

**Merit  
Students  
Encyclopedia**

**19**



# MERIT STUDENTS ENCYCLOPEDIA

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## ALPHABETICAL ARRANGEMENT OF ENTRIES

The entries in the *Merit Students Encyclopedia* are arranged in a simple alphabetical order. The method of arrangement combines elements of the system used in most dictionaries with that used in telephone directories. Each entry begins with a heading in dark type. Some of these headings contain a comma; others do not. The basic principles of arrangement are listed below, including rules for placement of identical headings.

The alphabetical sequence is letter by letter.

**air**  
**air conditioning**  
**aircraft**  
**aircraft carrier**  
**aircraft landing system**  
**airedale terrier**  
**airfoil**

When headings contain words out of their usual order, a comma is used to indicate the change of order, as in

**Alaska, University of**  
**Alba, Duke of**  
**Alger, Horatio**

Such entry headings are arranged in alphabetical sequence only up to the comma.

**Bryansk**  
**Bryant, William Cullen**  
**Bryant College**

When words preceding a comma are the same in two or more consecutive entries, the order is determined by the arrangement of the letters following the comma.

**Brooks, Phillips**  
**Brooks, Van Wyck**

When two or more entries have the same heading, the entries are placed in the following order: persons, places, things.

<b>Hannibal</b> (person)	<b>Hercules</b> (person)	<b>Phoenix</b> (place)
<b>Hannibal</b> (place)	<b>Hercules</b> (constellation)	<b>phoenix</b> (bird)

Rulers with identical names are listed alphabetically by the name of the territory ruled. Rulers with the same name and same realm are listed according to dates of reign.

**Frederick IX** (of Denmark)  
**Frederick I** (of Holy Roman Empire)  
**Frederick II** (of Holy Roman Empire)  
**Frederick II** (of Prussia)

Popes are listed by dates of reign, and they precede rulers of the same name.

**Paul VI** (Pope)  
**Paul I** (Emperor of Russia)

Other persons with identical names are listed according to date of birth.

**Butler, Samuel** (born 1612)  
**Butler, Samuel** (born 1835)

Places with identical names are listed according to the importance of the political unit, in descending order.

**New Brunswick** (Canadian province)  
**New Brunswick** (U.S. city)

When places of the same political unit have identical names, they are arranged alphabetically by location. Cities in the United States and Canada are always located in reference to states or provinces. Cities elsewhere are usually located in reference to countries.

<b>Abilene</b> (Kansas)	<b>Abydos</b> (Egypt)
<b>Abilene</b> (Texas)	<b>Abydos</b> (Turkey)

Things with identical names are arranged alphabetically according to the subject in which they are classified.

**aberration**, in astronomy  
**aberration**, in optics

## GUIDE TO PRONUNCIATION

Pronunciations in *Merit Students Encyclopedia* appear in parentheses following entry headings. Heavy and light stress marks are used after syllables to indicate primary and secondary accents. A heavy stress mark is used in words that contain one primary accent, such as **comet** (kom'it). Both heavy and light stress marks are used in words that have secondary as well as primary accents, as in **communication** (kə mū' nə ka' shən). When two or more entries have exactly the same pronunciation, as with Paris the mythological hero and Paris the French city, the pronunciation is given only with the entry that appears first. Where possible, letters of the standard alphabet are used as symbols in the pronunciation system in preference to less familiar symbols. The symbols used are shown below with some words in which their sounds appear.

a	hat, cap	j	jam, enjoy	u	cup, butter
ā	age, face	k	kind, seek	û	full, put
ā	care, air	l	land, coal	ü	rule, move
ä	father, far	m	me, am	ū	use, music
		n	no, in		
b	bad, rob	ng	long, bring		
ch	child, much			v	very, save
d	did, red	o	hot, rock	w	will, woman
		ō	open, go	y	young, yet
e	let, best	ô	order, all	z	zero, breeze
ē	equal, see	oi	oil, voice	zh	measure, seizure
ēr	term, learn	ou	house, out		
f	fat, if	p	paper, cup		
g	go, bag	r	run, try	ə	represents:
h	he, how	s	say, yes	a	in about
		sh	she, rush	e	in taken
		t	tell, it	i	in April
i	it, pin	th	thin, both	o	in lemon
ī	ice, five	th	then, smooth	u	in circus

In pronunciations for entries describing foreign persons and places it is sometimes necessary to represent sounds that are not used in English. Such foreign sounds are represented by four special symbols, which are listed below. Each symbol is accompanied by a brief indication of how the sound it represents is produced.

Y as in French *du*. Pronounce ē with the lips rounded as for English ū in rule.

œ as in French *peu*. Pronounce ā with the lips rounded as for ō.

N as in French *bon*. The N is not pronounced but shows that the vowel before it is nasal.

H as in German *ach*. Pronounce k without closing the breath passage.

# UPAS to WORLD WAR I

# 19

**upas** (ū'pas), also called upas tree, an Asiatic evergreen tree whose milky yellowish sap has long been used by natives to make a deadly arrow poison. The upas grows to a height of 250 feet (76 meters) and bears oblong leaves and tight clusters of yellowish flowers. In the making of the poison the sap is boiled until a thick tarlike substance is formed. This substance is a nerve poison and can be lethal when injected into the bloodstream. The upas is also used as a source of furniture wood, and its fibrous inner bark is sometimes used to make a crude cloth.

The upas, *Antiaris toxicaria*, is classified in the family Moraceae (mulberry). \*Richard A. Howard

**Updike, Daniel Berkeley** (up'dīk, dan'yəl bērk'li), American printer and author. Born Providence, R.I., Feb. 24, 1860. Died Boston, Mass., Dec. 28, 1941.

Updike was a master printer, whose work became a model for other printers. He founded the Merrymount Press in Boston, Mass., in 1893 and was a leader in the improvement of printing in the United States. From 1910 to 1917, he taught printing at Harvard University. His books include *Printing Types: Their History, Forms, and Use* (1922) and *Some Aspects of Printing* (1941). Cecil Golann

**Updike, John**, American author. Born Shillington, Pa., Mar. 18, 1932.

Updike is known for his novels, poems, and short stories. In his novel *The Centaur* (1962) he reworked Greek myth into the story of a Pennsylvania schoolteacher and his adolescent son. His first two novels, *The Poorhouse Fair* (1959) and *Rabbit, Run* (1961), are about the problems of adjusting to contemporary society. In *Rabbit Redux* (1971), Rabbit, now 10 years older, has resolved to settle down and accept his responsibilities. *Of the Farm* (1965) explores the complexities of a family relationship. *Couples* (1968) traces relationships within a circle of friends. Many of Updike's short stories were first published in *The New Yorker* magazine and later in such collections as *Pigeon Feathers* (1962), *The Music School* (1966), and *Museums and Women* (1972). *Assorted Prose* (1965) contains stories, essays, and prose fragments. Collections of his poetry include *The Carpentered Hen* (1958) and *Midpoint and Other Poems* (1969). *Picked-Up Pieces* (1975) is a collection of essays and reviews.

\*Walter B. Rideout

**Upenovik** (ūper'nävik), a village on the western coast of Greenland. Upenovik is the site of a radio station, a weather station, and a hospital. Stones

bearing inscriptions in the runic script of the ancient Vikings have been found in the vicinity. Pop. (1970 est.) 790. \*Norman J. G. Pounds

**Upjohn, Richard** (up'jon), American architect. Born Shaftesbury, England, Jan. 22, 1802. Died Garrison, N.Y., Aug. 17, 1878.

Upjohn led the Gothic revival in American architecture. His first important work, Trinity Church in New York City, was modeled after the English Gothic style. Among his other well-known buildings are the Church of the Ascension in New York City, Christ Church in Brooklyn, N.Y., St. James Church in New London, Conn., and Grace Church in Providence, R.I. He also designed many civic and residential buildings.

Upjohn emigrated to the United States in 1829. He was an assistant to the Boston architect Charles Bulfinch for several years before setting up his own practice in New York City. Upjohn was founder of the American Institute of Architects. \*Percival Goodman

**uplands** (up'landz'), lands that are elevated considerably above the surrounding country. Although there are no set limits to the elevation of uplands, they generally lie between 2,000 and 6,000 feet (600 to 1,800 meters) above sea level. Lands above 6,000 feet in elevation are usually designated as highlands.

\*Frank Ahnert

**Upper Darby** (där'bi), an urban township in southeastern Pennsylvania, in Delaware County, just west of Philadelphia. Upper Darby is a residential suburb of adjoining Philadelphia. In addition, some manufacturing is carried on in Upper Darby.

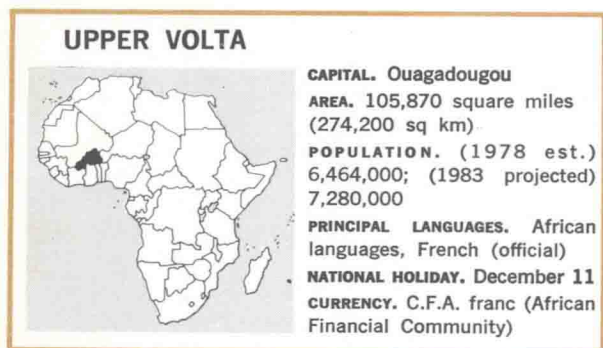
\*Ralph Blasingame, Jr.

**Upper Iowa University**, Fayette, Iowa, a private, accredited, coeducational college of liberal arts. The school offers undergraduate degree programs in the arts and sciences, education, physical education, and business administration. It was chartered in 1850 and began instruction in 1857. See also SCHOOLS, COLLEGES, AND UNIVERSITIES. \*Herschel Hendrix

**Upper Klamath Lake** (kla'məth), in southern Oregon, about 210 miles (338 km) south of Portland. Upper Klamath Lake is about 20 miles (32 km) long and 8 miles (13 km) wide and is one of the largest freshwater lakes west of the Rocky Mountains. Thousands of water birds nest along the shores of the lake, and a wildlife refuge has been established nearby.

\*Francis Haines





**Upper Volta** (vôl'tä), an independent country located south of Mali and north of the Ivory Coast and Ghana, in the drought-prone grassland area of western Africa.

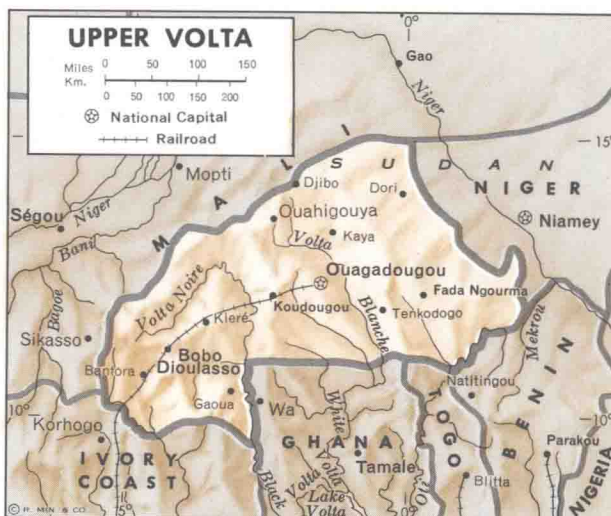
Upper Volta is mostly a plateau at about 650 to 1,300 feet (200–400 meters) above sea level. Annual rainfall varies from about 40 inches (1,000 mm) in the south to about 10 inches (250 mm) in the north. A dry dusty wind from the Sahara, the harmattan, blows from March to May. Grasses and small trees grow on the plateau. Wild animals include the hippopotamus, buffalo, antelope, monkey, and crocodile.

Most of Upper Volta's population is concentrated in the center and the south of the country. About half the population are Mossi, a farming people who live in the middle of the country. Other important peoples include the farming Bobo and Gurunsi, and the semi-nomadic Fulani (Peul), who live in the north and east. Islam is mainly limited to the pastoral people of the north and east. About 80 percent of the people practice traditional religions. French is the official language, but most people speak African languages.

Upper Volta is one of the poorest countries in Africa.

**Bobo-Dioulasso, a town in Upper Volta.** As in many other savanna area towns, the houses are made of dried mud.

CARL FRANK



About 90 percent of the people herd livestock or raise food crops. Cattle, sheep, and goats are the main animals raised. Millet, sorghum, corn, and cassava are grown for local use. Important cash crops are sesame seeds, peanuts, cotton, rice, and shea nuts, which are used largely for vegetable oil. Both herding and farming are severely limited by the paucity of water. A catastrophic drought, lasting more than 5 years, began in 1968. There are some irrigation dams, but even so only about 7 percent of the land is cultivated. Many farm workers migrate seasonally to work on coffee or cacao farms in Ghana and the Ivory Coast.

Industry in Upper Volta includes such handicrafts as weaving and leatherworking and the processing of local farm products. Gold is mined in small amounts.

Cattle account for about one quarter of Upper Volta's export earnings. Small amounts of animal products, peanuts, cotton, and vegetable oils are also exported. Imports, which usually cost far more than is earned from exports, include food and manufactured goods, chiefly from France. An important source of revenue for the government is French aid.

One of Upper Volta's chief problems is its distance from the coast, which helps to make its exports and imports expensive. A railroad runs 712 miles (1,146 km) southeastward from Ouagadougou, the capital and largest city, to the port of Abidjan, Ivory Coast. The country also has 5,600 miles (9,000 km) of all-weather roads and two international airports.

Mossi kingdoms were formed by invaders, probably in the 11th century. These states were ruled by strong kings (nabas), who were the chief religious and political figures. By the late 19th century the kingdoms were weak, and in 1896 the Mossi submitted to French control. The French, however, continued to rule through the traditional African rulers.

Between 1904 and 1919 and from 1932 to 1947 Upper Volta was divided among several neighboring French colonies. The area then became a single overseas territory of France, and in 1958 it gained internal self-government. Upper Volta became independent on Aug. 5, 1960. The army seized power in 1966. Civilian government was restored in 1970 under a new constitution, but the army dominated the civilian government. In 1974 the army again took direct control of the government and suspended the constitution. In 1978 a new constitution went into effect.



**Uppsala** (up'sä lä), a city in eastern Sweden; 46 miles (74 km) north of Stockholm. Pop. (1972 est.) 132,600.

Uppsala, sometimes spelled Upsala, is the capital of Uppsala province and the see of the Archbishop of Sweden. The city's industries include publishing and light manufactures. In Viking days, Gamla Uppsala, 3 miles (4 km) north of the present city, was the capital of pagan Sweden. In the 13th century the capital moved to Stockholm and Uppsala was built at its present site. Uppsala Cathedral, completed in 1435, is the coronation and burial place of many Swedish monarchs. The University of Uppsala, founded in 1477, is the oldest in Scandinavia. *\*Norman J. G. Pounds*

**Upsala College**, East Orange, N.J., a private, accredited, coeducational college of liberal arts related to the Lutheran Church in America. The school offers the bachelor of arts and bachelor of science degrees. It was founded in 1893. See also SCHOOLS, COLLEGES, AND UNIVERSITIES. *\*Carl G. Fjellman*

**Ur** (ér), an ancient city in southern Mesopotamia (now Iraq). It originated in prehistoric times, and the frequent reference in the Bible to Ur of the Chaldees, the birthplace of Abraham (Genesis 11:28, 31; 15:7) is probably to the same site. Located on the Euphrates River, Ur was a flourishing trading city in the 3d millennium B.C., when the kings of Ur gained control of the rest of Sumer. It was a center of Sumerian culture for nearly 500 years. After about 2000 B.C., Ur was successively conquered by various invading peoples. The Babylonian king Nebuchadnezzar rebuilt it in the 6th century B.C. Later the course of the Euphrates and the trade routes changed, and the city declined and was forgotten. Archaeologists discovered its ruins in the 19th century. *\*John H. Marks*

**Ural-Altaic languages** (ūr'al al tā'ik), a group of languages, sometimes classified as a family, that are believed to have originated in the Ural and Altai mountains of Europe and Asia. They are spoken by about 85 million people scattered from eastern Europe through Russia and Siberia to the Pacific Ocean. The languages are characterized by the extensive use

of suffixes to show grammatical relationships and by vowel harmony, whereby sounds in suffixes are changed in order to harmonize with the sounds in the root word. The Roman alphabet is generally used with these languages, although a few use forms of the Cyrillic alphabet. The Uralic, or Finno-Ugric, subgroup includes Finnish and Hungarian. In the Altaic, or Turkic, subgroup are such languages as Turkish, Tatar, Mongolian, and Manchu. Some scholars have denied any real connection between the Uralic and Altaic subgroups. *\*Mario A. Pei*

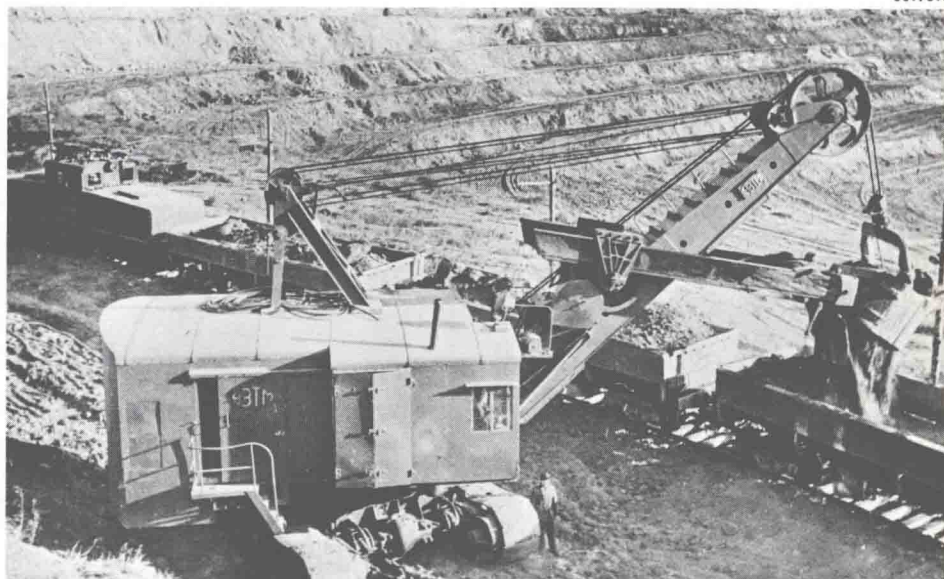
**Ural Mountains**, a mountain system in the Soviet Union. The Urals extend southward from the Arctic Ocean for about 1,300 miles (2,100 km) and form part of the traditional boundary between Europe and Asia.

The Urals are narrow in the north, but in the south their width extends to more than 100 miles (160 km). The Northern Urals are rugged and have an average elevation of between 2,000 and 3,000 feet (600-900 meters). Several peaks in this section are more than 5,000 feet (1,500 meters) high. Among these is Naroda, or Narodnaya, the highest peak in the Urals, which rises to 6,184 feet (1,885 meters).

The Central Urals are rolling and generally stand between 1,000 and 2,000 feet (300-600 meters) above sea level. In the section are deeply entrenched rivers and many low passes. The Southern Urals consist of several parallel ranges. Their average elevation is between 2,000 and 3,000 feet (600-900 meters). The highest peak in this section is the Yamantau with an elevation of 5,377 feet (1,639 meters). Except in the extreme north, forests cover much of the Ural Mountains. The mountains, especially the Central Urals, are rich in minerals. The great variety of minerals exploited includes copper, chromium, iron, and nickel ores. The Central and Southern Urals are among the leading industrial areas of the Soviet Union.

The Urals were first explored by fur traders from Novgorod during the 12th century. Large-scale colonization began in the 16th century, and mining and industry developed in the 17th and 18th centuries. Since the 1930's large industrial centers have been created. *\*W. A. Douglas Jackson*

An open-pit iron mine near the city of Magnitogorsk in the Ural Mountains of the Soviet Union. Many important minerals are found in the Urals.



SOVPOTO



**Ural River**, a river in the Soviet Union, about 1,575 miles (2,535 km) long. The Ural River rises in the southern Ural Mountains and flows generally southward past Magnitogorsk. At the southern end of the Ural Mountains the river bends westward. Farther on it turns southward again and flows into the Caspian Sea. The river is navigable as far as Orenburg, about 910 miles (1,465 km) from its mouth, during most of the year. It forms part of the traditional boundary between Europe and Asia. \*W. A. Douglas Jackson

**uraninite** (ū ran'ə nīt), the principal uranium ore. Formula  $UO_2$ . Metallic to dull luster. Brownish-black. Opaque. Hardness 5 to 6. Specific gravity 6.4 to 6.7.

Uraninite is a rare mineral that occurs in veins in igneous rocks, such as granite. It is often associated with silver minerals. Pitchblende is a name applied to the massive, knobby, or lumpy variety of poorly crystallized uraninite. The largest uraninite deposits in the world occur in Zaire (formerly the Belgian Congo) and in Canada. In the United States, uraninite is mined along the Colorado Plateau in Arizona, New Mexico, Colorado, and Utah.

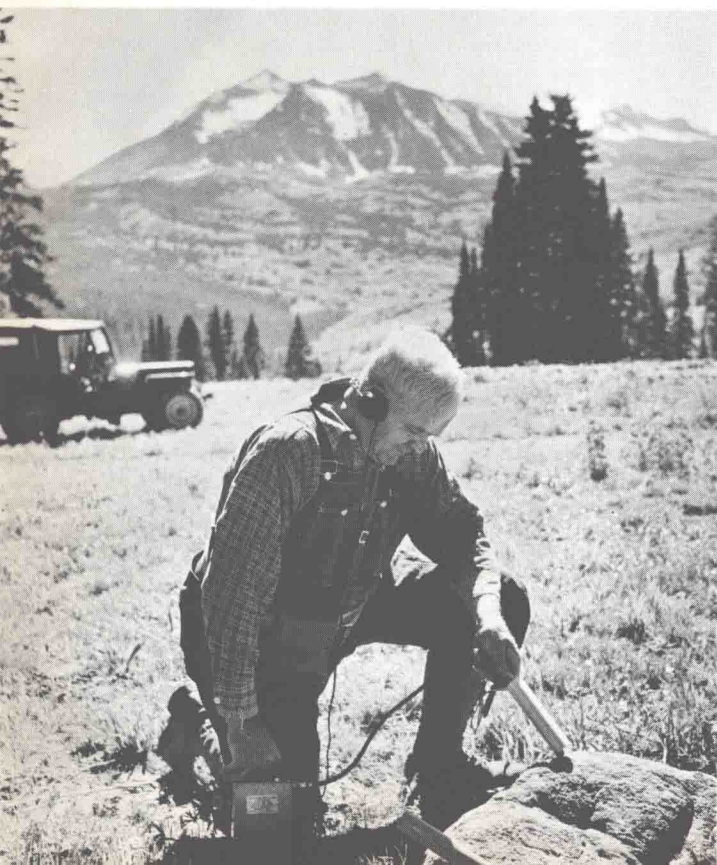
\*Cornelius S. Hurlburt, Jr.

**uranium** (ū rā'ni əm), a chemical element. Symbol U. Discovered in 1789 by Martin Klaproth (German). First isolated in 1841 by Eugene Peligot (French). Melting point  $1132^{\circ} \text{C}$ . ( $2070^{\circ} \text{F}$ ). Boiling point  $3818^{\circ} \text{C}$ . ( $6904^{\circ} \text{F}$ ). Oxidation numbers +2, +3, +4, +5, and +6. Atomic weight 238.03. Mass number of longest-lived isotope 238. Atomic number 92.

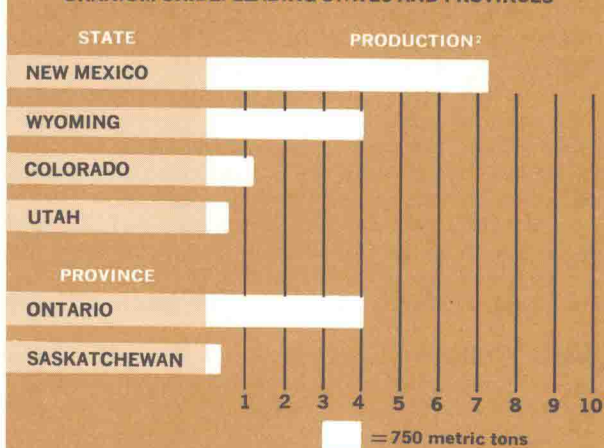
Uranium is a silvery metal. It is almost as hard as steel and is ductile and malleable. Its density at  $20^{\circ} \text{C}$  is 19.07 grams per cubic centimeter, which means that it is about as heavy as gold. Uranium is very

A uranium prospector tests rock with a Geiger counter.

WUNDER/MONKMEYER



#### URANIUM OXIDE: LEADING STATES AND PROVINCES<sup>1</sup>



<sup>1</sup>Figures for 1970. SOURCES: STATISTICS CANADA, U.S. BUREAU OF MINES

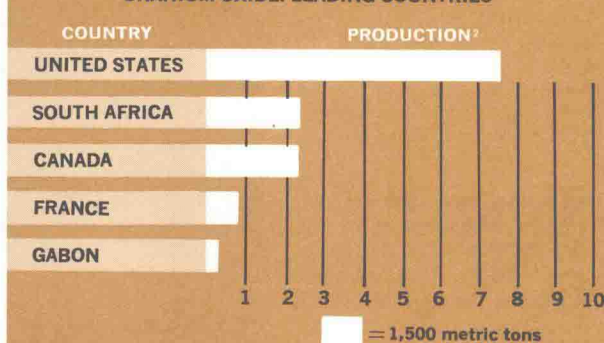
<sup>2</sup>In metric tons. To convert to short tons, multiply by 1.1.

reactive chemically and forms compounds with almost all nonmetals. Uranyl compounds are compounds containing the uranyl radical,  $UO_2^{++}$ . Uranium compounds are both radioactive and poisonous.

All 14 isotopes of uranium are radioactive. Uranium-235 and uranium-238 are important as a nuclear fuel or in producing nuclear fuel, in the manufacture of nuclear weapons, and for radioactive experimentation. Only four isotopes of uranium occur naturally: uranium-234, uranium-235, uranium-238, and, in trace amounts, U-236. More than 99 percent of natural uranium consists of uranium-238. It is the longest-lived uranium isotope and has a half-life of  $4.51 \times 10^9$  years. Uranium-235 is the only naturally occurring material that undergoes nuclear fission, and it is therefore an important nuclear fuel. Plutonium-239, another important nuclear fuel, can be produced from uranium-238.

Uranium-235 can be separated from natural uranium by gaseous diffusion. In this process the uranium is converted by chemical reactions to the volatile compound uranium hexafluoride,  $UF_6$ . The uranium hexafluoride is vaporized, and the gas is forced under pres-

#### URANIUM OXIDE: LEADING COUNTRIES<sup>1</sup>

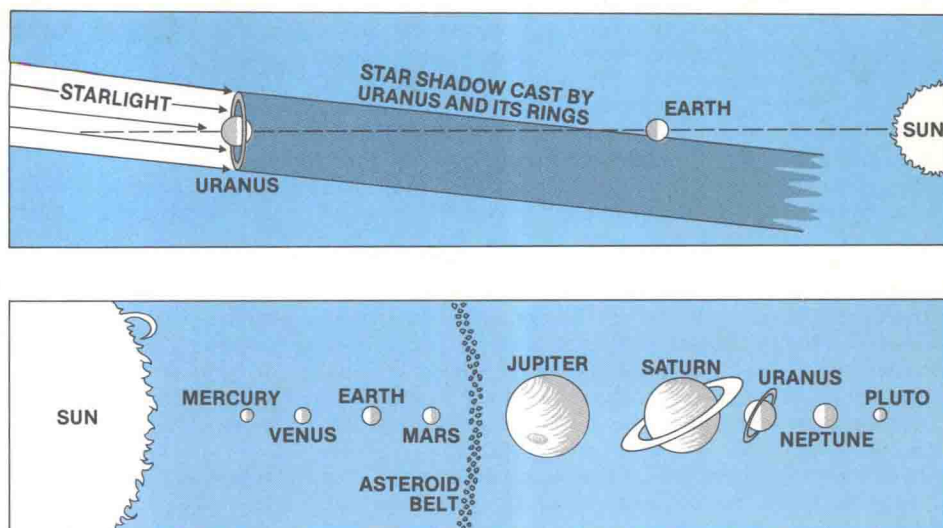


<sup>1</sup>Figures for 1970. The Soviet Union, China, Czechoslovakia, and Zaire, which are among the ten leading uranium-producing countries, are excluded because figures are not available. <sup>2</sup>In metric tons. To convert to short tons, multiply by 1.1.

SOURCE: U.S. BUREAU OF MINES



The rings of Uranus were discovered in 1977 when light from a star was eclipsed (occulted) as the star was about to pass behind the planet, and again when the star emerged from behind the planet. The lower diagram shows relative distances from the sun in our solar system.



sure through a porous material. Uranium-235 diffuses more rapidly than uranium-238 since it is lighter. By many successive passages through this material reasonably pure uranium-235 may be obtained. Uranium-235 can also be separated by a centrifugal process. An enrichment process using lasers is still in the experimental stages.

There are relatively few uses for uranium outside nuclear technology. Some uranium compounds are used in ceramics and glass to impart a beautiful yellow color. Uranyl acetate,  $\text{UO}_2(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$ , is used as a reagent for the analysis of sodium ions. Uranium is used in radioisotope dating. (See also RADIOISOTOPE DATING.)

Although uranium is widely distributed and is more abundant than mercury or silver, there are no rich uranium ores. The principal ores of uranium are pitchblende, a form of uraninite; uraninite,  $\text{UO}_2$ ; and carnotite,  $\text{K}_2(\text{UO}_2)_2(\text{VO}_4)_2 \cdot n\text{H}_2\text{O}$ . The principal non-Communist uranium-producing countries are the United States, Canada, and South Africa. No figures are available for Communist countries. In the United States the important uranium-producing states are New Mexico, Wyoming, Colorado, and Utah. The important uranium-producing provinces of Canada are Ontario and Saskatchewan. See also RADIOACTIVITY.

\*Alfred B. Garrett

**Uranium City**, a town in northwestern Saskatchewan, Canada, just north of Lake Athabasca, 40 miles (64 km) south of the Northwest Territories border. Uranium City, which lies on Beaverlodge Lake, is the center of a uranium mining area. The community was founded in the mid-1950's, when uranium mining was begun in the area. The city is administered by the provincial government. Pop. (1971) 1,867. \*Alan R. Turner

**Uranus** ( $\text{ūr'ə nəs}$ ), in Greek mythology, the personification of the sky and the first lord of the world. His wife was Gaea, the goddess of the earth, and his children included numerous giants, among them the Titans, the one-eyed Cyclopes, and the 100-handed Hecatoncheires. When Uranus imprisoned some of his children in the Underworld, Gaea encouraged Cronus, one of the Titans, to overthrow his father. Cronus wounded and deposed Uranus and took his place as ruler of the universe. \*Pearl Cleveland Wilson

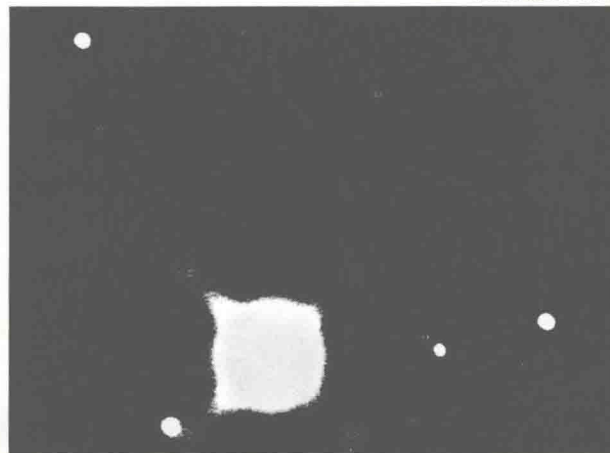
**Uranus**, the seventh planet from the sun, and the first planet to be discovered with a telescope. The planet is barely visible to the unaided eye and appears through a telescope as a greenish disc. Apart from Saturn, Uranus is the only other planet in the solar system known to have rings.

Uranus has the smallest mass of the four so-called giant planets. (The others are Jupiter, Saturn, and Neptune.) But its mass is  $87 \times 10^{27}$  grams, or about  $14\frac{1}{2}$  times the mass of the earth. Its diameter is 48,000 km (29,600 miles), or about  $3\frac{1}{2}$  times the earth's diameter, and its density is 1.60 grams per cubic centimeter, or less than one-third the density of the earth. Uranus' atmosphere is known to contain methane, hydrogen, and helium. The composition of the core of the planet is less certain, but it is believed to contain solid methane and ammonia, as well as ice and some of the heavier elements. Uranus' surface temperature is about  $-184^\circ \text{C}$ . ( $-300^\circ \text{F}$ .) and its visual magnitude when it is closest to the earth is about 5.5. (See also MAGNITUDE.)

Uranus is  $2.869 \times 10^9$  km ( $1.783 \times 10^9$  miles) from the sun, or about 19 times the earth's distance from the sun. It revolves around the sun once in 84 years and rotates on its axis once every  $10\frac{3}{4}$  hours. Uranus' equator is nearly at right angles to the plane of its

**Uranus and its moons.** A fifth moon, which is called Miranda, was discovered in 1948 by the American astronomer Gerard P. Kuiper.

YERKES OBSERVATORY

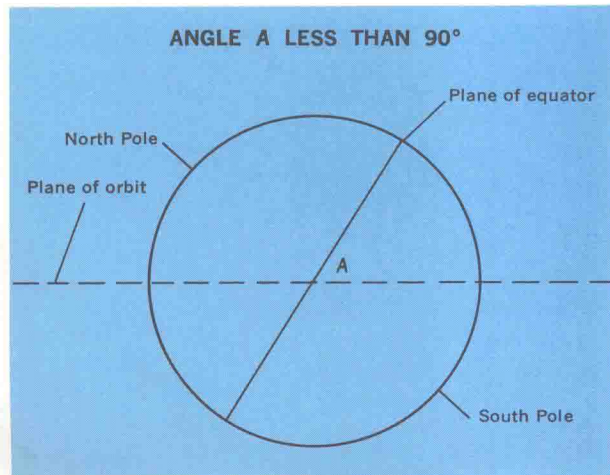
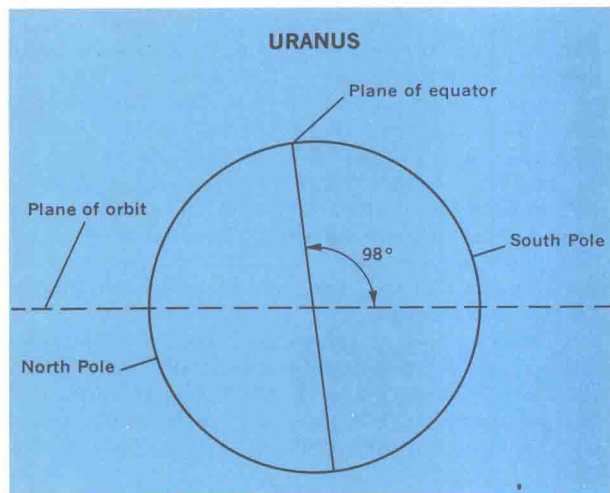




orbit, and it is the only planet whose equator is inclined more than  $30^\circ$  to its orbit. Uranus and Venus are the only planets whose rotations are retrograde, or opposite in direction to their revolutions around the sun. Uranus' motion is considered retrograde because the angle between its equator and its orbit is about  $98^\circ$ . (See diagram.) If the angle were less than  $90^\circ$ , the rotation would be considered direct. There is no generally accepted explanation for the large inclination of Uranus' orbit.

In 1977–1978 a system of at least 8 rings, much like those of Saturn, but much thinner, was discovered around Uranus. Observers found that the light from a star was eclipsed as the star passed behind Uranus, and again as it emerged from behind the planet. The rings consist of either ice or iron, and are believed to lie in a band about 18,000 to 26,000 km (11,000–16,000 miles) above the atmosphere of Uranus. They range in width from about 3 km (2 miles) for the inner ones to 10 km (6 miles) for the outer ones. They were probably formed when a former satellite of Uranus came too close to the planet and was broken up by its tidal action. The rings of Uranus were the first major structures in the solar system to be found since the discovery of the planet Pluto in 1930.

Uranus has retrograde motion because the angle between the plane of its orbit and its equator is greater than  $90^\circ$ . If the angle were less than  $90^\circ$ , its motion would be direct.



The orbits of the five large satellites of Uranus all lie in the plane of the planet's equator. The satellites revolve in the direction in which the planet rotates. They are several hundreds of miles in diameter, and each completes its revolution around Uranus in a few days.

Uranus was discovered by the British astronomer Sir William Herschel in 1781. He suspected at first that the steadily shining object he was observing was a new comet. However, further observations indicated that its orbit was that of a planet, rather than of a comet. It was later learned that Uranus had been observed in different positions about 20 times previous to Herschel's observation, but each time it had been recorded as a new star. Early observations of Uranus were combined with new ones, making it possible to plot the orbit that the planet would be expected to follow in its 84-year revolution around the sun. However, the calculated and observed positions of Uranus did not agree, and this discrepancy led to the prediction of the existence of Neptune, the next farthest planet from the sun. See also SOLAR SYSTEM.

\*Lloyd Motz

**Urban II** (èr'bàn), Pope from 1088 to 1099. Born Odo of Lagery, at Châtillon-sur-Marne, France, about 1042. Died Rome, Italy, July 29, 1099.

A Benedictine monk and member of the Cluniac reform movement, Urban became Pope at a time when Rome was in the hands of the antipope Guibert of Ravenna (Clement III), who was supported by the German emperor Henry IV. Urban was thus unable to dwell in Rome until 1093, when Henry withdrew. Meanwhile he traveled about Italy urging reform. Urban worked for the reunion of the Eastern and Western churches. He is best known for the speech he made at the Council of Clermont in 1095. The speech led to the launching of the First Crusade. He was beatified in 1881. \*Rev. Thomas H. McBrien, O.P.

**Urban VI**, Pope from 1378 to 1389. Born Bartolomeo Prignano, at Naples, Italy, 1318. Died Rome, Italy, Oct. 15, 1389.

Urban was elected in Rome in an effort to guarantee that the Popes would not return to Avignon, France, where they had lived in so-called Babylonian captivity for a number of years. However, Urban alienated many cardinals, who chose Robert of Geneva as Antipope Clement VII, thus beginning the religious split in Christendom known as the Great Schism. Urban was supported by England, Flanders, and most of Germany and Italy. Urban succeeded Gregory XI and was succeeded by Boniface IX. \*Rev. Thomas H. McBrien, O.P.

**Urban League, National**, a voluntary social welfare agency devoted to eliminating racial discrimination in the United States. The league, which was founded in 1910, has more than 100 branches throughout the United States. Among its present activities are job placement, job counseling, youth incentives, vocational training, health and religious programs, and improvement of family and neighborhood life. The league has done much work in the fight against racial discrimination in urban housing and employment. Headquarters are at 500 East 62nd Street, New York, N.Y. 10021. \*Whitney M. Young, Jr.

**urban renewal.** See under HOUSING.



**Urdu** (ūr'dü), a language belonging to the Indic branch of the Indo-Iranian subdivision of the Indo-European language group. It is spoken by about 70 million people in Pakistan and India and is one of the official languages of both countries. Urdu is similar to Hindi, and often the two are regarded as variants of a single language called Hindustani. Urdu is spoken by followers of the Moslem religion and is written in a slightly modified Arabic alphabet, whereas Hindi is used by people of the Hindu faith and is recorded in the Devanagari alphabet. Spoken Urdu and Hindi are very close, the only significant difference being in certain aspects of vocabulary. \*Mario A. Pei

**urea** (ū rē'ə), a chemical compound. Urea is a colorless crystalline organic compound whose formula is  $(\text{NH}_2)_2\text{CO}$ . It has a slightly salty taste and is readily soluble in both water and alcohol. Urea is produced in the body as a result of protein metabolism and is a constituent of almost all body fluids, particularly urine. A normal human being excretes about 30 grams of urea daily. Urea is used in fertilizers and animal feed and in the manufacture of urea-formaldehyde plastics, explosives, and barbiturates.

Urea was first prepared synthetically by the German chemist Friedrich Wöhler in 1828. It was the first time an organic substance had been synthesized from inorganic material in the laboratory and was thus the beginning of organic chemistry. Wöhler's synthesis consisted of heating ammonium cyanate, an isomer of urea. \*Alfred B. Garrett

**uremia** (ū rē'miə), the presence of urea and other waste products of metabolism in the blood. Since the kidneys normally filter these wastes from the blood, the most common cause of uremia is kidney disease. In some cases, however, uremia occurs when the kidneys are functioning normally, either because the blood flow to the kidneys is reduced or because excessive amounts of wastes are formed. In these cases, uremia is usually not severe.

Mild uremia does not cause symptoms. When uremia becomes severe, and particularly if it develops rapidly, it causes nausea or vomiting, headaches, irritability, and, finally, convulsions and coma. Unless the cause of the uremia is corrected, the condition is fatal. In the past, little could be done for people with advanced uremia because of kidney failure. In recent years, however, many people have been helped by the development of the artificial kidney, a machine that removes waste products from the blood by a process called dialysis. Transplantation of kidneys from healthy donors to uremic patients has also been effective in some cases. Louis J. Vorhaus, M.D.

**ureter** (ū rē'tər), a long slender tube through which urine passes from a kidney to the bladder. In human beings the ureters measure from 11 inches to 13½ inches (28–34 cm) long, with the right ureter being slightly shorter than the left one. See also ANATOMY AND PHYSIOLOGY: *Urinary System*.

**urethra** (ū rē'thrə), the canal that carries urine from the bladder to the outside of the body. In men the urethra is from 7 inches to 8 inches (17–20 cm) long, and in women it is about 1½ inches (3.8 cm) long. See also ANATOMY AND PHYSIOLOGY: *Urinary System*.

**Urey, Harold Clayton** (ūr'i, har'əld klā'tən), American chemist. Born Walkerton, Ind., Apr. 29, 1893.

Urey was awarded the 1934 Nobel Prize in chemistry for his discovery of deuterium, or heavy hydrogen, the isotope of hydrogen containing one proton and one neutron in each atomic nucleus. Ordinary hydrogen has a proton but no neutrons in the nucleus. Deuterium combines with oxygen to form heavy water, which is used in isotope-tracer research and also in nuclear reactors to slow down neutrons. Deuterium is also important in chemical and biological research.

During World War II, Urey was active in the development of the atomic bomb. He worked on a process for the separation of uranium isotopes necessary for nuclear fission. He is also known for his work in astrochemistry, particularly such topics as the origin of the solar system, the formation of meteorites, the atmospheres of planets, and the origin and formation of the moon. \*Alfred B. Garrett

**urinalysis** (ūr'ə nal'ə sis), any of various tests that are performed on the urine as an aid in diagnosis of disease. Urinalysis often involves microscopic examination of the urine and analysis for the presence of substances, such as sugar and protein, that are not normally present in the urine. The acidity and concentration of the urine are also determined. See also PHYSICAL EXAMINATION: *Tests and Other Procedures*.

**urinary system.** See under ANATOMY AND PHYSIOLOGY: *Urinary System*.

**urine** (ūr'an), a clear yellow or amber-colored liquid that is formed by the kidneys and contains dissolved wastes from the body. Urine is passed from each kidney through a slender tube, called a ureter, to the bladder. It is stored in the bladder until it is passed from the body. Approximately 1½ to 2 quarts (1.5–2 liters) of urine is eliminated every day.

The chief constituent of urine is water, which accounts for about 95 percent of its total volume. However, the amount of water varies, depending mostly on the amount of water taken into the body. Other constituents of normal urine include urea, uric acid, creatinine, and ammonia. Urine also contains small amounts of excess body elements, such as sodium, potassium, and calcium. Other substances, such as sugar, are sometimes excreted in the urine if their concentration in the body becomes too great.

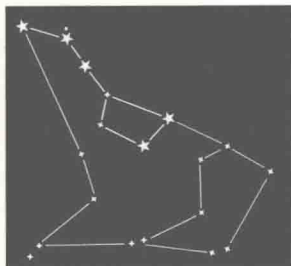
\*Louis J. Vorhaus, M.D.

**Uris, Leon** (ūr'is), American novelist. Born Baltimore, Md., Aug. 3, 1924.

Uris wrote *Battle Cry* (1953), which is one of the best-known novels about World War II. It is the story of a U.S. Marine battalion, told with vivid realism and including excellent character studies of men at war. His other novels include *The Angry Hills* (1955); *Exodus* (1958), a moving account of the development of the state of Israel; *Mila 18* (1961), which describes the hopeless struggle of the Warsaw ghetto against the Nazis during World War II; *Armageddon* (1964); *Topaz* (1967); *QB VII* (1970); and *Trinity* (1976). Uris also wrote motion-picture versions of his novels and an original script for the Western film *Gunfight at the O.K. Corral*. \*Walter B. Rideout

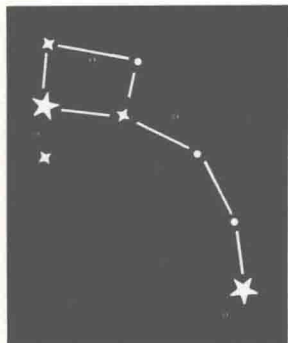


**urology** (ū rol'ə jī), the branch of medicine that deals with the male and female urinary tract and with the male reproductive system. Urologists diagnose and treat such conditions as infections, inflammations, and tumors of the kidney, bladder, ureters, and urethra. Another disorder treated by urologists is stones, which are solidified salts from the urine that may lodge anywhere along the urinary tract. Common disorders of the male reproductive organs are disorders of the prostate gland and of the testes. \*Louis J. Vorhaus, M.D.



The constellation Ursa Major

**Ursa Major** (ēr'sə), the Great Bear, a large constellation in the northern sky. It includes the group of stars known as the Big Dipper, which forms the neck and shoulders of the bear. The constellation contains six second-magnitude stars, all of them located in the dipper. Two of the most famous of these bright stars are the Pointers, Merak and Dubhe, which form the outer edge of the dipper's bowl. The Pointers are so named because Polaris, the North Star, can be located by extending a line through Merak and Dubhe to the north. Ursa Major is visible throughout the year in the Northern Hemisphere. \*Lloyd Motz



The constellation Ursa Minor

**Ursa Minor**, the Little Bear, commonly known as the Little Dipper, a small constellation in the northern sky. The brightest stars in the Little Dipper are the two second-magnitude stars Polaris and Kochab. Polaris, which is located at the end of the dipper's handle, is at the present time the North Star, or star closest to the north celestial pole. Kochab and the third-magnitude star Pherkad form the far edge of the dipper and are known as the Guardians of the Pole. Ursa Minor is visible throughout the year in the Northern Hemisphere. \*Lloyd Motz

**Ursinus College**, Collegeville, Pa., a private, accredited, coeducational school of liberal arts affiliated with the United Church of Christ. The school offers under-

graduate courses in biology, chemistry, classics, economics, English, German, health and physical education, history, mathematics, philosophy and religion, physics, political science, psychology, and romance languages. The college grants the bachelor of arts and the bachelor of science degrees in its day school, and the bachelor of business administration in its evening school. A double degree program in engineering is offered in cooperation with the University of Pennsylvania. Ursinus students may spend their junior year studying at universities in England, France, Germany, and Mexico. The college was founded in 1869. *See also SCHOOLS, COLLEGES, AND UNIVERSITIES.*

\*Geoffrey Dolman

**Ursula, Saint** (ēr'sə lə), legendary martyr. The daughter of a Christian King of Britain, Ursula set out on a pilgrimage to Rome with her ladies-in-waiting. On their way back they were slain in Cologne by the Huns. A memorial in Cologne, to several martyred virgins, dating from the 4th or 5th century A.D., is believed to be in their honor. St. Ursula is the patron saint of the Ursulines, a teaching order of women. She is often depicted as crowned and bearing a flag with a red cross. Her feast day is October 21.

\*Rev. Thomas H. McBrien, O.P.

**Ursuline College.** *See* BELLARMINE COLLEGE.

**Ursuline College**, Cleveland, Ohio, a private, accredited, Roman Catholic college of liberal arts for women, conducted by the Ursuline Nuns. The college offers undergraduate courses of study in humanities and arts and sciences. The bachelor of arts degree is awarded. The college also offers a program leading to high-school teacher certification in the Ohio school system and conducts two-year programs in merchandising and art. The college was founded in 1871 as Ursuline College for Women and was the first chartered women's college in the state. The school adopted its present name in 1967. *See also SCHOOLS, COLLEGES, AND UNIVERSITIES.* \*Sister Rose Angela

**Ursulines**, several Roman Catholic religious institutes of women, founded in Brescia, Italy, in 1535 by St. Angela Merici. This order was the first to be dedicated exclusively to the education of girls. St. Angela placed her company under the protection of St. Ursula, a virgin martyr and patroness of medieval universities who has popularly been venerated as a leader of women. In 1544 the company received its bull of approbation, or approval, from Pope Paul III. Immediately it spread to other cities in Italy and beyond the Alps. In 1639 the famous Marie de l'Incarnation left France for Quebec with a group of French Ursulines drawn from the monasteries of Tours, Paris, and Dieppe. In 1727 another group of missionaries began work in New Orleans. Later the Ursulines pioneered in Alaska and the Rocky Mountains and opened schools in many states. They number approximately 3,000 in the United States and are represented on every continent. Since 1900 many Ursuline communities have been joined in the Roman Union. Ursulines take vows of poverty, chastity, and obedience; live in a community; and wear a simple black habit. \*Maria Felicia Pastoors

**urticaria.** *See under* HIVES.





## URUGUAY

**CAPITAL.** Montevideo  
**AREA.** 68,536 square miles  
 (177,508 sq km)  
**POPULATION.** (1978 est.) 2,850,000  
 (1983 projected) 3,300,000  
**ELEVATION.** Highest point 1,644 feet  
 (501 meters); lowest point sea level  
**PRINCIPAL RIVERS.** Uruguay, Río  
 Negro

**PRINCIPAL LANGUAGE.** Spanish  
**NATIONAL HOLIDAY.** Independence  
 Day, August 25  
**NATIONAL ANTHEM.** *Himno nacional*  
 (The translation of the first line is  
 "Easterners, the fatherland or  
 death.")  
**CURRENCY.** 1 peso = 100 centesimos

**Uruguay** (ūr'ə gwā), an independent nation of Latin America, on the southeastern coast of South America, lying between Brasil and Argentina. Its official name, La República Oriental del Uruguay (the Eastern Republic of the Uruguay), and its historical name, Banda Oriental ("eastern bank"), refer to its location on the eastern shore of the Uruguay River.

The possession of the Banda Oriental was claimed and contested by Spanish Argentina and Portuguese Brazil in colonial times. Later, with the intervention of Great Britain, Uruguay was created as a buffer state. Its independence, however, brought Uruguay unrelieved political strife, and it was not until the early 20th century that it achieved political stability. For much of the 20th century Uruguay has enjoyed a democratic political system. It has also had one of the highest living standards in Latin America.

### Physical Geography

One of the smallest countries in South America, Uruguay is slightly larger than the state of Washington. Its pear-shaped area lies in a transition zone between the fertile grasslands of Argentina's humid Pampa and the subtropical highlands of Brazil, Uruguay embodies features of the climate, terrain, and vegetation of both regions.

**Surface Features.** The surface of Uruguay is generally low and hilly, with little variety in its relief. Wide sandy beaches, sand dunes, and shallow lagoons fringe the Atlantic coastline. The fertile lowlands in the southwest are a continuation of the Argentine Pampa. Low plateaus and hills, called *cuchillas*, lie to the north. Cuchilla de Santa Ana extends along the border of Brazil, and Cuchilla de Haedo reaches southwest into central Uruguay. Cuchilla Grande Principal, stretching southwest toward Montevideo, is topped by huge blocks of granite. Along this ridge the highest elevation reaches only 1,644 feet (501 meters).

The longest river within Uruguay is the Río Negro, which rises in Brazil and empties into the Uruguay River. A dam on the Río Negro has created the largest artificial lake in South America. The Uruguay River, which separates Uruguay from Argentina, also rises in Brazil, and it flows into the Río de la Plata. The Uruguay River is navigable for large steamers as far north as Paysandú and for smaller ships up to the falls at Salto, 190 miles (306 km) from its mouth.

**Climate.** Uruguay has short, mild winters and warm summers. Average temperatures are 50° F. (10° C.) in June and July, the coldest months, and 74° F. (23° C.) in January, the warmest month. The average rainfall varies from 38 inches (990 mm) in the south

to 50 inches (1,300 mm) in the north, but there are occasional droughts. Rainfall is fairly evenly distributed throughout the year.

**Plant and Animal Life.** The lowlands of Uruguay are covered with tall prairie grasses, which yield to short bunchgrasses on the ridges. A large variety of trees, such as urunday, algarroba, quebracho, and poplar, grow along the rivers, but only 3 percent of the total land area is forested. Along the southern coast, forests of pine, palm, and eucalyptus have been planted to stabilize the sand dunes.

Among the few wild animals that remain in Uruguay are the fox, deer, armadillo, capybara (also called carpincho or water hog), and the rhea, a large ostrich-like bird. Seals, on Lobos Island off the southern coast, are declining in number, as are jaguars and pumas in the highlands of the north. The large bird population includes parakeets, partridges, aquatic fowl, and the carancha, or caracara, a kind of hawk.

### Economic Activities

Uruguay has been so dependent on pastoral and agricultural activities that these activities have been called the country's two despots. Almost half the working population is employed in grazing and farming, and only about 20 percent in manufacturing.

Since the turn of the century the government has been an active participant in the country's economic life. One reason for this participation has been to keep foreign interests from monopolizing Uruguay's economy. Government participation has allowed the population such economic benefits as low-cost food, utilities, bank loans, and insurance. State enterprises and offices employ a substantial share of the working population. However, the large government payroll and heavy subsidy and social welfare costs have

### Student's Guide

This article is organized under the following major headings.

**PHYSICAL GEOGRAPHY**, including surface features, climate, and plant and animal life

**ECONOMIC ACTIVITIES**

**THE PEOPLE OF URUGUAY**, including religion and education and the arts

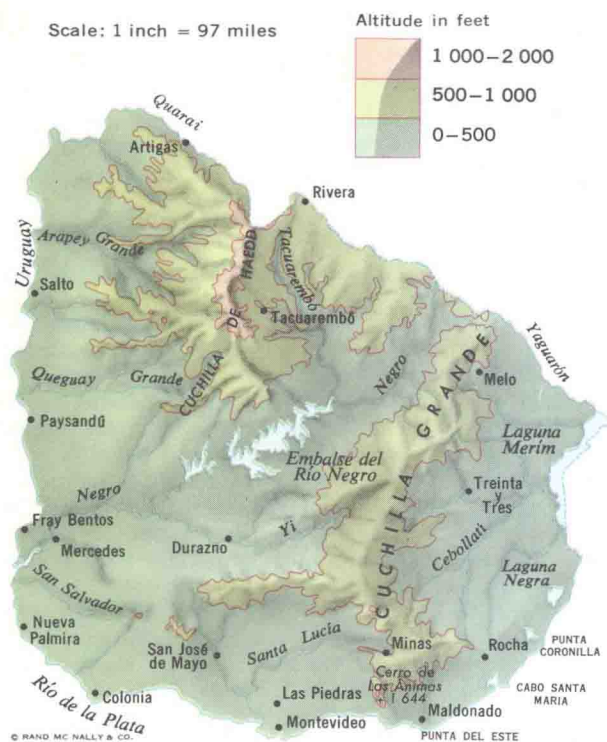
**GOVERNMENT**

**HISTORY**

The leading cities of Uruguay are the subjects of separate articles.



## PHYSICAL FEATURES AND RELIEF



placed an enormous strain on Uruguay's economy. Despite numerous income, sales, and producers' taxes, the government is hard pressed financially.

**Agriculture.** Most of the land of Uruguay is better suited to grazing activities than to crop production. There are about 20 million sheep and about 8 million dairy and beef cattle. Livestock generally is raised on huge ranches, but land-reform programs have been gradually breaking down the large holdings.

Grains, flax, sunflowers, fruits, and vegetables are grown, chiefly in the fertile southwest. In the 1950's a costly policy was undertaken to subsidize wheat for domestic consumption. It resulted in periodic wheat surpluses and inhibited the production of other crops.

**Manufacturing and Power.** Industrial activity has been largely confined to food processing and textile manufacture. Except for marble and building materials, Uruguay has no mineral resources and must import fuel and raw materials for its industries. Wool is processed and raw cotton, imported from Paraguay, is woven for domestic needs. Three of the four huge meat-packing plants in Montevideo were operated by British and American companies until the 1950's. Difficulties with labor unions and with the government, in addition to cost factors, forced these foreign concerns to leave Uruguay. The plants are now operated by a cooperative. Rubber, leather goods, paper, glass, and beverages are produced for the domestic market, as are chemicals and building materials. A few small plants assemble automobiles, stoves, and other imported goods. Petroleum refining, fishing, and the manufacture of alcohol and cement are among the industries dominated by government enterprises.

The electric power industry is also a state monopoly. The first of two hydroelectric plants on the Río

Negro was built in 1949. Projects for a dam on the Uruguay River are being developed jointly with Argentina.

**Transportation and Communication.** Uruguay's nationalized public utilities include an antiquated railroad network of about 1,800 miles (2,900 km), which is large by Latin American standards, and a domestic airline. More than 26,000 miles (42,000 km) of roads, of which 3,000 (4,800 km) are paved, radiate from Montevideo. There are plans to improve the roads and modernize the railroads. Uruguay has more than 500 miles (800 km) of waterways. Montevideo's modern port is operated by the state, but most goods are transported by foreign shippers. Uruguay stands high among Latin American nations in the number of its motor vehicles and telephones. Telephone and telegraph service is nationalized.

There are 80 radio stations and 4 television stations. Some are privately owned and some state owned. The main newspapers, such as *El Diario*, *El País*, and *El Día*, are published in Montevideo.

**Tourism and Trade.** Tourism is an important industry and receives state support. The government owns and operates hotels and resorts along the southern coast. The mild climate and a number of beautiful beaches, such as Punta del Este, Piriápolis, and Atlántida, attract vacationers from Argentina and Brazil.

The products of the ranches, such as wool, meat, and hides, constitute up to 90 percent of Uruguay's exports. The nation's prosperity thus depends heavily on weather conditions and on the fluctuating prices for wool and beef on the world market. Floods in 1959, drought in 1962, and cattle smuggling into Brazil injured export capacity. Also, the high costs of producing Uruguay's exports have made competition in world markets difficult. Furthermore, the growth of population leaves Uruguay with less to export.

Much of Uruguay's meat is exported to Great Britain, and a large share of the wool goes to the United States. Raw materials and machinery, bought mostly from the United States and West Germany, are Uruguay's major imports. Other trading partners are Japan and Caribbean and South American countries.

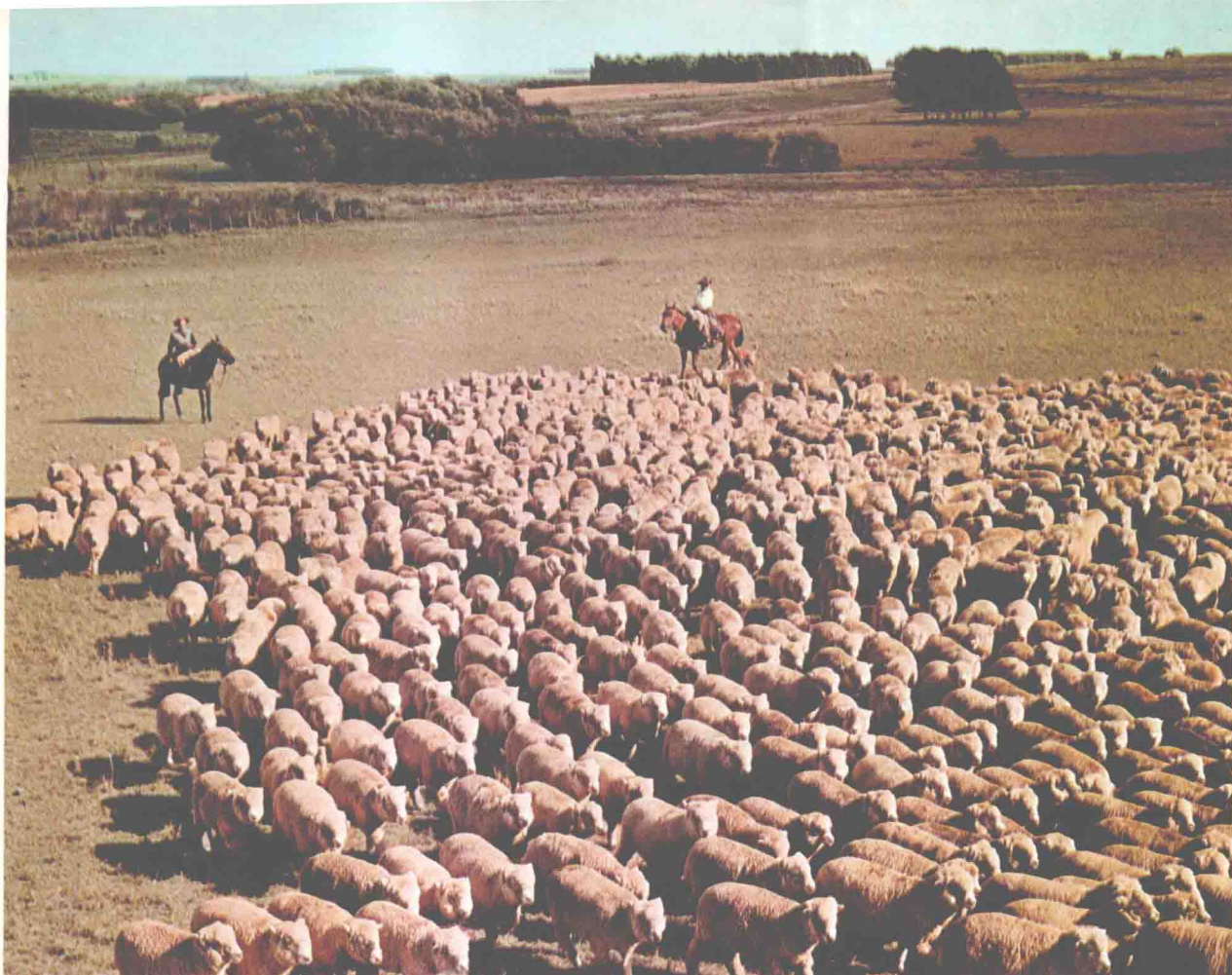
### The People of Uruguay

Although every part of the country is accessible to transportation, most of the population and economic activities are concentrated in the south. With more than a million inhabitants, Montevideo, the capital, plays a crucial role in the economic life of Uruguay. Paysandú, Salto, and Fray Bentos are port towns and livestock centers with less than 70,000 people each.

Most of the people of Uruguay are of European stock, principally Spanish and Italian. About 11 percent of the population is mestizo, or of mixed Spanish and Indian descent. The official language is Spanish, which has been somewhat influenced in vocabulary and pronunciation by Italian. Although it has a large rural population, Uruguay ranks high by Latin American standards in its literacy rate and in per capita income.

**Religion.** The constitution separates church and state, and there is complete freedom of worship. Most of the people are nominally Roman Catholic but are not generally demonstrative in religious matters. The government has changed the name "Christmas" to "Family Day" and the name "Easter" to "Tourist Week," and in 1907 it legalized divorce. To revive its influence,





BARNELL/IMAGE INTERNATIONAL

Rich pastureland has made raising sheep and cattle Uruguay's most important industry. Herdsmen and cowboys are called *gauchos*.

the Roman Catholic Church has organized clubs and trade unions. There is a small Catholic political party, as well as a Catholic newspaper.

**Education and the Arts.** All education in Uruguay is free, and it is compulsory in the primary grades. However, most students do not attend beyond that level. Because of inadequate facilities, attendance in both private and public schools is not strictly enforced. Montevideo's Technical University supervises about 60 industrial and agricultural schools located throughout Uruguay. With an enrollment of more than 18,000, the University of Montevideo is one of the largest in South America and attracts students from the entire continent.

Uruguay's writers made great contributions to Latin American literature in the late 19th century and early 20th century. Juan Zorilla de San Martín's romantic poem *Tabaré* and José Enrique Rodó's idealistic essay *Ariel* influenced many Hispanic writers. The principal writers of this period also include Horacio Quiroga, who is considered the greatest short-story writer of South America; Florencio Sánchez, South America's best-known dramatist; and Julio Herrera y Reissig, a famous Symbolist poet.

With its symphony orchestra, theaters, and auditoriums, Montevideo dominates the cultural life of the nation. It has almost half of the country's libraries, including the National Library. In Montevideo, also, are museums of history, natural history, oceanography, and a museum of art, which was named after Juan Manuel Blanes, Uruguay's foremost painter.

Carnival Week in Montevideo is an annual celebration, with festive music, masquerades, parades, and dancing.

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