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How to use this volume

This is one of the ten volumes of the *Ready Reference and Index*, or Micropædia (Volumes I through X).

Begin all reference searches here.

To satisfy a reference inquiry quickly.

To learn what *The New Encyclopædia Britannica* contains in its many articles.

Enter these volumes at any alphabetical point. The entries have been designed to provide information or to direct readers elsewhere in ways that are self-evident. But knowledge of a few editorial conventions will provide fuller understanding of what is offered:

1. Cross references appear often—identified by *see*, *see also*, or *q.v.* (*quod vide*, for "which see"), or as RELATED ENTRIES—and always refer to other entries in the *Ready Reference and Index* in alphabetical order (Volumes I-X).

2. Entries are alphabetized as if they were one word, up to the comma, regardless of the number of words in the title. Thus *mountaineering* precedes *mountain goat*, whereas *charge, electron* precedes *chargé d'affaires*.

3. Directions, or *Index* references, are given to the page in the Macropædia (Volumes 1-19) on which a subject or aspect of a subject may be found in the longer articles.

   Volume and page numbers immediately following the title of an entry always refer to a comprehensive article in volumes 1 through 19.

   All other volume and page references follow the text and cite *sections* of the longer (Macropædia) articles: the small, or lowercase, letters following page numbers—a, b, c, d, and e, f, g, h—identify the quarter of the column in which a reference begins. See marginal illustration.

   Another point about index references: *Major ref.* (for "major reference") followed by a volume and page number always cites a reference that is more comprehensive than the references following and should be considered the principal place to look for broad coverage of the topic under discussion.

   All other references carry brief descriptive phrases so that the reader may know what he may expect to find.

   Index volume-and-page references are preceded by a small dot [·]. Underscored phrases are headings under which several index references are grouped.

ephedrine, an alkaloid compound formerly derived from the leaves of several species of Chinese shrubs of the genus *Ephedra* of the family Ephedraceae (*q.v.*, order Gnetales), but now made synthetically. It is used as a decongestant drug (*q.v.*).

Johnson, Samuel 10:244 (b. Sept. 18, 1709, Lichfield, Staffordshire—d. Dec. 13, 1784, London), poet, essayist, critic, journalist, lexicographer, and conversationalist, is one of the outstanding figures of English 18th-century life and letters.

REFERENCES in other text articles:
· Addison's prose style and fame 1:84a
· advertising criticism 1:103h
· book publishing history 15:228e
· Boswell's friendship and biographical work 3:61h

a	e
b	f
c	g
d	h

Anglo-Norman literature, the writings in the French dialect of medieval England, also known as Norman-French or Anglo-French. Beginning effectively with the Norman Conquest (1066), it became the vernacular of the court, the law, the church, the schools and universities, Parliament, and, later, of municipalities and trade. *Major ref.* 10:1105d.
· chansons de geste and the Tristan tale 15:1021d *passim* to 1022g

piranha, also called CARIBE, or PIRAYA, any of several species of carnivorous fishes of the genus *Serrasalmus* and the family Characidae renowned for their voracity and reputed ferocity. Piranhas are abundant in rivers of eastern and central South America. Potentially one of the most dangerous species, *S. nattereri* attains a maximum length of about 60 centimetres (2 feet), but most species are smaller. Piranhas vary in colour, some being silvery and others completely black. All have deep bodies, saw-edged bellies, and large, blunt heads with strong jaws bearing triangular, razor-sharp teeth that close in a scissor-like bite. Piranhas travel in groups and usually prey on other fishes. They are attracted to the scent of blood and can reduce even a large animal to a skeleton in a short time.

Piranha (*Serrasalmus spilopleura*)
Jim Annan—Annan Photo Features

·destructive capabilities 1:654e
·feeding behaviour 13:759g; illus. 758
·tooth type and material 7:334b

Pirani gauge: *see in* vacuum gauge.

pirarucu, one of several bony tongue (*q.v.*) fishes.

Pirata, one of several species of wolf spider (*q.v.*).

Piratāpamutaliyār Carittiram (1879), Tamil novel by Vetanayakam Pillai.
·literary style and structure 17:149a

pirate: *see* piracy.

pirate perch (*Aphredoderus sayanus*), carnivorous, freshwater fish, alone comprising the family Aphredoderidae, found in weedy or muddy creeks, rivers, and lakes of eastern North America. Noteworthy is the peculiar position of its anus; located near the anal fin in the young, it moves forward, to the throat, as the fish matures. The fish is small, greenish, and about 10 to 12.5 centimetres (4 to 5 inches) long. It is of no known economic significance.
·classification and general features 13:982c

pirate radio station, radio station broadcasting without government license, commonly from outside territorial waters.
·development and control measures 3:314e

pirate spider, also called SPIDER-HUNTING SPIDER, any member of the family Mimetidae (order Araneida), noted for its habit of eating other spiders. The approximately 100 species are distributed worldwide. They are characterized by a row of sharp bristles on the first pair of legs. Pirate spiders do not build nests or webs. They move slowly on low plants or among leaf litter.

Pirate spider (*Pirata piraticus*)
D.W. Greenslade—Ardea Photographics

·classification and general features 1:1073e

Pircas Pass, at 15,836 ft (4,827 m) in the Central Andes east of Santiago, on the border between Argentina and Chile.
33°15′ S, 70°02′ W
·location and elevation 1:857c

Pire, Dominique (Georges) (b. Feb. 10, 1910, Dinant, Belg.—d. Jan. 30, 1969, Louvain), cleric and educator who was awarded the Nobel Peace Prize in 1958 for his aid to displaced persons in Europe after World War II. Pire became a Dominican in 1928 and taught moral philosophy (1937–47) at the Dominican Monastery of La Sarte, Huy, Belg. He was active in the World War II resistance movement and became deeply involved in the postwar refugee problem. In 1949 Pire founded the Aide aux Personnes Déplacées, which soon had branches throughout Europe. Its goal was to guarantee every means of aid to displaced persons, regardless of their nationality or religion.

Between 1950 and 1954, Pire founded four "homes of welcome" in Belgium for aged refugees. Seven European "villages" were subsequently founded in Germany, Belgium, and Austria (1956–62) to enable refugees to again become independent members of society. Pire also initiated the system of sponsors that allowed a refugee to be helped by a person in another country.

After accepting the Nobel Peace Prize, Pire established (1960) the Mahatma Gandhi International Peace Centre, Huy, later known as the University of Peace, for instructing youths in the principles and practice of peace. In 1962 he started the "Island of Peace" project, an international community in East Pakistan (now Bangladesh) governed by the principle of self-help. In 1967 this program ended, and Pire started a second Island of Peace in India. He was also the founder of World Friendships (to promote better understanding between races) and World Sponsorships (to aid African and Asian refugees). Pire was the author of *Bâtir la paix* (1966; *Building Peace*, 1967).

Pirelli, important family of industrialists in Italy since the 19th century. Giovanni Battista Pirelli (1848–1932) established Italy's first rubber factory in 1872 in Milan. He pioneered in the manufacture of electric cable (1884) and automobile tires (1899). His two sons, Piero (1881–1956) and Alberto (1882–1971), entered the Pirelli firm when they were in their 20s and expanded it into a truly international enterprise. Before becoming chairman of the company in 1956 (a post he held until his retirement in 1965), Alberto was active in international affairs, serving with the Supreme Economic Council of Versailles (1919), the International Labour Office (1920–22), the League of Nations (1923–27), and as a minister of state of the Italian government in 1938.

Giovanni Pirelli, 1923
By courtesy of Pirelli Ltd., London

Pirelli Building, also called PIRELLI CENTRE, or PIRELLI TOWER, first skyscraper in Italy, built (1955–59) to house the headquarters of the Pirelli Company in Milan. The building was designed by Gio Ponti and other architects in association with Pier Luigi Nervi and Arturo Danusso as consulting engineers.

Located near the Central Station, the building occupies an irregularly shaped site that is surrounded by streets. The office tower rises 407 feet (124 metres) in 34 stories above a low-rise building that houses auditoriums, parking, and other technical facilities. The shape of the office tower is one of aesthetic and structural elegance; triangular end buttresses give it the look of a double-convex lens. The tower is also notable for the use of a long-span structure that permits floor space to be divided by movable partitions.

Pirenne, Henri (b. Dec. 23, 1862, Verviers, Belg.—d. Oct. 24, 1935, Eccle, near Brussels), one of the most eminent historians of the Middle Ages and of Belgian national development.

The son of a well-to-do industrialist, he studied for his doctorate (1883) at the University of Liège under the medievalist Godefroid Kurth and the historian of the Low Countries Paul Frédéricq. He attended the universities of Leipzig and Berlin and the École des Hautes Études in Paris, and taught paleography and diplomatics at the University of Liège in 1885. The following year he moved to the University of Ghent, where he remained until his retirement in 1930, as professor of medieval and Belgian history. He was imprisoned (1916–18) by the Germans for refusing to teach while they occupied Belgium. In prison, he composed from memory a history of Europe, which was published after his death.

Pirenne's first important book was *Histoire de la constitution de la ville de Dinant au moyen âge* (1889; "History of the Constitution of the City of Dinant in the Middle Ages"), a study of medieval town life that became one of the major themes of his later works. His greatest work, *Histoire de Belgique* (7 vol., 1900–32; "History of Belgium"), gained him international respect for his innovative approach to socio-economic developments in town life and his contention that Belgian unity was not the result of ethnic identification or political centralization but instead emerged from the position of Belgium as a centre of industrial and intellectual commerce between Latin and Germanic cultures.

A series of lectures delivered at Princeton University in 1922 was published as *Medieval Cities* (1925), the classic exposition of Pirenne's analysis of the revival of urban centres and commercial activity during the late Middle Ages. In a work published posthumously, *Mahomet et Charlemagne* (1937), he set forth his now celebrated thesis that the Roman Empire and civilization declined not as a result of Germanic invaders, but rather because of Arab primacy in the Mediterranean by the 8th century. The decline of international trade and the disintegration of a money economy, he contended, brought about a regression to a less sophisticated closed agricultural system based on a local subsistence economy and a stratified class system. His radical reinterpretation of the transition between Roman and medieval civilizations has stimulated a great deal of criticism and controversy, particularly his almost exclusively economic interpretation of causation in history.

Pirenne's other works include *Origine des constitutions urbaines au moyen âge* (1895; "The Origins of the Constitutions of Medieval

Cities"), *Les anciennes démocraties des Pays-Bas* (1910; "The Old Democracies of the Low Countries"), *La Fin du Moyen Âge* (1931; "The End of the Middle Ages"). He also served as director of the Belgian Royal Commission on History and as the first president of the International Historical Congress, beginning at Brussels in 1923.
·essay and recording historical process **10**:1080a
·theory of Arab invasions' historical role **13**:155c

Pires, Diogo: *see* Molcho, Solomon.

Pires, Tomé, 15th-century Portuguese traveller and author who wrote *Suma Oriental.*
·Indonesian ethnic and royal description **9**:482f

Pírgos (Greece): *see* Pyrgos.

piri, Korean woodwind instrument.
·construction and use of Korean member **12**:679a

Pirineos (Europe): *see* Pyrenees Range.

Pirin Mountains, section of the Rhodope mountain system in southwest Bulgaria.
41°40′ N, 23°30′ E
·relief and boundaries **3**:468h

Piripauan Stage (geology): *see* Mata Series.

Pirithous, also spelled PEIRITHOUS, in Greek mythology, the companion and helper of the hero Theseus in his adventures, including the descent into Hades to carry off Persephone, the daughter of the goddess Demeter. They were detained in Hades until the Greek hero Heracles rescued Theseus but not Pirithous.

Pirithous originally belonged to the Lapiths, a northern mountain tribe, and probably his earliest legend was that of his marriage to Hippodamia (daughter of Butes the beemaster). The Centaurs, who had come to the wedding as guests, in drunken fury tried to violate the bride and her attendants; this led to the battle of the Lapiths and the Centaurs, a favourite subject of Greek art.

Pirkkalaiset (Scandinavian frontiersmen): *see* Birkarlar.

Pirmasens, city, Rheinland-Pfalz (Rhineland-Palatinate) *Land* (state), southwestern West Germany, near the French frontier. Named for St. Pirmin, who was supposed to have preached Christianity there in the 8th century, it originally belonged to the counts of Hanau-Lichtenberg but passed to Hesse-Darmstadt in 1736. Chartered in 1763, it was taken by the French in 1794 and passed to Bavaria in 1816. It was largely rebuilt after severe damage in World War II. An important shoe industry developed there in the 19th century; the city holds a biennial international shoe-trade fair and is the site of an internationally known technical school of shoemaking. It is the terminus of a branch of the railway linking Landau with Zweibrücken. Pop. (1970 est.) 56,172.
49°12′ N, 7°36′ E
·map, Federal Republic of Germany **8**:46

Pirmez, Octave (b. April 19, 1832, Châtelet, Belg.—d. May 1, 1883, Acoz), one of the outstanding Belgian men of letters of the period immediately before the literary revival of the 1880s. His works consist primarily of collections of essays, letters, and literary discussions; *e.g., Pensées et maximes* (1862; "Thoughts and Maxims") and *Heures de philosophie* (1873; "Hours of Thought"). A gentleman of private means, he led an uneventful life, interrupting the placid stays in his castle only for leisurely tours in France, Germany, and Italy. His temperament was retiring and reflective, and he was deeply influenced by such French writers as Rousseau and Chateaubriand, whose melancholy appealed to him, as did their love of nature.

Though not a profound or a systematic philosopher, Pirmez was deeply interested in Montaigne and Pascal, whose influence on the style and content of his maxims and philosophical notes is unmistakable. His Christianity was sincere, but his view of man was pessimistic, for he considered that human reason was incapable of controlling sentiments and passions. The hallmark of Pirmez's work is its stylistic elegance and purity. There is little that is essentially Belgian about his writing, and the tradition within which he worked was already passing in France. But, over a period when there were very few distinguished Belgian authors, Pirmez was outstanding.

Pirna, city, Dresden *Bezirk* (district), southeastern East Germany, southeast of Dresden on the left bank of the Elbe River, below the northern foothills of the Elbsandstein Gebirge (mountains). First mentioned in 933, it belonged to Bohemia from 1293 until it passed to the margraves of Meissen in 1405. Notable buildings are the 16th-century Sonnenstein Castle and St. Mary's Church (1504–46; later

Pirna on the Elbe River, E. Ger.
W. Krammisch—Bruce Coleman Inc.

restored). There are sandstone quarries nearby; other industries include the manufacture of rayon, glass, paper, cellulose, and machinery. Pop. (1971 est.) 47,468.
50°58′ N, 13°56′ E
·map, German Democratic Republic **8**:8

pirogue, Spanish PIRAGUA, in its simplest form, a dugout made from one log, but also a number of more elaborately fashioned boats, including various native canoes, the structure and appearance of which generally resemble those of a dugout. Widely distributed, the pirogue may be found as a fishing vessel in the Gulf of Mexico; as a shallow-draft boat to manoeuvre through the Louisiana swamplands; and as a boat used by the Indians of Guyana. Pirogues may be broadened by constructing them from two curved pieces or deepened by affixing planks to their sides.
·fishing vessel history **7**:359g

Piron, Alexis (1689–1773), French dramatist and wit, famous for his epigrams, produced several of his plays at the Comédie-Française, the most distinguished of which, *La Métromanie*, was produced well into the 19th century.

piroplasmid, any protozoan of the class Piroplasmea (formerly Actinopodea). These organisms have slender radiating cytoplasmic extensions, called pseudopodia, which are usually true axopodia composed of an axial rod and a cytoplasmic envelope. *See also* Babesia; heliozoan; radiolarian.
·protozoan features and classification **15**:128d

piroplasmosis (disease): *see* babesiasis.

Pirot, town in eastern Serbia, Yugoslavia on the Nišava River, near the Bulgarian border. In Roman days it was a strategic fortress on the military road from Niš to Bulgaria. Under Turkish rule Pirot prospered as a centre for handwoven Oriental carpets, for which it is still famous. After World War II a rubber industry was located there. Pop. (1971 prelim.) 29,200.
43°09′ N, 22°35′ E
·map, Yugoslavia **19**:1100

pirouette (French: "to whirl about"), ballet turn in place on one leg. The pirouette is often

Pirouette en dehors executed by Melissa Hayden of the New York City Ballet; solo variation from "Don Quixote" pas de deux
Fred Fehl

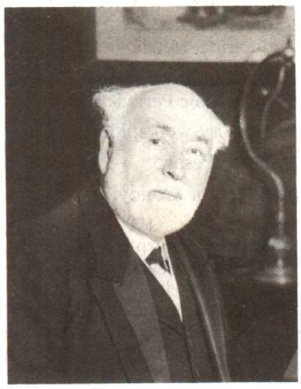
done in spectacular series, which women usually perform on toe (*pointe*) and men on the ball of the foot (*demi-pointe*). In a *pirouette sur le cou-de-pied*, the raised foot rests on the supporting ankle; in a *pirouette à la seconde* or *grande pirouette*, it is extended in the second position at a 90° angle to the supporting leg. The leg may be held at the front (attitude), side (*à la seconde* or *grande pirouette*), or back (arabesque and attitude). The body may turn toward the raised leg (*en dehors;* "outside" or "backwards") or the supporting leg (*en dedans;* "inside" or "forward"). Four and five pirouettes are now commonly performed, and up to 14 have been executed by 20th-century dancers.
·Vestris' technical improvement **2**:649d

pirouette, horsemanship movement in which the horse, while at a gallop, describes a circle with its shoulders while its hind legs serve as a pivot.
·haute école of Lipizzaner horses **15**:838f

Pīr Panjāl Range, south part of the western Punjab Himalayas, lies in northwest India and northern Pakistan and extends southeastward for 200 mi (320 km) between the Jhelum and upper Beās rivers. In the southeast portion many peaks rise to more than 19,000 ft (5,800 m), while the northwest section overlooks the Vale of Kashmir (to the northeast). The major passes through the range include the Pīr Panjāl (11,462 ft [3,494 m]) and Banihal (8,985 ft). The mountains extending to the north of the Kishanganga River in Pakistan are sometimes considered part of the range. The main activities of the region include climbing and skiing.
32°37′ N, 74°32′ E
·features, geology, and climate **10**:31b
·Lesser Himalayan ranges **8**:883b; map 882
·map, India **9**:278

Pirrie, William James Pirrie, 1st Viscount (b. May 31, 1847, Quebec—d. June 7, 1924, at sea), shipbuilder who controlled the largest ship-construction firm in the world and built the ill-fated liner "Titanic." In 1862 he became apprentice to the Belfast shipbuilding firm of Harland and Wolff. By the time he was 27 he had been made a partner and was soon left in almost exclusive control. He travelled widely to gain experience in ship design and to study practical shipping requirements. He contributed much to the burgeoning steel shipbuilding industry, and for many years the

largest passenger liners in the world came from his yards, notably the "Olympic," the "Britannic," and the "Titanic." Pirrie was also prominent in the development of the diesel engine for marine propulsion.



1st Viscount Pirrie

Radio Times Hulton Picture Library

Created a baron in 1906, Pirrie became a viscount in 1921. As comptroller general of merchant shipbuilding in 1918, he helped replace British shipping lost to submarine warfare. He was also mainly responsible for introducing the idea of standardizing ships, a principle that had economical results in World War II.

Pirro, André (1869–1943), French musicologist.
·organ literature development **13**:680g

Pirrotta, Nino (1908–), Italian musicologist.
·musical conservatism of Camerata **13**:579g

Pirsson, Louis Valentine (b. Nov. 3, 1860, Fordham, N.Y.—d. Dec. 8, 1919, New Haven, Conn.), geologist whose studies of the igneous rocks of Montana revealed many previously unknown varieties. In 1889 he served as an assistant with a U.S. Geological Survey party in Yellowstone Park and later in Montana. He joined the faculty of Yale University in 1892 and became professor of physical geology in 1897. In *Quantitative Classification of Igneous Rocks* (1903), Pirsson, along with the U.S. geologists Whitman Cross, Joseph Iddings, and Henry Washington, presented a totally new classification system and new terminology for igneous rocks. Pirsson's most important books are *Rocks and Rock Minerals* (1908) and *Textbook of Geology* (1915), which by 1929 was the most widely used geology textbook in the world.

pirssonite, a carbonate mineral, hydrated sodium and calcium carbonate [$Na_2Ca(CO_3)_2 \cdot 2H_2O$], that occurs in evaporite deposits, as at Borax Lake, Calif.; Green River, Wyo.; and Otavi, South West Africa. For detailed physical properties, *see* carbonate minerals.
·composition and evaporites table **6**:1133e

Piryatin, city and centre of a *rayon* (district), Poltava *oblast* (administrative region), Ukrainian Soviet Socialist Republic, on the Uday River. Piryatin dates at least from 1155, when it is first documented, and was incorporated in 1781. Before the October Revolution, it was an administrative centre and later became a railway junction. Today it has varied industries, including furniture, building materials, and foodstuffs. Pop. (1970) 16,000.
50°15′ N, 32°31′ E

Pisa 14:470, capital of the Italian province of Pisa, was, during the Middle Ages, a powerful Tuscan city-state and a flourishing commercial centre.

The text article recounts how, coming under Roman control *c.* 180 BC, Pisa became a Christian bishopric by AD 313, subsequently growing in wealth and strength to rival Venice. After it was finally conquered by Florence in 1509, Pisa's eminence abated. The birthplace of Galileo (b. 1564), Pisa is famous for its great university and its magnificent architecture, including the leaning tower and cathedral.

REFERENCES in other text articles:
·European botanical garden origin **3**:64b
·map, Italy **9**:1088
·medieval economic rivalries **9**:1133e
·province area and population, table 1 **9**:1094
·Renaissance history and culture **15**:663e

Pisa (crab): *see* spider crab.

Pisa, Council of, in Roman Catholic Church history, a council convened in 1409 with the intention of ending the Great Schism, when rival popes, each with his own Curia (bureaucracy), were set up in Rome and Avignon. This meeting, the result of concerted action by cardinals of both obediences, was well attended. It deposed the two existing pontiffs, who refused to cooperate, and elected a third, Alexander V. Western Christendom was therefore divided into three parties until the Council of Constance (1414–18) forced the three contending popes to resign and elected Oddone Colonna, a Pisan cardinal, as Pope Martin V. The Council of Pisa has never been admitted by canonists or theologians to be ecumenical.
·judicial action on papal schism **15**:1008b
·Louis XII's diplomatic goals **6**:1083h

Pisa, Università degli Studi di, English UNIVERSITY OF PISA, coeducational state institution of higher learning in Pisa, Italy. It was founded in 1343 as a *studium generale* (*see* university) under Pope Clement VI. Included among its faculties are law, economics, humanities, medicine, physical and biological sciences, and engineering. In the early 1970s enrollment was almost 21,000.

piśāca, in the mythology of India a fiend or evil spirit, either male or female (*piśācī*). It is regarded as the ghost of a liar, adulterer, madman, or animal and is said to drink blood and to rend human flesh. Described as hideous and revolting, it is depicted in art with an emaciated body, bones jutting out, veins visible under the skin, and stiffly spread out hair.
·demonic beings in Hindu lore **1**:875g

Pisaca languages: *see* Dardic languages.

Pisacane, Carlo (1818–1857), Neapolitan Socialist.
·Sapri expedition massacre **9**:1161b

Pisander, 5th-century-BC Athenian oligarch.
·Peloponnesian Wars and domestic policy **8**:359f

Pisanello (PISANO), **Antonio,** first name formerly wrongly called VITTORE (b. *c.* 1395, Pisa, Italy—d. 1455), medalist and painter whose work reflects the transition in Italy from the International Gothic to the Early Renaissance style. His early work suggests that he was the pupil of Stefano da Zevio, a Veronese artist, and was familiar with the style of the Lombard school.

Pisanello collaborated with Gentile da Fabriano on frescoes in the Doges' Palace in Venice (*c.* 1415–22) and in St. John Lateran in Rome (after 1427). After Gentile's death, Pisanello probably completed the Roman frescoes, known only through drawings, which show Gentile's great influence over the young Pisanello. His only surviving frescoes are an Annunciation at the tomb of Niccolò di Brenzoni in S. Fermo in Verona (*c.* 1423–24), and the legend of St. George in the Pellegrini Chapel in S. Anastasia, Verona (*c.* 1433–38). These works are characterized by the curvilinear design, calligraphic draperies, and decorative detail typical of the International Gothic style from which Pisanello never completely freed himself. Even a mature work such as his "St. Eustace" (National Gallery, London) is encrusted with rich detail that has been thought to detract from the compositional unity of the painting. The "Madonna with SS. Anthony and George" (National Gallery) displays a simpler conception. It is dominated by the monumental figures of the two saints and the bust of the Virgin in a mandorla, or almond-shaped aureole.

Pisanello's fame and his importance in court circles rested more upon his medals than upon his painting. They are thought to have resulted from his study of ancient Greek and Roman numismatic portraits. He had virtually no recent predecessors and, with him, the art reached its highest point. His work includes the medal of the Greek emperor John VIII Palaeologus (1438), the wedding medal of Lionello d'Este (1444), Sigismondo Pandolfo Malatesta (1445), and the medal of Alfonso of Aragon (1448), generally cited as his most successful work in the genre. Most of Pisanello's painted portraits, such as the "Margherita Gonzaga" (*c.* 1438; Louvre, Paris), and "Lionello d'Este" (*c.* 1440; Accademia Carrara, Bergamo), show the sitter in profile (a convention of Pisanello's portrait medals) against a background of delicate, colourful flowers and butterflies.

"Madonna with SS. Anthony and George," painting by Antonio Pisanello, after 1422; in the National Gallery, London

By courtesy of the trustees of the National Gallery, London; photograph, J.R. Freeman & Co. Ltd.

Pisanello's drawings have been preserved in the Codex Vallardi (Louvre, Paris). This is the only instance in which the drawings of a 15th-century workshop have been preserved virtually intact. They are of unique value, therefore, for the study of the style and techniques of draftsmanship of the period. Pisanello uses a large variety of techniques and materials to produce masterful drawings (some coloured) of animals, plants, costume design, and perspective studies. His drawings of various views of horses are particularly well known. He was one of the first 15th-century artists to draw from life instead of adhering to the medieval tradition of copying the drawings of others. The drawings reveal Pisanello's breadth of interest and his sensitive eye. They combine delicately rendered Early Renaissance naturalism with the beauty of Late Gothic line and are one of his most important contributions to the history of art.
·Alfonso V medal illus. **1**:484

Pisani, Niccolò (fl. 14th century), Venetian admiral, renowned for his victories in the third war between the feuding republics of Venice and Genoa (1350–55).

In 1350 Pisani led a squadron to Constantinople (now Istanbul) to conclude an alliance with the Byzantines. At the mouth of the Bosporus he engaged in a fierce battle with the

Genoese, defeating the distinguished admiral Paganino Doria (1352). A year later, surprising the Genoese fleet, he sank 33 enemy galleys and took 4,500 prisoners, who were later executed. In November 1354, however, Doria surprised him at Portolungo, near Greece. The Genoese admiral's audacity and tactical skill enabled him to capture Pisani and his entire fleet. Pisani was released when the two cities made peace (May 1355), and he spent the rest of his life in obscurity.

Pisani, Vettore (b. 1324, Venice—d. Aug. 15, 1380, Manfredonia, Italy), Venetian admiral, victor in a decisive battle in the fourth war between the maritime republics of Venice and Genoa.

Pisani joined his father Niccolò during the third war with Genoa (1350–55) and later distinguished himself in a war against Hungary. Named captain and senator, he led a squadron against the Aragonese fleet and the pirates in the waters near Sicily.

In 1378 he was given command of the Venetian fleet, which he directed to victory over the Genoan fleet at the Capo d' Anzio (May 1378). He later held the Genoan fleet on the Adriatic in check, after sacking Cattaro (modern Kotor, Yugos.) and destroying the port of Sebenico (modern Sibenik, Yugos.). Eventually, however, he and his fleet were captured by the enemy at Pola (modern Pula, Yugos.; May 1379). On his return to Venice, he was imprisoned, but popular protest secured his release. Given command once again of the Venetian fleet, he blockaded the port of Chioggia, occupied by the Genoans, who were finally compelled to surrender, turning over to Pisani some 19 galleys and more than 4,000 prisoners. Dispatched to confront another Genoan squadron in the Adriatic, Pisani fell ill and died.

Pisano, Andrea (b. *c.* 1270–90, Pontedera, near Pisa—d. *c.* 1348–49, Orvieto), one of the most important Italian sculptors of the 14th century whose chief works were executed in

"The Baptism of Christ," bronze panel from the south door of the Baptistery, Florence, by Andrea Pisano, completed 1336

Brogi—Alinari

Florence, where he came under the influence of Giotto. Andrea is recorded as the author of the earliest of three bronze doors for the baptistery of the cathedral of Florence, which, completed in 1336, has 20 quatrefoil panels with scenes from the life of St. John the Baptist and 8 with figures of the virtues. The figures are gilded and set against a smooth bronze surface.

On the death of Giotto in 1337, Andrea succeeded him as the chief architect in charge of the construction of the campanile (bell tower) of the cathedral of Florence, to which he added two stories adorned with panel reliefs. Most of the reliefs on the lower part, depicting the arts, sciences, and occupations of man and three scenes from Genesis, are generally attributed to Andrea and his studio. Statues in niches of the campanile (originally placed above the reliefs now in the cathedral museum), representing David and Solomon and two sibyls, have been attributed to Andrea, but this has been disputed. Two statuettes of Christ and Saint Reparate also in the cathedral's museum are generally considered his.

The iconography of the baptistery door was indebted to the mosaics on the interior of the building and to Giotto's frescoes in Sta. Croce. The composition of the door was influenced by that of the bronze doors of the cathedral of Pisa. Andrea's style is marked by a simplicity, restraint, and skillful arrangement of figures that places him in the front rank of the sculptors of the period.

He is last recorded as superintending architect of the cathedral of Orvieto, in which office his son Nino succeeded him.

·Andrea and Gothic sculpture developments **19**:372f
·Giotto's influence on Duomo reliefs of Andrea **8**:163f

Pisano, Antonio: *see* Pisanello, Antonio.

Pisano, Bonanno and Guglielmo, 12th-century Italian sculptors.

·Leaning Tower of Pisa artists **14**:471e

Pisano, Nicola and Giovanni **14**:472 (respectively b. *c.* 1220, Apulia, Italy—d. 1278/84, Pisa?; b. *c.* 1250, Pisa—d. after 1314, Siena?), sculptors, father and son, whose work—along with that of other artists employed in their workshops—created a new sculptural style for the late 13th and the 14th century in Italy. Aspects of the tradition they established remain noticeable throughout the Italian Renaissance. The younger Pisano has been called the only true Gothic sculptor in Italy.

Abstract of text biography. Nicola may have been trained in Apulia, Lombardy, or Tuscany; sculptural features peculiar to each of these regions may be discerned in his work. His hexagonal pulpit for the Pisa cathedral baptistery (*c.* 1255–60), fundamentally inspired by the deliberately archaic Roman art being practiced in southern Italy, also has details influenced by Byzantine, Romanesque, and French Gothic models and by Early Christian art in Rome. Nicola's son and other employees or apprentices collaborated with him on the Siena cathedral pulpit (1265–68) and the fountain in the piazza, or main square, of Perugia (1278). Doubtless for that reason, these works are less coherent in detail than the Pisa pulpit.

Active as an assistant to his father by 1265, Giovanni probably made a firsthand study of French architecture and sculpture. By 1285 he had transferred his practice and his citizenship from Pisa to Siena, where he designed the cathedral facade, which was the major influence on subsequent Gothic elevations in central Italy. His last great work is the remarkably intense design for the Pistoia cathedral pulpit (completed 1301).

REFERENCES in other text articles:
·Gothic sculpture developments **19**:371h; illus. 372
·Leaning Tower of Pisa artists **14**:471e

Pisarev, Dmitry Ivanovich (b. Oct. 4, 1840, Znamenskoye, Orël province, Russia—d. July 16, 1868, Dubulti, near Riga), critic and radical social thinker, the foremost representative of Russian nihilism. Pisarev valued art only for its utility and was known for saying that a pair of boots was more valuable than a play by Shakespeare, and for his denunciation of Pushkin's aesthetic theories. In 1862 he was imprisoned for defending the emigré Russian socialist Aleksandr Herzen, and during four and a half years in prison he wrote many of his critical articles. His hard-hitting, polemical style, notable for sincerity and vigour is reflected in his politico-literary articles *Realisti* (1864) and *Borba za zhizn* (1867–68). Some of his writings have been translated into English by R. Dixon and J. Katzer in *Selected Philosophical, Social, and Political Essays* (1958).

·social utilitarian doctrine **16**:64e

Pisatans, rural social class in ancient Greece.

·change of status in Archaic Period **8**:336c

Pisauridae: *see* nursery-web spider.

Pisaurum (Italy): *see* Pesaro.

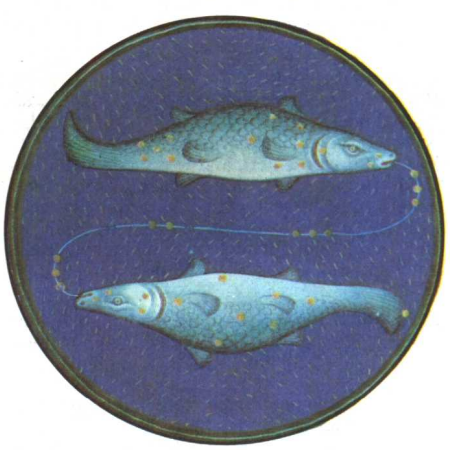
Piscataway (people): *see* Conoy.

Piscator, Erwin (b. Dec. 17, 1893, Ulm, Ger.—d. March 30, 1966, Starnberg, Bavaria, now in West Germany), theatrical producer and director famed for his ingenious Expressionistic staging techniques; the originator of the epic theatre style later developed by the German playwright Bertolt Brecht. Working in Berlin during the Weimar Republic (1919–33), Piscator frankly used the theatre to convey radical political instruction. Though not a communist, he sympathized at the time with the German working-class parties. A bold innovator, he used films and newsreels to enlarge landscapes and convey mass events, and he employed many optical, acoustical, and mechanical devices to create an experience of total theatre. His passion for machinery could be self-defeating, for sometimes the blaring loudspeakers, flashing lights, air-raid sirens, and revolving sets prevented the viewers from getting the message. In exile during the war, he headed the Dramatic Workshop of the New School for Social Research in New York City, from 1939 to 1951, when he returned to West Germany as director of West Berlin's Volksbühne. He continued to produce sensational works, such as Rolf Hochhuth's *The Deputy*, a study of the role of Pope Pius XII during the Nazi era, and *The Investigation* by Peter Weiss, dealing with the mass murders at Auschwitz concentration camp.

·Expressionist theory and scenic design **18**:230e
·staging of epic theatre **17**:551c

Pisces, or THE FISHES (symbol ♓, abbreviated Psc), in astronomy, a constellation of the zodiac lying between Aries and Aquarius, at about 1 hour right ascension (the coordinate on the celestial sphere analogous to longitude on the Earth) and 15° north declination (angular distance north of the celestial equator). The vernal equinox, the point where the Sun's annual apparent path takes it north of the celestial equator and from which celestial longitude and right ascension are measured, lies now in Pisces. The constellation contains only faint stars without any striking grouping.

In astrology, Pisces is the 12th sign of the zodiac, considered as governing the period *c.*



Pisces, illumination from a Book of Hours, Italian, *c.* 1475; in the Pierpont Morgan Library, New York (MS. G.14)

By courtesy of the Pierpont Morgan Library, New York, the Glazier Collection

February 19–*c.* March 20. Its representation as two fishes joined at the tails is usually related to the Greek myth of Aphrodite and Eros, who jumped into the river to escape the monster Typhon and changed into fishes, or, alternatively, the two fishes that carried them to safety. The sign of Pisces is always associated with water.
·constellation table **2**:226
·nature, ruler, decan, and exaltation, table 1 **2**:222

piscina, in the Middle Ages, a pool or tank in which fish were stored by monastic communities, for whose members fish was a staple item of diet. Although never a calculated feature of gardens, existing ponds, or fish stews, were sometimes later incorporated in decorative schemes.

Pisco, city, Ica department, southwestern Peru, Pacific port at the mouth of the Río Pisco. Founded in 1640 by Pedro Toledo y Leiva, it was devastated by an earthquake in 1682 and by a tidal wave in 1686. Pisco (Quechua Indian for "bird") is noted for its brandy made from muscat grapes. Other economic activities include subsistence farming, milling of cottonseed oil, textile manufacturing, and fishing. The Bahía (bay) de Paracas, to the south, sheltered by the Península Paracas, is a resort area. On the peninsula is the Paracas Necrópolis (pre-Inca ruins). Inc. city, 1898. Pop. (1980 est.) 74,300.
13°42′ S, 76°13′ W
·map, Peru **14**:129

Pisemsky, Aleksey Feofilaktovich (b. March 22, 1820, Kostroma province, now *oblast*, Russian S.F.S.R.—d. Feb. 2, 1881), novelist and playwright whom many critics rank with the great masters of Russian Realism, though his Realism borders on Naturalism and he lacks the philanthropic conscience that informs the work of his great contemporaries. He came from an impoverished noble family, attended Moscow University, and was a civil servant in his native province when his first stories attracted attention in reviews. He moved to St. Petersburg, where his lack of refinement, reactionary opinions, and general failure to conform to the image of a cultured liberal gentleman, estranged him from literary society. His best achievements are the novel *Tysyacha dush* (1858; "A Thousand Souls"), a memorable portrait of a "new man," Kalinovich, who marries, in spite of his love for another girl, the crippled heiress of "a thousand souls" (serfs), and climbs to the rank of provincial governor, a post he fills with impeccable integrity. Pisemsky's tragedy *Gorkaya sudbina* (1859; "A Bitter Lot"), is one of the masterpieces of the Russian theatre. Pisemsky was further estranged from his colleagues and public by a novel satirizing the radical younger generation, *Vzbalamuchennoye more* (1863; "The Stormy Sea"). The critical attacks directed against him by the radicals obscured his reputation.

Pi Sheng (fl. 11th century), Chinese inventor of movable type.
·movable type invention **14**:1052h

Pishpek (Kirgiz S.S.R.): *see* Frunze.

Pisides, Georgios: *see* George the Pisidian.

Pisidia, ancient region of southern Asia Minor, located north of Pamphylia and west of Isauria and Cilicia. Most of the district was composed of the abrupt, north–south-trending limestone ranges of the Taurus Mountains, providing refuge for a lawless population that stubbornly resisted successive conquerors. In the 1st century BC the population was organized in small tribes or in groups of villages. The theocratic rule characteristic of ancient Phrygia seems also to have been practiced in Pisidia, where there is evidence of temples with large estates and slave labour.

On the death of King Amyntas (25 BC), most of Pisidia was incorporated in the Roman province of Galatia, though it was partly regrouped with Lycia and Pamphylia by Vespasian in AD 74. The advance of Roman civilization was at first slow, but in the 2nd century AD urbanization proceeded rapidly. After Diocletian's reorganization (*c.* AD 297) Pisidia was included in the Dioecesis Asiana, and in later Byzantine times it fell partly in the Thracesian and partly in the Anatolic theme (province).

Pisidian language, spoken in Pisidia in the southern part of Asia Minor during ancient times. Pisidian is attested by a dozen surviving inscriptions.
·epigraphic inscription remains **1**:838d

Píslarsaga (1914; "Passion Story"), work by Jón Magnússon.
·content and influence **10**:1161g

Pisma iz Frantsii i Itali (1847–52; "Letters from France and Italy"), work by Aleksandr Herzen.
·denial of European social theories **8**:828c

Pisma ob izuchenii prirody (1845–46; "Letters on the Study of Nature"), work by Aleksandr Herzen.
·Hegelian and westernizing doctrines **8**:828a

pismo clam (*Tivela stultorum*), a clam of the invertebrate phylum Mollusca.
·body plan, illus. 1 **2**:1086

Piso Frugi, Lucius Calpurnius (2nd century BC), Roman tribune.
·criminal law reforms **15**:1097h

pisolite (geology): *see* oölite.

Pissarro, Camille **14**:474 (b. July 10, 1830, St. Thomas, Danish West Indies—d. Nov. 13, 1903, Paris), French Impressionist painter, who endured prolonged financial hardship in keeping faith with the aims of Impressionism.

Abstract of text biography. Pissarro early escaped from the business of his father, a prosperous Jewish merchant of St. Thomas. At age 12 he went to study in Paris, returned to the West Indies in five years, and then, after a struggle with his father, returned to France in 1855 to paint. He went to England with Monet during the Franco-Prussian War (1870–71), and in the 1880s he briefly adopted the divisionist technique of Seurat and Signac. Pissarro achieved prolific output (despite acute eye trouble) of Parisian and provincial scenes in his later years. He left behind more than 1,600 works, including oils, gouaches, temperas, and pastels, as well as nearly 200 prints.

REFERENCES in other text articles:
·Cézanne's Impressionist influences **4**:11a
·Gauguin's relationship **7**:958g
·modern visual art history **19**:474c
·19th-century French printmaking **14**:1093c

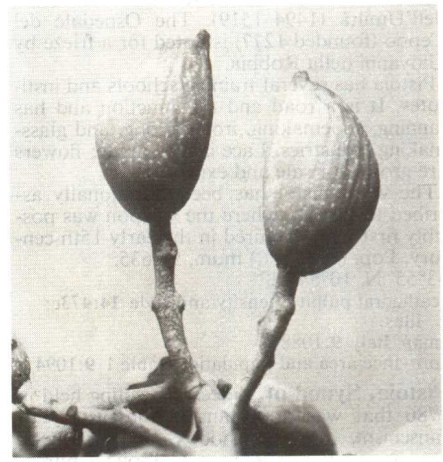
Pisseleu, Anne de, duchesse d'Étampes: *see* Étampes, Anne de Pisseleu, duchesse d'.

Pissevache Fall, on the Salanfe River, a tributary of the Rhône, in Valais canton, Switzerland, a short distance north of the village of Vernayaz. It attains its maximum flow in spring and summer and is best seen during the morning. The fall provides power for a hydroelectric power plant. It has a drop of 215 ft (65 m).
46°08′ N, 7°02′ E

Pissodes strobi: *see* pine weevil.

Pistacia, genus of flowering plants in the cashew family (Anacardiaceae), nine species of aromatic trees and shrubs native to Eurasia, with one species in southwestern North America and another in the Canary Islands. The Chinese pistachio (*P. chinensis*) is a tall ornamental tree with scarlet fruits and colourful autumn foliage. The mastic tree (*P. lentiscus*) and turpentine tree, or terebinth (*P. terebinthus*), produce sweet-smelling gums used in medicine. Mastic also is used in liqueurs and varnishes. Commercial pistachio nuts are seeds from the fruit of *P. vera*. The nuts are extensively used as food and for yellowish-green colouring in confections. Grown in dry lands in warm or temperate climates, the tree is believed indigenous to Iran; it is widely cultivated from Afghanistan to the Mediterranean region and to a limited extent in California. The tree has wide-spreading branches but rarely exceeds 9 metres (30 feet) in height. Each leaf has one to five pairs of thick, wide, leathery, pinnate leaflets; its small fruits are borne in clusters. The trees are usually dioecious (bearing either male or female blossoms) and are pollinated largely by wind.

The white fruits are 1.5 to 2 centimetres (0.6 to 0.8 inch) long and tend to split open at one side without discharging the nut, a greenish kernel enclosed within a thin, tightly adhering, reddish skin. The single, solid kernels have a pleasing mild resinous flavour. To ensure pollination and good yield, male trees are interplanted with female in a ratio of 1:5 or 1:6.



Pistachio fruits (*Pistacia vera*)
G. Tomsich—Photo Researchers

·fruit farming economics **7**:758d; tables 755
·Rutales order characteristics **16**:103a

Pistia stratiotes (plant): *see* Arales.

pistil, the centrally located female organs of a flower. The pistil consists of the pollen-receiving stigma, the slender style, and the basal ovary (*qq.v.*) in which one (simple pistil) or more (compound pistil) carpels (portions of the plant enclosing the ovules, or potential seeds) are contained.
·angiosperm floral structures, illus. 3 **1**:880
·Asterales pollination mechanism **2**:215a
·Fagales pollination methods **7**:142a
·orchid modifications **13**:649g
·pollen transference **14**:743g
·Primulales distinctive flower structure **14**:1048e; illus.
·reproductive systems in angiosperms **15**:722g; illus.
·seed, flower, and fruit development **16**:481e; illus. 482

Pistis Sophia ("Faith Wisdom"), 3rd-century Coptic Gnostic text translated from Greek and consisting of two works that are an important source for Gnostic teaching. It survives in a well-preserved 4th-century manuscript, the Askew Codex, in the British Museum. The text gives a Gnostic interpretation of some Old Testament psalms, many sayings of Jesus, and five Odes of Solomon.
·Christian mysticism and Gnosticism **4**:546c
·Gnostic literature **13**:1079g

Pistoia, capital of Pistoia province, in the Tuscany region of north central Italy, located on the Ombrone River south of the Apennines and northwest of Florence. The town (recorded as Pistoria) was previously a site of Gallic, Ligurian, Etruscan, and Roman occupation and in 63 BC was the scene of the death in battle of the Roman demagogue Catiline. A bish-

opric from the 5th century and an early and vigorous free Italian commune from the late 11th century, it came under the domination of Florence in 1329. In 1786 a famous Jansenist episcopal synod that opposed devotion to the Sacred Heart of Jesus was convened in Pistoia.

The medieval city centre is dominated by the 12th-century cathedral, with its freestanding bell tower (once a Lombard watchtower); the baptistery (begun 1337); the Palazzo Comunale (1294–1385); and the Palazzo Pretorio (1367). The cathedral contains the famous silver Altar of St. James, mentioned by the poet Dante. Churches include Giovanni Fuorcivitas (12th century; containing a Visitation in glazed terra-cotta by Andrea della Robbia), S. Andrea (12th century), S. Francesco al Prato (1294–1394), and the Madonna dell'Umiltà (1494–1519). The Ospedale del Ceppo (founded 1277) is noted for a frieze by Giovanni della Robbia.

Pistoia has several training schools and institutes. It is a road and rail junction and has tanning, shoemaking, ironworking, and glassmaking industries. Lace is also made; flowers are grown for sale and export.

The word pistol has been traditionally ascribed to Pistoia, where the weapon was possibly first manufactured in the early 15th century. Pop. (1975 est.) mun., 94,635.
43°55′ N, 10°54′ E
·cathedral pulpit intensity and style **14**:473c; illus.
·map, Italy **9**:1088
·province area and population, table 1 **9**:1094

Pistoia, Synod of, diocesan meeting held in 1786 that was important in the history of Jansenism, a nonorthodox and rigoristic movement in the Roman Catholic Church. The synod was presided over by Scipione de' Ricci, bishop of Pistoia-Prato, and was under the patronage of Peter Leopold, grand duke of Tuscany (later the Holy Roman emperor Leopold II). It was aimed at a reform of the Tuscan Church along the lines advocated by the Jansenists and the Gallicans, who sought to restrict the authority of the pope. The synod almost unanimously approved a series of decrees that were warmly received by the Grand Duke and aroused the enthusiasm of Jansenists in many parts of Europe.

At the insistence of Leopold, a national synod of Tuscan bishops subsequently met at Florence (April 23, 1787); they, however, rejected the decrees of Pistoia. In 1794 Pope Pius VI condemned 85 propositions of Pistoia, and Ricci, who had resigned his see in 1790, subsequently recanted.

pistol, small firearm designed for one-hand use, dating from the 14th century. The military advantages of a firearm that could be operated by one hand, leaving the other free for another weapon or for defense, were clear from the earliest days of gunpowder, and the pistol evolved simultaneously with its heavier counterpart, the shoulder weapon.

There are two important classes of pistol: the revolver (*q.v.*) and the automatic. Revolvers embody an element that revolves; in early revolvers, sheaves or bundles of tubes serving as barrels were revolved by hand to allow more than one shot without reloading. The modern revolver employs a short, many-chambered cylinder positioned behind a single barrel so that the cartridge in each chamber is brought successively in alignment with the barrel. Pulling the trigger revolves the cylinder, brings a fresh cartridge in line with the hammer, locks the cylinder in place, and releases the hammer to discharge the cartridge.

Automatic .45-calibre pistol
By courtesy of Colt Industries

Automatic pistols have their mechanism actuated by the energy of recoil when a bullet is fired; cartridges are fed into the mechanism through a magazine in the butt of the pistol. Though devotees of the automatic pistol have predicted the decline and disappearance of the revolver, there is little evidence that this is so. Both weapons are used by the military in many countries. Police use varies, with the revolver favoured in the U.S., the automatic elsewhere. Both types are used extensively for sport and target shooting.
·hunting and target shooting **8**:499d
·police use **14**:674g
·small arms design **16**:898a
passim to 902g
·target-shooting sports history **16**:705a

pistol shrimp: *see in* shrimp.

Piston, Walter (Hamor) (b. Jan. 20, 1894, Rockland, Maine—d. Nov. 12, 1976, Belmont, Mass.), composer noted for his symphonic and chamber music and his influence in the development of the 20th-century Neoclassical style in the U.S. After graduating

Piston
By courtesy of Harvard University Archives

from the Massachusetts School of Art, Piston studied music at Harvard University and in Paris with Nadia Boulanger and Paul Dukas (1924–26). On his return to the United States, he taught at Harvard, becoming professor of music in 1944 and retiring in 1960. He published four important textbooks, *Principles of Harmonic Analysis* (1933), *Harmony* (1941), *Counterpoint* (1947), and *Orchestration* (1955). His style of composition is Neoclassical, with occasional Romantic overtones, and is noted for its structural strength and rhythmic vivacity.

Piston's program music includes the orchestral suite *Three New England Sketches* (1959); his only composition for the theatre is the ballet *The Incredible Flutist* (1938). He composed eight symphonies, the third (1947) and seventh (1960) of which were awarded Pulitzer Prizes. He also wrote two violin concerti, a viola concerto, a concerto for two pianos, a *Capriccio* for harp and string orchestra (1963), a concerto for clarinet, the *Lincoln Center Festival Overture* (1962), and a concerto for string quartet and orchestra (1974). His chamber music includes five string quartets, a quintet for piano and string quartet, and a wind quintet.
·eclecticism in chamber works **4**:28e

piston and cylinder, in mechanical engineering, a circular sliding piece (the piston) moved reciprocally in a circular chamber (the cylinder) by or against pressure of a fluid, as in an engine or pump. The cylinder of a steam engine is closed by plates at both ends, with provision for the piston rod, which is rigidly attached to the piston, to pass through one of the end cover plates by means of a gland and stuffing box (steam-tight joint).

The cylinder of an internal-combustion engine is closed at one end by a plate called the head and open at the other end to permit free oscillation of the connecting rod, which joins the piston to the crankshaft. The cylinder head contains the spark plugs on spark-ignition (gasoline) engines and usually the fuel nozzle on compression-ignition (diesel) engines; on some engines the valves that control the admission of fresh fuel and the escape of burned fuel are also located in the cylinder head.

On most engines the cylinders are smoothly finished holes in the main structural component of the engine known as the block, which is usually made of cast iron or aluminum. On some truck engines the cylinders are lined with sleeves (liners) that can be replaced when worn. Aluminum blocks use centrifugally cast iron liners that are placed in the mold when the aluminum is being cast; these liners are not replaceable but can be rebored.

Pistons are usually equipped with piston rings. These are circular metal rings that fit into grooves in the piston walls and assure a snug fit of the piston inside the cylinder. They help provide a seal to prevent leakage of compressed gases around the piston and to prevent lubricating oil from entering the combustion chamber.

An important characteristic of an internal-combustion engine is its compression ratio (*q.v.*), defined as the total volume of the combustion chamber with the piston fully extended (maximum volume) divided by the total volume with the piston fully compressed (minimum volume). The actual compression ratio in practice is somewhat less. Higher compression ratios usually provide better engine performance, but they require a fuel with better antiknock characteristics.

Closely associated with the compression ratio is a characteristic known as the displacement—*i.e.*, the change in volume (measured in cubic inches or cubic centimetres) of the combustion chamber that takes place as the piston moves from one extreme to the other. The displacement is closely related to the horsepower rating of an engine.
·air compressor operational mechanism **14**:582f
·gasoline engine construction **7**:933f; illus. 933
·hydraulic pumps and power transmission **9**:78a; illus.
·pump types and uses **15**:270h
·steam engine functioning **17**:628c
·steam engines of Newcomen and Watt **17**:624h; illus.
·steam locomotive design, illus. 2 **15**:482

piston corer: *see in* core sampling.

piston valve, in a brass musical instrument, a device to deflect air into extra tubing when the valve is depressed, thereby lowering the pitch one step.
·horn pitch development **19**:849f

Pisuliidae, family of the insect order Trichoptera (caddisflies).
·classification criteria **18**:710g

Pisum sativum, one of several species of pea (*q.v.*).

Pita, capital of Pita Region, west central Guinea, at the intersection of roads from Labé, Télimélé, and Dalaba. It is a traditional market town of the Muslim Fulani people who occupy a densely populated region of the Fouta Djallon Plateau. Pop. (1972) region, 206,064.
11°05′ N, 12°24′ W
·map, Guinea **8**:467

Pitalkhorā, archaeological site of North India.
·monastery sculpture and yakṣa image **17**:188d

Pitane, ancient Greek city on the coast of Aeolis in Asia Minor.
·Sparta's territorial growth **8**:337e

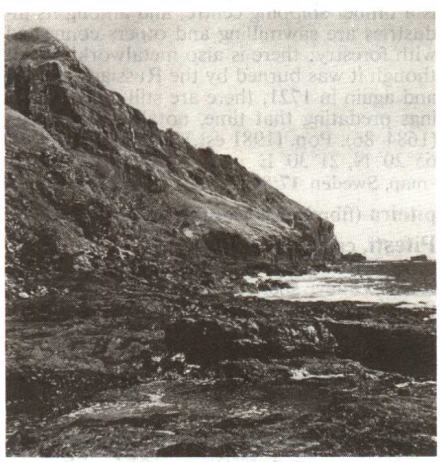
Pitangus (bird): *see* kiskadee.

P'i-t'an school (Buddhism): *see* Abhidharmakosa.

Pitcairnia, genus of herbs, of the order Bromeliales.
·environment adaptations and epiphytism **3**:325b

Pitcairn Island, isolated, volcanic formation in the south central Pacific Ocean, 1,350 mi (2,170 km) southeast of Tahiti. With the uninhabited Oeno, Henderson, and Ducie islands, it constitutes the British colony of Pitcairn Island. The main island, with an area of about 2 sq mi (5 sq km), is a rugged half crater rising to 1,100 ft (about 300 m), girded by precipitous coastal cliffs. The climate is subtropical with an adequate rainfall, and the soil is fertile.

Discovered (1767) by a British naval officer, Philip Carteret, Pitcairn is named for the sailor who first sighted it. Its population is descended from the mutineers of the British ship HMS "Bounty" and their Tahitian Polynesian consorts. On a voyage from Tahiti to the West Indies with a cargo of breadfruit saplings, the crew, led by the first mate, Fletcher Christian, mutinied and set their captain, William Bligh (*q.v.*), and several loyal sailors adrift and set course for the Austral Islands. The mutineers and their Tahitian companions eventually reached uninhabited Pitcairn (1790), went ashore, and then burned the ship.



The rugged coast at Bounty Bay, Pitcairn Island
Shostal

The island community survived in obscurity until discovered by American whalers in 1808. Resettled on Tahiti (1831), many islanders grew dissatisfied and returned to Pitcairn. Thereafter, the island became a port of call for whalers and passenger ships steaming between the U.S. and Australia. In 1856, because of overpopulation, some of the islanders were removed to Norfolk Island, and to this day the mutineers' descendants remain divided between the two places.

Adamstown, the chief settlement, is on the north coast near Bounty Bay, one of the few places where the island-made longboats can land. The islanders subsist on fishing, garden produce, and crops (including sweet potatoes, sugarcane, taro, oranges, bananas, and coffee). The sale of postage stamps and carved curios to passing ships brings cash income. They were converted to Seventh-day Adventist faith in 1877. A public school provides basic education. In 1898, the settlement was placed under the jurisdiction of the High Commissioner for the Western Pacific. Since 1952, the colony has been administered by the governor of Fiji through locally elected officers and an island council. Pop. (1980) 63. 25°04′ S, 130°05′ W
·area and population table **13**:830
·British Empire status map **3**:305
·isolated natural populations **15**:348g
·Norfolk Island history **2**:432f

pitch (geology): *see* strike.

pitch, in construction, the black or dark-brown residue obtained by distilling coal tar, wood tar, fats, fatty acids, or fatty oils.

Coal tar pitch is a soft to hard and brittle substance containing chiefly aromatic resinous compounds along with aromatic and other hydrocarbons and their derivatives; it is used chiefly as road tar, in waterproofing roofs and other structures, and to make electrodes.

Wood tar pitch is a bright, lustrous substance containing resin acids; it is used chiefly in manufacture of plastics and insulating materials, and in caulking seams.

The pitches derived from fats, fatty acids, or fatty oils by distillation are usually soft substances containing polymers and decomposition products; they are used chiefly in varnishes and paints and in floor coverings.
·conifer commercial uses **5**:3b
·sustained yield principles in forestry **7**:528c

Pitch, also called SETBACK OR AUCTION PITCH, a game of cards, the hardiest member of the "all fours" family of card games known in England in the 17th century or before, popular with U.S. card players, especially in the West, until replaced by poker. A precursor of pitch was Seven-Up (or Old Sledge), mentioned in the writings of Bret Harte, Mark Twain, O. Henry, and others. The family is called all fours because there are four scoring points: high, low, jack, and game. High is the ace of trumps, or the highest trump dealt. Jack is the knave of trumps. Low is the two of trumps, or the lowest trump dealt. Game is a plurality of high card points won in tricks, each 10 counting 10, aces 4, kings 3, queens 2, and knaves 1. In some variants, game is the 10 of trumps.

From four to seven may play pitch, but the best game is with four, each playing for himself. Each player in rotation clockwise is dealt six cards in rounds of three at a time. Then, beginning with eldest hand (to the left of the dealer), each in turn has one chance to bid the number of points that he thinks he can win, the highest bid being four. The high bidder "pitches" (leads first), and the suit of the card he pitches is trump. If able to follow suit, each player in turn may either follow suit or trump; if unable to follow suit, he may play any card. The highest trump, or, if no trump is played, the highest card of the suit led, takes the trick, the winner leading to the next trick. If the pitcher fulfills his contract, he scores as many points as he has made; if he falls short, he is "set back" the amount of his bid (has those points deducted from his score). Each other player scores what he makes. The first to score seven points wins. If two or more players reach seven on the same deal, the pitcher's points are counted first.

A special rule called smudge is often allowed —if a player fulfills a bid of four, he wins the game at once, unless he is "in the hole" (has a minus score) at the time. In some localities an ordinary bid of four can be overcalled by a bid of smudge, and the smudge bidder wins or loses depending on whether he makes or loses his contract.

pitch, in speech, the relative height or lowness of a tone as perceived by the ear, which depends on the number of vibrations per second produced by the vocal cords. Pitch notation is usually marked by numbers from 1 (low) to 4 (high); some scholars use 1 to note the highest pitch and 4 the lowest. Chinese and numerous African and American Indian languages use pitch to distinguish between two otherwise identical words; *e.g.*, *man*, in Mandarin Chinese, may mean "deceive" or "slow," depending on its pitch. *See also* intonation.
·English features, types, and patterns **6**:875g
·language system and function **10**:644g
·phonetic study of suprasegmentals **14**:278e
·psychophysiological explanation **15**:160c
·vocal attributes **17**:481h

pitch, in music, position of a single sound in the complete range of sound. Sounds are higher or lower in pitch according to the frequency of vibration of the sound waves producing them. A high frequency (*e.g.*, 880 cycles per second [hertz]) is perceived as a high pitch; a low frequency (*e.g.*, 55 hertz) as a low pitch. For singers or instrumentalists to perform together in tune, they must have a convention that fixes pitch precisely. Usually a′ above middle C (c′) is taken as a referent pitch; in 20th-century standard pitch, this a′ = 440 hertz.

Pitch was set at different levels in the past. Before 1500 the main evidence concerning pitch was the written compass of vocal music, especially plainsong, which suggests that pitch during the Middle Ages was not very different from that of today.

From about 1500 to 1670 large numbers of woodwind instruments survive. Their pitch is remarkably constant at about a′ = 466, or one semitone above a′ = 440. During this period the pitch of church music was set by the organ. It was usual to specify that the lowest pipe of the organ, which might be F or C, be five, six, eight, or ten feet long; five or ten feet was the standard. A longer pipe produces a lower pitch than a shorter pipe. In order to bring all the written notes of plainchant into the middle of the vocal range, organists were required to transpose the music upward or downward at sight. If they regarded the lowest organ note as F, the actual pitch played was about a third higher than the notated pitch; if they regarded the lowest organ note as C, the actual pitch was about a third lower than notated. This custom of transposing written music explains why the church music of William Byrd, Orlando Gibbons, and Thomas Tomkins is written either a third lower or a third higher than the pitch at which it should sound.

In the mid-17th century, the Hotteterres, Parisian instrument makers, remodelled the entire woodwind family. They used the Paris organ pitch of about a′ = 415, or a semitone below a′ = 440. This new, or Baroque, pitch, called *Kammerton* ("chamber pitch") in Germany, was thus one tone below the old Renaissance woodwind pitch, or *Chorton* ("choir pitch").

After about 1760 the conventional pitch rose, reaching a′ = 440 about 1820. By the latter half of the 19th century, it reached the "Old Philharmonic Pitch" of about a′ = 453. The inconvenience of this high pitch became apparent, for it strained singers' voices and made wind instruments quickly out of date. An international commission met in Paris in 1858–59 and adopted a compromise pitch called diapason normal (known in the U.S. as "French pitch" or "international pitch") at a′ = 435. England in 1896 adopted the "New Philharmonic Pitch" at a′ = 439 and in 1939 adopted the U.S. standard pitch of a′ = 440. In the mid-20th century, pitch again tended to creep upward as some European woodwind builders used the pitch a′ = 444.

Absolute, or perfect, pitch is the ability to identify by ear any note at some standard pitch or to sing a specified note, say G♯, at will. Fully developed absolute pitch is uncommon. It appears early in childhood and is apparently an acute form of memory of sounds of a particular instrument such as the home piano. Some musicians slowly acquire a degree of absolute pitch, if only for the familiar a′ = 440.

When frequency numbers are not used for a particular pitch, say D or B, a system of lowercase and capital letters indicates the octave in which it occurs. The notes in the octave below middle C are indicated by lowercase letters from c to b; the notes of the second octave below middle C are shown as *C*, *D*, . . . *B*; the notes of the next lower octave as C_1, D_1, . . . B_1. Middle C is shown as *c'*, and the notes in the octave above middle C as *d'*, *e'*, . . . *b'*. The C above middle C is shown as *c''*, and the next higher C as *c'''*.

·African musical scale **1**:244b
·Chinese tonal system **12**:672d
·intervallic relations in scale **16**:302g
·microtonality and special tuning **4**:25e
·musical sound's physical characteristics **17**:34h *passim* to 38c
·notation and problem of accuracy **12**:733b
·organ construction and tone production **13**:676c
·relation of compositional elements **12**:716a
·sound wave frequencies **17**:21c
·stringed instrument construction **17**:740a
·theoretical basis of music **12**:746h
·tuning of scale notes **18**:741a
·Vedic stress and Indian music theory **17**:152a
·vertebrate groups hearing abilities **17**:44f
·wind instrument generation **19**:848f

pitch, in mechanics, the angle between an element of the thread of a screw or the surface of a propeller blade and the axis of rotation. The pitch determines the axial advance of the screw or propeller attending each rotation.

In describing gears, paddlewheels, and the like, the term pitch denotes the distance between adjacent teeth or blades.

·aircraft propeller design **1**:374h

pitchblende, amorphous, black, pitchy form of the crystalline uranium oxide mineral uraninite (*q.v.*); it is one of the primary mineral ores of uranium, containing 50–80 percent of that element. Three chemical elements were first discovered in pitchblende: uranium by the German chemist Martin Klaproth in 1789, and polonium and radium by the French scientists Pierre and Marie Curie in 1898. Deposits, frequently in association with uraninite or with secondary uranium minerals, are known in Zaire; Czechoslovakia; England; the Northwest Territories and Saskatchewan in Canada; and Arizona, Colorado, Montana, New Mexico, and Utah in the U.S.

·Curies' utilization in experiments **5**:371g
·polonium occurrence and production **13**:818a

pitched roof, any of several types of roof composed of one or more planes inclined from the horizontal; such roofs are commonly used on domestic buildings of moderate span.

·design and construction **3**:955a

Pitcher, Molly, sobriquet of MARY LUDWIG HAYS MCCAULEY (1754–1832), heroic figure of the U.S. War of Independence. She joined her husband, a colonial soldier, in battle against the British at Monmouth, N.J., on July 28, 1778, and risked her life repeatedly to carry drinking water to the American troops.

pitcher plant, common name for any insect-catching plant with pitcher-shaped leaves. Old World pitcher plants are members of the family Nepenthaceae (order Nepenthales); New World pitcher plants belong to the family Sarraceniaceae (order Sarraceniales). The fly-catcher plant (*Cephalotus follicularis*) of southwestern Australia is the only species of the family Cephalotaceae (order Saxifragales). Another pitcher plant is *Dischidia rafflesiana*, of the family Asclepiadaceae (*q.v.*). Pitcher plants are found in a wide range of habitats, from pine barrens to sandy coastal swamps.

The name pitcher plant most commonly refers to members of the family Sarraceniaceae, especially the eight or nine species comprising the genus *Sarracenia*, native to eastern North America. The other two genera in the family are the cobra plant (*Darlingtonia*), native to northwestern North America, and *Heliamphora*, native to northern South America.

Common pitcher plant (*Sarracenia purpurea*)
Walter Chandoha

A pitcher plant of the genus *Sarracenia* has a low jug-shaped or tall trumpet-shaped leaf. Nectar exuded on the outside of the leaf attracts insects, which fall into the pitcher and are digested by an enzyme secreted within the leaf. A rosette of stalkless leaves rises from a long underground rootstalk.

The purple, or common, pitcher plant (*S. purpurea*) has heavily veined, green to reddish, flaring, juglike leaves that bear downward-pointing bristles. Its flowers are purple red. The parrot's head pitcher plant (*S. psittacina*) has small, fat, red-veined leaves that are topped by beaklike lids. It bears dark-red flowers. Sweet pitcher plant (*S. rubra*) produces dull-red, violet-scented flowers. Crimson pitcher plant (*S. leucophylla; S. drummondii* of some authorities) has white, trumpet-shaped pitchers with ruffled, upright hoods and scarlet flowers. Yellow pitcher plant (*S. flava*), also known as trumpets, has bright-yellow flowers and a long, green, trumpet-shaped leaf the lid of which is held upright. Species of pitcher plants cross-fertilize easily, so that the number of species varies according to the authority consulted.

·*C. follicularis* general features **16**:295g
·distribution and natural history in America **16**:252g; illus.
·flower simulation by luring devices **12**:216e
·Nepenthales carnivorous features **12**:958d *passim* to 962g

RELATED ENTRIES in the *Ready Reference and Index:*
cobra plant; fly-catcher plant; Nepenthes

pitch lake, large surface deposit of natural asphalt (*q.v.*), a mixture of heavy oils that probably is left after the lighter, more volatile components of a crude-oil seepage have evaporated. An example is Guanoco Lake in Venezuela, which covers over 445 hectares (1,100 acres), contains an estimated 6,000,000 tons of asphalt, and was used as a source of commercial asphalt from 1891 to 1935. Smaller deposits occur commonly where Tertiary marine sediments outcrop on the surface; an example is the tar pits at Rancho La Brea in Los Angeles (*brea* and "tar" are synonymous with "semisolid asphalt"). Although most pitch lakes are fossils of formerly active seeps, some, as that on the island of Trinidad, continue to be supplied with fresh crude oil seeping from a submerged source.

pitch pocket, a deposit of resin secreted by a tree into a cavity caused by disruption of the laminar tissues.

·wood structure defects **19**:918h

pitchstone, a natural glass with a conchoidal fracture (like glass), a resinous lustre, and a mottled, streaked, or uniform brown, red, green, gray, or black colour. It is formed by rapid cooling of viscous lava or magma.

Most pitchstone occurs as dikes or marginal phases of dikes and therefore may grade into porphyry. Pitchstone porphyry (vitrophyre) consists of a glassy base (groundmass) enclosing abundant large crystals (phenocrysts) of such minerals as quartz, alkali feldspar, and plagioclase, as well as fewer crystals of pyroxene or hornblende. Pitchstone may reveal evidence of fluid flow by the presence of wavy streaks and trains of crystals; in pitchstone dikes, the lines and layers of flowage are oriented parallel to the dike walls.

A rhyolite (*q.v.*), pitchstone has chemical composition, index of refraction, and specific gravity similar to those of obsidian (*q.v.*), but pitchstone is distinguished by a dull, rather than vitreous, lustre. Like obsidian, however, it is translucent on thin edges, but it is much richer in microscopic embryonic crystal growths (crystallites), the abundance of which is generally believed to account for the duller lustre. Of all the glassy rocks, pitchstone is the richest in water, generally containing 4 to 10 percent by weight; most of this water may have been absorbed from the sea or wet sediments into which the pitchstone was intruded. Some lavas and magmas appear to have congealed partly as glass and partly as crystalline material; water driven out from those portions undergoing crystallization may have been trapped or taken up by the glassy portions to form pitchstone. Pitchstone is unstable, and its conversion to a very fine-grained crystalline aggregate resembles the devitrification of obsidian.

·igneous rock classification **9**:208a; table 207

Piteå, town and port, *län* (county) of Norrbotten, northern Sweden, on the Piteälv (river) near its outlet on the Gulf of Bothnia. Originally, it was chartered at Öjebyn in 1621, but after a fire in 1666 it was moved to its present location. Lying in a forest-rich area, it is a timber-shipping centre, and among its industries are sawmilling and others connected with forestry; there is also metalworking. Although it was burned by the Russians in 1716 and again in 1721, there are still many buildings predating that time, notably the church (1684–86). Pop. (1981 est.) mun., 38,402.
65°20′ N, 21°30′ E

·map, Sweden **17**:849

piteira (fibre): *see* Mauritius hemp.

Piteşti, capital of Argeş district (*judeţ*), south central Romania. It is situated in the Argeş River Valley, sheltered by surrounding hills. Piteşti developed in the Middle Ages as a town trading between the mountainous Transylvania region and the Danube Plain. It is first documented in 1388, though Roman coins and relics have been found in the area.

Local People's Council headquarters, Piteşti, Rom.
E.P.A. Inc.—EB Inc.

The town is 70 mi (110 km) northwest of Bucharest. Pop. (1980 est.) 129,676.
44°52′ N, 24°52′ E

·map, Romania **15**:1049

pith, in botany, tissue composed of large, food-storing parenchyma (*q.v.*) cells, located in the central region of a vascular plant stem. Pith rays pass between vascular bundles (*q.v.*),

connecting the tissue external to the vascular tissue (cortex, *q.v.*) to the pith for the lateral transport of food.
·Dipsacaceae anatomical development **5**:817a
·fern structure and function **7**:241h; illus.
·organ structure and function **13**:727e; illus.
·stem tissue arrangement **18**:451c; illus.

Pithecanthropus, former genus name of fossil hominids including Java man (*q.v.*) and Peking man (*q.v.*), both now classified as *Homo erectus*.
·Australopithecine fossil discovery table **2**:437
·East Asian fossil remains **2**:198h
·fossils and taxonomic status **11**:423f
·hominid evolution theory **8**:1030g
·human evolution and ancestry **7**:20d

Pithecellobium auaremotemo, species of plant, order Fabales.
·legume fruit, illus. 1 **7**:129

Pithecia (monkey): *see* saki.

Pithecussae, Greek settlement on the island of Ischia established in the 8th century BC.
·settlement, growth, and importance **8**:330e

pi theorem, one of the principal methods of dimensional analysis (*q.v.*), introduced by the U.S. physicist Edgar Buckingham in 1914. The theorem states that if a variable A_1 depends upon the independent variables A_2, A_3, . . . A_n, then the functional relationship can be set equal to zero in the form: $f(A_1, A_2, A_3, \ldots A_n) = 0$. If these n variables can be described in terms of m dimensional units, then the pi (π) theorem states that they can be grouped in $n - m$ dimensionless terms that are called π-terms—that is, $\varphi(\pi_1, \pi_2, \pi_3, \ldots \pi_{n-m}) = 0$. Further, each π-term will contain $m + 1$ variables, only one of which need be changed from term to term.

The utility of the pi theorem is evident from an example in fluid mechanics. To investigate the characteristics of fluid motion and the influence of the variables involved, it is possible to group the important variables in three categories, namely: four linear dimensions that define channel geometry and other boundary conditions; a rate of water discharge and a pressure gradient that characterize kinematic and dynamic flow properties; and five fluid properties—density, specific weight, viscosity, surface tension, and elastic modulus. This total of 11 variables (n) can be expressed in terms of three dimensions (m); accordingly, a functional relationship can be written involving eight π-terms ($n - m$). The problem is reducible to solution of simultaneous linear equations to determine the exponents of the π-terms that will render each term dimensionless—*i.e.*, $\pi_i = L^{\circ}M^{\circ}T^{\circ}$ in which L°, M°, T° refer to a dimensionless combination of length, mass, and time, the three fundamental units in which each variable is described.

The interesting result of this algebraic exercise is: $E = k\varphi(a, b, c, F, R, W, C)$, in which E is the Euler number, characterizing the basic flow pattern, k is a constant, and φ expresses the functional relationship between E and a, b, c (parameters defining the boundary characteristics), and F, R, W, and C. The latter are the dimensionless Froude, Reynolds, Weber, and Cauchy numbers that relate fluid motion to the properties of weight, viscosity, surface tension, and elasticity, respectively.
·dimensional measures and constants **11**:742g
·mathematical concepts and formulations **14**:422f

Pitho: *see* spider crab.

Pithom, Egyptian PER-ATUM or PER TUM, modern TALL AL-MASKHŪṬAH, ancient Egyptian city located near Ismailia in al-Ismāʿīlīyah *muḥāfaẓah* ("governorate"). Mentioned in the Bible (Ex. 1:11) as one of the treasure cities built for the pharaoh by the Hebrews, it was known to have been enlarged by the Rameside pharaohs, especially by Ramses II (reigned 1304–1237 BC), in whose reign the Exodus may have taken place. Pithom later became one of the cities on the Nile–Red Sea Canal built by Darius I the Great of Persia. 30°33′ N, 32°07′ E
·Moses' traditional and probable dates **12**:487g
·Ramses II's construction **15**:502h

Pithomyces chartarum, or SPORIDESMIUM BAKERI, species of microfungus (class Deuteromycetes) whose toxin causes facial eczema and liver damage in cattle.
·toxic microfungi, table 2 **14**:608

Pithoragarh, administrative headquarters, Pithoragarh district, Uttar Pradesh state, northern India, east of Almora, on a ridge of the Himalayan foothills. The district is 2,797 sq mi (7,243 sq km) in area and lies entirely within the Himalayan Range. The district borders Nepal (east) and China (north). Rice, barley, and wheat are grown. Pop. (1971 prelim.) town, 11,956; district, 308,220.

Pithou, Pierre (b. Nov. 1, 1539, Troyes, Fr. —d. Nov. 1, 1596, Nogent-sur-Siene), lawyer and historian who was one of the first French scholars to collect and analyze source material of France's history.

Reared as a Calvinist, Pithou received his lawyer's robes at Paris (1560), after his talents already had been recognized for his essays on Roman laws. On the outbreak of the Second War of Religion against the Protestants in 1567, he fled to Sedan (now in France) and later to Basel, Switz., returning to France after the Edict of Pacification (1570). He accompanied the duke of Montmorency on his embassy to England and returned shortly before the massacre of the Huguenots (1572). He converted to Catholicism in 1573 and was named procurer general (1579) for a temporary court set up by King Henry III to render justice in the province of Guyenne.

When the Holy League for the extermination of Protestantism prevented Pithou from practicing law, he devoted himself to his researches on the history and discipline of the church. Sympathetic to the royal cause, he helped in producing *Satire Ménippée* (1593), a polemical tract that did much to damage the cause of the League. In the same year he was appointed procurer general for the parliament at Paris. On the order of King Henry IV, he wrote *Les Libertéz de l'Église gallicane* (1594; "Liberties of the Gallican Church"), a work echoing the position of the French legal scholars in the conflict between the government and the Holy See; it became the basis for the declaration of the French clergy (1682) concerning the authority of the pope.

Pithou's other historical works are *Leges Wisigothorum* (1579; "Laws of the Visigoths"), the first publication of the laws of the Visigoths, and *Annales Francorum* (1588; "Annals of the French").
·Gallican reply to Ultramontanism **7**:631d

Pitkin glass, a glassware originating from a glasshouse established by the Pitkin family in East Hartford (now Manchester), Connecticut, in 1783 and active until *c.* 1830.

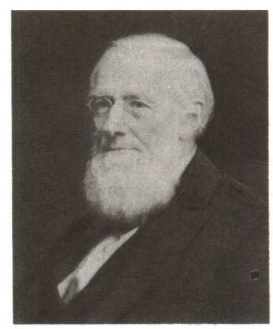
The product's fame rests almost entirely on so-called Pitkin flasks, which were much sought by collectors in the 1920s. These flasks, which vary in colour from green to aquamarine and amber, were a kind of pocket bottle molded with a swirl or ribbed pattern. Pitkin flasks made in the Eastern glasshouses are generally olive green or amber in colour; whereas those made in Ohio or Pennsylvania either vary from green to aquamarine or are amber and are somewhat rounder.
·history and ware characteristics **8**:190g

Pint-size flask, Pitkin-type glass made in the eastern United States, *c.* 1820; in the Brooklyn Museum, New York

By courtesy of the Brooklyn Museum, gift of Mr. & Mrs. A. L. Chapins in memory of Louis Chardon

Pitlochry Dam, on Tummel River, in Perthshire, Scotland; 84 feet high; completed 1950.
·drum-gate operation **5**:446f

Pitman, Sir Isaac (b. Jan. 4, 1813, Trowbridge, Wiltshire—d. Jan. 12, 1897, Somerset), educator and inventor of the shorthand system named for him. After clerking in a textile mill, he entered a training college for teachers (1831) and taught in elementary schools for 11 years before opening his own private school in Bath.



Pitman, detail of an oil painting by A.S. Cope (born 1857); in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Earlier he had taken up Samuel Taylor's system of shorthand and became interested in developing shorthand based on sound. In 1837, at the suggestion of publisher Samuel Bagster, Pitman produced his *Stenographic Sound Hand*, which Bagster published at a low price for widest possible distribution. To encourage the adoption of his system, Pitman established a Phonetic Institute and a *Phonetic Journal* at Bath. He also printed a number of standard works in shorthand, and his book *Phonography* (1840) went through many editions. He was an enthusiastic spelling reformer and adopted a phonetic system that he tried to bring into general use.
·shorthand system design **16**:709f; illus. 710

pitman chest, wind chest used in many pipe organs that has especially fast action and stop control.
·history, construction, and mechanisms **13**:677b

Pitman shorthand, system of rapid writing based on the sounds of words (*i.e.*, the phonetic principle) rather than on conventional spellings. Invented by Sir Isaac Pitman, an English educator, Pitman shorthand was first published in 1837 as *Stenographic Sound Hand*. Pitman's system classifies the sounds of a language scientifically and makes use of simple abbreviations for rapidity. Consonants are drawn from simple geometrical forms, straight lines, and shallow curves. As far as possible they are paired; thus, a light slanted line stands for p and a heavier slanted line for b, a light vertical line stands for t and a heavier one for d, and so on. Vowels are indicated by disjoined dots and dashes that are placed in specific positions relative to the consonants and the line of writing. The system makes use

of circles, loops, and hooks for sounds frequently used in consonant combinations and syllables (*e.g.*, for *s*, *st*, *str*, *spr*, and *-ter*, *-der*, *-tion*). Syllables are also added by halving or doubling the length of a consonant stroke.

Pitman shorthand was introduced into the United States in 1852; among the many languages to which it has been adapted are Hindi, Hebrew, Arabic, Persian, German, French, Spanish, and Dutch.

·shorthand systems **16**:709f; illus. 710

pit membrane, part of the structure of a cell of wood.

·wood cell structure **19**:918d; illus.

Pitoëff, Georges (1886–1939), Russian-born French actor, producer, and playwright.

·directing and foreign drama contribution **18**:233d

pit organ, a temperature-sensitive organ in the head of venomous snakes of the subfamily Crotalinae, family Viperidae. Crotalines, known collectively as pit vipers, include rattlesnakes, moccasins, fer-de-lance, and a number of other New World vipers, as well as a few Old World species. The pit organs are located on each side of the face, somewhat below a line from the eye to the nostril. They function in the detection of the small, warm-blooded animals on which the snakes feed, and they aid in orienting the snake's strike.

·bionics use of natural models **2**:1033e
·boid and pit viper sedentary habits **16**:563a
·snake thermoreception ability **15**:735d

Pitot, Henri (b. 1695, Aramon, Fr.—d. 1771, Aramon), hydraulic engineer and inventor of the pitot tube, which measures flow velocity. Beginning his career as a mathematician and astronomer, he won election to the Academy of Sciences in 1724. Becoming interested in the problem of flow of water in rivers and canals, he discovered that much contemporary theory—for example, that the velocity of flowing water increased with depth—was erroneous. He devised a tube, with an opening facing the flow, that provided a convenient and reasonably accurate measurement of flow velocity; it has found wide application ever since, being used especially in anemometers for measuring wind speed. Appointed chief engineer for Languedoc, Pitot performed a variety of maintenance and construction works including construction of an aqueduct for the city of Montpellier (1753–86).

·fluid mechanics development **11**:780f

pitot tube: *see in* anemometer.

pitṛ (Sanskrit: "father"), in Hinduism the spirit of a dead ancestor; the dead who have been cremated or buried in accordance with the proper rites.

In the Vedas, the sacred scriptures of ancient India, the "fathers" were considered to be immortal like the gods and to share in the sacrifice, though they received different offerings. The "way of the fathers," the traditional duties that lead to rebirth, came to be distinguished from the "way of the gods," which was a way of faith, directed toward the goal of liberation from rebirth.

The performance at regular intervals of ceremonial rites for the deceased ancestors (*śrāddha*) continues to be a lifelong duty of male Hindus. It is the need to ensure the continuance of the *śrāddha* rites for the dead forefathers, as well as for those now living after their death, that causes Hindu culture to place such importance on male offspring.

pit saw, saw operated by two men, one above and one below the log.

·log ripping technique **8**:619a

Pitt, Thomas, called DIAMOND PITT (b. July 5, 1653, Blandford St. Mary, Dorset—d. April 28, 1726, Swallowfield, Berkshire), British merchant whose involvement in the East India trade brought him into conflict with the English East India Company; later, the company made him governor of Madras, India. Pitt was the grandfather of William Pitt the Elder, the great 18th-century British statesman.

Thomas Pitt, detail of a print after an oil painting by Sir Godfrey Kneller (1646/49–1723)

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

Without receiving permission from the East India Company, Pitt began to trade out of Balasore, India, in 1674. The company retaliated by having him arrested (1683) and fined (1687). Nevertheless, he was elected to Parliament in 1689 and 1690, when he bought the manor of Old Sarum, thereby securing control of this parliamentary seat for his family.

In 1693 Pitt embarked on another trading venture in the East. Failing to put an end to his activities, the East India Company took him into its service in 1694 and appointed him president of Ft. St. George, Madras, three years later. Dismissed from his post in 1709, he returned to England and resumed his seat in Parliament. In 1717 he sold an extremely valuable diamond to Philippe II, duc d'Orléans, regent of France; now known as the "Regent," the jewel is in the Louvre, Paris. Pitt's eldest son, Robert, was the father of William Pitt. Sir Cornelius Neale Dalton's *Life of Thomas Pitt* was published in 1915.

·personality and fortune **14**:475f

Pitt, William, the Elder, (1st earl of Chatham) **14**:475 (b. Nov. 15, 1708, London —d. May 11, 1778, Hayes, Kent), British statesman known as the "Great Commoner," who transformed Britain into an imperial power in the mid-18th century.

Abstract of text biography. Born into a distinguished Whig family, Pitt received an education at Eton and Trinity College, Oxford, that helped mold him into the great orator he was to become. His political career began with election to Parliament (1735) from Old Sarum, in Wiltshire, and his enmity toward George II. He formed a ministry in 1756 and successfully conducted most of the Seven Years' War (1756–63), securing Britain a vast new empire. Pitt fell from power in 1761 but formed another ministry in 1766. Unsuccessful and plagued by fits of insanity, he resigned in 1768. He continued to champion the cause of the American Colonies until his death. At the age of 46, Pitt married Lady Hester Grenville; their second son was William Pitt the Younger.

REFERENCES in other text articles:
·British 18th-century politics **3**:254a *passim* to 257c
·diplomatic and military goals **6**:1097d
·East India Company's political enemies **4**:743b
·Hogarth's political engravings **8**:988b
·Prussian aid renewal in Seven Years' War **7**:704g
·resignation and opposition to Bute **7**:1125h
·Seven Years' War policy direction **16**:576h

Pitt, William, the Younger **14**:477 (b. May 28, 1759, Hayes, Kent—d. Jan. 23, 1806, London), prime minister who led Britain during the French Revolutionary Wars and had considerable influence in strengthening the office of the British prime minister.

Abstract of text biography. The son of William Pitt the Elder, Pitt was called to the bar and entered politics in 1780. He emerged as a reform leader and formed his first ministry (1783–1801), dealing with financial reforms, colonial and Irish governmental problems, and the French Revolution.

During his second ministry (1804–06) Pitt led Britain during the Napoleonic Wars. Although he dominated the House of Commons with his forceful oratory, he was, in his personal life, a shy, lonely man.

REFERENCES in other text articles:
·Britain's political development **3**:258c *passim* to 259h
·Canning's entrance into politics **3**:772b
·Fox's political relations **7**:579a
·Irish governmental assimilation **3**:290a
·ministry under George III **7**:1126g
·neutrality in French revolutionary war **17**:1004b
·regulation of East India Company **9**:398h
·tax law origins in Britain **17**:1084c
·Third Coalition against Napoleon **7**:725a

pitta, any of about 23 species of Old World birds of the genus *Pitta* comprising the family Pittidae (order Passeriformes). All are stub tailed, long legged, and short necked. They have a rather stout bill and are 15–27 centimetres (6–10½ inches) in length. Pittas faintly resemble thrushes and are sometimes

Indian pitta (*Pitta brachyura*)

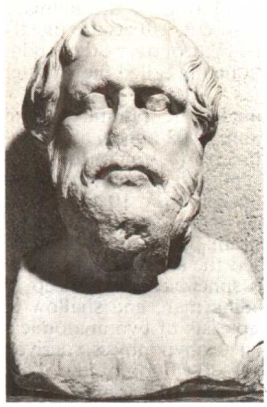
Tierbilder Okapia, Frankfurt am Main

known by such names as jewel thrush or ant thrush. The sexes may be alike or unlike in appearance. Most species are found in the Indo-Malayan region, some ranging to the Solomon Islands; three occur in Australia, two in Africa. The Indian pitta (*P. brachyura*) is typically colourful. The blue-winged pitta (*P. moluccensis*) is common in tropical Africa and from Burma to Sumatra. *P. nympha*, also called blue-winged pitta, is found in Japan, Korea, and eastern China.

Pittas are shy birds of forest or scrubland, where they move rapidly in long hops, foraging for insects and snails in ground litter. Their call is usually a trill or a short whistle. Their nests, on or near the ground, tend to be large and roughly made.

·classification and general features **13**:1059f

Pittacus of Mytilene (b. *c.* 650—d. *c.* 570 BC), statesman and sage who is known as one of the Seven Wise Men of ancient Greece. He collaborated with the brothers of the poet Alcaeus in the overthrow of the tyrant Melan-



Pittacus, herm; in the Louvre, Paris

By courtesy of the Musee du Louvre, Paris; photograph, Cliche Musees Nationaux

chrus (612/611?) and distinguished himself as a commander in the war against Athens for Sigium, killing the Athenian commander, Phrynon, single-handedly. He was elected *aisymnetes* (dictator appointed during times of internal strife) by the Mytileneans (*c.* 590 BC) and served in that post for ten years. Diogenes Laërtius quotes a number of sayings ascribed to him (mostly moral or political maxims) and five lines of lyric verse, as well as a spurious letter to Croesus.

·rule over Mytilene **8**:345g

Pitt diamond: *see* Regent diamond.

Pittendreich, Lord: *see* Balfour, Sir James.

Pitti, Luca (1394–1472), wealthy Florentine merchant, distinguished for beginning (*c.* 1440) the construction of the celebrated Pitti Palace designed by Filippo Brunelleschi.

·opposition to Medici rule **11**:818d

·Palazzo Pitti building history **7**:423b

Pitti Conspiracy (1466), Florentine republican conspiracy against Piero de' Medici.

·Florentine republican sentiment **9**:1143e

Pitt Island (Kiribati): *see* Makin Atoll.

Pittosporaceae, family of flowering plants in the order Saxifragales, 9 genera and 200 spe-

Tobira (*Pittosporum tobira*)

Javier Palaus Soler—Ostman Agency

cies of trees, shrubs, or vinelike plants distributed from tropical Africa to the Pacific islands. Members of the family have long, leathery, evergreen leaves; resin in stem ducts; and white, blue, yellow, or reddish flowers. Species of the genus *Pittosporum* are commonly known as Australian laurel. Tobira (*P. tobira*) is a popular aromatic hedge plant. Karo (*P. crassifolium*) often is planted as a windbreak on seacoasts. The genera *Hymenosporum*, *Bursaria*, and *Sollya* also contain ornamental species.

·general features and classification **16**:292h

Pittosporum, genus of shrubs and trees, order Saxifragales.

·distribution and general features **16**:292h

Pitt-Rivers, Augustus Henry Lane-Fox (b. April 14, 1827, Hope Hall, Yorkshire—d. May 4, 1900, Rushmore, Wiltshire), often called the "father of British archaeology," who stressed the need for total excavation of sites, thorough stratigraphic observation and recording, and prompt and complete publication. Like the noted British archaeologist Sir Flinders Petrie, Pitt-Rivers adopted a sociological approach to the study of excavated objects and emphasized the instructional value of common artifacts.

An army officer for most of his life, Pitt-Rivers retired from the military in 1882 and in the following year embarked on a series of prehistoric, Roman, and Saxon excavations on his 29,000-acre estate in Wiltshire. In Neolithic and later prehistoric times Wiltshire had been one of the most populous areas of England, and many early remains are to be found there. His large-scale excavations, models of organization and painstaking care, unearthed villages, camps, cemeteries, and barrows (burial mounds) at classic sites such as Woodcutts, Rotherley, South Lodge, Bokerly Dyke, and Wansdyke.

Pitt-Rivers, detail from a drawing by C.W. Walton, *c.* 1850; in the Pitt Rivers Museum, Oxford

By courtesy of the Pitt Rivers Museum, Oxford

His efforts resulted in one of the classics of archaeology, the richly illustrated *Excavations in Cranborne Chase* (5 vol., 1887–1903), which Pitt-Rivers printed privately. He also observed a similarity between the stone implements used in Europe when certain rhinoceroses and mammoths roamed there and the implements characteristic of the dawning stages of Egyptian culture.

·archaeological technique **1**:1079e

Pittsburg, city and inland port, Contra Costa County, western California, U.S., at the confluence of San Joaquin and Sacramento rivers. It was founded in 1849 as New York of the Pacific (later New York Landing) by Col. J.D. Stevenson and laid out by Lieut. (later Gen.) W.T. Sherman. Because of coal-shipping activities during the Mt. Diablo coal boom (1855–1902), it was renamed Black Diamond (1863). The impact of the steel industry evoked a name change to Pittsburg in 1911. It subsequently shared diversified industrial development with a cluster of riverside towns, including West Pittsburg and Antioch (east). Camp Stoneman (U.S. Army, 1942–54) is now a residential-industrial site. Inc. 1903. Pop. (1980) 33,034.

38°02′ N, 121°53′ W

Pittsburg, city, Crawford County, extreme southeastern Kansas, U.S. Founded in 1870 as a coal-mining camp, it was named after Pittsburgh, Pa. By 1888, it had become one of the nation's most important zinc-smelting centres. With the decline in the coal market, the city became a thriving agricultural, industrial, and educational centre. Kansas State College of Pittsburg was founded in 1903. The city is also the site of the Age Search Branch of the U.S. Bureau of the Census. Nearby pits left by strip-mining operations provide fishing and hunting facilities. Inc. 1880. Pop. (1980) 18,770.

37°25′ N, 94°43′ W

·map, United States **18**:909

Pittsburgh, city, seat (1788) of Allegheny County, southwestern Pennsylvania, U.S., at the confluence of the Allegheny and Monongahela rivers, which unite at the point of the "Golden Triangle" (the business district) to form the Ohio River. A city of hills and valleys, it is the centre of an urban industrial complex that includes the cities of Aliquippa, McKeesport, New Kensington, Washington, and Wilkinsburg.

After years of conflict between the British and French over territorial claims in the area, the argument was settled in 1758 when Gen. John Forbes and his British and Colonial Army moved on Fort-Duquesne (built 1754) and found it in flames and the French in flight. Forbes named the site to honour the British statesman William Pitt the Elder. To assure their dominance at the source of the Ohio, the British built Ft. Pitt (completed in 1761). After the defeat of Pontiac's Indian forces (1763), a later settlement with Indian tribes by the Penns, and the end of a boundary dispute between Pennsylvania and Virginia, settlers began arriving in large numbers. Pittsburgh was laid out (1764) by John Campbell in the area around the fort (now the Golden Triangle). Following the Revolutionary War, the town became an outfitting point for settlers travelling down the Ohio River.

Its strategic location and wealth of natural resources spurred its commercial and industrial growth in the 19th century. A blast furnace, erected by George Anschutz about 1792, was the forerunner of the iron and steel industry. The Pennsylvania Canal and the Portage Railroad, both completed in 1834, opened vital markets for trade and shipping.

Pittsburgh is now the nation's largest inland river port and a leading transportation centre. Though steel is the major economic factor (one-fifth of U.S. steel-making capacity is located within a 50-mi [80-km] radius of the city centre), industrial diversification embraces the manufacture of petroleum, glass, electrical equipment, machinery, and coal, coke, and chemical products. More than 100 industrial research laboratories are in the area.

Since World War II, the city has undergone an extensive redevelopment program with emphasis on smoke control, flood prevention, and sewage disposal. In 1957 it became the

Pittsburgh skyline along the Monongahela River

Porterfield-Chickering—Photo Researchers

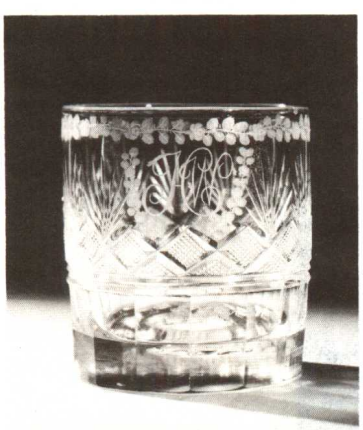
first U.S. city to generate electricity by atomic energy. A large portion of the Golden Triangle has been rebuilt and includes the Civic Arena, the 36-ac (15-ha) Point State Park (site of Ft. Pitt Blockhouse), and the Gateway Center (site of several skyscrapers and a 2-ac garden).

The University of Pittsburgh was chartered in 1787. Other institutions of higher education include Carnegie-Mellon University (1900), Duquesne University (1878), Chatham College (1869), Carlow College (1929), Point Park College (1933), and Allegheny County Community College (1966). Carnegie Institute has a 2,000,000-volume library, museums of fine arts and natural history, and the Carnegie Music Hall. The Phipps Conservatory and Buhl Planetarium are also there. Pittsburgh is represented in major U.S. professional sports. Inc. borough, 1794; city, 1816. Pop. (1970) city, 520,117 (20% black); metropolitan area (SMSA), 2,401,245; (1980) city 423,938 (24% black); SMSA, 2,263,894.
40°26′ N, 80°00′ W
·map, United States **18**:908
·metropolitan population density map **18**:930
·Pennsylvania colonial importance **14**:26b

Pittsburgh Convention (May 31, 1918), agreement, made by Czechs and Slovaks in the U.S., that expressed support for the formation of a unified Czechoslovak state but that later became the basis for Slovak nationalist dissension within the new state. Shortly before the end of World War I, Tomáš Masaryk, the chairman of the Czechoslovak National Council and the future president of Czechoslovakia, visited the United States and met with representatives of Czech and Slovak émigré societies at Pittsburgh (May 31, 1918). At that meeting an agreement, later known as the Pittsburgh Convention, was signed. It stated that the signatories favoured the establishment of a new, united Czech and Slovak state, which would provide a separate diet (legislature), judicial system, and administration for Slovakia as well as allow the use of the Slovak language in the schools and in all official transactions in Slovakia.

Though Masaryk regarded the agreement only as a local understanding among the Czechs and Slovaks of the U.S., many Slovaks accepted it as an outline for the structure of the Czechoslovak state. Consequently, when the Slovaks failed to receive the degree of autonomy they had expected, Slovak nationalist leaders, headed by Andrej Hlinka, charged that the Czechs were not fulfilling the provisions of the Pittsburgh Convention.
·Masaryk's Czechoslovak negotiations **11**:572g

Pittsburgh glass, American glassware produced from the end of the 18th century at numerous factories in that Pennsylvania city. Pittsburgh had the twin advantages of proximity to a source of cheap fuel (coal) and access to a good waterways system, which afforded an inexpensive means of distribution; thus, of the 50 glasshouses that sprang up in Pennsylvania between 1763 and 1850, 40 or more were situated in Pittsburgh (although of these only 14 produced flint glass, a type of clear crystal, the other 26 making strictly utilitarian items such as windowpanes and cider, beer, and whiskey bottles). The city ultimately became the largest glassmaking centre in the United States. *See also* bakewell glass.
·Bakewell ware characteristics **8**:190h



Pittsburgh glass tumbler, Pittsburgh Flint Glass Works of Bakewell, Page and Bakewell, Pa., *c.* 1824; in the Corning Museum of Glass, N.Y.

By courtesy of The Corning Museum of Glass, N.Y.

Pittsburgh Platform, Jewish manifesto of religious principles enunciated by Reform rabbis at the Pittsburgh Conference in 1885.
·Reform and Jewish identity **10**:324a

Pittsburg Landing, Battle of: *see* Shiloh, Battle of.

Pittsfield, city, seat (1761) of Berkshire County, western Massachusetts, U.S., on the headstreams of the Housatonic River, in the Berkshire Hills. Settled in the 1740s as the Pontoosuc Plantation, it was incorporated as a town in 1761 and named for the English prime minister William Pitt, earl of Chatham. It developed from a farming to an industrial community during the early 19th century because of abundant waterpower. Manufactures include electrical machinery, ordnance supplies, paper, textiles, plastics, and foundry products. The insurance business is also significant.

The city is a tourist base for the Berkshires (including Pittsfield State Forest, lakes, ski resorts, and state parks). Oliver Wendell Holmes, senior, and Herman Melville at times lived in Pittsfield; and Tanglewood, at Lenox, 6 mi (10 km) south, where Hawthorne had his cottage, is the summer home of the Boston Symphony Orchestra. The city is the site of Berkshire Community College (established 1960). Inc. city, 1890. Pop. (1920) city, 41,763; (1980) city, 51,974; metropolitan area (SMSA), 90,505.
42°27′ N, 73°15′ W

Pitt's India Act (1784): *see* Government of India Acts.

Pittston, city, Luzerne County, northeastern Pennsylvania, U.S., on the Susquehanna River, near the mouth of the Lackawanna River, at the entrance to the Wyoming Valley just northeast of Wilkes-Barre. Connecticut Yankees settled there about 1762 and named it for William Pitt the Elder, the British prime minister and friend of the colonists. They erected Ft. Pittston, then on the frontier, in 1772. Pennsylvanians protested Connecticut's charter claims to this land in three local Pennamite-Yankee Wars (1769–75, 1775–82, 1784–87). During the American Revolution, the colonists met the British and Indians in bloody fighting.

With the decline of the anthracite mines in the 1930s the people turned to light manufacturing (textiles, furniture, tobacco and paper products). Inc. borough, 1853; city, 1894. Pop. (1930) 18,246; (1980) 9,930.
41°19′ N, 75°47′ W

pittura metafisica: *see* Metaphysical painting.

pituitary basophilism, also called CUSHING'S DISEASE, syndrome caused by overgrowth of the basophil cells in the pituitary gland which produces many bodily changes, including bone damage and hormonal imbalances.
·cause, symptoms, and treatment **6**:828g

pituitary gland, also called HYPOPHYSIS, one of the endocrine (ductless) glands that secrete their hormones directly into the bloodstream. The term hypophysis (from the Greek, "lying under") describes the gland's position on the lower surface of the vertebrate brain. The pituitary plays a vital role in the animal's physiology; and because its effects are mostly mediated through its control over other endocrine glands, it is frequently called the "master gland."

In the adult human, the pituitary gland weighs about 0.5 gram (0.02 ounce) and measures about 1 centimetre (0.4 inch) long, 1.5 centimetres wide, and 0.6 centimetre deep. That of the whale weighs from 10–60 grams; of cattle, 2.5 grams; of the dog, 0.065 gram; and the cat, 0.009 gram. The gland is situated in a depression called the sella turcica (Turkish saddle) on the sphenoid bone—deep in some species, including man, and shallow in others. The gland consists of two anatomical divisions: (1) the neurohypophysis, derived embryologically from the floor of the diencephalon, and (2) the adenohypophysis, derived from an upward outpouching of the roof of the mouth (Rathke's pouch). The neurohypophysis consists of three parts: the median eminence of the tuber cinereum, the infundibular stem, and the infundibular process, or neural lobe. In most species the posterior portion of the developing adenohypophysis becomes so closely applied to the neural lobe that the two cannot be separated; together they form the posterior lobe.

The portion of the posterior lobe derived from the adenohypophysis is known as the pars intermedia (intermediate lobe). In certain animals such as the cetaceans, armadillos, beavers, and birds, the intermediate lobe is absent; and the anterior and neural lobes are separated by a thin layer of connective tissue. The anterior lobe consists of branching cords of cells supported by a reticulum of connective tissue and separated by vascular channels (sinusoids). The cells are classified as chromophobes and chromophils, based on their staining properties. About 75 percent of the latter contain granules stainable with acidophilic dyes and are known as acidophils, or alpha cells. The other 25 percent stain with basophilic dyes and are known as basophils, or beta cells.

Sufficient specific cell types have been demonstrated in the human adenohypophysis to indicate that each cell type secretes only one (or possibly two closely related) pituitary hormones. The acidophil appears to be the production site of prolactin (luteotropic hormone, LTH) and somatotropic hormone (STH or growth hormone, GH). Subtypes of basophil cells seem to secrete the following: thyrotropic hormone (thyroid-stimulating hormone, TSH), adrenocorticotropic hormone (ACTH), follicle-stimulating hormone (FSH), luteinizing hormone (LH, or interstitial cell stimulating hormone, ICSH), and melanocyte-stimulating hormone (MSH), intermedin. In animals in which there is an anatomically distinct intermediate lobe, MSH is found at that site. The preceding anterior pituitary hormones, with the exception of STH and MSH, exert their primary action on other endocrine glands ("target" glands or cells), causing them to secrete their own hormones, (*e.g.*, TSH causes the thyroid gland to secrete thyroid hormone). Blood levels of the latter, in turn, check the stimulating action of the pituitary;

$$\text{TSH} \xrightarrow{+} \text{TH} \xrightarrow{-} \text{TSH}$$

$$\xrightarrow{+} \text{TH} \longrightarrow \text{etc.,}$$

in a cycle known as "feedback control."

Two hormones have been extracted from the posterior pituitary: oxytocin (pitocin) and vasopressin or antidiuretic hormone (ADH, or pitressin). They are structurally similar, each containing eight amino acids but in different sequences. Vasopressin causes an elevation of blood pressure via direct action on the muscles of the blood vessels and exerts a powerful antidiuretic action because of its effect on the kidney tubule cells in which it increases reabsorption of water. Oxytocin causes contraction of the uterus, a fall of blood pressure in

birds, and secretion of milk from the breasts of lactating mammals during suckling. Vasopressin appears to exert considerable oxytocin effect; and oxytocin has, but to a much lesser degree, some antidiuretic potency.

adenohypophysis
- ·brainstem-induced malfunctions **12**:1005h
- ·embryonic origin **5**:639d
- ·human ovarian influence **15**:695b
- ·human testicular stimulation **15**:692d
- ·vertebrate endocrine system domination **8**:1074h

anti-diuretic hormone (vasopressin)
- ·argenine vasopressin (anti-diuretic hormone) activity in mammals **8**:1077f
- ·biomedical deficiency models, table 1 **5**:866
- ·body water content regulation **5**:843h; table 859
- ·brainstem influences on secretion **12**:1005g
- ·concentration decline in children **4**:224g
- ·drug aid in water reabsorption **5**:1046f
- ·excretory mechanisms in mammals **7**:49b
- ·function, structure, and production **15**:97b
- ·function and diabetes involvement **6**:820b
- ·hormone therapy in diabetes insipidus **18**:284h
- ·hypothalamic control of secretion **12**:1037f
- ·neuroendocrine interactions **12**:992h
- ·physiologic regulation by hormones **14**:439c
- ·renal absorption of water **7**:39c
- ·secretory control of water loss **2**:1114f
- ·source, chemical nature, and function **6**:810d; table 801
- ·vasopressin effect on kidney function **8**:1077h
- ·water and salt balancing function **7**:431e; illus. 432
- ·water conservation in kidney **7**:55g

comparative zoology
- ·animal organ systems interactions **13**:724b
- ·animal tissue comparisons **18**:447g
- ·embryonic origin of posterior lobe **5**:633f
- ·endocrine system interrelationships **6**:839g; illus. 840
- ·feedback linkages for endocrine systems **2**:812h
- ·homeostatic control mechanisms **8**:1015e
- ·hypothalamic function relationships **6**:847g; illus. 840
- ·light stimulus perception **14**:353c
- ·mammalian reproductive cycles **11**:403a
- ·metabolic changes in animal migrants **12**:183h
- ·metamorphosis and growth controls **5**:642a
- ·neuroendocrine interactions **12**:992h
- ·ovarian–pituitary hormone interactions **8**:1084d
- ·radiation effects in man and animals **15**:383f
- ·reproductive cycle controls **16**:591b
- ·vertebrate hormonal regulation **8**:1074h; illus. 1075
- ·embryogenesis, components, and hormones **6**:841g; illus. 840

human anatomy and physiology
- ·anatomy, hormones, and neural controls **6**:809a; illus. 800
- ·bone development and growth hormone **3**:22d
- ·brain anatomy, illus. 5, 8, and 14 **12**:1001
- ·brainstem mediation mechanisms **12**:1005f
- ·control of skin pigmentation **16**:848a
- ·ectodermal derivatives of stomodeum **6**:750b
- ·hypothalamic nuclei relationships **12**:1029g
- ·lactation preparation and initiation **10**:582h
- ·menstruation and ovarian function **11**:908b
- ·physiological psychology, illus. 1 **15**:159
- ·pregnancy's effect on gland size and secretion **14**:974h
- ·sinus position and importance **16**:807a
- ·skeletal anatomy relationships **16**:814g
- ·water and salt balancing function of vasopressin **7**:431e; illus. 432

human disorders
- ·aging's association with reduced functioning **1**:308c
- ·atrophy of viscera due to malfunction **2**:352g
- ·brain control of transplanted glands **5**:657f
- ·disease causation mechanisms **5**:860a
- ·disease symptoms and treatment **6**:818d
- ·menopause and endocrine function **11**:907c
- ·muscle changes in acromegaly **12**:634g
- ·neural symptoms of endocrine disease **12**:1043g
- ·pregnancy affected by endocrine disease **14**:979c
- ·reproductive system disorders **15**:697b *passim* to 699d
- ·stereotactic surgery techniques **17**:819a
- ·therapeutic replacement of hormones **18**:284h
- ·tumour compression on optic nerves **7**:121f
- ·vasopressin function and diabetes involvement **6**:820b

neurohypophysis
- ·animal tissue comparisons **18**:447g
- ·vasopressin and oxytocin source **6**:841a; illus.
- ·vertebrate endocrine system domination **8**:1074h

oxytocin
- ·breast and uterus stimulation **12**:1037g
- ·chemical nature and function **6**:810d; table 801
- ·endocrine system disorders **6**:820b
- ·lactation and milk ejection **10**:583e
- ·source and site of action, table 3 **5**:859
- ·structure and biosynthesis **15**:97b
- ·uterine contraction stimulation **13**:1038h
- ·uterine influence during labour **6**:811e

pituitary growth hormone, substance secreted by the anterior lobe of the pituitary gland; it has a regulatory effect on metabolism and controls the rate at which the body grows.
- ·glandular control of human development **5**:657b

Pituophis melanoleucus: *see* bull snake.

pit viper (snake): *see* viper.

pit wheel, part of a waterwheel sometimes used to drive a horizontal shaft that in turn may be used to drive individual wheels.
- ·waterwheel's driving power **19**:661c

Pityaceae (fossil plant): *see* Cordaitales.

Pitymys (rodent): *see* vole.

Piura, department of northern Peru, consisting of coastal desert, particularly in the west and south, and low, forested Andes in the east. Its area of 12,767 sq mi (33,067 sq km) is drained by the Río Chira, in the north, and the Río Piura, in the south. The irrigated valleys of these two rivers are used chiefly for the production of cotton. Upstream on the Río Piura, sugarcane, rice, tobacco, and maize (corn) are grown. Cattle are grazed in the mountains and fattened on lowland irrigated pastures.

Piura is also important for its production of petroleum. The important Lobitos and Negritos fields form a belt about 80 mi (129 km) long on either side of Talara, site of an oil refinery. The smaller Zorritos field is further north.

The Pan-American Highway traverses the desert, passing through the capital city, Piura. Other roads connect Piura city and the oil fields with seaports and penetrate the mountains. Piura city and Talara are also accessible by air. Pop. (1981 prelim.) 1,168,442.
- ·archaeological importance and artifacts **1**:689g
- ·area and population table **14**:131

Piura, capital of Piura department and province, northwestern Peru, on the Río Piura in the warm coastal desert. San Miguel de Piura was the first city founded (1532) in Peru by the conquistador Francisco Pizarro. The site chosen proved to be unhealthful, however, and several other locations were occupied before settlement of the present site in 1588.

Piura is the commercial centre of northwestern Peru, which produces cotton, rice, and sugarcane. In and around Piura are cotton gins and cottonseed-oil mills, in addition to various small manufacturing plants. The city is accessible by the Pan-American Highway, by air, and by sea through the coastal town of Paita, 40 mi (64 km) west. Pop. (1980 est.) 179,300.
5°12′ S, 80°38′ W
- ·map, Peru **14**:129

A modern office building and the cathedral at Piura city, Peru

Walter Aguiar—EB Inc.

Pius I, Saint (b. Aquileia, Italy—d. 155), pope from *c.* 140 to 155. He was a slave, according to his supposed brother, the apostolic father Hermas. As pope, Pius combatted Gnosticism—a religious movement teaching that matter is evil and that emancipation comes through spiritual truth attained only by revelatory esoteric knowledge—and the Marcionites, followers of a heretical Christianity proposing especially a doctrine of two gods as taught by the semi-Gnostic Marcion, whom Pius is believed to have excommunicated in 144/150. The claim that Pius was martyred is unsubstantiated. His feast day is July 11.

Pius II, Pope 14:481, originally AENEAS SILVIUS PICCOLOMINI (b. Oct. 18, 1405, Corsignano, Italy—d. Aug. 14/15, 1464, Ancona), outstanding humanist and astute politician who as pope tried to unite Europe in a crusade against the Turks at a time when they threatened to overrun all of Europe.

Abstract of text biography. He was involved in church affairs quite early, especially at the Council of Basel (1431–37). Frederick III of Austria, impressed by Piccolomini's talents there, invited him to Vienna (1442) and named him poet laureate and private secretary. In 1445 Piccolomini broke with the antipope Felix V, was absolved of excommunication, amended his dissolute life, and was ordained to the priesthood (1446). After being named bishop of Trieste (1447), he continued to mediate between the German state and the Holy See, was transferred to Siena (1449), and arranged the coronation (1452) of Frederick as Holy Roman emperor by Pope Nicholas V. Following the death of Pope Calixtus III, he was elected pope on August 19, 1458, determined to carry forward the great crusade initiated by his predecessor against the Turks. Pius II died disappointed after valiant but futile efforts to unite rival factions in Europe. He wrote voluminously about the events of his day.

REFERENCES in other text articles:
- ·autobiographical writings **2**:1010c
- ·Bohemian Compacts nullification **2**:1190a
- ·Medici image as Florentine rulers **11**:817d
- ·Neapolitan political crisis **9**:1144g
- ·Papal States recovery of power **9**:1142g