



The New Encyclopædia Britannica

Volume 11

MICROPÆDIA

Ready Reference

FOUNDED 1768

15 TH EDITION



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First Edition	1768–1771
Second Edition	1777–1784
Third Edition	1788–1797
Supplement	1801
Fourth Edition	1801–1809
Fifth Edition	1815
Sixth Edition	1820–1823
Supplement	1815–1824
Seventh Edition	1830–1842
Eighth Edition	1852–1860
Ninth Edition	1875–1889
Tenth Edition	1902–1903

Eleventh Edition
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Twelfth Edition
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Thirteenth Edition
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Fourteenth Edition
© 1929, 1930, 1932, 1933, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973
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Fifteenth Edition
© 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993
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Printed in U.S.A.

Library of Congress Catalog Card Number: 91-75907
International Standard Book Number: 0-85229-571-5

How to use the MICROPAEDIA

The 12 volumes of the MICROPAEDIA contain tens of thousands of shorter articles on specific persons, places, things, and ideas, arranged in alphabetical order. The MICROPAEDIA can be used as an information resource on its own; and it can function as support for the longer articles in the MACROPAEDIA (to which it refers whenever appropriate). The MICROPAEDIA in turn is supported by references in the INDEX and by the lists of suggested readings in the PROPAEDIA. Finally, the MICROPAEDIA is the portion of the *Encyclopædia Britannica* best suited for the reader who wishes to browse among the countless subjects in all fields of human learning and history in all times and places.

Alphabetization

Entry titles are alphabetized according to the English alphabet, A to Z. All diacritical marks (such as in ö, ð, or ñ) and foreign letters without parallels in English (such as ayin [ʾ] and hamza [ʔ]) are ignored in the alphabetization. Apostrophes likewise are ignored. Titles beginning with numbers, such as **1812, War of**, are alphabetized as if the numbers were written out (**Eighteen-twelve, War of**).

Alphabetization proceeds according to the “word-by-word” principle. Thus, **Mount Vernon** precedes **mountain**; any **John** entry precedes **John Henry**, which in turn precedes **Johne’s disease**. Any character or string of characters preceding a space, hyphen, or dash is treated as a word and alphabetized accordingly. Thus, **De Broglie** precedes **debenture**, and **jack-o’-lantern** precedes **jackal**. Titles with identical spellings are arranged in the following order: (1) persons, (2) places, (3) things.

For many rulers and titled nobility, chronological order, as well as alphabetical order, governs placement. Rulers of the same given name (e.g., **William**) may be grouped together, separate from other entries, and indicated by the symbol ●. They may be subgrouped alphabetically by country and, within each country, arranged chronologically (**William I, William II**, etc.). Nobility or peers of the same titled name (e.g., **Essex, EARLS OF**) are similarly grouped together, separate from other entries; they are indicated by the symbol ● and arranged chronologically.

Places with identical names are arranged in the alphabetical order of the countries where they are located. Identical place-names in the same country are alphabetized according to the alphabetical order of the state, province, or other political subdivision where they are found.

Entry arrangement

The titles of entries are arranged according to the forms commonly found in indexes and dictionaries, with some special conventions.

Entry titles for certain physical features, institutions, structures, events, and concepts are ordinarily inverted to place the substantive word first. Thus, the Bay of Bengal is entered as **Bengal, Bay of**; the Bank of England as **England, Bank of**; the Tower of London as **London, Tower of**; the Siege of Vienna as **Vienna, Siege of**; and the balance of power as **power, balance of**. If the name of a physical feature, institution, structure, event, or concept has two or more descriptors, it is entered under the descriptor appearing first. Thus, the Episcopal Church in Scotland is entered as **Episcopal Church in Scotland** (not **Scotland, Episcopal Church in**); the Leaning Tower of Pisa as **Leaning Tower of Pisa**; and the kinetic theory of gases as **kinetic theory of gases**.

The entries for most Western persons are arranged so that one can read a name in correct order by beginning after the first comma, proceeding to the end of the boldface type, returning to the beginning word or words, and proceeding forward to the first comma. Thus, the entry **March, Patrick Dunbar, 2nd Earl of**, is read “Patrick Dunbar, 2nd Earl of March”; the entry **Orléans, Louis, duc d’**, is read “Louis, duc d’Orléans.” Names of Far Eastern origin are given in Oriental order, with the surname preceding the personal name (e.g., **Tōjō Hideki, Deng Xiaoping, Nguyen Cao Ky**).

Cross-references

Some cross-reference entries appear in the MICROPAEDIA for the purpose of leading a reader from names that are familiar to alternate names that may not be. Cross-references also appear frequently within or at the ends of standard entries, where they are identified by *see*, *see also*, *see under*, *q.v.* (*quod vide*, “which see”), or *qq.v.* (*quae vide*, “which see,” plural).

Certain entries serve both as relatively brief essays on general subjects and as cross-references to the same subjects treated at greater length and in greater depth in the MACROPAEDIA. Such an entry (e.g., **igneous rock**) begins with a definition of the subject and then provides the following cross-reference: “A brief treatment of igneous rocks follows. For full treatment, *see* MACROPAEDIA: Minerals and Rocks.”

Entries on certain broad subjects (e.g., **music**) direct the reader to several relevant articles in the MACROPAEDIA and also to the PROPAEDIA for listings of related articles in the MICROPAEDIA.

Abbreviations

Abbreviations used in the MICROPAEDIA are given in a list that appears at the end of every MICROPAEDIA volume.

Territorial boundaries

In articles and maps indicating disputed geopolitical boundaries and territories, the attribution of sovereignty or administrative subordination to any specific area does not imply recognition of the status claimed by an administering power.

Solovyov, Sergey Mikhaylovich, Solovyov also spelled SOLOVIEV (b. May 5 [May 17, New Style], 1820, Moscow, Russia—d. April 4 [April 16], 1879, Moscow), one of the greatest Russian historians.

The son of a clergyman, Solovyov graduated from Moscow University in 1842 and joined the faculty of that institution as an assistant professor of Russian history in 1845. He became a full professor in 1850 and served in that capacity until his retirement in 1877. In the course of his academic career Solovyov held several important administrative posts at Moscow University, published several works concerning Peter I the Great and Alexander I, and acted as tutor to the tsarevich Nikolay Aleksandrovich (1859) and to the future tsar Alexander III (1866). Solovyov's reputation as one of the greatest of all Russian historians rests on his monumental 29-volume *History of Russia From Ancient Times*, 28 volumes of which were published between 1851 and Solovyov's death in 1879. The *History* wove a vast body of data into a unified and orderly whole that provided an exceptionally powerful and vivid picture of Russia's political development over the centuries. The work inaugurated a new era in Russian scholarship with its depiction of Russia as evolving through organic and rational processes from a primitive, family-based society into a centralized, autocratic state. Solovyov's work greatly influenced virtually all later Russian historians.

Solovyov, Vladimir Sergeyevich, Solovyov also spelled SOLOVIEV (b. Jan. 16 [Jan. 28, New Style], 1853, Moscow, Russia—d. July 31 [Aug. 13], 1900, Uzkoye, near Moscow), Russian philosopher and mystic who, reacting to European rationalist thought, attempted a synthesis of religious philosophy, science, and ethics in the context of a universal Christianity uniting the Orthodox and Roman Catholic churches under papal leadership.

He was the son of the historian Sergey M. Solovyov. After a basic education in languages, history, and philosophy at his Orthodox home, he took his doctorate at Moscow University in 1874 with the dissertation "The Crisis of Western Philosophy: Against the Positivists." After travels in the West, he wrote a second thesis, a critique of abstract principles, and accepted a teaching post at the University of St. Petersburg, where he delivered his celebrated lectures on *Godmanhood* (1880). This appointment was later rescinded because of Solovyov's clemency appeal for the March 1881 assassins of Tsar Alexander II. He also encountered official opposition to his writings and to his activity in promoting the union of Eastern Orthodoxy with the Roman Catholic church.

Solovyov criticized Western empiricist and idealist philosophy for attributing absolute significance to partial insights and abstract principles. Drawing on the writings of Benedict de Spinoza and G.W.F. Hegel, he regarded life as a dialectical process, involving the interaction of knowledge and reality through conflicting tensions. Assuming the ultimate unity of Absolute Being, termed God in the Judeo-Christian tradition, Solovyov proposed that the world's multiplicity, which had originated in a single creative source, was undergoing a process of reintegration with that source. Solovyov asserted, by his concept of Godmanhood, that the unique intermediary between the world and God could only be man, who alone is the vital part of nature capable of knowing and expressing the divine idea of "absolute unitotality" in the chaotic multiplicity of real experience. Consequently, the perfect revelation of God is Christ's incarnation in human nature.

For Solovyov, ethics became a dialectical problem of basing the morality of human acts and decisions on the extent of their contribution to the world's integration with ultimate

divine unity, a theory expressed in his *The Meaning of Love* (1894).

Solow, Robert Merton (b. Aug. 23, 1924, Brooklyn, New York, N.Y., U.S.), American economist who was awarded the 1987 Nobel Prize for Economics for his important contributions to the theory of economic growth.

Solow received his B.A. (1947), M.A. (1949), and Ph.D. (1951) degrees from Harvard University. He began teaching economics at the Massachusetts Institute of Technology in 1949 and became a full professor there in 1958. He served on the Council of Economic Advisers in 1961–62 and was a consultant to that body from 1962 to 1968.

In the 1950s Solow developed a mathematical model that could show the relative contributions of various factors to producing sustained national economic growth. Contrary to traditional economic thinking, he showed that the rate of technological progress is actually more important than capital accumulation and increases in labour in achieving such growth. The greater efficiency and productivity that result from qualitative improvements such as new machines and improved human skills are thus more important than strictly quantitative investments that result in a greater number of machines and factories. From the 1960s on, Solow's studies were influential in persuading governments to channel their funds into technological research and development in order to spur economic growth.

Solstad, Dag (b. July 16, 1941, Sandefjord, Nor.), novelist, short-story writer, and dramatist, one of the most significant Norwegian writers to emerge during the 1960s.

Solstad began his career as a writer of short experimental fictions that investigated the themes of identity and alienation: *Spiraler* (1965; "Spirals") and *Svingstol* (1967; "Swing Chair"). His novel *Irr! Grønt!* (1969; "Patina! Green!") described the efforts of a peasant student to escape his limited background. Solstad's fiction took a more directly political turn with the novel *Arild Asnes, 1970* (1971), which traced the development of a young man to the point at which he perceived that political revolution was necessary and must be brought about by conflict. In *25 September Plassen* (1974; "September 25th Square") he showed the growing political awareness on the part of factory workers in the period following World War II. *Svik. Førkrigsår* (1977; "Betrayal: Prewar Years") and *Krig, 1940* (1978; "War: 1940") were the first two in a series of novels that gave a minutely documented account of Norway in World War II.

solstice, either of the two moments in the year when the Sun's apparent path is farthest north or south from the Earth's Equator. In the Northern Hemisphere the summer solstice occurs on June 21 or 22 and the winter solstice on December 21 or 22. The situation is exactly the opposite in the Southern Hemisphere, where the seasons are reversed. The term solstice also is used in reference to either of the two points of greatest deviation of the ecliptic (the Sun's apparent annual path) from the celestial equator.

At the time of the summer solstice in the Northern Hemisphere, the North Pole is tilted 23.45° (23°27') toward the Sun. Because the Sun's rays are shifted northward by the same amount, the vertical noon rays are directly overhead at the Tropic of Cancer (23°27' N). Six months later, the south polar end of the Earth is inclined 23.45° toward the Sun. On this day of the summer solstice in the Southern Hemisphere, the Sun's vertical overhead rays progress to their southernmost position, the Tropic of Capricorn (23°27' S). Compare equinox; see also season.

Solti, Sir Georg, original name GYÖRGY SOLTÍ (b. Oct. 21, 1912, Budapest, Hung.), Hungarian-born British conductor and pianist,

one of the most highly regarded conductors of the second half of the 20th century.

Solti studied at the Liszt Academy in Budapest with Béla Bartók and Zoltán Kodály. At 18 he joined the coaching staff of the Budapest Opera and made his conducting debut there in 1938. A Jew, he found safety in Zürich during World War II, but his alien status prevented him from conducting professionally. He won the Geneva International Piano Competition in 1942. After the war, he became musical director of the Bavarian State Opera in Munich (1946–52), the Frankfurt Opera (1952–60), and Covent Garden (1961–71). He was knighted in 1971 and assumed British citizenship in 1972.

From 1969 to 1991 he was musical director of the Chicago Symphony Orchestra, reestablishing that orchestra's international reputation. He served in the same post for the Orchestra of Paris (1972–75) and acted as musical adviser to the Paris Opéra from 1971 to 1973. He was the principal conductor and artistic director of the London Philharmonic Orchestra from 1979 to 1983.

As a conductor Solti was best known for his dramatic and deeply felt interpretations of operas, symphonies, and other large-scale works by W.A. Mozart, Ludwig van Beethoven, Franz Schubert, Richard Wagner, Richard Strauss, and Gustav Mahler. He was particularly notable for his sharp attention to musical detail and his ability to evoke a wide range of tonal colours from an orchestra. He made many highly praised recordings from the late 1940s as both conductor and solo performer. In 1966 Solti made the highly acclaimed first complete recording of Richard Wagner's opera cycle, *The Ring of the Nibelung* (*Der Ring des Nibelungen*).

soluble glass: see water glass.

solution, in chemistry, homogenous mixture of two or more substances in relative amounts that can be varied continuously up to what is called the limit of solubility. The term solution is commonly applied to the liquid state of matter, but solutions of gases and solids are possible. Air, for example, is a solution consisting chiefly of oxygen and nitrogen with trace amounts of several other gases, and brass is a solution composed of copper and zinc.

A brief treatment of solutions follows. For full treatment, see MACROPAEDIA: Matter.

Life processes depend in large part on solutions. Oxygen from the lungs goes into solution in the blood plasma, unites chemically with the hemoglobin in the red blood cells, and is released to the body tissues. The products of digestion also are carried in solution to the different parts of the body. The ability of liquids to dissolve other fluids or solids has many practical applications. Chemists take advantage of differences in solubility to separate and purify materials and to carry out chemical analysis. Most chemical reactions occur in solution and are influenced by the solubilities of the reagents. Materials for chemical manufacturing equipment are selected to resist the solvent action of their contents.

The liquid in a solution is customarily designated the solvent, and the substance added is called the solute. If both components are liquids, the distinction loses significance; the one present in smaller concentration is likely to be called the solute. The concentration of any component in a solution may be expressed in units of weight or volume or in moles. These may be mixed—e.g., moles per litre and moles per kilogram.

Crystals of some salts contain lattices of ions—i.e., atoms or groups of atoms with alternating positive and negative charges. When such a crystal is to be dissolved, the attraction of the oppositely charged ions, which are

largely responsible for cohesion in the crystal, must be overcome by electric charges in the solvent. These may be provided by the ions of a fused salt or by electric dipoles in the molecules of the solvent. Such solvents include water, methyl alcohol, liquid ammonia, and hydrogen fluoride. The ions of the solute, surrounded by dipolar molecules of the solvent, are detached from each other and are free to migrate to charged electrodes. Such a solution can conduct electricity, and the solute is called an electrolyte.

The potential energy of attraction between simple, nonpolar molecules (nonelectrolytes) is of very short range; it decreases approximately as the seventh power of the distance between them. For electrolytes the energy of attraction and repulsion of charged ions drops only as the first power of the distance. Accordingly, their solutions have very different properties from those of nonelectrolytes.

It is generally presumed that all gases are completely miscible (mutually soluble in all proportions), but this is true only at normal pressures. At high pressures, pairs of chemically dissimilar gases may very well exhibit only limited miscibility. Many different metals are miscible in the liquid state, occasionally forming recognizable compounds. Some are sufficiently alike to form solid solutions (*see* alloy).

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first

Solutrean industry, short-lived style of tool-making that flourished approximately 17,000 to 21,000 years ago in southwestern France (*e.g.*, at Laugerie-Haute and La Soutre) and in nearby areas. The industry is of special interest because of its particularly fine workmanship. The Solutrean industry, like those of other late Paleolithic big-game hunters, contained a variety of tools such as burins (woodworking tools rather like chisels), scrapers, and borers; but blades that were formed in the shape of laurel or willow leaves and shouldered points are the implements that distinguish the Solutrean.

In the early Solutrean, unifacial points (flaked on only one side) are common. In the middle Solutrean, these are gradually replaced by laurel-leaf blades and bifacial points. Tiny blunt-backed flint blades and scrapers and single-shouldered points also occur. Bizarre implements, with notches or asymmetrical shapes, appear; these and laurel-leaf blades so fine as to have precluded their use as tools suggest the production of fine-flaked implements for purposes of luxury alone. In the late Solutrean, the willow-leaf blade (slim, with rounded ends and retouching on one side only) of extremely fine workmanship made its appearance. Bone needles with eyes occur and indicate the use of fitted clothing, useful in a near-glacial climate. There is much evidence of the use of ornament: bracelets, bead necklaces, pendants, bone pins, and coloured pigments must have been used for personal adornment. Stone friezes, bas-reliefs, and paintings on stone plaques and cave walls are known. Even tool stone was chosen for its beauty; coloured quartz, jasper, and handsome flints abound.

The origin of the Solutrean stoneworking technique is in some dispute. Most of the evidence indicates it was an invention indigenous to the Dordogne region of France, but some scholars attribute its swift appearance to the arrival of a new people and its equally swift disappearance to destruction of the Solutrean people by another group arriving with a dif-

ferent tool industry. The Solutrean follows the Perigordian and Aurignacian industries and is succeeded by the Magdalenian.

Solvay, Ernest (b. April 16, 1838, Rebecqur-Rognon, near Brussels, Belg.—d. May 26, 1922, Brussels), Belgian industrial chemist, best known for his development of a commercially viable ammonia-soda process for producing soda ash (sodium carbonate), widely used in the manufacture of such products as glass and soap.

After attending local schools, Solvay entered his father's salt-making business. At the age of 21 he began working with an uncle at a gas-works near Brussels, and while there he began to develop the conversion method for which he is known.

Although the ammonia-soda process had been understood since 1811, a suitable and economical means of large-scale commercial production had evaded industrial chemists. Solvay, who was unaware that the reaction itself had been known for 50 years, solved the practical problems of large-scale production by his invention of the Solvay carbonating tower, in which an ammonia-salt solution could be mixed with carbon dioxide. In 1861 he and his brother Alfred founded their own company and in 1863 had a factory built. Production started in 1865, and by 1890 Solvay had established companies in several foreign countries. Solvay's method was gradually adopted throughout much of Europe and elsewhere and by the late 19th century had supplanted the Leblanc process, which had been chiefly used for converting common salt into sodium carbonate since the 1820s.

This success brought Solvay considerable wealth, which he used for various philanthropic purposes, including the founding of various international institutes of scientific research in chemistry, physics, and sociology. The Solvay conferences on physics were particularly noted for their role in the development of theories on quantum mechanics and atomic structure.

Solvay process: *see* ammonia-soda process.

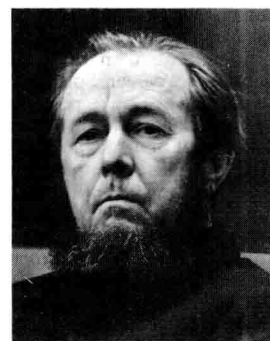
Solyman (Turkish or Arabic personal name): *see* under Süleyman.

Solzhenitsyn, Aleksandr (Isayevich) (b. Dec. 11, 1918, Kislovodsk, Russia [U.S.S.R.]), Russian novelist and historian, who was awarded the Nobel Prize for Literature for 1970 and was exiled from the Soviet Union in 1974.

Solzhenitsyn was born into a family of Cossack intellectuals and brought up primarily by his mother (his father was killed in an accident before his birth). He attended the University of Rostov-na-Donu, graduating in mathematics, and took correspondence courses in literature at Moscow State University. He fought in World War II, achieving the rank of captain of artillery; in 1945, however, he was arrested for writing a letter in which he criticized Joseph Stalin and spent eight years in prisons and labour camps, after which he spent three more years in enforced exile. Rehabilitated in 1956, he was allowed to settle in Ryazan, in central Russia, where he became a mathematics teacher and began to write.

Encouraged by the loosening of government restraints on cultural life that was a hallmark of the de-Stalinizing policies of the early 1960s, Solzhenitsyn submitted his short novel *Odin den iz zhizni Ivana Denisovicha* (1962; *One Day in the Life of Ivan Denisovich*) to the leading Soviet literary periodical *Novy Mir* ("New World"). The novel quickly appeared in that journal's pages and met with immediate popularity, Solzhenitsyn becoming an instant celebrity. *Ivan Denisovich*, based on Solzhenitsyn's own experiences, described a typical day in the life of an inmate of a forced-labour camp during the Stalin era. The impression made on the public by the book's

simple, direct language and by the obvious authority with which it treated the daily struggles and material hardships of camp life was magnified by its being one of the first Soviet literary works of the post-Stalin era to directly describe such a life. The book produced a political sensation both abroad and in the Soviet



Solzhenitsyn, 1974

Gilbert Uzan—Gamma/Liaison Agency

Union, where it inspired a number of other writers to produce accounts of their imprisonment under Stalin's regime.

Solzhenitsyn's period of official favour proved to be short-lived, however. Ideological strictures on cultural activity in the Soviet Union tightened with Nikita Khrushchev's fall from power in 1964, and Solzhenitsyn met first with increasing criticism and then with overt harassment from the authorities when he emerged as an eloquent opponent of repressive government policies. After the publication of a collection of his short stories in 1963, he was denied further official publication of his work, and he resorted to circulating them in the form of *samizdat* ("self-published") literature—*i.e.*, as illegal literature circulated clandestinely—as well as publishing them abroad.

The following years were marked by the foreign publication of several ambitious novels that secured Solzhenitsyn's international literary reputation. *V krug pervom* (1968; *The First Circle*) was indirectly based on his years spent working in a prison research institute as a mathematician. The book traces the varying responses of scientists at work on research for the secret police as they must decide whether to cooperate with the authorities and thus remain within the research prison or to refuse their services and be thrust back into the brutal conditions of the labour camps. *Rakovy korpus* (1968; *Cancer Ward*) was based on Solzhenitsyn's hospitalization and successful treatment for terminally diagnosed cancer during his forced exile in Kazakhstan during the mid-1950s. The main character, like Solzhenitsyn himself, was a recently released inmate of the camps.

In 1970 Solzhenitsyn was awarded the Nobel Prize for Literature, but he declined to go to Stockholm to receive the prize for fear he would not be readmitted to the Soviet Union by the government upon his return. His next novel to be published outside the Soviet Union was *Avugst 1914* (1971; *August 1914*), a historical novel treating Germany's crushing victory over Russia in their initial military engagement of World War I, the Battle of Tannenberg. The novel centred on several characters in the doomed 1st Army of the Russian general A.V. Samsonov and indirectly explored the weaknesses of the tsarist regime that eventually led to its downfall by revolution in 1917.

In December 1973 the first parts of *Arkhipelag Gulag* (*The Gulag Archipelago*) were published in Paris after a copy of the manuscript had been seized in the Soviet Union by the KGB. (*Gulag* is an acronym formed from the official Soviet designation of its system of prisons and labour camps.) *The Gulag Archipelago* is Solzhenitsyn's attempt

to compile a literary-historical record of the vast system of prisons and labour camps that came into being shortly after the Bolsheviks seized power in Russia (1917) and that underwent an enormous expansion during the rule of Stalin (1924–53). Various sections of the work describe the arrest, interrogation, conviction, transportation, and imprisonment of the Gulag's victims as practiced by Soviet authorities over four decades. The work mingles historical exposition and Solzhenitsyn's own autobiographical accounts with the voluminous personal testimony of other inmates that he acquired during his imprisonment and that he retained mentally using only his photographic memory.

Upon publication of the first volume of *The Gulag Archipelago*, Solzhenitsyn was immediately attacked in the Soviet press. Despite the intense interest in his fate that was shown in the West, he was arrested and charged with treason on Feb. 12, 1974. Solzhenitsyn was exiled from the Soviet Union on the following day, and in December he took possession of his Nobel Prize.

The following year, in 1975, a documentary novel, *Lenin v Tsyurikhe: glavy* (*Lenin in Zurich: Chapters*), appeared. Subsequently, Solzhenitsyn traveled to the United States, where he eventually settled on a secluded estate in Cavendish, Vt. He published two books of nonfiction in 1980: *The Oak and the Calf* portrayed literary life in the Soviet Union, and the brief *The Mortal Danger* analyzed what he saw as the perils of American misconceptions about Russia. In 1983 a greatly expanded and revised version of *August 1914* appeared in Russian as a part of a projected series, *Krasnoe koleso* (*The Red Wheel*); other published or projected volumes (or *uzly* ["knots"]) in the series were *Oktyabr 1916* ("October 1916"), *Mart 1917* ("March 1917"), and *April 1917* ("April 1917").

In presenting alternatives to the Soviet regime, Solzhenitsyn tended to reject Western emphases on democracy and individual freedom and instead favoured somehow the formation of a benevolent authoritarian regime that would allegedly draw upon the resources of Russia's traditional Christian values. The introduction of *glasnost* ("openness") in the late 1980s, however, brought renewed attention to Solzhenitsyn's work in the Soviet Union. In 1989 the Soviet literary magazine *Novy Mir* published the first officially approved excerpts from *The Gulag Archipelago*. Other works were also published, and Solzhenitsyn's Soviet citizenship was officially restored in 1990.

soma, in ancient Indian cult worship, an unidentified plant, the juice of which was a fundamental offering of the Vedic sacrifices. The stalks of the plant were pressed between stones, and the juice was filtered through sheep's wool and then mixed with water and milk. After first being offered as a libation to the gods, the remainder of the soma was consumed by the priests and the sacrificer. It was highly valued for its exhilarating, probably hallucinogenic, effect. The personified deity Soma was the "master of plants," the healer of disease, and the bestower of riches.

The soma cult exhibits a number of similarities to the corresponding haoma cult of the ancient Iranians and is suggestive of shared beliefs among the ancient Indo-Europeans in a kind of elixir of the gods. Like haoma, the soma plant grows in the mountains, but its true origin is believed to be heaven, whence it was brought to earth by an eagle. The pressing of soma was associated with the fertilizing rain, which makes possible all life and growth. In the post-Vedic classical period, soma is identified with the moon, which wanes when soma is drunk by the gods but which is periodically reborn.

soma, in biology, all the living matter of an animal or a plant except the reproductive, or

germ, cells. The distinction between the soma and the germ cells was propounded by the 19th-century German biologist August Weismann in a theory that emphasized the role of the immortal, heredity-carrying genes and chromosomes, which are transmitted through successive generations of each species and determine the character of each individual in the propagative chain.

Somacandra (Jaina author): see Hemacandra.

Somadeva (fl. 1070), Kashmiri Brahman of the Śaiva sect and Sanskrit writer who preserved much of India's ancient folklore in the form of a series of tales in verse.

The court poet to King Ananta of Kashmir, Somadeva apparently was commissioned to compose a cycle of stories to amuse and calm the queen Sūryamati during a political crisis. He borrowed from an earlier work, now lost, the *Brhat-katha* ("Great Tale") by the Sanskrit writer Guṇādhya, who probably had used Buddhist sources of an even earlier period. Somadeva's work *Kathā-saritsāgara* ("Ocean of Rivers of Stories") bears a strong resemblance to medieval European fairy tales: magic, demons, bloody orgies, vampires, love, and high adventure abound in the 124 sections, or chapters, known as *tarāṅga* ("waves"). An English translation by Charles H. Tawney, titled *The Ocean of Story*, was published in 1924–28. Somadeva wrote his monumental work during the two periods of Ananta's interrupted rule, which ended in 1077.

Somali, people of Africa occupying all of Somalia, a strip of Djibouti, the southern Ethiopian region of Ogaden, and part of northwestern Kenya. Except for the arid coastal area in the north, the Somalis occupy true nomad regions of plains, coarse grass, and streams. They speak a language of the Cushitic branch of the Hamito-Semitic family.

It is believed that in the 14th century the Somalis, converted to Islam by Arabs from across the Red Sea, began their expansion southward from the arid steppes to their present borders, which overflow what was traditionally known as Somaliland. Although three great divisions of Somalis exist, roughly corresponding to the northern, central, and southern parts of the region, the Somalis demonstrate considerable cultural unity and take great pride in their race.

The basis of Somali society is the *rēr*, or large, self-contained kinship group or clan, consisting of a number of families claiming common descent from a male ancestor. A Somali has obligations both to his *rēr* and to the loosely defined tribe of which his *rēr* is a part. Government of the *rēr* is markedly patriarchal, although the chief is chosen by a group of elders who counsel him.

The Somalis are primarily nomadic herdersmen who, because of intense competition for scarce resources, have been extremely individualistic and frequently involved in blood feuds or wars with neighbouring tribes and peoples. Their conception of Islam is vague, and religious practices are dominated by the worship of ancestral saints.

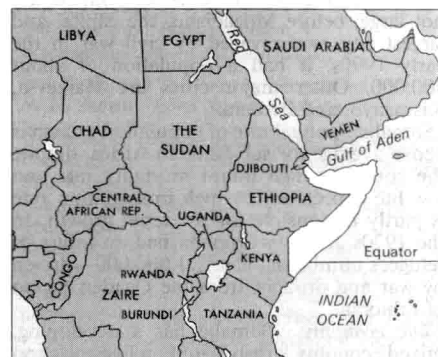
A second category of Somalis are the townspeople and agriculturalists of the urban centres, especially along the coast of the Horn of Africa, where intense and prolonged intimacy with the Islamic tradition has rendered the culture highly organized and religiously orthodox and where geographic position has turned the townspeople into commercial middlemen between the Arab world and the nomadic tribes of the interior.

Somali Basin, submarine basin on the floor of the southwestern Arabian Sea, an arm of the Indian Ocean, east of Somalia. The Carlsberg Ridge separates it from the shallower Arabian Basin to the northeast. The Somali Basin also connects with the Mascarene and Madagascar

basins to the south, with sill depths greater than 11,800 feet (3,600 m). Sill depths between the Somali and Arabian basins have been deduced from the minimum temperatures observed in the two areas.

Somali Current, surface current of the western Indian Ocean, caused during the northern summer months by the blowing of the southwest monsoon along the coast of East Africa, moving coastal waters northeastward along with it for about 950 miles (1,500 km). At longitude 6–10° N (off Somalia), the northeastward Somali flow turns eastward as the Monsoon Current. With the monsoon's reversal to the northeast in September, the current begins to weaken until, in the winter, it disappears entirely to be replaced by a slow southwestward drift.

Somalia, officially SOMALI DEMOCRATIC REPUBLIC, Somali SOOMAALIYA, or JAMHUURIYADDA DIMUQRAADIGA SOOMAALIYA, Arabic AS-SUMĀL, or JUMHŪRIYAH AS-SUMĀL AD-DĪMUQRĀTIYAH, country of northeastern Africa located in the Horn of Africa, the most easterly projection of the continent, covering an area of 246,000 square miles (637,000 square km). The capital of Somalia is Mogadishu. Stretching from the Equator to the Red Sea, Somalia is bounded on the north by the Gulf of Aden, on the east by the Indian Ocean, on the west by Kenya and Ethiopia, and on the northwest by Djibouti. The population in 1990 was estimated at 7,555,000.



Somalia

A brief treatment of Somalia follows. For full treatment, see MACROPAEDIA: Eastern Africa.

For current history and for statistics on society and economy, see BRITANNICA WORLD DATA ANNUAL.

The land. Lying in the north of the country and paralleling the Gulf of Aden coast is the Guban, a maritime plain. Scrub-covered, semiarid, and generally drab in appearance, this plain is characterized by a hot and humid climate, low rainfall, and sparse vegetation. Away from the Gulf of Aden the plain rises to the precipitous north-facing cliffs of dissected highlands, which form rugged mountain ranges that extend from the northwestern border with Ethiopia eastward to the tip of the Horn. Along this range occur the highest elevations in the country, including Surud Cadd mountain, reaching an altitude of 7,900 feet (2,408 m). To the south the mountains give way to the Hawd Plateau, which is cooler and drier. There are artificial water reservoirs throughout the area. The extreme south consists mainly of flat plains. The two major rivers, the Jubba and the Shabeelle, rise in Ethiopia and flow southward across the country toward the Indian Ocean. Somalia lies within the tropical and subtropical zones. Mean daily maximum temperatures range from 86° to 107° F (30° to 42° C), while mean daily minimums range from about 65° to 80° F (18° to 27° C). Rainfall is usually

higher in the south and northwest and varies from 4 to 24 inches (100 to 610 mm) over the country as a whole. Most of the northern areas of Somalia support scattered low trees and widely scattered patches of grass. In higher regions small forests are found. The country's animal life includes lion, elephant, hyena, fox, leopard, giraffe, zebra, and antelope. Only about 2 percent of Somalia's land area is arable, nearly half of which is cropped with cereals. About half of the land area, however, is available as pasture or rangeland.

The people. More than two-thirds of Somalia's populace are nomadic or seminomadic. During the dry season the nomads concentrate in villages near water sources; when the rains begin they disperse with their herds. Traditionally, nomadism is the most desirable life-style. Somalis constitute the vast majority of the population. Cultural divisions between pastoral nomads (the Samaal) and sedentary cultivators and herdsmen (the Saab) have been weakened by large migrations from the countryside into towns, but most Somalis maintain a strong loyalty to one of many clans and sub-clans. The Somali language, spoken throughout the country, has been one of the nation's strongest unifying factors. Islām is the official religion and is nearly universal.

The largest concentrations of sedentary population are in the south and in the Jubba and Shabeelle valleys. Although the arid areas are sparsely populated, the urban population has increased rapidly since World War II and continues to grow. The cities of Somalia are not large; before Mogadishu, the capital and largest city, was ravaged by civil war in the early 1990s, it had a population of about 700,000. Other major cities are Hargeysa, Kismaayo, and Berbera.

Somalia's annual rate of population growth is above average for sub-Saharan Africa, despite the country's high infant mortality rate and low life expectancy. A high immigration rate is partly responsible for the rapid growth. In the 1970s and '80s Somalia had an influx of refugees numbering nearly 1,000,000—driven by war and drought from the Ogaden region of Ethiopia.

The economy. Somalia has a developing, mixed economy largely based on livestock and agriculture. While a potential for economic growth exists, external financial assistance will be required for some time to meet Somalia's budgetary deficit and economic development needs. The gross national product (GNP) is not growing as rapidly as the population; the GNP per capita is among the lowest in the world. Agriculture accounts for about three-fourths of the gross domestic product (GDP) and employs almost three-fourths of the work force. The livestock industry has expanded rapidly, and livestock products constitute well over one-half of the total exports. Bananas and other fruits are grown along the Jubba and Shabeelle rivers; other crops include sugarcane, cotton, corn (maize), and sorghum. Government efforts to revitalize the Somali fishing industry have improved the size of catches.

Industry, accounting for a negligible portion of the GDP and employing less than one-tenth of the work force, is small-scale and consists mostly of meat and fish processing, textiles, and leather goods. Most of the enterprises are state-owned, but the private sector is of increasing importance. Electricity is limited to the urban areas and is entirely generated by thermal sources.

The national budget of Somalia is divided into the ordinary budget, which is financed from internal sources, and the development budget, which is largely financed from overseas sources. Somalia is burdened by an increasing balance of payments deficit, and increasing

amounts of foreign assistance are required to offset deficits. Imports, composed largely of petroleum products, fertilizers, pesticides, basic manufactures, and foodstuffs, are supplied chiefly by western Europe. Italy and Greece are the chief markets for Somalia's exports of livestock, skins and hides, and bananas. The country has no railways, and internal transportation is by truck and bus. International and domestic air service is available, however, and there are several deepwater ports.

Government and social conditions. Since independence in 1960, Somalia has nominally been a republic. Its 1979 constitution vested executive power in the president and legislative authority in an elected People's Assembly, from which a central committee and cabinet were to be chosen. In reality, political parties as well as armed rebel groups have been based on loyalties to clan and region, and Somalia has never known stable, democratic rule.

Much of Somalia's judicial system is based on Islāmic law. At the apex of the judicial system is a supreme court, presided over by civilian justices, with jurisdiction over civil, penal, administrative, and financial affairs.

Health service in Somalia is provided through hospitals in the regional and district headquarters, while a network of dispensaries serve the rural areas. Tuberculosis and leprosy are common diseases, but the major health problem is maternal and infant mortality. Doctors, however, are few, and medical supplies scarce; nurses and laboratory technicians are virtually unavailable. Social conditions are poor, and wages are at the subsistence level. There is an acute housing shortage in the towns. Education is officially compulsory at the primary level, but less than one-fifth of all primary-age children actually attend school. Secondary education is not compulsory. Somali National University (1954) at Mogadishu is the major institution of higher education. There are also vocational and teacher-training schools. The government controls all mass-communication media in the country. Newspapers, printed in Arabic, Italian, or English, can be read only by a small educated elite. Radio Mogadishu and Radio Somali in Hargeysa broadcast daily in the Somali language.

Cultural life. Poetry is important in Somalia and deals with such subjects as war, peace, women, horses, and camels. Folk dancing is also a popular art. Somalis have a rich oral literature touching on subjects such as astronomy and astrology. The two principal cultural institutions in the country are the Garesa Museum and the National Theatre.

History. The northern and eastern Somali coasts probably formed part of Punt, mentioned in ancient Egyptian writings. Between the 7th and 10th century, immigrant Muslim Arabs and Persians developed trading posts along the Gulf of Aden and Indian Ocean coasts. By the 10th century the area inland from the Gulf of Aden was occupied by Somali nomads, and the south and west were inhabited by various groups of pastoral Oromo peoples. By this time Islām was firmly established in the trading centres of Mogadishu, Marka, Baraawe, Seylac, and Berbera. Intensive European exploration began after the British occupation of Aden in 1839. The British set up a protectorate in the north in 1884. In 1889 Italy acquired two protectorates in the northeast corner of Somalia, and in 1905 Italy assumed responsibility for another colony on the southern part of the Somali coast. In the early 1900s British rule of its dominions was hampered by Sayyid Maxamed Cabdulle Xasan, who rallied national Muslim solidarity against the British colonizers. In Italian Somaliland, however, Italian settlement was encouraged, and in 1936 Italian Somaliland was incorporated as a state in the Italian East African empire. During World War II the Italians invaded British Somaliland (1940); a year later British troops retook the

area, and Britain administered the whole area until 1950, when Italian Somaliland became a United Nations trust territory, administered by Italy. In 1960 it was united with the former British Somaliland, and the two became the independent Republic of Somalia. In 1967 Cabdirashiid Cali Sharma'arke was elected president and Maxamed Xaaji Ibrahiim Cigaal became prime minister. Sharma'arke was assassinated in 1969, and the government of Prime Minister Cigaal fell to a military coup led by Major General Maxamed Siyaad Barre. Siyaad replaced the parliamentary regime with a Supreme Revolutionary Council consisting of military officers, formed the Somali Democratic Republic, and established strong relations with the Soviet Union. In 1977 Somalia invaded the Ogaden region of Ethiopia (inhabited almost entirely by ethnic Somalis) in an unsuccessful attempt to annex the territory. When the Soviet Union switched its support to Ethiopia, Siyaad's armies were pushed back into Somalia, and hundreds of thousands of refugees from the Ogaden region filled camps near the Ethiopian border. Armed insurgents began a protracted civil war against Siyaad's rule, and, even after his ouster in 1991 by an alliance of rebel groups, Somalia's deteriorating economy was more dependent than ever on foreign aid.

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Somaliland, historically, the area now comprising Somalia and Djibouti.

The region probably formed part of the "Land of Punt" known to the ancient Egyptians. Between the 7th and the 12th century AD, Muslim traders from Arabia and Iran settled on the coast, founding the cities of Seylac and Berbera on the Gulf of Aden, and Marka, Baraawe, and Mogadishu along the Indian Ocean. They exported precious gums, ostrich feathers, and slaves, waged war against the Christian Ethiopians of the interior, and organized themselves into sultanates (Adal, centred at Seylac, and Ajuran, centred at Mogadishu). The nomadic Somalis, who occupied the northern part of the country between the 10th and the 15th century, adopted Islām and served in the armies of the sultanates. Gradually the sultanates themselves came under Somali control, and the Somalis expanded southward toward Kenya.

When the European nations began to partition Africa among themselves in the late 19th century, France already possessed (from 1862) a station at Obok near the mouth of the Red Sea, other areas of the north coast were occupied by Egypt, and southern Somaliland recognized the overlordship of the sultan of Zanzibar. By the end of the 1880s France had expanded its holdings to the area of present Djibouti. Britain had established a protectorate over the north coast opposite its base at Aden, and Italy controlled the remainder of the country. In the north the Muslim leader Sayyid Maxamed Cabdulle Xasan began a war against the British in 1899 and maintained his hold over the interior until his death in 1920. The Italians acquired Jubaland in the extreme south after World War I, and in 1936 they united their Somali possessions with Ethiopia to form Italian East Africa. The British won control of the Italian zone during World War II. In 1960 British and Italian Somaliland were united to form the independent Republic of Somalia. French Somaliland (renamed the French Territory of the Afars and Issas in 1967) became independent as the Republic of Djibouti in 1977.

somatotype, human body shape and physique type. The term somatotype is used in the sys-

jor artery in bringing summer visitors to the county. Pop. (1983 est.) 435,700.

Somerset, EARLS AND DUKES OF, titled English nobility of three creations, in the families Beaufort, Carr, and Seymour, grouped below chronologically and indicated by the symbol ●.

● **Somerset, Edmund Beaufort, 1st duke of**, 1ST EARL OF DORSET, also called (1444–48) 4TH EARL OF SOMERSET (b. c. 1406—d. May 22, 1455, St. Albans, Hertfordshire, Eng.), English nobleman and Lancastrian leader whose quarrel with Richard, duke of York, helped precipitate the Wars of the Roses (1455–85) between the houses of Lancaster and York.

He was a member of the Beaufort family, which in the 1430s obtained control—with William de la Pole, duke of Suffolk—of the government of the weak king Henry VI (ruled 1422–61 and 1470–71). He was created earl of Dorset in 1441 and inherited the earldom of Somerset from his brother in 1444. A veteran of the English campaigns in France, Beaufort was appointed captain general in France in 1447, and in the following year he was created duke of Somerset.

His poor leadership was largely responsible for the reconquest of Normandy by the French in 1449–50. Public indignation over this disaster brought about the fall of Suffolk, but Somerset survived the storm and became Henry's chief minister. His unrelenting enemy was the powerful Richard, duke of York. Following Henry's mental collapse in July 1453, Parliament imprisoned Somerset (c. December 1453) and appointed York lord protector of the realm. The King recovered in December 1454, however, and shortly thereafter Somerset was restored to his former role in government. York then resorted to arms, and in May 1455 Somerset was killed by York's troops at the Battle of St. Albans.

● **Somerset, Henry Beaufort, 2nd duke of**, 2ND EARL OF DORSET (b. 1436—d. May 15, 1464, Hexham, Northumberland, Eng.), leading Lancastrian in the English Wars of the Roses.

He was the eldest son of Edmund Beaufort, the 2nd duke; and, as duke of Somerset, marquess of Dorset, and titular count of Mortain, he was the victorious Lancastrian commander at the battles of Wakefield (1460) and of St. Albans (1461). But he fled to Scotland after the disaster of Towton (1461) and was then attainted and condemned to forfeiture. Failing to get French help, he deserted to the Yorkists in 1463 and was restored to his position; but a further equivocation brought his attainder, forfeiture, and execution on the day of his defeat and capture as Lancastrian commander at the Battle of Hexham.

When his brother Edmund, "duke of Somerset" to the Lancastrians alone, was captured and beheaded at the Battle of Tewkesbury (May 6, 1471), the male line of Beauforts ended.

● **Somerset, Edward Seymour, 1st duke of**, BARON SEYMOUR OF HACHE, byname THE PROTECTOR, also called (1523–36) SIR EDWARD SEYMOUR, or (1536–37) VISCOUNT BEAUCHAMP OF HACHE, or (1537–47) EARL OF HERTFORD (b. c. 1500/06—d. Jan. 22, 1552, London), the Protector of England during part of the minority of King Edward VI (reigned 1547–53). While admiring Somerset's personal qualities and motives, scholars have generally blamed his lack of political acumen for the failure of his policies.

After the marriage of his sister, Jane Seymour, to King Henry VIII in 1536, he rose rapidly in royal favour. He became earl of

Hertford in 1537, and in 1542 he was appointed lord high admiral, a post he soon relinquished. He commanded the English forces that invaded Scotland in 1544 and sacked Edinburgh; a year later he won a brilliant victory over the French at Boulogne.

After the death of Henry VIII (Jan. 28, 1547), Hertford was named protector by the regency council that Henry had nominated to run the government for the nine-year-old king Edward. He soon became duke of Somerset (Feb. 16, 1547) and for two and a half years acted as king in all but name. His chief rival for power was John Dudley, earl of Warwick. Somerset tried, unsuccessfully, to persuade the Scots to join a voluntary union with England, but, when his appeal was rejected, he destroyed all chances of reconciliation by invading Scotland and defeating the Scots at the Battle of Pinkie (Sept. 10, 1547). In domestic affairs, the Protector proceeded with moderation in consolidating the Protestant Reformation in England. He repealed Henry VIII's heresy laws, which had made it treason to attack the king's leadership of the church; the first *Book of Common Prayer*, which was imposed (1549) by an Act of Uniformity by Somerset, offered a compromise between Roman Catholic and Protestant learning. Nevertheless, these and other apparently moderate measures stirred up antagonisms that resulted in Catholic uprisings in western England in 1549.

Somerset attempted to aid the rural poor by forbidding enclosures—that is, the taking of arable common land by the propertied classes to use as pasturage—and this action led to his downfall. The landowners foiled his efforts;



The 1st Duke of Somerset, detail of an engraving by Willem van de Passe, from the *Herwologia Anglica*, by Henry Holland, published in 1620

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

the desperate peasants revolted in Norfolk under the leadership of Robert Kett; and in October 1549 Somerset was swept from power and imprisoned by a coalition of Warwick and the propertied classes. When the coalition broke down, he was released in February 1550 and ostensibly reconciled with his rival. But in October 1551, the Duke of Northumberland (as Warwick was then called) had Somerset imprisoned on a trumped-up charge of treason. Four months later he was executed. A.F. Pollard's biography, *England Under Protector Somerset* (1900), presents a favourable picture of the Protector, but he is severely judged by M.L. Bush in *The Government Policy of Protector Somerset* (1975).

● **Somerset, Robert Carr, earl of**, Carr also spelled KER, also called (1607–11) SIR ROBERT CARR, or (1611–13) VISCOUNT ROCHESTER (b. c. 1590—d. July 1645), favourite of King James I of England from 1607 to 1615. His influence on governmental policy was slight, but he brought discredit on James's court by his involvement in a scandal.

Son of a Scottish nobleman, the handsome Carr first attracted James's interest in 1607. The King soon made him a gentleman of the bedchamber, and thereafter he rose rapidly in

royal favour, becoming Viscount Rochester in 1611 and a privy councillor in April 1612. Upon the death of the chief minister, Robert Cecil, earl of Salisbury, in May 1612, Carr began to serve as James's secretary.

Meanwhile, he had fallen in love with Frances Howard, wife of Robert Devereux,



Robert Carr, earl of Somerset, oil painting after a portrait by J. Hoskins, c. 1620–25; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

3rd earl of Essex. He persuaded James to have a commission annul Frances' marriage, and during these proceedings Frances, probably with Carr's assistance, secretly poisoned Carr's former friend and mentor Sir Thomas Overbury (died Sept. 15, 1613), who had opposed the annulment. Carr and Frances were married in December 1613, shortly after Carr had been made earl of Somerset and treasurer of Scotland. He became lord chamberlain in 1614, but in the following year the circumstances of Overbury's death were made public. Somerset and Frances were found guilty of murder; they were imprisoned until 1621 and pardoned fully in 1624. Carr died 21 years later in obscurity.

● **Somerset, Charles Seymour, 6th duke of**, BARON SEYMOUR OF TROWBRIDGE (b. Aug. 12, 1662—d. Dec. 2, 1748, Petworth, Sussex, Eng.), British statesman during the reign of Queen Anne, who helped to secure the accession of George I of Hanover.

His brother, Francis Seymour, inherited the dukedom on the death of a cousin (the 4th duke) but was shot in 1678 at the age of 20 by a Genoese gentleman named Horatio Botti, whose wife Somerset was said to have insulted. Charles, who thus inherited the barony of Seymour of Trowbridge along with the dukedom of Somerset, was educated at Trinity College, Cambridge; and in 1682 he married a great heiress, Elizabeth, daughter of Joceline Percy, earl of Northumberland, who brought him immense estates, including Alnwick Castle, Petworth, Syon House, and Northumberland House in London. In 1683 Somerset received an appointment in the King's household, and two years later a colonelcy of dragoons; but at the Revolution of 1688 he bore arms for William of Orange.

Having befriended Princess Anne in 1692, he became a great favourite with her after her accession to the throne, receiving the post of master of the horse in 1702. Finding himself neglected by Marlborough, he made friends with the Tories and succeeded in retaining the Queen's confidence, while his wife replaced the Duchess of Marlborough as mistress of the robes in 1711. In the memorable crisis when Anne was at the point of death, Somerset acted with Argyll, Shrewsbury, and other Whig nobles who, by insisting on their right to be present in the privy council, secured the Hanoverian succession to the crown. He retained the office of master of the horse under George I until 1716, when he was dismissed and retired into private life.

Somerset, Edward: see Worcester, Edward Somerset, 2nd Marquess of.

Somerset, FitzRoy James Henry: see Raglan, FitzRoy James Henry Somerset, 1st Baron.

Somerville, city, Middlesex county, eastern Massachusetts, U.S., on the Mystic River, surrounded by Boston (Charlestown), Cambridge, Arlington, and Medford. Settled in 1630, it was originally known as the Cow Commons and was entirely fenced in until 1685. In the city stands the Old Powder House (c. 1704), from which the British general Thomas Gage seized gunpowder in 1774. Somerville was the last of the Mystic valley towns to separate (1842) from the early Charlestown colony. Its name is said to honour Captain Richard Somers, hero of the Tripolitan-American War. After the American Revolution, brickmaking became important, and the opening of the Middlesex Canal (1802), which passed through Somerville, added to its desirability as an industrial site. By 1835 the town was a regular stop on the new Boston and Lowell Railroad. The greatest growth in population and industrial activity occurred after 1900, when slaughtering and meat-packing were developed as the principal activities.

The city has become a residential and industrial suburb of Boston with some importance as a distribution centre. Inc. town, 1842; city, 1871. Pop. (1990) 76,210.

Somerville, borough, seat (1784) of Somerset county, north-central New Jersey, U.S., on the Raritan River. Settled by Dutch farmers in the late 17th century, it took its present name in 1801. The Wallace House (a state historic site) was headquarters for General George Washington during the winter of 1778–79. Somerville's growth was stimulated by the opening of the Delaware and Raritan Canal in 1834 and by the completion of the Elizabethtown and Somerville Railroad (later Jersey Central) in 1842. The borough is now a trade centre for nearby farm and industrial areas. Light manufactures include drugs and electronic equipment.

The Old Dutch Parsonage (1751), a state historic site, was where Rutgers University (now in New Brunswick, a few miles southeast) and the New Brunswick Theological Seminary were first established. The Duke estate, established by tobacco magnate James B. Duke, is a research and exhibition centre for the New York Horticultural Society. The Knox-Porter Resolution ending the state of war between the United States and Germany was signed (July 2, 1921) by President Warren G. Harding at the Somerville estate of Joseph Frelinghuysen. Somerset County College (1968) is in the borough. Inc. town, 1863; borough, 1909. Pop. (1990) 11,632.

Somerville, William, Somerville also spelled SOMERVILLE (b. Sept. 2, 1675, Colwich, Staffordshire, Eng.—d. July 17, 1742, Henley-in-Arden, Warwickshire), British writer who, after studies directed toward a career at law, lived the life of a country gentleman, indulging in the field sports that were to make up the subject matter of his best-known poems, especially *The Chase* (1735). That poem traces the history of hunting up to the Norman Conquest of England (1066) and gives incidental information on kennel design, hare hunting, stag hunting, otter hunting, the breeding and training of dogs, and dog diseases and bites. Among the many digressions is one on Oriental hunting.

Somerville and Ross, also called E. & E. SOMERVILLE AND MARTIN ROSS, pseudonyms of EDITH ANNA OENONE SOMERVILLE and VIOLET FLORENCE MARTIN (respectively b. May 2, 1858, Corfu, Greece—d. Oct. 8, 1949, Castlehaven, County Cork, Ire.; b. June 11, 1862, Ross House, County Galway, Ire.—d. Dec.

21, 1915, Cork, County Cork), Irish cousins and writers who collaborated on a series of novels and short stories that wittily and sympathetically portrayed Irish society in the late 19th century. Edith Somerville continued to use their joint pseudonym after her cousin's death, claiming that she was still inspired by her.

Violet Martin grew up in a genteel Protestant literary family living on a country estate, Ross House, in somewhat straitened finances. After her father's death in 1872, the family lived in Dublin, where she attended Alexandra College. Edith Somerville's father was a British army lieutenant colonel serving in Corfu who retired a year after her birth and returned the family to Drishane House in rural County Cork, where Somerville spent all her childhood. She studied briefly at Alexandra College and studied painting at studios in London, Düsseldorf, and Paris.

The 27-year-old Somerville and the 23-year-old Martin first met on Jan. 17, 1886, and began a literary partnership that resulted three years later in their first book, *An Irish Cousin* (1889). By the time that Martin died in 1915 they had cowritten 14 books, including a powerful novel called *The Real Charlotte* (1894) and a collection of short stories, *Some Experiences of an Irish R.M.* (1899), which, with its sequels, is their most popular work. After 1915 the Somerville and Ross name appeared on such Somerville works as *Irish Memories* (1917), *Mount Music* (1919), and *The Big House of Inver* (1925).

During their life together, the cousins resided at Ross House and Drishane House but traveled frequently, abroad and at home. Both were excellent horse riders to the fox and hounds, and Martin suffered a serious hunting accident in 1898, from which she never fully recovered. In later years Somerville often traveled, visiting Denmark and France and joining her friend the English composer, author, and feminist Dame Ethel Mary Smyth (1858–1944) in trips to Italy and the United States.

Somes, Michael (George) (b. Sept. 28, 1917, Horsely, Gloucestershire, Eng.), English dancer, premier danseur and assistant director of the Royal (formerly Sadler's Wells) Ballet, whose extensive repertoire included leading roles, frequently as Margot Fonteyn's partner, in both classical and contemporary ballets.



Somes and Margot Fonteyn in *Dante Sonata*

Penguin Photo Collection

In 1934 Somes received the first scholarship given to a male by the Sadler's Wells School, and in 1935 he joined the ballet company. By 1937 he was appearing in solo parts; his first major creation was in Frederick Ashton's *Horoscope* (1938). After serving in World War

II, he returned to create additional important roles in ballets choreographed by Ashton, including *Symphonic Variations* (1946), *Cinderella* (1948), *Daphnis and Chloë* (1951), *Tiresias* (1951), and *Orndine* (1958). He also performed in such classical ballets as *Swan Lake*, *Giselle*, and *The Sleeping Beauty*.

In 1950 Somes succeeded Robert Helpmann as Margot Fonteyn's official partner, and in 1959 he was made a Commander of the Order of the British Empire. After retiring as premier danseur (1961), he became assistant director of the Royal Ballet in 1963 and appeared in pantomime roles such as the Father in *Marguerite and Armand* (1963). Leaving his assistant directorship in 1970, he remained with the Royal Ballet as its principal teacher until 1984. After the death of his wife, Deirdre Dixon (1959), he was briefly married to the dancer Antoinette Sibley.

Somes River, Hungarian SZAMOS, river, one of the most important in Transylvania, northwestern Romania. It has two headstreams: the Great Someș, which rises in the Rodnei Mountains and flows southwest, and the Little Someș, which rises in the Apuseni Mountains as the Someșu Cald and Someșu Rece and flows northeast. The two headstreams flow rapidly out of the mountains to meet at the town of Dej in the Transylvanian Basin. From there the river follows a zigzag course toward the northwest to enter the Tisza (Tisa) River in Hungary after a course of about 250 miles (400 km), including either headstream. Between Dej and the Tisza, the Someș is joined by several tributaries. The city of Satu Mare is located on the Someș.

somite, in embryology, one of a longitudinal series of blocklike segments into which the mesoderm, the middle layer of tissue, on either side of the embryonic spine becomes divided. Collectively, the somites constitute the vertebral plate. Out of the somites arise the sclerotome, forerunner of the bodies and neural arches of the vertebrae; the dermatome, precursor of the connective tissue of the skin; and the myotome, or primitive muscle, from which the major muscles of vertebrates are derived. The term somite is also used more generally to refer to a body segment, or metamer, of a segmented animal.

Somme, département, Picardie région, northern France, fronting the English Channel for about 30 miles (48 km) and embracing the valley of the river that bears its name. With an area of 2,382 square miles (6,170 square km), it was created from a large part of the historic province of Picardy, or Picardie, and also from a small portion of the neighbouring province of Artois. The estuary of the Somme River and the Bay of Somme occupy a large part of the low-lying coast.

The Somme River flows generally from the east to the northwest along its marshy valley through Péronne, Amiens (capital of the Somme département), and Abbeville. The Bresle, to the south, and the Authie, to the north, flow parallel to the Somme along the borders of the département.

The climate is mainly oceanic, with frequent showers. The land is extremely fertile in the southwest where the cliffs rise above the English Channel. The estuaries of the Somme and the Authie have silted up, creating marshlands beyond the cliffs. Sand dunes have formed along the shore, which is dotted with harbours and small seaside resorts. Cattle and market gardens flourish in the reclaimed marshland and along the river valleys. Cereals, fodder, and sugar beets are grown and cattle are raised on the rolling chalk plateau of Picardie, which extends over most of the département. There are some industries (tex-

tiles, food processing, metals, chemicals, and rubber) in the vicinity of Amiens, Abbeville, Vimeu, and other towns; but the region is predominantly rural. Many cemeteries mark the Somme valley battlefields of World War I, located in a region over which armies have fought throughout French history. The *département* has four *arrondissements*: Amiens, Abbeville, Jimeu, Montdidier, and Péronne. It is in the educational division of Amiens. Pop. (1990) 547,825.

Somme, First Battle of the (July 1–Nov. 13, 1916), costly and largely unsuccessful Allied offensive on the Western Front during World War I.

The Germans were securely entrenched and strategically located when the British and French launched their frontal attack on a 21-mile (34-kilometre) front north of the Somme River. A week-long artillery bombardment preceded the British infantry's "going over the top," but the latter were nevertheless mown down as they assaulted the virtually impregnable German positions. The British sustained nearly 60,000 casualties (20,000 dead) on the first day of the attack. In September the British introduced their new weapon, the tank, into the war for the first time, but with little effect on the battle. The Somme offensive gradually deteriorated into a battle of attrition. In October torrential rains turned the battlefield into an impassable sea of mud, and by mid-November the Allies had advanced only 5 miles (8 km).

Although the figures have been much disputed, the casualties from the First Battle of the Somme perhaps amounted to roughly 650,000 German, 195,000 French, and 420,000 British. The Battle of the Somme became a metaphor for futile and indiscriminate slaughter. By taking the offensive in the Somme, the Allies did manage to relieve the German pressure on Verdun, however.

Somme, Second Battle of the, also called BATTLE OF SAINT-QUENTIN (March 21–April 5, 1918), partially successful German offensive against Allied forces on the Western Front during the later part of World War I.

The German commander, General Erich Ludendorff, believed that it was essential for Germany to use the troops freed from the Eastern Front by the collapse of Russia to achieve a victory on the Western Front in the spring of 1918, before American troops arrived in sufficient numbers to effectively reinforce the war-weary Allies. His first offensive was directed against the rather weak British armies north of the Somme River, between Arras and La Fère. The British trenches were shelled and gassed before a massive morning attack in dense fog, which took the British by surprise. Their first and second lines quickly fell, and by March 22 the shattered British 5th Army was in retreat and had lost contact with the French to the south. The Germans moved rapidly forward, hoping to drive a permanent wedge between the French and the British, but by March 28, the Allies had quickly assembled new troops that checked the German advance east of Amiens. The German offensive had obtained the single largest territorial gain on the Western Front since the early months of the war in late 1914. The Germans had advanced almost 40 miles (64 km) and had taken about 70,000 prisoners, but in spite of these gains the Allied lines were only bent, not broken.

Somme River, river, northern France. It rises in the hills at Fonsommes, near Saint-Quentin in the Aisne *département*, and flows generally westward for 152 miles (245 km) to the English Channel, crossing Somme *département* and the ancient province of Picardy. From Amiens, near which its headstreams (includ-

ing the Ancre and Avre) converge, the Somme follows the floor of a trench across the chalk country. Its valley is a marshy belt; and its line, an important barrier in the approaches from Flanders toward Paris, was of great strategic importance during World War I. The name Somme is derived from the Celtic *samara*, meaning "tranquil." The upper basin of the Somme was the scene of heavy fighting during World War I, particularly the First Battle of the Somme (July–November 1916). The valley was occupied by the Germans in May–June 1940 in World War II and was recovered by the Allies in August 1944.

The basin of the Somme River occupies about 2,300 square miles (6,000 square km). Below Abbeville the Somme enters a sand-encumbered estuary, which requires constant dredging, with the port of Saint-Valéry-sur-Somme situated at its mouth. From the river's upper valley there are canals to the Oise and the Escaut, or Scheldt, rivers, connecting it with the navigable waterways that link Paris and Flanders.

Sommeiller, Germain (b. March 15, 1815, Saint-Jeoire, Fr.—d. July 11, 1871, Saint-Jeoire), French engineer who built the Mount Cenis (Fréjus) Tunnel in the Alps, the world's first important mountain tunnel.

While working at the University of Turin on the construction of a compressed-air ram to supply extra power to locomotives on steep grades, Sommeiller conceived the idea of adapting the machine to rock drilling, for which steam power was not suited because of the difficulty of transmitting it over distances. Commissioned to drive the 7-mile (12-kilometre) tunnel under Mount Cenis, between France and Switzerland, Sommeiller introduced his new drill, which he perfected by trial and error, and a little later, dynamite, just invented by Alfred Nobel. The tunnel was completed in December 1870.

Sommer, Ferdinand (b. May 4, 1875, Trier, Ger.—d. April 3, 1962, Munich), German historical linguist known primarily for his scholarship concerning Hittite and the classical languages.

During his academic career, Sommer held professorships at the universities of Basel (1902–09), Rostock (1909–13), Jena (1913–24), Bonn (1924–26), and Munich (1926–51). His most important works include *Handbuch der lateinischen Laut- und Formenlehre* (1902; "Handbook of Latin Phonology and Morphology"); *Zur Geschichte der griechischen Nominalkomposita* (1948; "Contributions to a History of the Greek Nominal Compounds"); and a number of significant contributions to Hittite studies, including *Die Ahhiyawa-Urkunden* (1932; "The Ahhiyawa Documents") and *Hethiter und Hethitisch* (1947; "Hittites and the Hittite Language").

Sommerfeld, Arnold (Johannes Wilhelm) (b. Dec. 5, 1868, Königsberg, Prussia [now Kaliningrad, Russia]—d. April 26, 1951, Munich), German physicist whose atomic model permitted the explanation of fine-structure spectral lines.

After studying mathematics and science at Königsberg University, Sommerfeld became an assistant at the University of Göttingen and then taught mathematics at Clausthal (1897) and Aachen (1900).

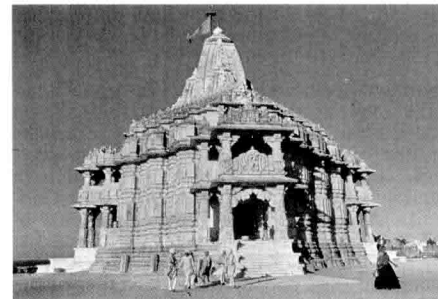
As professor of theoretical physics at Munich (1906–31), he did his most important work. His investigations of atomic spectra led him to suggest that, in the Bohr model of the atom, the electrons move in elliptical orbits as well as circular ones. From this idea he postulated the azimuthal quantum number. He later introduced the magnetic quantum number as well. Sommerfeld also did detailed work on wave mechanics, and his theory of electrons in metals proved valuable in the study of thermoelectricity and metallic conduction.

Sommo, Judah Leone ben Isaac, also called LEONE DE SOMMI PORTALEONE, original name YEHUDA SOMMO (b. 1527, Mantua [Italy]—d. 1592, Mantua), Italian author whose writings are a primary source of information about 16th-century theatrical production in Italy.

Sommo wrote the first known Hebrew drama, *Tzaḥut bedihuta de-qiddushin* (1550; "An Eloquent Comedy of a Marriage"), in which characters such as the pining lover, the comic servant, and the crafty lawyer reflect the influence of the Italian *commedia dell'arte*. Sommo's experience as a playwright and producer of dramas for various noble patrons was the basis for his *Dialoghi in materia di rappresentazioni sceniche* (c. 1565; *Dialogues on the Art of the Stage*), a summation of contemporary theatre practice containing one of the earliest extant discussions of stage lighting. It gives directions on the use of small reflectors to intensify lighting, the importance of dimming house lights, and the expressive use of lighting to create mood.

somnambulism: see sleepwalking.

Somnāth, also called PĀTAN-SOMNĀTH, or SOMNĀTH-PĀTAN, ancient ruined city, southwestern Gujarāt state, west-central India. It is the site of the temple of Siva (Shiva) as So-



Temple of Śiva at Somnāth, Gujarāt, India
Baldev—Shostal Assoc.

manātha (which means "lord of the soma," a sacred intoxicating drink, and, by extension, "lord of the Moon"). The temple was sacked by the Turkic Muslim invader Mahmud of Ghazna in AD 1024–25. Reconstructed in 1169, it was destroyed again in the final Muslim invasions of the late 13th century. Subsequently rebuilt and destroyed on several occasions, it was reconstructed again beginning in 1951. According to an ancient tradition in the Indian epic *Mahābhārata*, Somnāth was the scene of the internecine massacre of the Yādava clan and of the subsequent death of Krishna, the eighth incarnation of Vishnu. Recent excavations there have revealed a settlement dating from about 1500 BC.

Pātan, a port on the old city site, is now overshadowed by the adjacent port of Verāval.

Somnus (Greco-Roman god): see Hypnos.

Somogy, megye (county), southwestern Hungary. It extends from the southern shore of Lake Balaton to the Yugoslav frontier with an area of 2,331 square miles (6,036 square km). Once known for its combination of great landed estates and poverty-stricken peasants, it initiated the development of cooperative farms in the 20th century. The main crops are now rye, potatoes, sugar beets, and tobacco. Pigs and sheep are raised, and the swineherds and shepherds developed an art of intricate wood carving for which Somogy is nationally famous. The Lake Balaton shoreline is a recreation area, with Siófok the local focus. Kaposvár (*q.v.*), the *megye* seat, is the principal market town. In the Völgyeség district the population is mixed Magyar and German with migrants from Transylvania, Bukovina, and the Great Alföld. There is a small petroleum and natural-gas field in southern Somogy, around Babócsa. Pop. (1990 prelim.) 344,925.

Somolu (Nigeria): see Shomolu.

Somoza FAMILY, family that maintained political control of Nicaragua for 44 years.

The founder of the dynasty, Anastasio Somoza García (b. Feb. 1, 1896, San Marcos, Nicaragua—d. Sept. 29, 1956, Ancón, Panama Canal Zone [now Panama]), was the son of a wealthy coffee planter and was educated in Nicaragua and the United States. By marrying the daughter of a prominent Nicaraguan family, he ensured himself a secure political career. He rose quickly through the political ranks to become head of Nicaragua's army, the National Guard, in 1933. With the army at his disposal, he three years later deposed the elected president, Juan Bautista Sacasa; Somoza assumed the office on Jan. 1, 1937. Although he was officially not president from 1947 to 1950, his position as commander in chief guaranteed his continuous, firm rule; his authority was again made official by his election to a presidential term beginning in 1951.

Somoza's administration fostered reforms and made Nicaragua less dependent on banana income. At the same time, however, Somoza amassed a considerable personal fortune, exiled most of his political opponents, and took over the ownership of large areas of land and many businesses.

Following the assassination of Somoza, the presidency passed to his elder son, Luis Somoza Debayle (b. Nov. 18, 1922, León, Nicaragua—d. April 13, 1967, Managua). He won election to his own term of office (1957–63), during which he extended the family's business interests and, by most accounts, ruled more gently than had his father. After he refused to run for a second term, the presidency was held until 1967 by politicians favourable to the Somoza family.

His younger brother, Anastasio Somoza Debayle (b. Dec. 5, 1925, León, Nicaragua—d. Sept. 17, 1980, Asunción, Paraguay), then won the presidency in a general election. He ruled aggressively in the manner of his father, and he continued to expand the family's fortune. He relinquished his office in 1972 but in 1974 returned to the presidency under a new constitution that permitted him to rule until 1981. Violent insurrection against the alleged oppression of Somoza's rule, as well as foreign accusations of violations of human rights, led to his resignation in 1979, and he was assassinated while in exile.

son et lumière, English SOUND-AND-LIGHT SHOW, nighttime entertainment conceived by Paul Robert-Houdin, curator of the Château de Chambord on the Cosson River, France, where the first one was presented in 1952. Multicoloured lights of changing intensity are directed against the facade of a historic building or ruin. The changes of light are synchronized with a sound track (relayed through loudspeakers) carrying music and the dramatized story of the site. Usually, no live participants appear. Live effects such as smoke bombs or fireworks are occasionally used.

The medium rapidly became popular in France, where, by the late 20th century, about 50 annual productions took place, notably in the Loire River valley, Versailles, and Invalides. European productions outside France included those in Rome (the Forum) and Athens (the Parthenon). The first British performance was produced in 1957 (Greenwich Palace) and the first U.S. presentation in 1962 (Independence Hall, Philadelphia). The first African production took place at Cairo, Egypt (the Pyramids of Giza), in 1961; the first Asian production was at Delhi, India (the Red Fort), in 1965. *Son et lumière* is also produced at the ruins of Teotihuacán, near Mexico City, and elsewhere.

Son La, town, northwestern Vietnam, about 190 miles (310 km) northwest of Hanoi. Son La is a market centre for an agricultural area

specializing in corn (maize) and tea but also producing rice, cotton, and livestock. The population of the region is made up predominantly of the Tai Dam (Black Thai), but there are also Meo, Tai Khao (White Thai), and Muong peoples. There is an airport at nearby Na San. Pop. (1979) 14,810.

Son Pyông-hi (b. 1861—d. 1922), third leader of the apocalyptic, antiforeign Tonghak religious sect in Korea.

Born the illegitimate son of a low-echelon government official, Son grew up in poverty, suffering much discrimination. In 1897 he was elected to the leadership of Tonghak, succeeding Ch'oe Si-hyông, and he successfully reconstructed the sect, which had been hurt by the failure of its uprising in 1894.

Branded a political criminal by the state, he went into exile in Japan. When Korea lost its sovereignty to Japan in 1905, he renamed the Tonghak sect the Ch'ôndogyô (*q.v.*; literally "Religion of the Heavenly Way") and set about reorganizing it as a genuine religion. He undertook educational and cultural projects, running or supporting schools, conducting enlightenment programs for Ch'ôndogyô followers, and leading campaigns for constructive living. In 1919 he led the nationwide movement for Korean independence.

Son River, also spelled SONE, principal southern tributary of the Ganges River, rising in Madhya Pradesh state, central India. It flows north past Mânpur and then turns northeast. The river cuts through the Kaimur Range and joins the Ganges above Patna, after a 487-mile (784-kilometre) course. The Son valley is geologically almost a continuation of that of the Narmada River to the southwest. Largely forested, it is sparsely populated. The valley is bordered by the Kaimur Range (north) and the Chota Nâgpur plateau (south). The river's flow is seasonal, and the Son is unimportant for navigation. Dams have been constructed on some of its tributaries, and at Dehri, Uttar Pradesh state, are the headworks of the Son Canal system.

sonar (from "sound navigation ranging"), technique for detecting and determining the distance and direction of underwater objects by acoustic means. Sound waves emitted by or reflected from the object are detected by sonar apparatus and analyzed for the information they contain.

Sonar systems may be divided into three categories. In active sonar systems an acoustic projector generates a sound wave that spreads outward and is reflected back by a target object. A receiver picks up and analyzes the reflected signal and may determine the range, bearing, and relative motion of the target. Passive systems consist simply of receiving sensors that pick up the noise produced by the target (such as a ship, submarine, or torpedo). Waveforms thus detected may be analyzed for identifying characteristics as well as direction and distance. The third category of sonar devices is acoustic communication systems, which require a projector and receiver at both ends of the acoustic path.

Sonar was first proposed as a means of detecting icebergs. Interest in sonar was heightened by the threat posed by submarine warfare in World War I. An early passive system, consisting of towed lines of microphones, was used to detect submarines by 1916, and by 1918 an operational active system had been built by British and U.S. scientists. Subsequent developments included the echo sounder, or depth detector, rapid-scanning sonar, side-scan sonar, and WPESS (within-pulse electronic-sector-scanning) sonar.

The uses of sonar are now many. In the military field are a large number of systems that detect, identify, and locate submarines. Sonar is also used in acoustic homing torpedoes, in acoustic mines, and in mine detection. Non-

military uses of sonar include fish finding, depth sounding, mapping of the sea bottom, Doppler navigation, and acoustic locating for divers.

A major step in the development of sonar systems was the invention of the acoustic transducer and the design of efficient acoustic projectors. These utilize piezoelectric crystals (*e.g.*, quartz or tourmaline), magnetostrictive materials (*e.g.*, iron or nickel), or electrostrictive crystals (*e.g.*, barium titanate). These materials change shape when subjected to electric or magnetic fields, thus converting electrical energy to acoustic energy. Suitably mounted in an oil-filled housing, they produce beams of acoustic energy over a wide range of frequencies.

In active systems the projector may be deployed from an air-launched sonobuoy, hull-mounted on a vessel, or suspended in the sea from a helicopter. Usually the receiving and transmitting transducers are the same. Passive systems are usually hull-mounted, deployed from sonobuoys, or towed behind a ship. Some passive systems are placed on the seabed, often in large arrays, to provide continuous surveillance.

sonata, form of musical composition for one or more instruments, usually consisting of three or four movements that are contrasted in rhythm and mood but related in tonality.

A brief treatment of the sonata follows. For full treatment, see MACROPAEDIA: Musical Forms and Genres.

The use of the word sonata is associated with the rise of instrumental music: its derivation from the Italian *sonare* implies something sounded, as opposed to cantata, something sung. The term first appeared in the 13th century and became widespread toward the end of the 16th century, when instrumental music began to be written in much greater quantities. At that stage its meaning was quite general: Giovanni Gabrieli wrote sonatas for several groups of instruments, to be performed in a church, as well as ones for more modest ensembles.

During the 17th century more precise definitions began to emerge, and the sonata took on its association with small groups of instruments, the names *sinfonia*, *symphony*, and *concerto* being introduced for larger ensembles. At the same time, it became common practice for sonatas to be written in several separate sections, or movements, contrasting in speed, and to be scored for one or two soloists with harmonic support, usually supplied by a keyboard and a bass instrument such as the viola da gamba (a stringed instrument of the period); the two-soloist type is normally called the trio sonata, and it became the central form of chamber music for Baroque composers from Arcangelo Corelli and Henry Purcell to Johann Sebastian Bach and George Frideric Handel. Another development of the period was the distinction between the *sonata da chiesa* (church sonata) and the *sonata da camera* (chamber sonata), a distinction that cut across that between the solo and trio sonata. Church sonatas usually had four movements in a slow-fast-slow-fast pattern; the genre survived until the end of the 18th century. Chamber sonatas were less standardized, sometimes having sequences of dances, as did suites, or the fast-slow-fast pattern that became usual in the Classical period.

Around the middle of the 18th century the trio sonata began to disappear, and with the rise of keyboard virtuosity the sonata for solo harpsichord increased in importance. Domenico Scarlatti wrote more than 500 such sonatas in single-movement form. As Joseph Haydn and Wolfgang Amadeus Mozart understood the sonata, it was in essence a keyboard

solo, perhaps with one other instrument taking a subsidiary part. Both composers adopted the three-movement fast-slow-fast pattern as standard. Beethoven also adhered to this convention in his 32 piano sonatas, though with significant deviations: his last sonata, for instance, has only two movements. He did not, however, accept the dominance of the piano in sonatas with other instruments, and in his violin and cello sonatas the string player becomes an equal partner.

To the next generation of composers the sonata seemed an old-fashioned and constricted form. Robert Schumann and Frédéric Chopin felt more at ease in genres of their own devising; Franz Liszt incorporated a literary program in his *Après une lecture de Dante* and combined the normally successive movements of the sonata into a single span in his Sonata in B Minor. The duo sonata fell into a decline until near the end of the 19th century and the appearance of the late works of Johannes Brahms and César Franck.

In the 20th century the use of the term sonata has become as confused as it was in the Renaissance. Piano sonatas have been composed with explicit reference to the works of Beethoven, including the sonatas of Sir Michael Tippett and Pierre Boulez, but otherwise the form and instrumentation of sonatas has become much freer.

The term sonata form denotes both the organization of tonal material within a movement and the relationship between movements. The main divisions within a movement in sonata form are the exposition, the development, and the recapitulation.

In the exposition the two-part tonal material has an inherent element of contrast. Its themes, though not necessarily two in number, present a conflict of mood. The tension between these parts is heightened by a conflict of key: the opening material is in the tonic key; the contrasting material is in a second key, normally in a close relationship to the tonic but sufficiently distinct to mark a certain distance from the starting point.

In the development any portion of the preceding material and in many cases new, or seemingly new, material may appear in any order and in any combination. Frequently the material is broken down into its constituent fragments, and these fragments are themselves combined and developed. Opposing moods are illustrated and made to interact. Toward the end of the development section a sense of premonition is introduced that is fulfilled by a return of the tonic key and, with it, the original opening material.

In the recapitulation both of the opposites that set up their contrasting tonalities and moods in the exposition are heard again and in the same order. Instead of appearing in a key or keys contrasted with the tonic key, the opposing material now appears in the same, or mainly in the same, key as the opening material. The tension of the opposites is not so much relaxed as brought into balance. A coda may then follow, sometimes of such elaborate proportions as to simulate further development; but a sonata-form movement is complete only if it ends with reconciliation.

sonata da camera (Italian: "chamber sonata"), a type of trio sonata (*q.v.*) intended for secular performance.

sonata da chiesa (Italian: "church sonata"), a type of trio sonata (*q.v.*).

sonatina, in music, curtailed form of the sonata, usually in three short movements, or independent sections. The first movement normally follows the sonata form with respect to the exposition and recapitulation of the musical materials but not necessarily the de-

velopment section, which is either quite perfunctory or lacking altogether. The sonatina form without development is also found in certain slow movements of full-fledged 18th-century sonatas and in opera overtures (e.g., Mozart's *Marriage of Figaro*).

Early piano sonatinas, including those of Muzio Clementi (1752-1832) and Friedrich Kuhlau (1786-1832), were often intended for pedagogical purposes. Later piano sonatinas, on the other hand, including those of Maurice Ravel (1875-1937) and Ferruccio Busoni (1866-1924), require considerable technical proficiency. Less common are sonatinas for instruments other than piano, such as that for violin, viola, and cello by Darius Milhaud (1892-1974).

Sønderborg, port and seaside resort, Sønderjyllands *amtskommune* (county), Denmark, on the southwestern coast of Als Island. It was founded in the mid-13th century around Sønderborg Castle and chartered in 1461. King Christian II was a prisoner at the castle 1532-49. The city was razed in 1864 during a Prussian assault on Danish trenches near Dybbøl nearby Dybbøl Mill, site of heroic Danish resistance, became a symbol of national unity. It passed to Germany and, as a part of the North Slesvig region, was restored to Denmark by a plebiscite in 1920. Sønderborg Castle now houses a museum. The city's chief products are textiles, machinery, furniture, chemicals, margarine, and beer. Pop. (1981) city, 26,885; (1982 est.) mun., 27,867.

Sonderbund (German: Separatist League), formally SCHUTZVEREINIGUNG (Defense Union), league formed on Dec. 11, 1845, by the seven Catholic Swiss cantons (Luzern, Uri, Schwyz, Unterwalden, Zug, Fribourg, and Valais) to oppose anti-Catholic measures by Protestant liberal cantons. The term Sonderbund also refers to the civil war that resulted from this conflict.

In 1841 the government of the Aargau canton decreed the dissolution of the Catholic monasteries in its territory, despite the fact that the Federal Pact (constitution of 1815) had guaranteed the monasteries' property. The seven Catholic cantons in 1843-44 agreed that they would dissociate themselves from any canton disloyal to the Federal Pact, and in 1844 the Jesuits, whom 19th-century liberals detested, were invited to take charge of religious education in Luzern. This cantonal act, although constitutionally permissible, provoked widespread popular indignation, and a Bernese staff officer led bands of volunteers from Protestant cantons in an unsuccessful expedition against Luzern in the spring of 1845. The Catholic cantons' subsequent formation of the so-called Sonderbund was even more vehemently denounced by the liberal and radical cantons.

In the summer of 1847, a reformist majority in the Swiss Diet voted for the dissolution of the Sonderbund, for the drafting of a new Federal Pact, and for the expulsion of the Jesuits. The Sonderbund, led politically by Konstantin Sigwart-Müller of Luzern, took up arms in November 1847 and appealed for help from abroad, but neither its military organization, commanded by Johann Ulrich von Salis-Soglio, nor its appeal were satisfactorily effective. The forces of the majority, ably led by Henri Dufour, took Fribourg on November 14 and Zug on November 21; they won a decisive victory at Gislikon on November 23, entered Luzern itself, the nucleus of the Sonderbund, on November 24, and subdued Valais on Nov. 28, 1847. The peace settlement of 1848 required the former members of the Sonderbund to pay 6,000,000 francs for the cost of the war and charged the cantons of Appenzell Inner-Rhoden and Neuchâtel 15,000 and 300,000 francs, respectively, as fines for having been neutral; a new constitution for Switzerland also was adopted. In 1852 the

unpaid balance of the war costs was written off.

Sønderjyllands, amtskommune (county), southern Jutland, Denmark, created in 1970 from the former counties of Tønder, Abenrå-Sønderborg, and Haderslev, with an area of 1,517 sq mi (3,929 sq km). Bounded by the North Sea, the Little Belt, and Germany, the county comprises the historical region of North Slesvig, which passed to Germany in 1864 and was returned to Denmark after a plebiscite in 1920. While the western portion is sometimes marshy, the eastern section has fertile clay loams, and agriculture, livestock raising, and dairying are carried on throughout the county. The administrative centre is at Abenrå (*q.v.*). Christiansfeld in the north was laid out in 1773 by the Moravians, whose famous honey-cake bakery, museum, and cemetery remain. Pop. (1982 est.) 250,409.

Sondheim, Stephen (Joshua) (b. March 22, 1930, New York City), U.S. composer and lyricist whose brilliance in matching words and music in dramatic situations broke new ground for Broadway musical theatre.

Precocious as a child, he early showed musical aptitude among other wide-ranging interests. He studied piano and organ, and at 15 wrote a musical at the George School in Bucks County, Pa. Under the tutelage of a family friend, Oscar Hammerstein II, he studied musical theatre. He also studied music at Williams College, Williamstown, Mass., and wrote college shows there. When he graduated in 1950, he received the Hutchinson Prize for composition, a fellowship. He then studied further in New York with the composer Milton Babbitt.

In the early 1950s he wrote scripts in Hollywood for the "Topper" television series. Returning to New York, he wrote incidental music for *The Girls of Summer* (1956). He made his first mark on Broadway as the lyricist for Leonard Bernstein's *West Side Story*, which opened Sept. 26, 1957, in New York City. He was also lyricist for *Gypsy* (1959; music by Jule Styne).

A Funny Thing Happened on the Way to the Forum—based on comedies by the Roman playwright Plautus—opened in New York City on May 8, 1962, with music and lyrics by Sondheim. It ran for 964 performances. Two years later, his *Anyone Can Whistle*, closed after only nine performances in April 1964.

Sondheim later won Tony awards for a number of Broadway productions of shows with his music and lyrics—*Company* (1970), on marriage and bachelorhood; *Follies* (1971), which includes many pastiche songs; *A Little Night Music* (1973), based on Ingmar Bergman's *Smiles of a Summer Night* (1955); and *Sweeney Todd: The Demon Barber of Fleet Street* (1979). Harold Prince, producer of the first three shows, also produced *Pacific Overtures* (1976), in which Sondheim looked to Kabuki for stylized effects.

He later collaborated as composer-lyricist with playwright-director James Lapine to create *Sunday in the Park With George*, which opened on Broadway May 2, 1984, after a lengthy preparation. This musical was inspired by the painting "Sunday Afternoon on the Island of la Grande Jatte" by the pointillist Georges Seurat.

Sondheim's acerbic lyrics hit responsive chords with many. Most critics agree that his work marked a break from more traditional and sentimental musical comedies of the earlier decades of the century. "Sondheim: A Musical Tribute" was staged in New York City, March 11, 1973.

The Last of Sheila (1973) is a nonmusical film mystery that Sondheim, an enthusiast for games and puzzles (featured in the film), wrote with Anthony Perkins.

Sondheim & Co. (1974), by Craig Zadan, is a lively history of Sondheim's work with quota-

tions from him and his associates. Appendixes cover Broadway and other stage productions, original-cast recordings, and motion-picture sound-track recordings.

Søndre Strømfjord, inlet, southwestern Greenland, located just north of the Arctic Circle and 60 miles (95 km) southeast of Holsteinsborg. About 120 miles (190 km) long and 1–5 miles (1.5–8 km) wide, the inlet extends northeastward from Davis Strait to the edge of the inland ice cap, where its arms are fed by several glaciers. Near the head of the inlet is Bluie West 8 (BW 8), a U.S. World War II air base, which now serves as a trans-polar intermediate stop between Scandinavia and North America.

Sondrio, city, capital of Sondrio *provincia*, Lombardia (Lombardy) *regione*, northern Italy; it is the chief town of the Valtellina (the upper Adda River valley), near the mouth of the Mallerio River, and lies at an elevation of 1,017 feet (310 m), north of Bergamo. It has an archaeological museum, and its old castle, Castello Masegra, is now a barracks. The city, well-known for its wines (notably Sassella), is an agricultural and commercial centre and has cotton and silk textile industries. Sondrio is also a tourist base linked by cableways with nearby Alpine resorts, including Bormio and Santa Caterina Valfurva. It is connected by rail and road with Switzerland via Tirano and the Bernina Pass and by road with the Stelvio Pass and with Bolzano. Pop. (1989 est.) mun., 22,783.

Sone River (India): see Son River.

*Articles are alphabetized word by word,
not letter by letter*

sone, unit of loudness. Loudness is a subjective characteristic of a sound (as opposed to the sound-pressure level in decibels, which is objective and directly measurable). Consequently, the sone scale of loudness is based on data obtained from subjects who were asked to judge the loudness of pure tones and noise. One sone is arbitrarily set equal to the intensity of a 1,000-hertz tone at a level of 40 decibels above the standard reference level (*i.e.*, the minimum audible threshold). A sound with a loudness of four sones is one that listeners perceive to be four times as loud as the reference sound.

Sonepat, town, east-central Haryana state, northern India, 27 miles (43 km) north of New Delhi. The town was probably founded by early Aryan settlers about 1500 bc and flourished on the banks of the Yamuna River, which now has receded 9 miles (14 km) to the west. Mentioned in the Hindu epic the *Mahābhārata* as Sonaprastha, the town is in the region known as the Kurukṣetra ("Land of Kurus"), the scene of the epic war between the Kauravas and the Pāṇḍavas. It is one of the largest towns in Haryana state, and its proximity to New Delhi as a source of raw materials and power has helped its industrial development. Sonepat is one of the major bicycle-manufacturing centres in the country; other products include sewing-machine parts, automobile parts, rolled steel, hosiery, and textiles. Carpets, handloomed textiles, and brass and copper ware are among the handicrafts. The mosque of Abdullah Nāṣer ud-Dīn (built in 1272), tombs of Khwāja Khizr, and the ruins of the old fort wall are in the town. Pop. (1981) 109,369.

song, piece of music performed by a single voice, with or without instrumental accompaniment. Works for several voices are called duets, trios, etc.; larger ensembles sing choral music. Speech and music have been combined from the earliest times; music heightens the effect of words, allowing them to be rendered with a projection and passion lacking

in speech alone. Singing style differs among cultures, reflecting such variables as social structure, level of literacy, language, and even sexual mores. Wordy solo songs predominate in technologically advanced, highly centralized societies, whereas primitive cultures often stress ensemble singing, with less attention to careful enunciation and a more relaxed vocal quality than is found in, for example, Oriental solo singing.

In Western music, folk song is customarily distinguished from art song. Folk songs are usually sung unaccompanied or with simple accompaniment—*e.g.*, by guitar or dulcimer. They are usually learned by ear and are infrequently written down; hence they are susceptible to changes of notes and words through generations of oral transmission. Composers of most folk songs are unknown.

Art songs are intended for performance by professional, or at least carefully taught, singers, generally accompanied by piano or instrumental ensemble. The notes are written down, and notes and words are thereafter resistant to casual alteration. Popular songs stand midway between folk and art songs with regard to technical difficulty, sophistication, and resistance to change.

Folk songs often accompany activities such as religious ceremonies, dancing, labour, or courting. Other folk songs tell stories; chief among these are narrative ballads and lyrics. Anglo-American ballads are action-oriented, often dealing with a tragic episode. Lyric songs are more emotion-oriented, more sentimental. Both types display relatively simple melodies, usually with only one or a few notes per syllable. The language tends to follow certain conventions and is often repetitive. Music and words are easily understandable.

Art songs in the European tradition are rarely connected with extramusical activities. Their texts tend to be sophisticated, their melodies often wide-ranging and complex, demanding repeated hearings for full comprehension. Art song, like "classical" music, is essentially an urban phenomenon, with origins in the medieval courts, colleges, cities, and churches. Twelfth-century *trouvères* and *troubadours* left a large corpus of melodies and sung verse; they were imitated throughout Europe. Melodies and poems are subtle and highly organized, the products of an aristocratic society. Manuscripts indicate no accompaniment; presumably it was improvised.

With the growth of polyphonic music in Europe in the 13th and 14th centuries, composers learned to assign the principal melody to a solo singer, with subsidiary melodies played on instruments. The technique of having one melody imitate a preceding one led by the 15th century to elaborate textures wherein the vocal line's primacy was threatened; there followed a reaction in songs with the simplest possible accompaniment, merely a few chords. These became widely popular, and by the 16th century careful declamation and audibility of text became again a central concern.

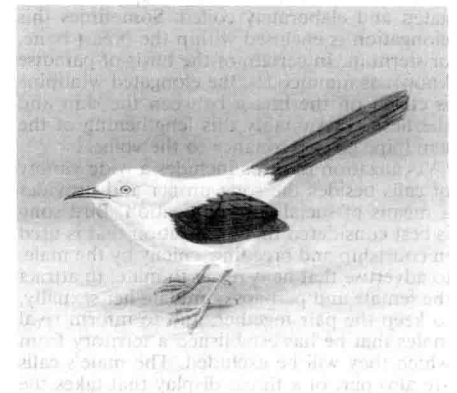
Seventeenth-century dramatic music saw further refinement of song style. Distinctions arose between recitative and aria, the former entirely word-oriented and free, with simple chordal accompaniment, the latter more virtuosic and melodically elaborate, with varied accompaniment. Being musically more interesting, arias came to dominate opera, cantata, and oratorio, and in the 18th century relatively little attention was paid to solo song outside these genres. The songs of W.A. Mozart and Joseph Haydn, for example, are not considered among their best works. Only in popular music did simple strophic (stanzaic) songs with keyboard accompaniment flourish.

In the early 19th century Franz Schubert's songs excelled in dramatic realization and musical quality. Robert Schumann, Johannes Brahms, and the other leading Romantic songwriters learned from Schubert not only the

art of varying a strophic melody but also the potential significance of the accompaniment. In French song the works of composers such as Gabriel Fauré and Claude Debussy characteristically possess shifting, kaleidoscopic harmonies, influenced in part by the fluid accentual patterns of the language. Twentieth-century composers continued to explore the relation of voice to accompaniment and to expand the singer's range of expression and technique, sometimes treating the voice instrumentally. See also *chanson*; *lied*.

Song DYNASTY (China): see Sung dynasty.

song-babbler, any of about 140 bird species of the babbler family *Timaliidae* (order *Passeriformes*). Also called laughing-thrushes, from a major subgroup, song-babblers are found in tropical Africa and Asia. They include all the brightly coloured *timaliids*. About 10 to 30



Pied babbler (*Turdoides bicolor*)

Painting by John P. O'Neill

cm (4 to 12 inches) long, they have strong bills and some have rather long tails. They stay under cover but are detected by their songs of quick phrases. Typical song-babblers are the 26 species of the genus *Turdoides*. The common babbler (*T. caudatus*), found from Iraq eastward across India, is 23 cm (9 inches) long, brown, and long-tailed; small parties feed on the ground in scrublands, uttering low warbling sounds. The pied babbler (*T. bicolor*), 21 cm (8 inches) long, of southwestern Africa, is white, with black wings and tail; it is very inquisitive. See also laughing thrush.

Song Jiaoren (Chinese leader): see Sung Chiao-jen.

Song of Hildebrand (German ballad): see Hildebrandslied.

Song of Roland, The (epic poem): see *Chanson de Roland*, La.

Song of Solomon (biblical literature): see Solomon, Song of.

Song Qingling (Mme Sun Yat-sen): see Soong Ch'ing-ling.

songbird, also called *PASSERINE*, any member of the suborder *Passeres* (or *Oscines*), of the order *Passeriformes*, including about 4,000 species—nearly half the world's birds—in 35 to 55 families. Most cage birds belong to this group. Songbirds are alike in having the vocal organ highly developed, though not all use it to melodious effect. Classification in this suborder is much disputed. *Alaudidae* (larks) and *Hirundinidae* (swallows) are the most distinctive families.

Songbirds range in size from tiny kinglets and sunbirds to comparatively large crows. They are mainly land birds that live in a wide variety of situations, from open grassland to forest. Although songbirds include some of the best songsters, such as thrushes, some have

harsh voices like crows, and some do little or no singing. Songbirds are distinguished from other perching birds by certain anatomical characteristics, especially the more complicated vocal organ, or syrinx.

The syrinx—as the voice-producing structure, or song box, is called—is located at the point where the windpipe divides into two bronchial tubes to go to the lungs. The syrinx is an intricately constructed organ with a firm bony framework and filmlike vibrating internal membranes over which the air, during exhalation, passes rapidly, producing all the many utterances of the bird. A variable number of syringeal muscles and their controlling nerves adjust the tension on the membranes. The song box reaches its greatest complexity in the true songbirds. (But it is not a complicated syrinx alone that determines singing ability, for some true songbirds hardly sing at all). In some birds the windpipe is elongated and elaborately coiled. Sometimes this elongation is enclosed within the breast bone, or sternum. In certain of the birds-of-paradise known as manucodes, the elongated windpipe is coiled on the breast between the skin and the flesh. Presumably this lengthening of the windpipe gives resonance to the voice.

Vocalization in birds includes a wide variety of calls besides the song proper and provides a means of social communication. Bird song is best considered the vocalization that is used in courtship and breeding, chiefly by the male, to advertise that he is ready to mate, to attract the female and perhaps stimulate her sexually, to keep the pair together, and to inform rival males that he has established a territory from which they will be excluded. The male's calls are also part of a threat display that takes the place of actual combat in repelling intruding rivals. However, similar song is sometimes given spontaneously when there is no obvious use for it. Occasionally females sing, and especially in tropical species pairs may duet, again perhaps as a method of reinforcing the bond between the pair. Often the song is delivered from a series of regularly used perches. Some species, especially those that live in grasslands, have flight songs.

Bird song need not be pleasing to the human ear. The hooting of the owl, the monotonously repeated phrases of the North American whippoorwill, the crazed, repeated whistle of a Malayan cuckoo that has given it the name of the brain-fever bird, and the African tinkerbird's repeated notes, which, from their resemblance to hammering on metal, have given the bird its name—all must be called songs.

Which birds are the best songsters is a question that is subjective. The nightingale of Europe (*Luscinia megarhynchos*), a small thrush, perhaps heads the list of famous songsters of European literature. Also a favourite of the poets was the European skylark (*Alauda arvensis*). In North America the mockingbird (*Mimus polyglottos*) is a wonderful performer with a rich, melodious, long-continued song. In Australia the lyrebirds, which are not true songbirds, have songs that are superlative in variety and intensity and have a dramatic quality. Though the best songsters may be true songbirds, some birds of other groups have pleasing or musical utterances, like the quavering trill of the screech owl and the cheery whistle of the bobwhite quail.

Sŏnggyun'guan, original name KUKHAK, national university of Korea under the Koryŏ (935–1392) and Yi, or Chosŏn (1392–1910), dynasties. Named the Kukhak ("National Academy") during the Koryŏ dynasty, it was renamed the Sŏnggyun'guan and served as the sole highest institute for training government officials during the Yi dynasty.

The national university at first had 200 students, but the number was later reduced to 126. The students were selected from four groups: the official candidates who had passed the lower civil-service examinations and thus qualified for the *saengwon* or *chinsa* degrees; graduates of the four secondary public schools in Seoul; sons of merit subjects; and lower officials.

The university, located in Seoul, had two residential halls, a lecture hall, and a shrine where rites were held regularly in spring and in autumn in honour of Confucius and eminent Confucian scholars. It also offered two programs of study: readings in Confucian classics and literary composition in Chinese.

Upon the Japanese annexation of Korea in 1910, the institute became a centre of Korean Confucianism. After Korea's liberation in 1945, it was reorganized as Sŏnggyun'guan University and equipped with modern educational facilities. Rites honouring Confucius are still held in spring and autumn in the shrine within the compound of the university.

A list of the abbreviations used in the MICROPAEDIA will be found at the end of this volume

Songhai, also spelled SONGHAY, also called SONRHAI, ethnolinguistic group inhabiting the area of the great bend in the Niger River in Mali, extending from Lake Debo to the mouth of the Sokoto River in Nigeria. The Songhai are a Negroid people of probable Caucasoid admixture. They are composed of many related groups, the most important of which are the Zerma. Their language, also called Songhai, is of independent stock.

Songhai society traditionally was highly structured, comprising a nobility, free commoners, artisans, *griots* (bards and chroniclers), and, formerly, slaves. Marriage could be polygynous, cousins being preferred partners. Descent and succession are patrilineal. Cultivation, largely of cereals, is practiced intensively only during the rainy season, from June to November. Cattle are raised on a small scale, and fishing is of some importance. Each craft of workers in iron, wood, pottery, leather, or cotton belongs exclusively to one particular caste. As a result of their advantageous location at the crossroads of western and central Africa, the Songhai have traditionally prospered from caravan trade. Many young Songhai have left home for the coast, especially Ghana.

Songhai empire, also spelled SONGHAY, great trading state of West Africa (fl. 15th–16th century), centred on the middle reaches of the Niger River in what is now central Mali and eventually extending west to the Atlantic coast and east into Niger and Nigeria.

Though the Songhai people are said to have established themselves in the city of Gao about AD 800, they did not regard it as their capital until the beginning of the 11th century during the reign of the *dia* (king) Kossoi, a Songhai convert to Islām. Gao so prospered and expanded during the next 300 years that from 1325 to 1375 the rulers of Mali added it to their empire. In about 1335 the *dia* line of rulers gave way to the *sunni*, or *shi*, one of whom, Sulaiman-Mar, is said to have won back Gao's independence. The century or so of vicissitudes that followed was ended by the accession in about 1464 of Sonni 'Ali, also known as 'Ali Ber (d. 1492). By repulsing a Mossi attack on Timbuktu, the second most important city of Songhai, and by defeating the Dogon and Fulani in the hills of Bandiagara, he had by 1468 rid the empire of any immediate danger. He later evicted the Tuareg from Timbuktu, which they had occupied since 1433, and, after a siege of seven years, took Jenne (Djenné) in 1473 and by 1476

had dominated the lakes region of the middle Niger to the west of Timbuktu. He repulsed a Mossi attack on Walata to the northwest in 1480 and subsequently discouraged raiding by all the inhabitants of the Niger valley's southern periphery. The civil policy of Sonni 'Ali was to conciliate the interests of his pagan pastoralist subjects with those of the Muslim city dwellers, on whose wealth and scholarship the Songhai empire depended. His son Sonni Baru (reigned 1493), who sided completely with the pastoralists, was deposed by the rebel Muhammad ibn Abi Bakr Ture, also known as Muhammad I Askia (reigned 1493–1528), who welded the central region of the western Sudan into a single empire. He too fought the Mossi of Yatenga, tackled Borgu, in what is now northwestern Nigeria (1505)—albeit with little success—and mounted successful campaigns against the Diara (1512), against the kingdom of Fouta-Toro in Senegal, and to the east against the Hausa states. In order to win control of the principal caravan markets to the north, he ordered his armies to found a colony in and around Agadez in Air. He was deposed by his eldest son, Musa, in 1528. Throughout the dynastic squabbles of successive reigns (Askia Musa, 1528–31; Bengan Korei, also known as Askia Muhammad II, 1531–37; Askia Ismail, 1537–39; Askia Issihak I, 1539–49), the Muslims in the towns continued to act as middlemen in the profitable gold trade with the states of Akan in central Guinea. The peace and prosperity of Askia Dāwūd's reign (1549–82) was followed by a raid initiated by Sultan Ahmad al-Manšūr of Morocco on the salt deposits of Taghaza. The situation, which continued to worsen under Muhammad Bāni (1586–88), culminated disastrously for Songhai under Issihak II (1588–91) when Moroccan forces, using firearms, advanced into the Songhai empire to rout his forces, first at Tondibi and then at Timbuktu and Gao. Retaliatory guerrilla action of the pastoral Songhai failed to restore the empire, the economic and administrative centres of which remained in Moroccan hands.

Songhua Jiang (China): see Sungari River.

Songjiang (China): see Sung-chiang.

Sŏngjin (North Korea): see Kimch'aek.

Songkhla, also called SINGORA, city, southern Thailand, located on the eastern coast of peninsular Thailand. Songkhla is a port at the outlet of Luang Lagoon. It is a regional centre for the Gulf of Thailand coastal area and is commercially oriented to Malaysia and Singapore. Rubber, tin, coconuts, peanuts (groundnuts), edible birds' nests, and forest and fish products are exported from its roadstead harbour. On a rail spur from Hat Yai, Songkhla is also served by an airport. Educational facilities include the Prince of Songkla University (1964) and the Southern Technical Institute. The city is a popular tourist centre, with beaches and parks. Pop. (1986 est.) 84,738.

songlark, either of the two species of the Australian genus *Cinclorhamphus*, of the songbird family Maluridae (order Passeriformes) or the subfamily Orthonychinae (see Muscicapidae). Both are drab and vaguely larklike; males of both species are much larger than females. The rufous songlark (*C. mathewsi*), 20 cm (8 inches) long, lives in open forests and has a lively song; the 30-centimetre (12-inch) brown, or black-breasted, songlark (*C. cruralis*) lives in open country, utters creaky chuckling notes, and has a flight song, as larks do.

Sŏngnam, city, Kyŏnggi *do* (province), northwestern South Korea, 12 miles (19 km) southeast of Seoul. Given the status of a municipality in 1973, it developed rapidly as a satellite city of Seoul, absorbing some of the capital's population and light industries. From 1970 to 1975 alone, Sŏngnam's popula-

tion increased nearly fivefold to more than a quarter of a million persons, the highest rate of growth in the country. The government has continued to encourage the movement of industry from Seoul to Sŏngnam. Pop. (1984 est.) 434,078.

Songnim, city, southwestern North Korea. It is North Korea's largest iron and steel centre, as well as a river port on the banks of the Taedong-gang (river). During the Japanese occupation (1910-45) it was named Kyōmip'o. Formerly, it was a poor riverside village, but after the establishment of an iron foundry in 1916 it developed rapidly. During the Korean War it was destroyed by bombing, but it has been rebuilt. A plant located there processes pig iron, steel, and rolled steel. The city is served by rail and highway and also uses the Taedong and Chaeryōng rivers to transport raw materials and finished products. The river port accommodates ships of 4,000 tons. Pop. (latest est.) 53,035.

songshrike, any of several birds of the family Cracticidae (order Passeriformes) including the bell-magpie, butcherbird, and currawong (q.v.).

sonic boom, shock wave that is produced by an aircraft or other object flying at a speed equal to or exceeding the speed of sound and that is heard on the ground as a sound like a clap of thunder.

When an aircraft travels at subsonic speed, the pressure disturbances, or sounds, that it generates extend in all directions. Because this disturbance is transmitted earthward continuously to every point along the path, there are no sharp disturbances or changes of pressure. At supersonic speeds, however, the pressure field is confined to a region extending mostly to the rear and extending from the craft in a restricted widening cone (called a Mach cone). As the aircraft proceeds, the trailing parabolic edge of that cone of disturbance intercepts the earth, producing on earth a sound of a sharp bang or boom—with silence before and after. When such an aircraft flies at a low altitude, the shock wave may be of sufficient intensity to cause glass breakage and other damage. The intensity of the sonic boom is determined not only by the distance between the craft and the ground but also by the size and shape of the aircraft, the types of maneuvers that it makes, and the atmospheric pressure, temperature, and winds. If the aircraft is especially long, double sonic booms might be detected, one emanating from the leading edge of the plane and one from the trailing edge.

Soninke, also called SARAKOLE, SERACULEH, or SERAHULI, a people located in Senegal near Bakel on the Sénégal River and in neighbouring areas of West Africa. They speak a Mande language of the Niger-Congo family. Some Senegalese Soninke have migrated to Dakar, but the population in the Bakel area remain farmers whose chief crop is millet. The Soninke were the founders of the ancient empire of Ghana, which was destroyed after the invasions of Muslim conquerors in the 10th century. Their social structure and organization are typical of the Mande (q.v.) peoples.

Sonneberg, city, Thuringia Land (state), eastern Germany, on the southern slope of the Thüringer Wald (forest), southeast of Suhl city, near the border with Bavaria Land. Mentioned in 1207, it was chartered in 1349 and belonged to the Duchy of Saxe-Meiningen from 1735 to 1918. A rail junction, it is the centre of the Thuringian toy-making industry, based in the nearby villages, and has a toy museum. Pop. (1989 est.) 27,649.

Sonneck, Oscar (George Theodore) (b. Oct. 6, 1873, Jersey City, N.J., U.S.—d. Oct. 30, 1928, New York City), American musicologist, librarian, and editor.

Sonneck was mainly educated in Germany

and attended the universities of Heidelberg and Munich, studying philosophy, composition, conducting, and, especially, musicology.

A significant portion of his studies on American musical life before 1800—an area of study that remained his lifelong interest—was carried out at the new Library of Congress in Washington, D.C. In 1902 he was appointed the first head of the library's music division, in which capacity he organized and developed one of the finest and most comprehensive collections of music, manuscripts, and books on music in the world.

In 1917 he resigned from the library and accepted the post of director of the publication department of G. Schirmer, Inc. (New York City), whose *Musical Quarterly* he had edited since its first issue in 1915. After his appointment as vice-president of the company (1921), he actively supported American composers and directed the publication of new music by Ernest Bloch, John Alden Carpenter, Charles Tomlinson Griffes, Rubin Goldmark, Charles Martin Loeffler, and others.

Sonneck's writings laid the foundation for the scientific study of music in the United States. His elaborate catalogs (issued by the Library of Congress) and his work on opera librettos remain the outstanding reference works in their field, and the system he devised for the classification of music collections is an invaluable contribution to music bibliography.

sonnet, lyric poem of 14 lines having a formal rhyme scheme; it is unique among poetic forms in Western literature in that it has retained its appeal for major poets for five centuries. The sonnet seems to have originated in the 13th century among the Sicilian school of court poets, who were influenced by the love poetry of Provençal troubadours. From there it spread to Tuscany, where it reached its highest expression in the 14th century in the poems of Petrarch. His *Canzoniere*, a sequence of poems including 317 sonnets, addressed to his idealized beloved, Laura, established and perfected the Italian (or Petrarchan) sonnet, which remains one of the two principal sonnet forms, as well as the one most widely used. The other major form is the English (or Shakespearean) sonnet.

The Italian sonnet characteristically treats its theme in two moods. The first eight lines, the octave, state a problem, ask a question, or express an emotional tension. The last six lines, the sestet, resolve the problem, answer the question, or relieve the tension. The octave is rhymed *abbaabba*. The rhyme scheme of the sestet varies; it may be *cdecde*, *cdccdc*, or *cddede*. The Petrarchan sonnet became a major influence on European poetry. It soon became naturalized in Spain, Portugal, and France and was introduced to Poland, whence it spread to other Slavic literatures. In most cases the form was adapted to the staple metre of the language—e.g., the Alexandrine (12-syllable iambic line) in France and iambic pentameter in English.

The sonnet was introduced to England, along with other Italian verse forms, by Sir Thomas Wyatt and Henry Howard, earl of Surrey, in the 16th century. The new forms precipitated the great Elizabethan flowering of lyric poetry, and the period marks the peak of the sonnet's English popularity. In the course of adapting the Italian form to a language less rich in rhymes, the Elizabethans gradually arrived at the distinctive English sonnet, which is composed of three quatrains, each having an independent rhyme scheme, and is ended with a rhymed couplet.

The rhyme scheme of the English sonnet is *abab cdcd efef gg*. Its greater number of rhymes makes it a less demanding form than the Italian sonnet, but this is offset by the difficulty presented by the couplet, which must summarize the impact of the preceding quatrains with the compressed force of a Greek

epigram. Even Shakespeare sometimes failed at it.

The typical Elizabethan use of the sonnet was in a sequence of love poems in the manner of Petrarch. Although each sonnet was an independent poem, partly conventional in content and partly self-revelatory, the sequence had the added interest of providing something of a narrative development. Among the notable Elizabethan sequences are Sir Philip Sidney's *Astrophel and Stella* (1591), Samuel Daniel's *Delia* (1592), Michael Drayton's *Idea's Mirror* (1594), and Edmund Spenser's *Amoretti* (1591). The last-named work uses a common variant of the sonnet (known as Spenserian), which follows the English quatrain and couplet pattern, but resembles the Italian in using a linked rhyme scheme: *abab bcbe cdcd ee*. Perhaps the greatest of all sonnet sequences is Shakespeare's, addressed to a young man and a "dark lady." In these sonnets the supposed love story is of less interest than the underlying reflections on time and art, growth and decay, and fame and fortune.

In its subsequent development, the sonnet was to depart even further from themes of love. By the time John Donne wrote his religious sonnets (c. 1610) and Milton wrote sonnets on political and religious subjects or on personal themes such as his blindness (i.e., "When I consider how my light is spent"), the sonnet had been extended to embrace nearly all the subjects of poetry.

It is the virtue of this short form that it can range from "light conceits of lovers" to considerations of man, time, death, and eternity, without doing injustice to any of them. Even during the Romantic era, in spite of the emphasis on freedom and spontaneity, the arbitrary Italian and English sonnet forms continued to challenge major poets. The sonnets of Wordsworth (e.g., "It Is a Beauteous Evening: Calm and Free" and "The World Is Too Much With Us") and those of Keats (e.g., "When I Have Fears That I May Cease To Be" and "Bright Star, Would I Were Steadfast as Thou Art") are among the finest and best known in English.

In the later 19th century the love sonnet sequence was revived by Elizabeth Barrett Browning in *Sonnets from the Portuguese* (1850) and by Dante Gabriel Rossetti in *The House of Life* (1876). The most distinguished 20th-century work of the kind is Rainer Maria Rilke's *Sonnetten an Orpheus* (1922).

Sonni 'Ali, Sonni also spelled SUNNI, also called SONNI 'ALI BER (Arabic: 'Ali the Great) (d. 1492), West African monarch who initiated the imperial expansion of the Western Sudanese kingdom of Songhai. His conquest of the leading Sudanese trading cities established the basis for Songhai's future prosperity and expansion.

When Sonni 'Ali ascended the Songhai throne c. 1464, the kingdom comprised only a small area in the upper Niger valley around its capital, the prosperous trading city of Gao. Although the Songhai people had managed to throw off the domination of the Mali Empire, they also hoped to obtain territorial benefits, like other West African peoples, from the disintegration of Mali. Sonni 'Ali saw an excellent opportunity to oblige in 1468, when Muslim leaders of the city of Timbuktu (Tombouctou), formerly one of the chief cities in the empire of Mali, asked his aid in overthrowing the Tuareg, the nomadic desert Berbers who had conquered the city when Mali control declined. After Sonni 'Ali conquered Timbuktu and drove out the Tuareg, he plundered the city and murdered many of its inhabitants, presumably in retaliation for the Muslim leader's failure to provide him with promised transport across the Niger River.