

The New Encyclopædia Britannica

Volume 8

MICROPÆDIA

Ready Reference

FOUNDED 1768
15TH EDITION



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Kyoto Exhibit 2018
BioGatekeeper v. Kyoto University
IPR2014-01286

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

© 1911

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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, 1994, 1995, 1997, 1998, 2002, 2003

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Printed in U.S.A.

Library of Congress Control Number: 2002113989

International Standard Book Number: 0-85229-961-3

Britannica may be accessed at <http://www.britannica.com> on the Internet.

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at Philadelphia. He was very successful but left the bank to accept a command against the English in San Domingo, under Rochambeau. He made a brilliant defense of the Môle Saint-Nicolas and escaped with the garrison to Cuba; but in making for Havana his ship was attacked by an English frigate, and after a long engagement he was severely wounded and died of his injuries.

Noailles, Anna de, in full ANNA-ÉLISABETH DE NOAILLES, PRINCESS BRANCOVAN, COUNTESS (comtesse) MATHIEU (b. Nov. 15, 1876, Paris, France—d. April 30, 1933, Paris), poet, a leading literary figure in France in the pre-World War I period.

The daughter of a Romanian prince and granddaughter of a Turkish pasha, she adopted France and its language for her life and writings even before her marriage to a French count. Her friends included the novelists Marcel Proust and Colette and the poets Paul Valéry and Jean Cocteau. In her literary salon she kept most of the writers of her time under the spell of her artful conversation. Her volumes of poems, *Le Cœur innombrable* (1901; "The Numberless Heart"), *Les Éblouissements* (1907; "Resplendence"), and *L'Honneur de souffrir* (1927; "The Honour of Suffering"), are vibrant with a sensual love of nature. Her lyricism draws from the Romantic themes of the 19th-century poets Alfred de Vigny and Alphonse de Lamartine. Her later works reflect her fear of the thought of the inevitable collapse of her physical powers. She was made a commander of the Légion d'Honneur and elected to the Royal Academy of French Language and Literature of Belgium.

Noailles, Louis-Antoine de (b. May 27, 1651, Château de Tessières, near Aurillac, France—d. May 4, 1729, Paris), cardinal and archbishop of Paris, who, with his brother, the second duc de Noailles, made the name Noailles one of the most honoured in France.

Educated in Paris and receiving a doctorate in theology from the Sorbonne, he became successively bishop of Cahors (1679), bishop of Châlons (1680–95), and archbishop of Paris (from 1695); he was named cardinal in 1700.

He was involved in the controversies over Jansenism, mildly approving the Jansenism of Pasquier Quesnel's *Reflexions morales* and, by 1713, demonstrating intense opposition to the most resolute anti-Jansenists, the Jesuits. His opposition to Pope Clement XI's anti-Jansenist bull *Unigenitus* ended ambiguously in 1728, when he accepted it unconditionally after signing a preliminary protest against any such acceptance. He died the following year.

Noākhālī, port city, southern Bangladesh, on the Noākhālī Watercourse near the Meghna Estuary as it empties into the Bay of Bengal. The port is connected by road and rail with Comilla and by steamer with Barisal. Industries include cotton weaving. Formerly called Sudhārām, the city was constituted a municipality in 1876 and contains several government colleges affiliated with the University of Dhākā.

Around Noākhālī on three sides is an alluvial plain that is annually inundated and fertilized by silt deposits from the Meghna Estuary; the area is broken only by a hilly tract in the northeast known as Bāraiādhāla. Rice, jute, oilseeds, pulses, betel nuts, chilies, and sugarcane are the chief local crops. Pop. (1991 prelim.) city, 73,766.

Nōami, original name NAKAO SHINNŌ (b. 1397, Japan—d. 1494), Japanese poet, painter, and art critic, the first nonpriest who painted in the *suiboku* ("water-ink"), or Chinese, style.

Nōami was in charge of the art collection of Ashikaga Yoshimitsu, the military dictator who ruled Japan from 1368 to 1394, and was

perhaps the first great art expert in Japan. His catalog of Yoshimitsu's collection, *Kundaikan sayū chōki* (1476; "A Treatise on the Scrolls in the Lord's Watchtower"), is invaluable as an early Japanese appraisal of Chinese artists.

Many of Nōami's paintings have been preserved. Among the best known are "The Pines of Miho," a landscape executed on a screen in the soft ink-wash technique associated with Mu-ch'i Fa-ch'ang, the 13th-century Chinese priest-painter whose work Nōami admired, and "The White-Robed Kannon," a portrait in ink of the Buddhist goddess of mercy painted for his child's memorial service. Nōami's son, Geiami (d. 1485), and grandson, Sōami, also served the Ashikaga court as painters and art advisers; together they are known as the San Ami (Three Amis).

Noatak National Preserve, formerly NOATAK NATIONAL MONUMENT, national preserve in Alaska, U.S., adjoining Gates of the Arctic National Park to the east and Kobuk Valley National Park to the south. Proclaimed a national monument in 1978, the area underwent boundary and name changes in 1980. The entire area is located north of the Arctic Circle and contains the largest untouched river basin in the United States. Landforms of scientific interest include the Grand Canyon of the Noatak (65 miles [105 km] long), a transition zone and migration route for flora and fauna between subarctic and Arctic environments. The preserve has hundreds of archaeological sites, and wildlife includes caribou, grizzly bears, Dall sheep, moose, and wolves, and waterfowl, raptors, and other bird species. The total area is 10,273 square miles (26,607 square km).

Nobel, Alfred Bernhard (b. Oct. 21, 1833, Stockholm, Sweden—d. Dec. 10, 1896, San Remo, Italy), Swedish chemist, engineer, and industrialist who invented dynamite and other, more powerful, explosives and founded the Nobel Prizes.

Through his mother he was descended from the Swedish naturalist Olof Rudbeck, noted for his description of the lymphatic vessels (c. 1653). From his father, Immanuel Nobel, he learned the fundamentals of engineering, and, like his father, he had a talent for invention. The Nobel family left Stockholm in 1842 to join the father in St. Petersburg. Educated mainly by tutors, young Nobel was a competent chemist at 16 and was fluent in English, French, German, Russian, and Swedish. He left Russia in 1850 to spend a year in

Paris studying chemistry and four years in the United States working under the direction of John Ericsson, builder of the ironclad warship *Monitor*. Upon his return to St. Petersburg, Nobel worked in his father's factory until it went bankrupt in 1859.

Returning to Sweden, Nobel began the manufacture of the liquid explosive nitroglycerin. Shortly after production was under way in 1864, the factory blew up, causing the death of his youngest brother, Emil, and four other persons. Forbidden by the Swedish government to rebuild the factory, Nobel, who had become stereotyped as a "mad scientist," began experimenting on a barge to find a way to minimize the danger of handling nitroglycerin. A chance discovery that nitroglycerin was absorbed to dryness by kieselguhr, a siliceous packing material, and that the mixture could be handled safely led him to perfect dynamite and a detonating cap. Granted patents for dynamite in Britain (1867) and the United States (1868), he further experimented and developed a more powerful form of dynamite, blasting gelatin, patented in 1876. About a decade later, he produced ballistite, one of the first nitroglycerin smokeless powders and a precursor of cordite. Nobel's claim that his patent covered the latter was the occasion of vigorously contested lawsuits between him and the British government in 1894 and 1895, which he eventually lost. An accomplishment of importance equal to that of his explosives was his construction and perfection of detonators for such explosives as could not be made to explode by simple firing.

His worldwide interests in explosives, in addition to large holdings in the Baku oil fields of Russia, brought him an immense fortune but required him to travel almost constantly. He had the inclinations of a recluse, however, and he never married. Though he was essentially a pacifist and hoped that the destructive powers of his inventions would help bring an end to wars, his view of mankind and nations was pessimistic. He had an abiding interest in literature, and in his youth he had written poetry in English. The beginnings of a novel were found among his papers.

Generous in humanitarian and scientific philanthropies, he left the bulk of his fortune in trust to establish what came to be the most highly regarded of international awards, the Nobel Prize.

Nobel Prize, any of the prizes (five in number until 1969, when a sixth was added) that are awarded annually by four institutions (three Swedish and one Norwegian) from a fund established under the will of Alfred Bernhard Nobel. Distribution was begun on Dec. 10, 1901, the fifth anniversary of the death of the founder, whose will specified that the awards should annually be made "to those who, during the preceding year, shall have conferred the greatest benefit on mankind." The five prizes established by his will are: the Nobel Prize for Physics (Nobelpriset i Fysik); the Nobel Prize for Chemistry (Nobelpriset i Kemi); the Nobel Prize for Physiology or Medicine (Nobelpriset i Fysiologi eller Medicin); the Nobel Prize for Literature (Nobelpriset i Litteratur); and the Nobel Prize for Peace (Nobels Fredspris). An additional award, the Prize for Economic Sciences in Memory of Alfred Nobel (Priset i Ekonomisk Vetenskap till Alfred Nobels Minne), was set up in 1968 by the Bank of Sweden, and the first award was given in 1969.

The institutions cited as prize awardees by Alfred Nobel in his will are the Royal Swedish Academy of Sciences (physics and chemistry), the Royal Caroline Medico-Chirurgical Institute (physiology or medicine), and the Swedish Academy (literature)—all in Stockholm—and the Norwegian Nobel Committee (peace), located in Oslo and appointed by the Norwegian Storting (parliament). The Academy



Alfred Nobel, detail of a portrait (from a photograph) by Emil Österman, 1915; in the Nobel Foundation, Stockholm
By courtesy of the Svenska Porträttarkivet

of Sciences also supervises the economics award. The Nobel Foundation, established in pursuance of the provisions of the will, is the legal owner and functional administrator of the funds and serves as the joint administrative body of the prize awarders, but it is not concerned with the prize deliberations or decisions, which rest exclusively with the four institutions. Each award consists of a gold medal, a diploma bearing a citation, and a sum of money, the amount depending on the income of the foundation.

The selection of the prizewinners starts in the early autumn of the year preceding the awards, with the prize-awarding institutions sending out invitations to nominate candidates to those competent under the Nobel statutes to do so. The basis of selection is professional competence and international range; self-nomination automatically disqualifies a person. Prize proposals must reach the proper committee in writing before February 1 of the year of the prize decision.

On February 1, six Nobel committees—one for each prize group—start their work on the nominations received. If necessary, the committees may call in experts, irrespective of nationality. During September and early October the committees submit recommendations to their respective prize-awarding bodies—only in rare cases has the question been left open. The final decision by the awarders must be made by November 15. A committee recommendation is usually but not invariably followed. The deliberation and the voting are secret at all stages. Prizes may be given only to individuals, except the Peace Prize, which may also be given to an institution. An individual may not be nominated posthumously, but a prize duly proposed may be so awarded, as with Dag Hammarskjöld (for peace; 1961) and Erik A. Karlfeldt (for literature; 1931). The awards may not be appealed against. Official support, diplomatic or political, for a certain candidate has no bearing on an award because the prize awarders, as such, are independent of the state.

A prize is either given entire to one person, divided equally between at most two works, or shared jointly by two or three persons. Sometimes a prize is withheld until the following year; if not then awarded it is paid back into the funds, which happens also when a prize is neither awarded nor reserved. Two prizes in the same field can thus be awarded in one year—i.e., the prize withheld from the previous year and the current year's prize. If a prize is declined or not accepted before a set date, the prize money goes back to the funds. Prizes have been declined, and in some instances governments have forbidden their nationals to accept Nobel Prizes. Those who win a prize are nevertheless entered into the list of Nobel laureates with the remark "declined the prize." Motives for nonacceptance may vary, but the real reason has mostly been external pressure; e.g., Hitler's decree of 1937 forbade Germans to accept Nobel Prizes because the Peace Prize to Carl von Ossietzky in 1935 was taken as an affront. In some cases, the refuser has later explained his situation and on application received the Nobel gold medal and the diploma—but not the money, which had reverted to the funds.

Prizes are withheld or not awarded when no worthy candidate in the meaning of Nobel's will can be found or when the world situation prevents the gathering of information required to reach a decision, as happened during World Wars I and II. The prizes are open to all, irrespective of nationality, race, creed, or ideology. They can be awarded more than once to the same recipient. The ceremonial presentations for physics, chemistry, physiology or medicine, literature, and economics take place in Stockholm; and that for peace takes place in Oslo, on December 10, the anniversary of Nobel's death. The laureates usually receive

their prizes in person; each presents a lecture in connection with the award ceremonies.

The general principles governing awards were laid down by Alfred Nobel in his will. In 1900 supplementary rules of interpretation and administration were agreed upon between the executors, representatives of the prize awarders, and the Nobel family and were confirmed by the king in council. These statutory rules have on the whole remained unchanged but have been somewhat modified in application; e.g., the will's ambiguous words "idealistic tendency," as qualification for the prize for literature, were in the beginning interpreted strictly but have gradually been interpreted more flexibly, as the list of laureates shows. The basis for the economics award was scientific—i.e., mathematical or statistical, rather than political or social. The first two laureates, economist Ragnar Frisch (Norway) and Jan Tinbergen (The Netherlands), were given the prize for their work in econometrics, the analysis of economic activity by means of mathematical expression.

The scientific and medical prizes have proved to be the least controversial, while those for literature and peace by their very nature have been the most exposed to critical differences. The Peace Prize has been most frequently reserved. For Nobel Prize winners, see Table, pages 740–747.

nobelium (No), synthetic chemical element of the actinide series in Group IIIB of the periodic table, atomic number 102. Not occurring in nature, nobelium (as the isotope nobelium-254) was discovered (April 1958) by Albert Ghiorso, T. Sikkeland, J.R. Walton, and Glenn T. Seaborg at the University of California, Berkeley, as a product of the bombardment of curium (atomic number 96) with carbon ions (atomic number 6) accelerated in a heavy-ion linear accelerator. An international team of scientists working at the Nobel Institute of Physics in Stockholm had claimed less than a year before that they had synthesized the same element, which they named nobelium (for Alfred Nobel); but experiments performed in the Soviet Union (at the I.V. Kurchatov Institute of Atomic Energy, Moscow, and at the Joint Institute for Nuclear Research in Dubna) and in the United States (University of California, Berkeley) failed to confirm the discovery. The Berkeley and Dubna teams have subsequently produced more than a half dozen isotopes of nobelium; nobelium-255 (three-minute half-life) is the stablest. Using traces of this isotope, radiochemists have shown nobelium to exist in aqueous solution in both the +2 and +3 oxidation states. The +2 state is very stable, an effect more pronounced than was anticipated in comparison with the homologous lanthanide element ytterbium (atomic number 70).

atomic number	102
stablest isotope	255
valence	2,3
electronic config.	2-8-18-32-32-8-2 or (Rn)5f ¹⁴ 7s ²

Nobeoka, city, Miyazaki *ken* (prefecture), Kyushu, Japan, on the delta of the Gokase River (Gokase-gawa). It developed as a castle town in the 12th century and has been a fishing port since the mid-18th century. Nobeoka is now the largest industrial city of the prefecture. Several large chemical plants produce fertilizer, medicines, and fibres. Pearls are cultivated along the coast, and sweet potatoes, cereals, and tobacco are grown. Pop. (1983 est.) 136,255.

Nobile, Umberto (b. Jan. 21, 1885, Lauro, near Salerno, Italy—d. July 30, 1978, Rome), Italian aeronautical engineer and pioneer in Arctic aviation who in 1926, with the Norwegian explorer Roald Amundsen and Lincoln Ellsworth of the United States flew over the North Pole in the dirigible *Norge*, from Spits-

bergen (now Svalbard), north of Norway, to Alaska.

As a general in the Italian air force and a professor of aeronautical engineering at the University of Naples in 1928, Nobile began a new series of flights over unexplored Arctic regions with a craft similar to the *Norge*. On the third flight the airship crashed on the ice north-northeast of Spitsbergen. Though Nobile and 7 companions were rescued, 17 lives were lost. When an Italian commission of inquiry found him responsible for the disaster, he resigned his commission. In 1931 he took part in a Soviet voyage to the Arctic. After World War II the commission's report was discredited, and he was reinstated in the air force. He resumed teaching at Naples and was a deputy in the Italian Constituent Assembly (1946). Nobile's own account of his Arctic adventures is given in *Gli italiani al Polo Nord* (1959; *My Polar Flights*).

Nobility, Charter to the (Russian history): see Gentry, Charter to the.

Noble, Sir Andrew, 1ST BARONET (b. Sept. 13, 1831, Greenock, Renfrew, Scot.—d. Oct. 22, 1915, Argyll), Scottish physicist and gunnery expert, considered a founder of the science of ballistics. His pioneering research on fired gunpowder, often in conjunction with the British chemist Frederick Abel, contributed greatly to the progress of gunnery.

Noble was educated at Edinburgh Academy and the Royal Military Academy, Woolwich, London, and then entered the Royal Artillery in 1849. During the 1850s, in a study of the relative merits of smoothbore and rifled cannon, he devised a method of comparing their accuracy of fire. He became assistant inspector of artillery in 1859 but later left the service to join the engineering and ordnance firm of Sir William (later Lord) Armstrong, of which he became chairman in 1900.

About 1862 he applied his invention, the chronoscope, a device for measuring very small time intervals, to determine the velocity of shot in gun barrels. His experiments helped establish the science of ballistics and also led to new types of gunpowder, the redesigning of guns, and new methods of loading. Noble was elected a fellow of the Royal Society (1870), knighted (1893), and created a baronet (1902).

noble gas, any of the six chemical elements that make up Group O of the periodic table. The elements are helium (He), neon (Ne), argon (Ar), krypton (Kr), xenon (Xe), and radon (Rn).

A brief treatment of the noble gases follows. For full treatment, see MACROPAEDIA: Chemical Elements. See also MICROPAEDIA for entries on each of the individual noble gases.

All of the noble gases are present in the Earth's atmosphere. With the exception of hydrogen, helium is the most plentiful element in the universe, comprising almost 25 percent of its total mass. Under ordinary conditions, the noble gases are colourless, odourless, and nonflammable. Their atoms have stable electron configurations; thus they do not easily gain or lose electrons and rarely share them with other elements. The term "noble" alludes to the extraordinarily limited reactivity of the gases. They also are sometimes called inert gases for the same reason. It was, however, discovered in 1962 that the heavier noble gases—krypton, xenon, and radon—can form chemical compounds with fluorine, the strongest electron attracting of all elements. The outer electrons of the atoms of these three gases, screened from the nucleus by intervening electrons, are held less firmly and can be removed more readily from the atoms than can the electrons of helium, neon, and argon.