine, leaves the city of Rome to the apostles of the Suffering Servant and of the One God of all mankind.

The Greek Captivity. In isolation, apart from its vital role in the interplay of the main religions as sketched above, the advance of Zoroastrianism was halted by Alexander the Great, who burned Darius the Great's city, Persepolis, and (it is said) the books of Zarathustra, 331 B.C. Subsequently, Alexander's Greeks spread childish myths about Zarathustra. It was said (for example) that he had lived 5,000 years before the Trojan War, and that the Greek philosopher Plato had been a new incarnation of Zarathustra. Greek philosophical speculation took the place of Zarathustrian piety. A God of Time was invented (Zurvan, or Zervan) and it was maintained that the gods of Good and Evil are his eternally warring children. In true, pre-theological Zoroastrianism, however, evil never was (and is not now) given equal stature with Good, for the individual believer and the Evil, or Falsehood, are seen on one and the same level, while Ahura Mazda towers infinitely high over both.

EUGEN ROSENSTOCK-HUESSY

ZOSER, or Djoser, or, most correctly, Neter-khet 2780-2720 B.C., Egyptian Pharaoh, was the founder of the Third Dynasty, and, according to tradition, the first of the Egyptian kings to build in hewn stone. The Step Pyramid near Memphis, designed by Zoser's famous advisor Imhotep, was built more than 70 years before the Great Pyramid of Khufu (Cheops), and is thus the earliest large stone structure extant. This structure, roughly pyramidal in shape, marks a transition from rectangular, flat-roofed tombs to pyramids. See IMHOTEP; PYRAMID.

ZOSIMUS, SAINT, died 418, pope from 417 until his death, was the successor to Innocent I. Except that he was of Jewish origin, nothing is known of his life prior to his elevation to the papacy. He is chiefly remembered for his part in the Pelagian controversy.

ZOSIMUS, fifth-century Byzantine historian. His history traces the decline of the Roman power from

ZUÑI, a North American Pueblo Indian tribe of western New Mexico. The Zuñi constitute a distinct linguistic family, but are otherwise similar to other Pueblo tribes. The first European known to have encountered the Zuñi was the Spanish priest Fray Marcos de Niza, who visited them in 1539. De Niza's reports of their wealth to the authorities in Mexico City resulted in the expedition of Francisco Vasquez de Coronado, who reached the Zuñi, 1540, and found their seven adobe villages a poor substitute for the cities of gold and turquoise that Fray Marcos' account had led him to expect (see *CINOLA, SEVEN CITIES OF*). During the Pueblo revolt against the Spanish, 1680, the seven villages were abandoned; the present single pueblo was built in the 1690's on the site of one of the original seven. The population of the Zuñi was about 2,500 in 1680; in 1950, there were 2,759 Zuñi Indians living on the Zuñi Reservation, McKinley and Valencia counties, New Mexico.

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ZUPPKE, ROBERT CARL, 1879–1957, U.S. football coach, was born in Berlin, Germany. He was brought to the United States, 1881, and was graduated from the University of Wisconsin, 1905. While he was head football coach at the University of Illinois, 1913–41, his teams won or tied for seven Western Conference (Big Ten) championships. He introduced the huddle and the spiral pass from center.

ZÜRICH, canton, N Switzerland; bounded N by Germany and the canton of Schaffhausen, E by Thurgau and St. Gallen, S by Schwyz and Zug, and W by Aargau; area 668 sq. mi.; pop. (1950) 777,002. Lake Zürich lies in its southern part and extends eastward between Zürich and Schwyz and between St. Gallen and Schwyz. The lake drains northwestward into the Rhine through the Limmat and Aare rivers. The canton has low mountains and fertile valleys. Much of the land is in pasture, and cattle and cereals are raised. In the south are orchards and vineyards. The mountain slopes are forested. The principal manufacturing centers are Zürich, the capital, and Winterthur. Silk and cotton mills, and plants producing machinery and railroad equipment, utilize hydroelectric power generated at plants along the Rhine River in the northern part of the canton. Most of the people are German-speaking and are Protestants.

ZÜRICH, city, N Switzerland, capital of the canton of Zürich; situated on both banks of the Limmat River where it emerges from Lake Zürich; 45 miles ESE of Basel. Zürich is the largest city in Switzerland, and the banking, cultural, and educational center of the country. The industrial area is located in the northern part of the city. Precision machinery, automotive equipment, electrical apparatus, textiles, chemicals, cement, food products, and tobacco are manufactured. Zürich is a tourist resort and has an international airport. The newer section of the city occupies land recovered from the lake, and the concert hall, the civic theater, and other public buildings are located there. Among the city's old buildings are eleventh century Grossmünster; Fraumünster, founded for nuns in the ninth century; St. Peter's; and the fifteenth century Wasserkirche which from 1631 to 1916 was the city library. The National Museum was opened in Zurich in 1898. Among the educational institutions are the University of Zürich (1523) and the Federal Polytechnic School, which was opened in 1855. Zürich is an old city, which was known to the Romans as Turicum, Huldreich Zwingli (1484–1531), a leader in the Protestant movement, was a rector of a Zürich church. Pop. (1959) 409,300.

ZÜRICH, UNIVERSITY OF, a public institution of higher education in Zürich, Switzerland, was founded by the Swiss religious reformer Huldreich Zwingli as a secondary school and theological training center, 1523, but became a university by public vote in 1832. There are faculties of theology, law and political economy, medicine, veterinary medicine, dentistry, philosophy I (liberal arts, social sciences, and education), and philosophy II (natural sciences). All instruction is in the German language.

Affiliated with the university are separate institutes for the study of the German language, dentistry, political science, and natural history. The university operates a museum of medical history and a museum of zoology, and maintains ethnological and archaeological collections and a phonetics laboratory.

ZUTPHEN, or Zutphen, city, E Netherlands, in the province of Gelderland; on the IJssel River, which flows from the Rhine River to the IJsselmeer; 57 miles ESE of Amsterdam. Zutphen is a trade center for grain and timber shipped down the Rhine River from Germany. The manufactures include leather, textiles, oil, and paper. Points of interest are a twelfth century church and the remains of the old town wall. Pop. (1959 est.) 23,793.

ZWEIBRÜCKEN, city, W Germany, in the West German state of Rhineland-Palatinate; near the French border; 18 miles E of Saarbrücken. Zweibrücken is a railroad junction, and machinery, metal products, leather, and cotton goods are manufactured. During a part of the Napoleonic period it belonged to France. It is known to scholars for an early printing press, which produced Greek and Latin classics. Pop. (1958) 33,720.

ZWEIG, ARNOLD, 1887–, German Jewish writer, was born in Glogow, Silesia, and was educated at Breslau, Berlin, Göttingen, and other German universities. During World War I he was a member of the German Labor Corps. As a prominent antimilitarist and an influential Jewish spokesman, he was banished by the Nazis, 1933, and subsequently settled in Palestine. His sardonic *Case of Sergeant Grischa* (1927), the story of a Russian war-prisoner who falls victim to Prussian bureaucracy, is the first and best known of a cycle of novels depicting the impact of war on society; later novels in the series are *Young Woman of 1914* (1931), *Education Before Verdun* (1935), and *The Crowning of a King* (1937). Among other works are *Claudia* (1912), *Ritual Murder in Hungary* (1913), *Lessing, Kleist, Büchner* (1925), *De Vriendt Goes Home* (1933), and *The Axe of Wandsbek* (1946).

ZWEIG, STEFAN, 1881–1942, Austrian writer, was born in Vienna of a wealthy Jewish family and studied at the University of Vienna. He traveled widely in Europe and Asia before settling down in Salzburg, Austria, after World War I. He went to London, 1934, to do research on Mary, Queen of Scots, and, unwilling to return to Austria, where the influence of fascism was increasing, remained in London until 1940, when he went to the United States, from where he soon moved on to Brazil, 1941. Having decided that he did not have the "immense strength [needed] to reconstruct [his] life" in this new country, Zweig and his 30-year-old wife committed suicide.

Zweig's first important literary work was the symbolic dramatic poem, *Jeremias* (1917), in which he expressed his opposition to war. Zweig, a sensitive, inward-looking personality, had an affinity for the defeated, yet as a biographer he was most attracted to triumphant creative geniuses such as Honoré de Balzac, Charles Dickens, Friedrich Nietzsche, and Lev Tolstoi. Among his works are



CULVER SERVICE
Stefan Zweig

Paul Verlaine (1913), *Drei Meister*, 1920 (*Three Masters*, 1930), *Amok*, 1922 (Eng. tr., 1931), *Verwirrung de Gefühle*, 1926 (*Conflicts*, 1927), *Sternstunden der Menschheit*, 1927 (*The Tide of Fortune*, 1940), *Marie Antoinette*, 1932 (Eng. tr., 1933), *Triumph und Tragik des Erasmus von Rotterdam*, 1934 (*Erasmus of Rotterdam*, 1934), *Baumeister der Welt*, 1935 (*Master Builders*, 1939), *Magellan*, 1938 (*Conqueror of the Seas*, 1938), *Ungeduld des Herzens*, 1938 (*Beware of Pity*, 1939), and *Schachnovelle*, 1944. (*The Royal Game*, 1944). The posthumous *The World of Yesterday* (1943) is autobiographical.

ZWICKAU, city, E Germany, in the East German district of Chemnitz; on the Zwickauer Mulde; 42 miles S of Leipzig. Zwickau is a rail and road junction and has manufactures of textiles, machinery, chemicals, porcelain, paper, glass, wire goods, aluminum, lacquer, and hosiery. St. Mary's, a fifteenth century Gothic church, was restored in the late nineteenth century. Also of interest is the Gewandhaus, a guildhall for cloth merchants, erected in the early sixteenth century. Zwickau was a trading center as early as the twelfth century. In 1470 the discovery of silver nearby brought prosperity. In 1525 the Anabaptist movement started there. The city is the birthplace of Robert Schumann, a noted German composer. The opening of a coal field nearby in 1823 increased the city's prosperity and population. Pop. (1958) 129,069.

ZWINGLI, HULDREICH, 1484–1531, religious reformer of the German Swiss (see REFORMATION), was born to wealthy parents in the highest community of the Toggenburg, Wildhaus, over which the Abbot of St. Gall ruled. As a student in Bern, Vienna, and Basel, Huldreich (or Ulrich) was raised in the atmosphere of the new Humanistic enthusiasm for the older, pre-Scholastic traditions (see HUMANISM; SCHOLASTICISM). Once ordained a priest and made a Master of Divinity, he became the curate of Glarus, and in the decade 1506–16 served his parishioners both at home and in their campaigns across the Alps in the service of the Pope. He was made an Acolyte of the Vatican, 1518, and was receiving a papal pension as late as 1520. While serving in these varied capacities he was able to observe and gain a rare degree of insight into both the local and international activities of the church. In 1513 he began and pursued the study of Greek so zealously as to memorize the New Testament in this tongue.

From 1516 until he was called to Zürich in December, 1518, Zwingli served at the center of pilgrimages, Einsiedeln, and saw the abyss between the daily practice there (particularly with respect to the granting of indulgences) and the doctrines and practices in the ancient church; by now he had clearly recognized and rejected the innovations of the Papacy. Hence, upon arriving in Zürich he demanded of the high magistrate a reformation of the church. In January, 1523, the city council acceded to Zwingli's demands and his tenets were made law for all the priests in the lands under Zürich's rule, and the obedience to the bishop of Constance ceased. On April 2, 1524, Zwingli entered into marriage with Anna Reinhart Meyer. In 1525 the Mass was abolished. The Zwinglian reform was spread through public disputations such as that in Bern, January, 1528, when Zwingli upheld 10 theses so impressively that Bern, Basel, St. Gall, and Schaffhausen joined Zürich.

The German reformer Martin Luther, however, was bent on setting the Reformation on the rock of orthodoxy, and treated the "juggler Zwingli with his juggleries" with incorrigible suspicion. After an exchange of violent writings on the Eucharist, 1528, the two men clashed in person in Marburg, autumn, 1529. While Zwingli felt that he could elucidate the operation of this sacrament as a spiritual process from the Gospel of St. John 6:51–59, where the Lord is called the Bread of Life, Luther impatiently chalked on the

table in front of him: "This is my body." At this hour the movements for reformation of the church permanently split assunder into the Lutherans and the Reformed Church. Luther's declaration of war against Zwingli laid the basis for the Thirty Years' War. In the 1600's, however, there was no question but that nine out of ten Lutherans shared Zwingli's more comprehensive view, and thus Zwingli emerged the victor in spirit. Fatal as the break between the two reformers proved to be, it must be stressed that they fought together against ranters and Anabaptists. Although not so implacable as Luther, Zwingli still acquiesced when an Anabaptist was drowned by order of the city council, 1527. It was Zwingli who provided an asylum for Ulrich von Hutten on the Ufenau, in the Lake of Zürich. See ANABAPTISTS; HUTTEN, ULRICH VON.

In distinction from Luther and John Calvin, Zwingli never lost sight of the ecumenical task of the Reformation, and thus he was more in tune with the modern ecumenical movement than they. But it is difficult to assess his full stature since his life and his religious development were cut short by his death in the Battle of Kappel, by which the five Forest Cantons, faithful to the Pope, vanquished Zürich. Zwingli's body, treated ignominiously as that of a heretic, was quartered and burned in dung.

It has been said of Zwingli that "everything in the man was grandiose" (H. Bullinger, *Reformationsgeschichte*, ed. 1838). Indeed, he envisaged an alliance of Zürich with the Protestants of southern Germany, France, Denmark, Venice, England, Bohemia, Hungary, and Turkey. Had he lived longer this vision might well have been realized, and it may be said that this one man's death incalculably changed the course of the Reformation.

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ZWORYKIN, VLADIMIR KOSMA, 1889–
U.S. electronic engineer, was born in Murom, Russia, and studied physics at the Institute of Technology, St. Petersburg, and at the Collège de France. He did radio research as a member of the Russian Signal Corps in World War I, then emigrated to the United States, 1919, and became a citizen, 1924. He received his Ph.D. from the University of Pittsburgh, 1926. Zworykin was associated with the Westinghouse laboratories, 1920–29, where he invented the iconoscope or electronic camera of the television transmitter and the kinescope or cathode ray tube of the television receiver. He directed electronic research for the Radio Corporation of America Manufacturing Company, 1930–42, 1946–54. He invented the electron microscope, 1939.

ZYGOTE. See EMBRYOLOGY; EMBRYOLOGY OF MAN; GERM CELL; REPRODUCTION.

ZYRYANOVSK, city, U.S.S.R., E Kazakh Soviet Socialist Republic, Kazakhstan Region; near the Bukhtarma River at the W end of the Atlai Mountains; 140 miles ESE of Semipalatinsk. The city is mainly a nonferrous metal-processing center, and the smelting of lead and zinc are especially important. Deposits of gold and silver are in the vicinity. Pop. (1959) 40,000.

ZYZZYVA, a genus of South American weevils belonging to the order Coleoptera. Zyzzymas are characterized by their short, thick beak with mandibles at the tip of the snout, and an oblong body that is covered with yellow scales. The larvae are whitish grubs that are cylindrically shaped and without legs. Both the larval and adult weevils like to feed on plant structures. The genus Zyzzyma is primarily found in Brazil. See WEEVIL.

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