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BRITANNICA JUNIOR ENCYCLOPÆDIA

BRITANNICA JUNIOR ENCYCLOPÆDIA

For Boys and Girls

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Prepared under the supervision of the editors of

ENCYCLOPÆDIA BRITANNICA

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KEY TO PRONUNCIATION

It is of especial importance that an encyclopaedia for children give the pronunciation where the boy or girl might go astray. In all such instances the pronunciation in BRITANNICA JUNIOR ENCYCLOPÆDIA is clearly marked. The accent is shown by the mark (′). The sounds for the different letters, when not self-evident, are as follows:

ā as in *pale*
ã as in *care*
ă as in *bat*
ä as in *farm*
á as in *task*
ạ as in *ball*
ē as in *be*
ĕ as in *met*

e͝r as in *her*
ī as in *mice*
ĭ as in *tin*
ō as in *cold*
ŏ as in *not*
ô as in *for*
oi as in *oil*
o͞o as in *loot*

ou as in *out*
ū as in *use*
ŭ as in *run*
u͟ as in *pull*
ü as in French *début*, German *über*
g (always hard) as in *gay*
j for *g* as in *gentle*
K for *ch* as in German *Bach* or Scottish *loch*

ṅ (nasal) as in French *bon*
th as in *think*
t͟h as in *thee*
t̨ as in *picture* (Sound varies from *t* to *ch*)
z̨ as in *pleasure* (Sound varies from *z* to *zh*)

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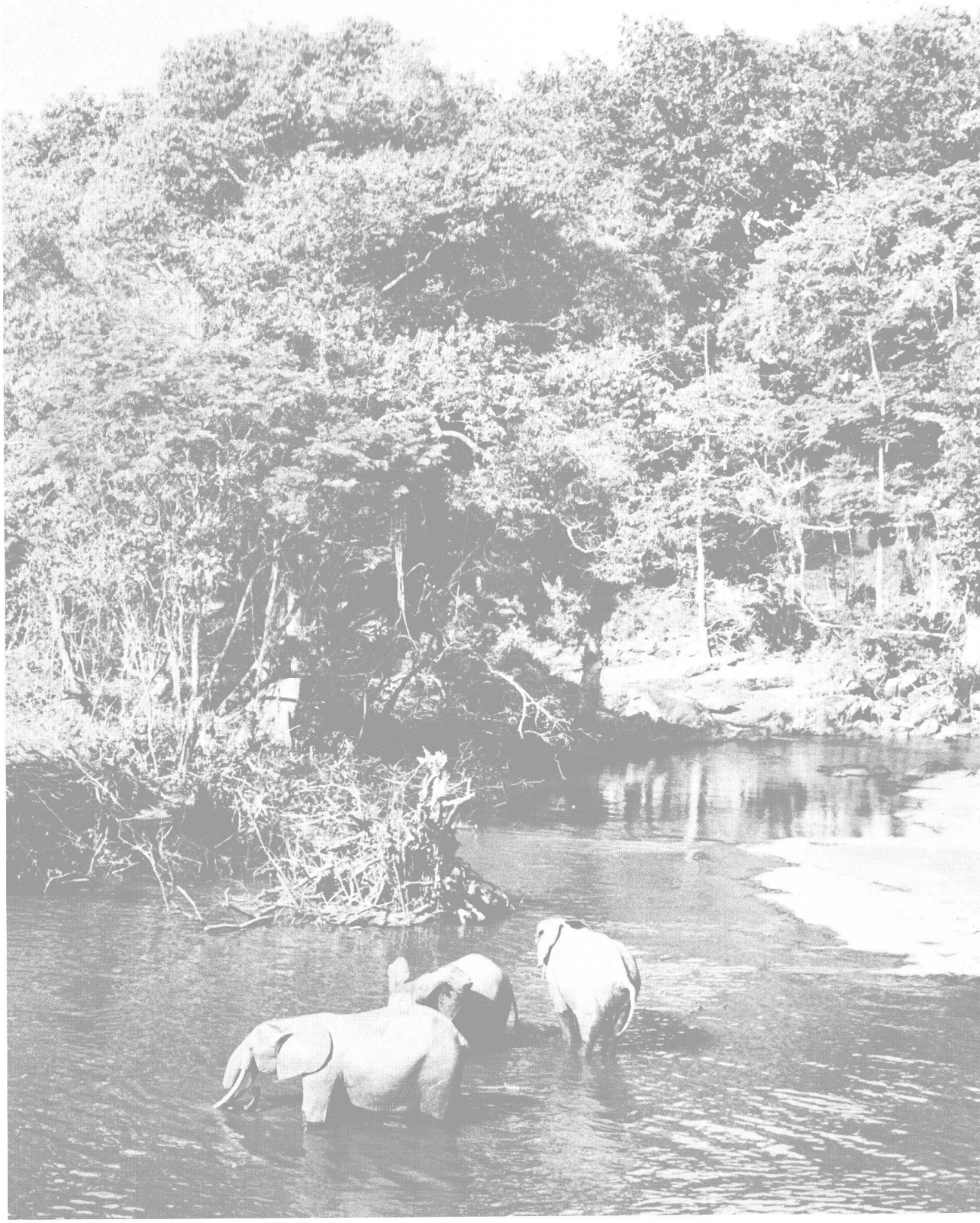
THE UNIVERSITY
OF CHICAGO

BRITANNICA JUNIOR ENCYCLOPÆDIA IS PUBLISHED WITH THE EDITORIAL ADVICE OF THE FACULTIES OF THE UNIVERSITY OF CHICAGO AND THE UNIVERSITY LABORATORY SCHOOLS

Let knowledge grow from more to more and thus be human life enriched



Elephants refresh themselves at the Epula River in the Democratic Republic of the Congo, Africa. See ELEPHANT.

DAEDALUS (*dĕd'ä lŭs*) **AND ICARUS** (*ĭk'ä rŭs*), in Greek mythology, were a skillful inventor and his son. Daedalus built the famous Labyrinth for Minos, King of Crete, as a cage for the Minotaur, a monster half man and half bull. The Labyrinth was a huge maze with hundreds of hallways and passages opening into each other. It seemed to have neither beginning nor end. Anyone entering the Labyrinth was unable to find his way out. The Greek hero Theseus, however, entered the Labyrinth, killed the Minotaur, and escaped. (See THESEUS.)

King Minos was angry because he suspected that Daedalus had helped Theseus. He had Daedalus and Icarus imprisoned in the Labyrinth, and even Daedalus himself could not find the way out. He invented a way to escape, however, by making large wings of feathers and wax. He and Icarus flew out of the Labyrinth and over the sea toward Greece. Unfortunately, Icarus flew too high, and the heat of the sun melted the wax in his wings. He fell into the sea and drowned.

King Minos was furious that Daedalus had escaped. In order to find out where his prisoner had gone, Minos offered a prize to the person who could string a thread through all the coils of a sea shell. Minos knew that only the clever Daedalus could solve such a difficult problem and in order to claim the prize would have to reveal his whereabouts. Daedalus tied a thread to an ant and put it into a tiny hole in the small end of the shell. The ant walked through all the coils of the shell, pulling the thread behind it, and the problem was solved. Learning where the winner lived, Minos went to Sicily, but was killed before he could locate Daedalus.

DAFFODIL (*dăf'ō dĭl*), a member of the Amaryllidaceae family, is a common flowering plant. *Narcissus* is the name of the genus that includes daffodils, narcissuses, and jonquils. Narcissus and daffodil are both correct common names for all species. (See NARCISSUS.) Jonquils are daffodils with small, fragrant yellow flowers, several growing on a stem.

All daffodils grow from bulbs. Most species have long, narrow leaves, either rushlike or flat. In early spring, yellow or white blossoms, with trumpets in the centers, appear. The color of the trumpet ranges from white, yellow, and orange to pink and brilliant red. Time of blossoming depends on the species, climate, soil, and depth of planting, but most species bloom in April or May.

J. Horace McFarland Company

The daffodil is a narcissus with a long trumpet.

The daffodil is native to Europe where in some regions it grows wild. It grows well in cultivated gardens, and can also be naturalized (grown like a wild flower) under trees. Several of the daffodils, especially the paper white narcissus, can be potted for indoor bloom. There are now more than 10,000 name varieties, and breeders continue to develop new ones.

Bulbs should be planted in late summer or early autumn, from two to six inches deep, about $2\frac{1}{2}$ times the diameter of the bulb. They need little fertilizing, but bone meal is sometimes added to the soil. After the blossoms die, the leaves should be left on the plant until dried. Bulbs should be divided and transplanted when clumps become crowded because crowding reduces bloom.

DAHLIA (*däl'yä*), a member of the Compositae family, is a flowering plant. It is native to Mex-

ico, Central America, and northern South America. Dahlias were cultivated by the Aztecs, taken to Europe by the Spaniards, and soon spread throughout the world in widely different climates. There are 18 species and thousands of hybrid varieties.

Dahlias are many-branched plants grown from underground tubers. The stalks range in height from 10 inches (dwarf varieties) to 20 or 30 feet, but the usual height is from 1 to 8 feet. Flowers may be single or double. The petals are straight, rolled upward, and ruffled or flaring. Blossoms may be from 1 to 15 inches across. Colors range from white to nearly black and in all hues except blue. The petals often are flecked with another color. Blossoming time depends on climate, soil, and variety; it is usually from August until frost.

A sunny location and light soil are best for dahlias, but they can be grown in partial shade and in almost any soil that is not waterlogged. The tubers should be planted when the soil is warm, two or three feet apart (closer for dwarfs), and four inches deep. The plants need to be well watered, especially while blooming. It is helpful to fertilize before planting and again at the beginning of August. Stakes should be placed firmly in the ground before planting so that the stalks can be tied to the stakes when they are about two feet tall. After the tops are frozen in late fall, the tubers may be dug, cleaned, dried for a few days, and stored until spring. Dahlias may be grown from seeds, and dwarf dahlias can be grown indoors in winter.

The Rose Glary is one of the large, decorative dahlias.
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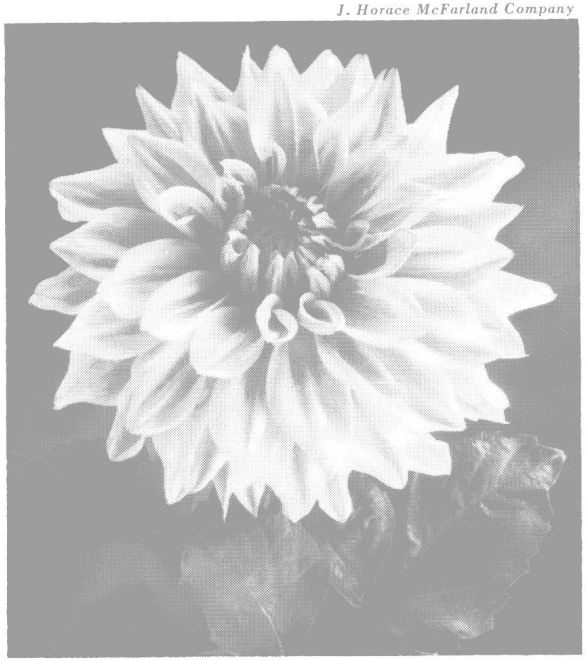


DAHOMEY (*dä hōm′ ē*) **(BENIN), AFRICA,** is a small country on the Atlantic coast of the continent. Long and narrow, Dahomey is about the size of Pennsylvania with 43,475 square miles of area. It is bordered by Togo on the west, Upper Volta and Niger on the north, Nigeria on the east, and the Bight (Bay) of Benin on the south. The country was officially renamed the People's Republic of Benin in 1975.

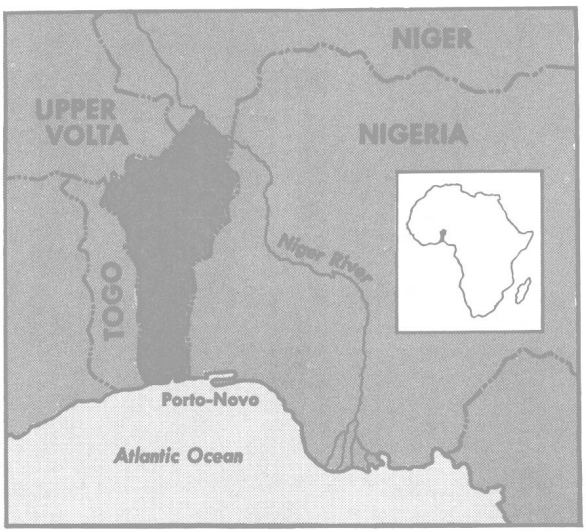
Dahomey's coast is dotted with lagoons and lined with sandbars. The southern part of Dahomey is lowland. Farther inland is a series of low plateaus. The Atacora Mountains, in the northwest, reach elevations of more than 2,000 feet. The country has hot summers and warm winters. Rainfall averages between 35 and 50 inches a year, most of it between April and November.

Most Dahomeans are Negroid. The population density is greatest near the coast. The port city of Porto-Novo, with a population of 100,000 (1972 estimate), is the capital. The chief port and largest city, however, is Cotonou, with a population of 175,000 (1972 estimate).

Agriculture is the most important activity in Dahomey. In the south, oil palms, corn, and vegetables are the leading crops. In the north, cassava, cotton, yams, and millet are grown, and cattle are raised. Fishing is an important activity in the lagoons.

The major industry in Dahomey is the processing of agricultural products. Several mills extract palm oil, and a number of plants pack meat. Palm kernels and palm oil are the country's principal exports.

During the 15th, 16th, and 17th centuries several European nations established forts and trading stations along the Dahomey coast. The native kingdom soon became a center of the slave trade. The Dahomey peoples were famous for their practice of human sacrifice and



Locator map of Dahomey (Benin).

their use of women as soldiers. France gained control over the region in 1851, and gradually these practices were done away with. Dahomey became an independent nation in August 1960.

Dahomey's estimated population in 1974 was 3,029,000.

DAIRYING (*dãr′ ē ĭng*) is the business of producing and selling milk and its products, in highly populated areas where milk—which spoils quickly—can be close to its market.

The United States is one of the world's largest producers and users of dairy products. In the mid-1970's more than 11,000,000 U.S. cows produced milk at the rate of more than 57,000,000 tons per year. The cows are kept on about 445,000 farms. Since the late 1950's the number of dairy farms declined rapidly as milking methods improved and fewer people could get more milk from fewer cows. The amount of milk produced varied little during that period, but the amount of milk consumed per person dropped. Dairy products account for about one-fourth of the food served in the United States.

Chief Dairy Sections

In the United States the largest amounts of milk are produced in Wisconsin, New York, Minnesota, California, Pennsylvania, Iowa, Ohio, Michigan, Illinois, and Missouri. In the eastern and middle western states, milk and its by-products supply the chief income of the farmers who own cows. This is because of the great number of cities in these sections.

Dairy farmers in the northern part of the Mississippi Valley specialize in making butter. They produce more than any other section of the country. The skim milk which remains after the butterfat has been removed is used as food for pigs and calves. Recently, however, farmers have been feeding less skim milk to their livestock. They have been selling their whole milk to dairies to be made into nonfat milk powder as well as butter.

The breeds of cattle commonly used for dairy purposes are Ayrshires, Brown Swiss, Guernseys, Holstein-Friesian, Jerseys, and Milking Shorthorns. None of these breeds are native to America. They were imported from Scotland, Switzerland, the Isles of Guernsey and Jersey, the Netherlands, and England.

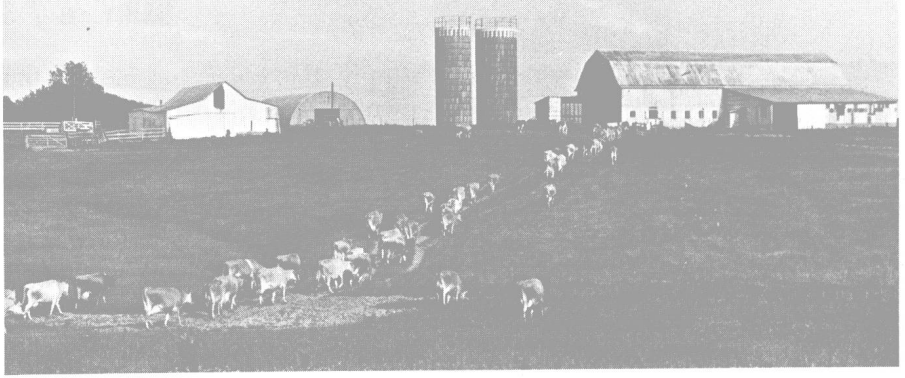
Dairying is important in Canada, which is especially noted for its Cheddar cheese. It is sold at home and in the United States, and is exported to Great Britain in large amounts. Most of Canada's dairy products, other than cheese, are used in Canada. Ontario and Quebec are centers of the Canadian dairy industry. They supply more than 70 percent of the total dairy production of the country.

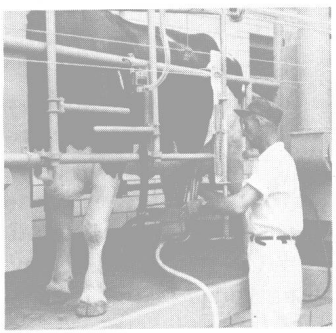
Dairying is also an important industry in France, Germany, the United Kingdom, Australia, the Netherlands, New Zealand, Denmark, and Sweden. In many of these countries the dairy animals are also the main source of meat. The bull calves are raised to weights ranging from 500 to 1,000 pounds and sent to market. In the United States dairy animals supply nearly one-third of the beef. (See CATTLE.)

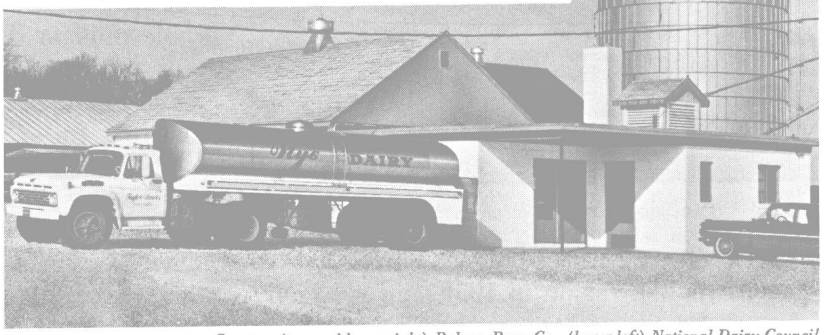
Dairy Industry

Until a few years ago dairying was thought of as a summer industry. When winter came and the grass was short and brown, cows were allowed to "go dry" until spring. Then they would have calves and start giving milk again. Dairy farmers have learned that good cows will give milk almost all year if they are well fed and properly sheltered.

As a result of research on new crops, methods







Courtesy (top and lower right) Babson Bros. Co., (lower left) National Dairy Council

When pasture grass is available, dairy cows usually graze in the fields. At other times they are fed silage, hay, and grains. In either case they are milked by machines in clean barns. The dairy farm's daily milk output is cooled and then collected in large cans or by tank truck and taken to a creamery for processing.

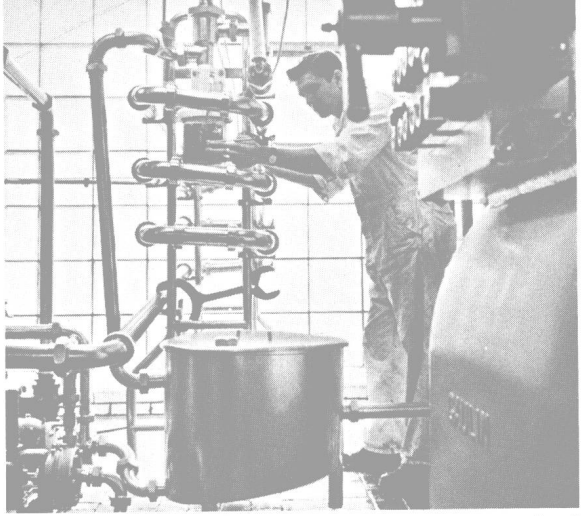
of storing crops, and feeding, dairymen have greatly improved their farming practices. They have modern machinery for making quality hay out of rich grass. They also can make ensilage or silage out of grass. Other common feeds are corn silage, ground corn, oats, and barley. Soybean and linseed meals form an important part of dairy feeds. Silage, hay, and grains are usually fed in the winter or dry months of the year. When there is pasture grass, cows either graze or the green grass is chopped and brought to them. (See SILO AND SILAGE.)

Most cows are milked by a vacuum machine that milks two or more cows at one time. Some of the cows are kept in barns in stalls (stanchions). Their feed is brought to them on carts or by hand. On other dairy farms the cows are allowed to be loose in barns. They walk to their feed from their resting area, and also to and from the building where they are milked. Because of modern barn arrangements and because of new machinery, one farmer can take care of a great many dairy cows.

As a result of improvements in feeding and management, milk production per cow has been increasing rapidly. The average output per cow was about 4,000 pounds in 1934. It increased to about 7,000 pounds in 1960 and to 10,893 pounds in 1976. Today fewer cows produce more milk than ever before.

Most milk is sold by farmers as *whole milk*. It is sold exactly as it comes from the cow except that it is cooled. Some farmers still separate the cream from the milk with a machine called a cream separator. Many years ago they waited until the cream rose to the top of the milk and then skimmed it off. By means of machines the cream can be separated from the milk, pasteurized, cooled, and bottled ready for sale in a very short time.

To find the amount of butterfat in a cow's milk a machine called the Babcock tester is used. The same amounts of milk and sulfuric acid are mixed. The acid dissolves all the materials in milk except the fat. The machine then quickly brings the butterfat to the top of the liquid. There its percentage can be learned. Milk or cream with a large amount of butterfat is used to make butter. The cream is churned until pieces of butter are formed about the size



of grains of wheat. Then the butter is washed in cold water to make it firm. After this it is salted and pressed with a ladle to work off the buttermilk, distribute the salt, and make large tubs of solid butter, ready to be cut and packaged. (See BUTTER.)

Some milk is used to make cheese. Cheese is made from cow's milk, or milk given by sheep, goats, and even reindeer. (See CHEESE.)

Marketing Dairy Products

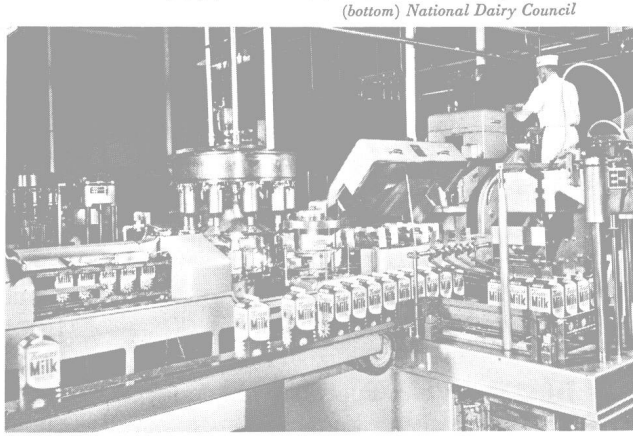
A dairy farmer may sell milk and cream directly to a buyer. He may also sell large amounts to a dairy or milk distributor. The dairy then pasteurizes and bottles the milk before selling it to the public. Most milk reaches the buyer through large distributing companies. About one-fourth of all dairy products sold is delivered to homes. Three-fourths are sold to stores, where, in turn, they are sold to the public.

The cities where milk is sold inspect the distributing companies and also the dairies from which they buy their milk. The inspectors want to be sure that the milk sold in their cities is free of harmful bacteria.

Dairymen in some places have formed co-operative creameries. They sell the milk for the dairymen to the big distributors and prevent waste and loss by making the surplus milk into cheese and other by-products. The co-operative creameries pay their members shares of the profits. The number of shares each dairyman receives is based on the amount and quality of the milk supplied by him. (See CO-OPERATIVE SOCIETY.)

The whole milk is pasteurized, put in cartons or bottles by automatic machines, and distributed to stores or homes within a matter of hours. Other dairy products include butter, cheese, nonfat dry milk powder, buttermilk, whipping cream, ice cream, milk sugar, curd, skimmed milk, and even synthetic fiber.

Courtesy (left) Kraml Milk, (below) The Borden Company, and (bottom) National Dairy Council



Special By-products

There are many by-products of milk besides butter and cheese. Powdered or dry milk is easy to carry. When it is mixed with water, it is regular whole milk. Ice cream is a favorite dessert. (See ICE CREAM.) Milk sugar is made from skimmed milk and whey. Milk sugar (lactose) is used in making penicillin and some other medicines. It is often added to baby foods.

The curd of skimmed milk contains casein. When dried and properly prepared it is sometimes used in glue and in cold-water paint. Its most important use is as a coating for magazine and book paper. It is also made into a plastic material used for making buttons, combs, and

other things. A synthetic fiber called *Aralac* has been made from skimmed milk. It is usually used in combination with other fibers. (See SYNTHETIC OR MAN-MADE FIBER.)

Other Dairy Animals

Dairying is carried out with milk from many animals other than cows. Some farmers keep goats to produce milk, which they sell for special diets. In India, Egypt, and other middle eastern and Asiatic countries the milk of the water buffalo is used. Milk from sheep, camel's milk, and the milk of mares is drunk in some places. The Laplanders drink reindeer milk. The yak, and even the donkey, are used for milk production in certain areas. (See also MILK.)

DAISY (*dā'zē*). Poets have been inspired by the daisy. Everyone knows some species or other. It may be the common white oxeye field daisy, or black-eyed Susan with its yellow-ray flowers, or the English daisy, a dwarf with pink or white rays and a golden center. The daisy takes its name from the early English description of the flower as "day's eye"—meaning that its petals close at dusk and open at daybreak to disclose the large eye or center. It belongs to the largest plant family in the world, the composite. It numbers among its more than 10,000 members the chrysanthemum, dahlia, sunflower, aster, and dandelion.

In the United States the field daisy is often called whiteweed. It is sometimes considered a pest because it is a hardy perennial, increasing abundantly and crowding out other plants. The flowering heads are one or more inches across. They have a single outer row of pure white petals. These surround a central, closely packed cluster of tiny golden yellow flowers, which make up the eye. Such heads are borne singly at the tops of slender stalks. Many stalks arise from a cluster of deep green leaves which lies close to the surface of the soil.

Other kinds of daisies have been widely cultivated, and garden varieties can be had in a considerable array of colors. Burbank's famous Shasta daisy is a Japanese species having large white flower heads up to four or more inches across. In the "language of flowers" the daisy stands for modesty and simplicity. Although it was transplanted from Europe to the United States during the 18th century, it seems so typically and beautifully American that it has been chosen by the American Legion as its floral emblem.

J. Horace McFarland Company

Although a daisy looks like one flower, it is really many flowers. The outermost ones have white or colored petals.

DALLAS (*dăl'ăs*), **TEXAS.** Dallas is on the Trinity River in northeast Texas. It is the second largest city in Texas (after Houston), and a trade, insurance, banking, and manufacturing center of the Southwest. Located in an area rich in cotton and oil, it is one of the world's largest inland cotton markets and the headquarters for many large oil companies. It is also a well-known women's fashion center.

Dallas manufactures more than half of the world's cotton gins. Other important products include cotton textiles, cottonseed products,

aircraft equipment, leather goods, oil-field machinery, and packed meat.

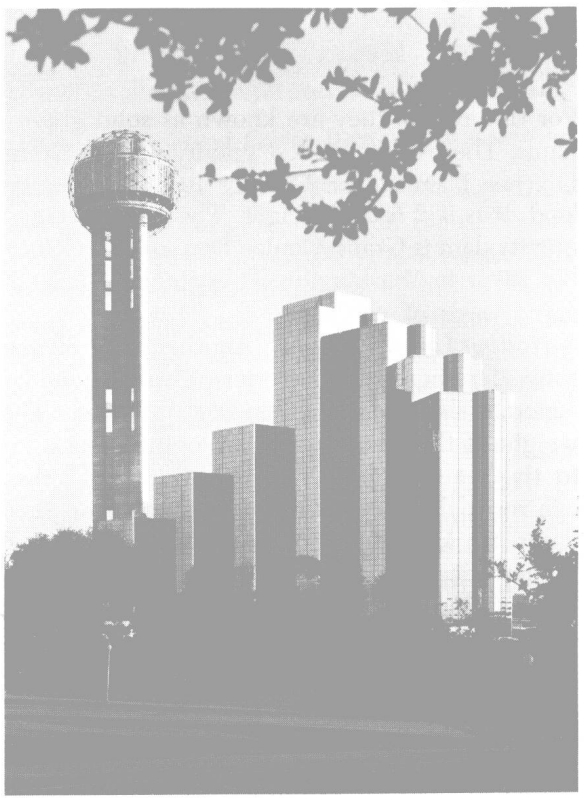
Dallas is a modern, growing city surrounded by many fine suburbs. The city's cultural life includes the Dallas Symphony, the famous Margo Jones "Theater in the Round," and an auditorium which houses the Metropolitan Opera Company of New York City during the spring. Outstanding buildings include the Museum of Fine Arts, the Hall of State, the Natural History Museum, and the Cotton Bowl football stadium. The State Fair of Dallas, held every October, is one of the largest in the world.

Texas Stadium, a lavish, partially domed sports stadium, was opened in nearby Irving in 1971. It is the home of the Dallas Cowboys football team. The Texas Rangers baseball team plays in Arlington, a suburb.

Dallas is the site of Southwestern Medical School of the University of Texas, and the Baylor School of Dentistry. Southern Methodist University is in suburban University Park.

The 50-story Reunion Tower in downtown Dallas is topped by a geodesic dome that encircles two revolving restaurants, an observation deck, and a radio station. It overlooks the gleaming Hyatt Regency Dallas Hotel.

Balthazar Korab



In 1841 John Neely Bryan from Tennessee settled on the east side of Trinity River at the present site of Dallas. By 1842 a number of settlers had made their homes in the settlement called Peter's Colony. Three years later the settlement's name was changed to Dallas in honor of the United States vice-president, George Mifflin Dallas. Dallas was incorporated as a town in 1856 and as a city in 1871. Unlike many other Texas cities, Dallas never had a reputation for wild days of cattlemen, gamblers, and outlaws.

The town began to grow during the U.S. Civil War, as a supply depot for Confederate troops. In 1872 the first railroad came to Dallas. The city became an important cotton shipping center, and the population increased from 6,000 to 36,000 between 1872 and 1886.

During the 1920's Dallas had many traffic problems because of an unplanned transportation system. Out of the improvement program that followed grew the beginnings of modern Dallas. After World War II demands for Texas oil and the boom in manufacturing and construction brought prosperity. The Dallas-Fort Worth Regional Airport was the largest in the world when it opened in January 1974.

Dallas is governed by a city manager, appointed by the mayor, and a city council. The population is estimated at 848,829 in the city and 2,585,300 in the metropolitan area (1976).

DAM (*dăm*), a wall-like barrier built across a river or stream to block or control the flow of water. The dam may raise the water level and form an artificial lake, or reservoir. It may direct the flow of water through a canal, pipeline, or tunnel to the place where it is to be used. The area filled is limited by the dam's height. The dam's height, therefore, regulates the amount of water that can be held back.

Dams may be built on main streams or their branches, wherever there is enough flow of water to make a dam necessary or useful. They are usually built at some spot where the river valley becomes narrow. The valley selected usually is wide upstream from the dam so that

large amounts of water can be stored.

Purposes of Dams

Dams that direct water into canals, pipelines, or tunnels are used to provide water power, crop irrigation, or water for home, store, office, or factory use. Dams that raise the level of the water are used to produce water power or to deepen streams enough to float boats over obstructions in the stream bed. They may form ponds or lakes for recreation, or they may stop the rise and fall due to tides in rivers near the sea.

Dams also are used to store flood waters for irrigation during the growing season. They are used to meet year-round needs for city water supplies, or to add to low flows in the dry season to make water power more dependable. Dams are used to furnish clean water to dilute water that has become polluted and to make streams more attractive. Dams that are used to store flood waters may prevent damage from flooding downstream. (See FLOOD.)

Dams also are often built for a combination of some or all of the above purposes. Parts of the stored water are used for the different purposes. Where floods come only at certain seasons, the reservoir can be kept partially empty during the flood season. Then after the flood season the reservoir may be allowed to fill with water to be used for other purposes during the dry season.

Types of Dams

A dam is built as a wall of stone masonry, concrete, steel, or timber, or as an embankment of earth or rock. Early masonry dams were built of blocks of stone. Today, most masonry dams are of concrete.

The type of dam will depend upon the size necessary, its purpose, the foundation upon which it is to rest, the shape and strength of the river banks, the construction materials at hand, and the climate.

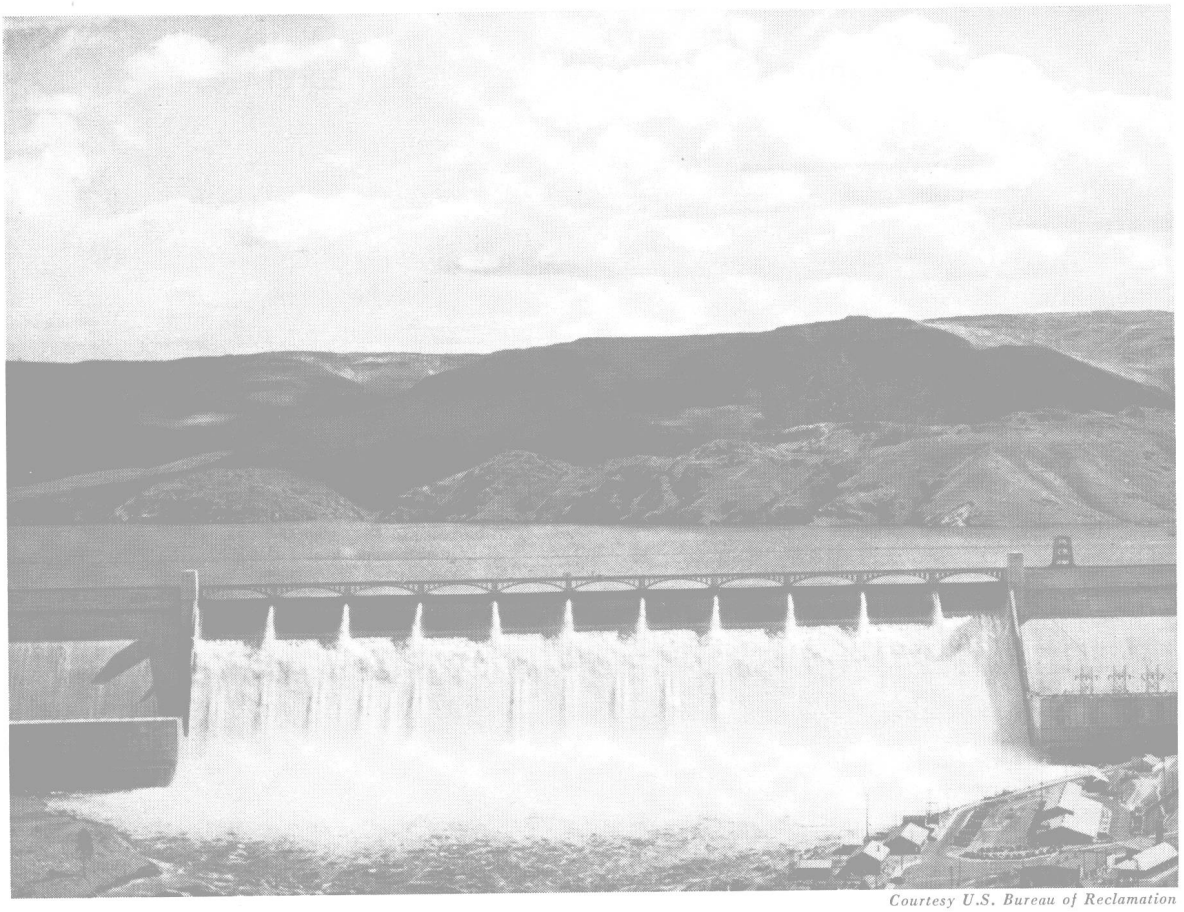
A safe dam must rest on a sound foundation and against firm abutments at the ends. The foundation under the base of the dam is not always solid rock, however. Often the bedrock is very deep below the stream bed, and then the dam must be built on the overlying material, which may be gravel, sand, or other earth layers. These earth layers may settle under the heavy weight of the dam, and may not be watertight. Such layers are made watertight by means of a wall of steel, concrete, timber, or clay, which connects the base of the watertight part of the dam with the rock or other watertight layer. Leaky foundations or banks may be covered with a blanket of watertight material. This blanket must reach a great enough distance to lengthen the path of seepage of the water through the foundation or banks so that seepage will not cause damage.

The high pressure created by the water behind the dam can cause water to seep through the tiniest openings in the foundation rock. Such seepage can weaken the rock and thereby endanger the dam. This danger is prevented by grouting, or pumping cement into the cracks and crevices of the rock.

Solid Masonry Gravity Dams. The greatest number of dams are solid masonry dams of the simplest form. They have plain heavy walls, and in cross section are triangular in shape, broad at the base, and narrow at the top. Their great weight keeps them from overturning or sliding from the force of the water pressure. For this reason they are known as solid gravity dams. The world's highest gravity dam is Grand Dixence Dam on the Dixence River in Switzerland. It is 932 feet in height. The world's largest gravity dam is Grand Coulee Dam on the Columbia River in Washington. It contains 10,585,000 cubic yards of concrete.

Hollow Gravity Dams. Another type of masonry dam consists of a series of walls joined by concrete slabs or arches sloping upstream. The weight of the water on these sloping faces adds to the weight on the buttresses, so that they can resist the force of the water pressure. Such dams are known as hollow gravity dams. The highest dam of this type is the Ancipa Dam, 365 feet high, on the Troina River in Italy.

Arch Dams. Masonry dams in deep, narrow valleys with rock sides may be made of thinner walls if they are curved upstream. This type of dam is made to stand the force of the water pressure by using its curve as an arch that carries



Courtesy U.S. Bureau of Reclamation

Grand Coulee Dam, on the Columbia River, Washington, is about ⅘ mile long.

the pressure into the rock walls of the valley. One of the world's highest arch dams, Vaiont Dam, on the Piave River, Italy, is 858 feet high.

Earth-Fill Dams. Earth dams are embankments of gravel, sand, and clay, with slopes flat enough to keep the materials from sliding off the faces of the dam. The core of the dam is built of fine earth that will pack tightly to resist seepage of water through the dam. The outer portion of the dam is gradually graded to coarser, and therefore more free draining, materials for the sloping faces. The upstream slope is protected from wave action by a facing of large stones, called riprap. The earth-fill material is spread into thin layers and pressed firm by heavy rollers. A dam built this way is known as a rolled-fill dam. The largest rolled-fill dam in the world is Oahe Dam on the Missouri River in South Dakota. It is 245 feet high and contains 92,000,000 cubic yards of earth.

In special cases the earth is dumped and then washed into place from the outer slope. The finer material is washed toward a pool at the center of the dam, where the finest materials settle to form the central core of the dam. In some instances the earth is dredged from the river bottom and pumped to the dam. It may be washed into pipes so that it flows by gravity or pumping to the beaches of the central core pool to form the dam. Such dams are called hydraulic-fill dams. Among the largest dams of this type is the Fort Peck Dam, on the Missouri River in Montana. It is 250 feet high and contains 125,600,000 cubic yards of earth.

Rock-Fill Dams. Rock-fill dams are constructed as embankments. Their slopes are steeper than earth embankments because they are made of coarser, stronger materials. They

SOME OF THE HIGHEST DAMS OF THE UNITED STATES

Dam and River	*State*	*Height* (in feet)*	*Crest Length† (in feet)*	*Type‡*	*Purpose§*	*Year Completed¶*
Oroville, Feather	California	770	6,920	E	I, P, F, W, R	1967
Hoover, Colorado	Arizona-Nevada	726	1,244	A	I, P, F, W, N	1936
Dworshak, North Fork Clearwater	Idaho	717	3,287	G	P, F, N, R	1973
Glen Canyon, Colorado	Arizona	710	1,550	A	P, W	1964
Auburn, North Fork American	California	685	4,000	E	I, P	UC
New Bullards Bar, North Yuba	California	635	2,200	A	P	1969
New Melones, Stanislaus	California	625	1,600	E-R	I, P, F, R	UC
Mossyrock, Cowlitz	Washington	605	1,750	A	P, F, R	1968
Shasta, Sacramento	California	602	3,460	G	I, P, F, N	1945
New Don Pedro, Tuolumne	California	585	1,900	E	I, P	1971
Hungry Horse, Flathead	Montana	564	2,115	A	I, P, F, N	1953
Grand Coulee, Columbia	Washington	550	4,173	G	I, P, F, N	1942
Yellowtail, Bighorn	Montana	545	1,450	A	I, P, F	1966
Ross, Skagit	Washington	540	1,300	A	P, F, R	1949
Trinity, Trinity	California	537	2,450	E	I, P	1962
Cougar, McKenzie	Oregon	515	1,730	E	I, P, F, N, R	1963
Flaming Gorge, Green	Utah	502	1,285	A	I, P	1964
Exchequer, Merced	California	492	1,400	G	I, P	1926
Donnels, Stanislaus	California	484	960	A	I, W	1957
Fontana, Little Tennessee	North Carolina	480	2,365	G	P, F, R	1944
Anderson Ranch, Boise	Idaho	456	1,350	E	I, P, F	1950
Detroit, North Santiam	Oregon	454	1,528	G	I, P, F, R, N	1953
Carters Lake, Coosawattee	Georgia	453	2,054	E-R	P, F, R	1974
Libby, Kootenai	Montana	446	2,244	G	P, F	1974
Round Butte, Deschutes	Oregon	440	1,400	R	P	1964
Pine Flat, Kings	California	440	1,840	G	I, F, R	1954
O'Shaughnessy, Tuolomne	California	430	910	G	I, P, W	1938
Union Valley, Silver Creek	California	428	1,950	E	P	1962
Mud Mountain, White	Washington	425	700	R	F	1948
Owyhee, Owyhee	Oregon	417	833	A	I, F	1932
Navajo, San Juan	New Mexico	408	3,800	E	I, F	1963
Brownlee, Snake	Idaho	395	1,700	R	P	1958
Diablo, Skagit	Washington	389	1,180	A	P	1929
Boundary, Pend Oreille	Washington	385	720	A	P, R	1967
San Luis, San Luis Creek	California	384	18,500	E	I, P	1967
Morris, San Gabriel	California	375	750	G	W	1935
Pacoima, Pacoima Creek	California	372	640	A	F	1929
Pardee, Mokelumne	California	358	1,350	G	P, W	1929
Arrowrock, Boise	Idaho	350	1,150	A	I, F	1915
Folsom, American	California	340	10,200	E-G	I, P, F, R	1955
Castaic, Castaic	California	340	5,200	E	W	1971
Lucky Peak, Boise	Idaho	340	1,700	E	I, F, R	1955
Gross, South Boulder Creek	Colorado	340	1,022	M	W	1935
Hills Creek, Middle Fork Willamette	Oregon	338	2,170	E	I, P, F, N, R	1962
Cherry Valley, Cherry Creek	California	330	2,600	E-R	I, P, F, W	1955
Briones, Bear Creek	California	330	2,100	E	W	1964
Alder, Nisqually	Washington	330	1,600	A	P, F, R	1945
Mammoth Pool, San Joaquin	California	330	820	R	P	1960
Salt Springs, N. Fork Mokelumne	California	328	1,300	R	P	1931
Green Peter, Middle Santiam	Oregon	327	1,380	G	I, P, F, N, R	1967
Buffalo Bill, Shoshone	Wyoming	326	200	A	I, P	1910
Abiquiu, Chama	New Mexico	325	1,540	E	F	1963
Yale, Lewis	Washington	323	1,550	E	P	1953
Beardsley, Middle Fork Stanislaus	California	320	960	E	I, P	1957

HIGHEST DAMS OF THE UNITED STATES (Continued)

Dam and River	*State*	*Height* (in feet)*	*Crest Length† (in feet)*	*Type‡*	*Purpose§*	*Year Completed ♀*
Parker, Colorado	Arizona-California	320	856	A	P, F, W	1938
Friant, San Joaquin	California	319	3,488	G	I, F	1942
Watauga, Watauga	Tennessee	318	900	E-R	P, F, R	1948
Merwin, Lewis	Washington	313	1,250	A	P	1931
Courtright, Helms Creek	California	310	850	R	P	1958
Sultan, No. 1, Sultan	Washington	310	¶...	G	¶...	1952
Green Mountain, Blue	Colorado	309	1,150	E	I, P	1943
Upper Baker, Baker	Washington	308	1,200	G	P	1959
Kensico, Bronx	New York	307	1,843	G	W	1915

LONGEST DAMS OF THE UNITED STATES

Dam and River	*State*	*Height* (in feet)*	*Crest Length† (in feet)*	*Type‡*	*Purpose§*	*Year Completed ♀*
Barker, Buffalo Bayou	Texas	37	71,900	E	F	1945
Amistad, Rio Grande	Texas-Mexico	287	34,100	E-G	F, W, R	1969
Weiss, Coosa	Alabama	90	31,150	E-G	P	1961
Cochiti, Rio Grande	New Mexico	251	28,200	E	F, R	UC
Falcon, Rio Grande	Texas-Mexico	150	26,294	E	I, P, F	1954
Fort Peck, Missouri	Montana	250	21,026	E	I, P, F, N	1940
McGee Bend, Angelina	Texas	120	19,430	E	P, F, C	UC
San Luis, San Luis Creek	California	384	18,500	E	I, P	1967
Kingsley, North Platte	Nebraska	170	17,840	E	I, P, F	1942
Hartwell, Savannah	Georgia	240	17,777	E-G	P, F, N, W, R	1961
Whitney, Brazos	Texas	159	17,695	E-G	P, F, W, R	1951
Denison, Red	Oklahoma-Texas	165	17,200	E	P, F, W, N, R	1945
Sardis, Little Tallahatchie	Mississippi	117	15,300	E	F, R	1940
Harlan County, Republican	Nebraska	107	11,828	E-G	I, F	1952
Pinopolis, Santee	South Carolina	140	11,600	E	P, F, W, N	1941
Garrison, Missouri	North Dakota	210	11,300	E	I, P, F, N, R	1956
Buchanan, Colorado	Texas	150	11,200	M	F, W	1936
Fort Randall, Missouri	South Dakota	165	10,700	E	P, F, N, I, R	1956
Big Bend, Missouri	South Dakota	95	10,570	E	I, P, F, W, R	1967
Folsom, American	California	340	10,200	E-G	I, P, F, R	1955
Barkley, Cumberland	Kentucky	155	10,180	E	P, F, N, R	1966
Priest Rapids, Columbia	Washington	184	10,137	E-G	P, F	1961
Oahe, Missouri	South Dakota	245	9,300	E	I, P, F, N, R	1963
The Dalles, Columbia	Washington-Oregon	135	8,875	G	P, N, R	1957
Wanapum, Columbia	Washington	191	8,707	E-G	P, N, F	1964
Kentucky, Tennessee	Kentucky	206	8,422	E-G	P, F, N, R	1944
Saluda, Saluda	South Carolina	208	8,000	E	P	1930
Pickwick Landing, Tennessee	Tennessee	113	7,715	E-G	P, F, N, R	1938
McNary, Columbia	Oregon-Washington	220	7,365	E-G	I, P, N	1953
Oroville, Feather	California	770	6,920	E	I, P, F, W, R	1967
Cherokee, Holston	Tennessee	175	6,760	E-R-G	P, F, R	1941
Pensacola, Grand	Oklahoma	145	6,500	M-G	P, F	1940
Table Rock, White	Missouri-Arkansas	252	6,423	G	P, F, R	1959
Sanford, Canadian	Texas	228	6,410	E	F, W	1965
Wheeler, Tennessee	Alabama	72	6,342	G	P, F, N, R	1936

* Height measured from lowest point of base to top of dam. † Length measured along the top of the dam.
‡ A = arch; E = earth-fill; G = gravity; M = multi-arch; R = rock-fill.
§I = irrigation; P = power; F = flood control; W = water supply; N = navigation; R = recreation; C = water conservation.
♀ UC = under construction. ¶... = information not available.

SOME IMPORTANT WORLD DAMS

Dam and River	*Country*	*Height* (in feet)*	*Crest Length† (in feet)*	*Type‡*	*Purpose§*	*Year Completed♀*
Nurek, Vakhsh	Soviet Union	1,017	2,390	E	I, P	1972
Grand Dixence, Dixence	Switzerland	932	2,296	G	P	1962
Inguri, Inguri	Soviet Union	892	2,198	A	P, F, I	UC
Mica, Columbia	Canada	794	2,598	E	P	1973
Mauvoisin, Drance	Switzerland	777	1,706	A	P	1957
Sayano-Shushenskaya, Sayany Yenesei	Soviet Union	774	3,503	A	P, N	UC
Manicouagan 5, Manicouagan	Canada	740	4,200	G	P	1969
Bhakra, Sutlej	India	740	1,700	G	P, I	1963
Pahlavi, Dez	Iran	668	787	A	I, P	1963
Reza Shah Kabir, Karun	Iran	656	1,247	A	I, P	1973
Almendra, Tormes	Spain	649	1,860	A	P	1970
Kurobe, Kurobe	Japan	610	1,603	A	P	1964
Bennett, Peace River	Canada	600	6,700	E	P	1967
Tignes, Isere	France	592	1,230	A	P	1952
Tachien, Tachia	Taiwan	591	853	A	P, I, F	1973
Amir Kabir, Karadj	Iran	584	1,300	A	I, P	1962
Alpe Gera, Cormor	Italy	584	1,707	G	P	1965
Vidraru, Arges	Romania	545	1,000	A	P	1967
Talbingo, Tumut	Australia	530	2,300	R	P	1971
Specchieri, Leno di Vallarsa	Italy	514	631	A	P	1957
Lienne, Rhone	Switzerland	512	918	A	P	1957
Shihmen, Tan-Shui	Taiwan	512	1,496	E-R	I, P, F, W	1964
Monteynard, Drac	France	509	705	A	P	1962
Yanhee (Bhumiphol), Ping	Thailand	505	1,532	A-G	P, I	1964
Place Moulin, Buthier	Italy	502	2,175	G	P	1965
El Infiernillo, Balsas	Mexico	492	1,132	R	P	1963
Ogochi, Tama	Japan	489	1,158	G	W, P	1957
Valle de Lei, Reno di Lei	Italy-Switzerland	469	2,264	A-G	P	1960
Warragamba, Warragamba	Australia	450	1,150	G	P, W	1960
Kariba, Zambezi	Rhodesia	420	2,025	A	I, P, F	1959
Bratsk, Angara	Soviet Union	410	16,863	G-E	P, W, N	1964
Mangla, Jhelum	Pakistan	380	11,000	E	I, P	1967
Zeyskaya, Zeya	Soviet Union	377	2,379	G	P, I, F	1974
Aswan High Dam, Nile	Egypt	364	12,565	E-R	I, P, R	1970
South Saskatchewan River, South Saskatchewan	Canada	210	16,700	E	I, P, F	1966

* Height measured from lowest point of base to top of dam. † Length measured along the top of the dam.
‡ A = arch; E = earth-fill; G = gravity; M = multi-arch; R = rock-fill.
§ I = irrigation; P = power; F = flood control; W = water supply; N = navigation; R = recreation.
♀ UC = under construction. ¶ . . . = information not available.

are made watertight by a central core or upstream blanket of earth fill, or by paving the upstream face with concrete or with wood planking. The highest rock-fill dam is the Cougar Dam, 515 feet high, on the South Fork of the McKenzie River in Oregon.

Timber and Steel Dams. Timber dams consist of planks tightly fitted together and supported by rock-filled timber cribs. They are common where timber is plentiful and where a permanent dam is not needed. Steel dams consist of a steel plate face supported by steel frames. Very few of this type have been built.

A dam must have a spillway over which water flows to the river below. It releases surplus water after the reservoir behind the dam is filled. Concrete dams use all or part of the top of the dam as a spillway. A concrete spillway section may be provided for earth dams. Sometimes the spillway is formed in the rock at the