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D—Dys
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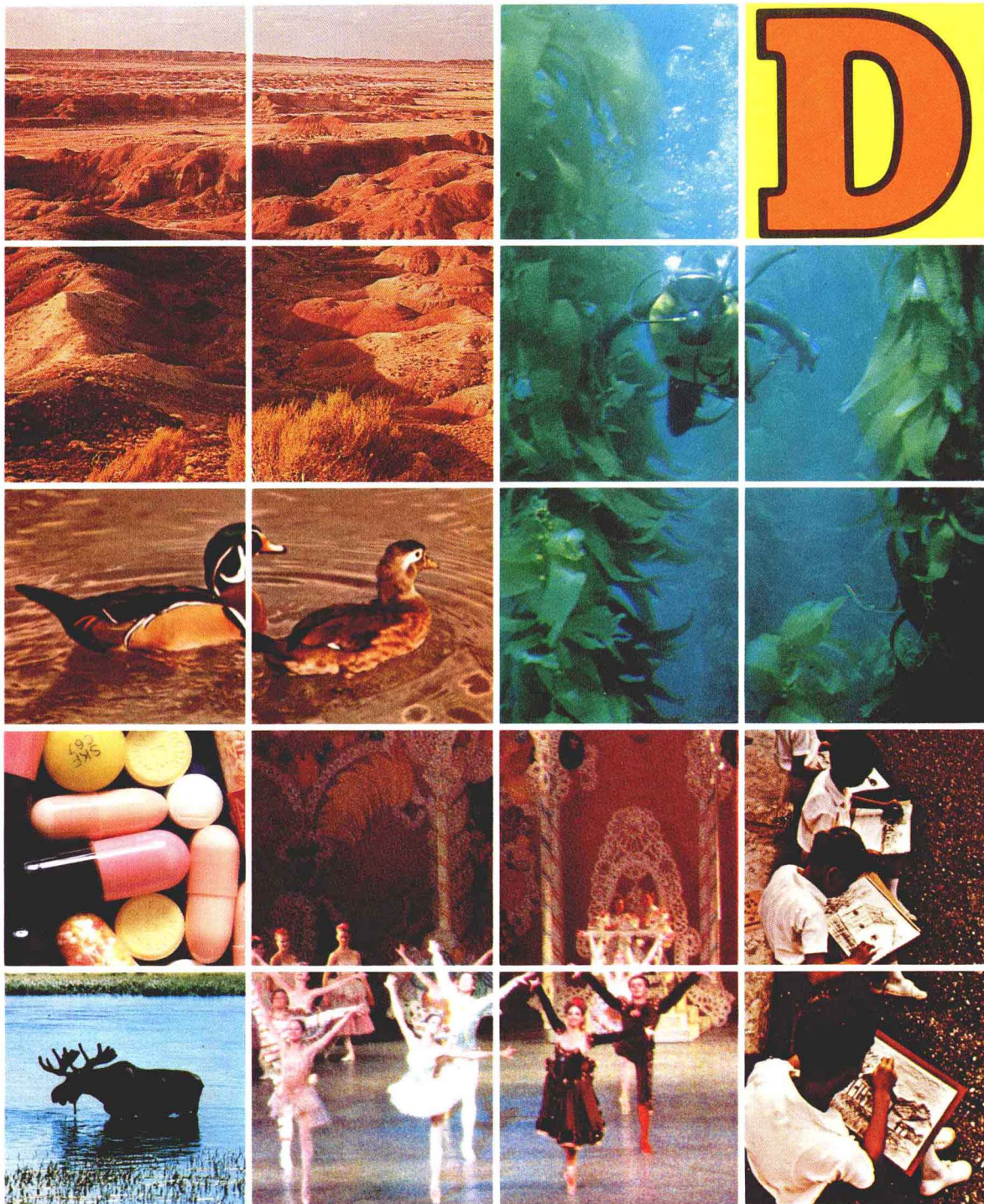
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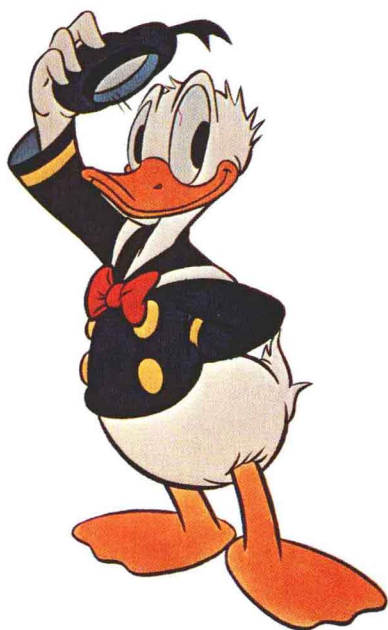
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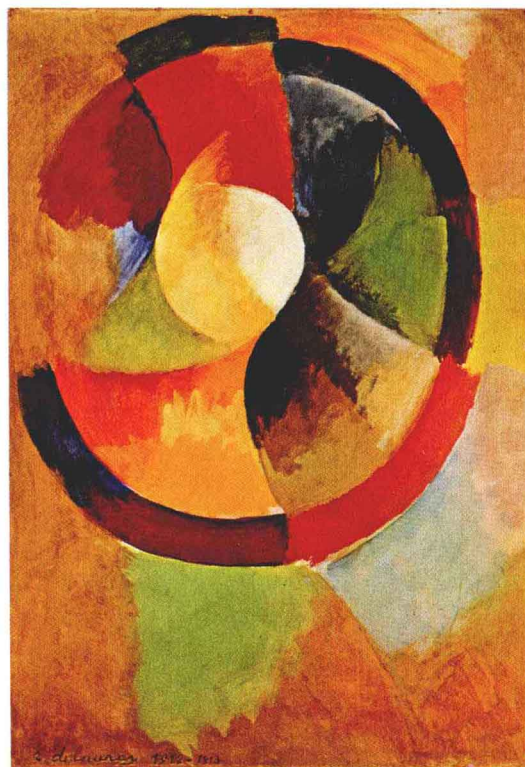
EXPLORING VOLUME 6



How many languages have been used on the sound tracks of cartoonist Walt Disney's animated films? 185.

© Walt Disney Productions, World Rights Reserved

Service de Documentation Photographique
de la Réunion des Musées Nationaux, Versailles



Why did a French poet use the term orphism for Robert Delaunay's variation of cubism? 69.

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Giraudon — Art Resource/EB Inc.

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Schunemann — Bavaria-Verlag



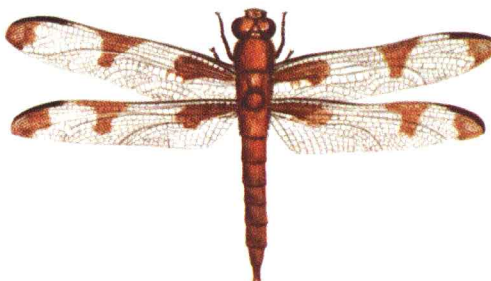
Zev Radovan

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Nicholas — Photo Researchers



What Mexican flower, brought to Europe by Spaniards, was named for a Swedish botanist? 3.



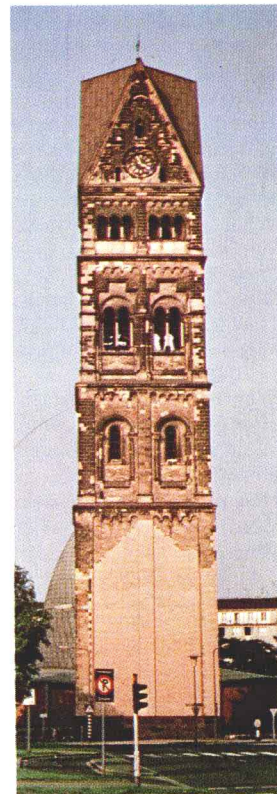
Which six-legged insect can curve its legs to form a basket for scooping other insects from the air? 238.

Russian Matreshka dolls, which nest inside each other, are fashioned from wood. What other materials have dolls been made of? 216.



Courtesy of Toy Museum, Rottingdean, Sussex; photo © EB Inc.

Name the city whose most prominent landmarks are a 13th- to 14th-century church tower and Germany's first skyscraper. 293.



Katherine Young — EB Inc.



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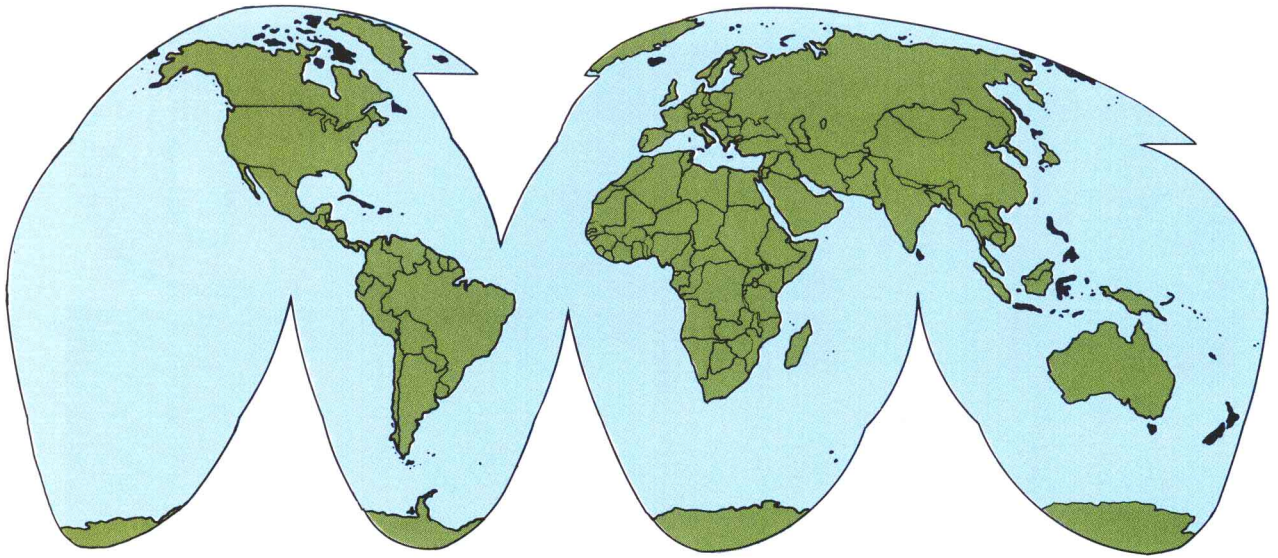
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HERE AND THERE IN VOLUME 6

From the A-1 satellite to the zygote cell, thousands of subjects are gathered together in Compton's Encyclopedia and Fact-Index. Organized alphabetically, they are drawn from every field of knowledge. Readers who want to explore their favorite fields in this volume can use this subject-area outline. While it may serve as a study guide, a specialized learning experience, or simply a key for browsing, it is not a complete table of contents.

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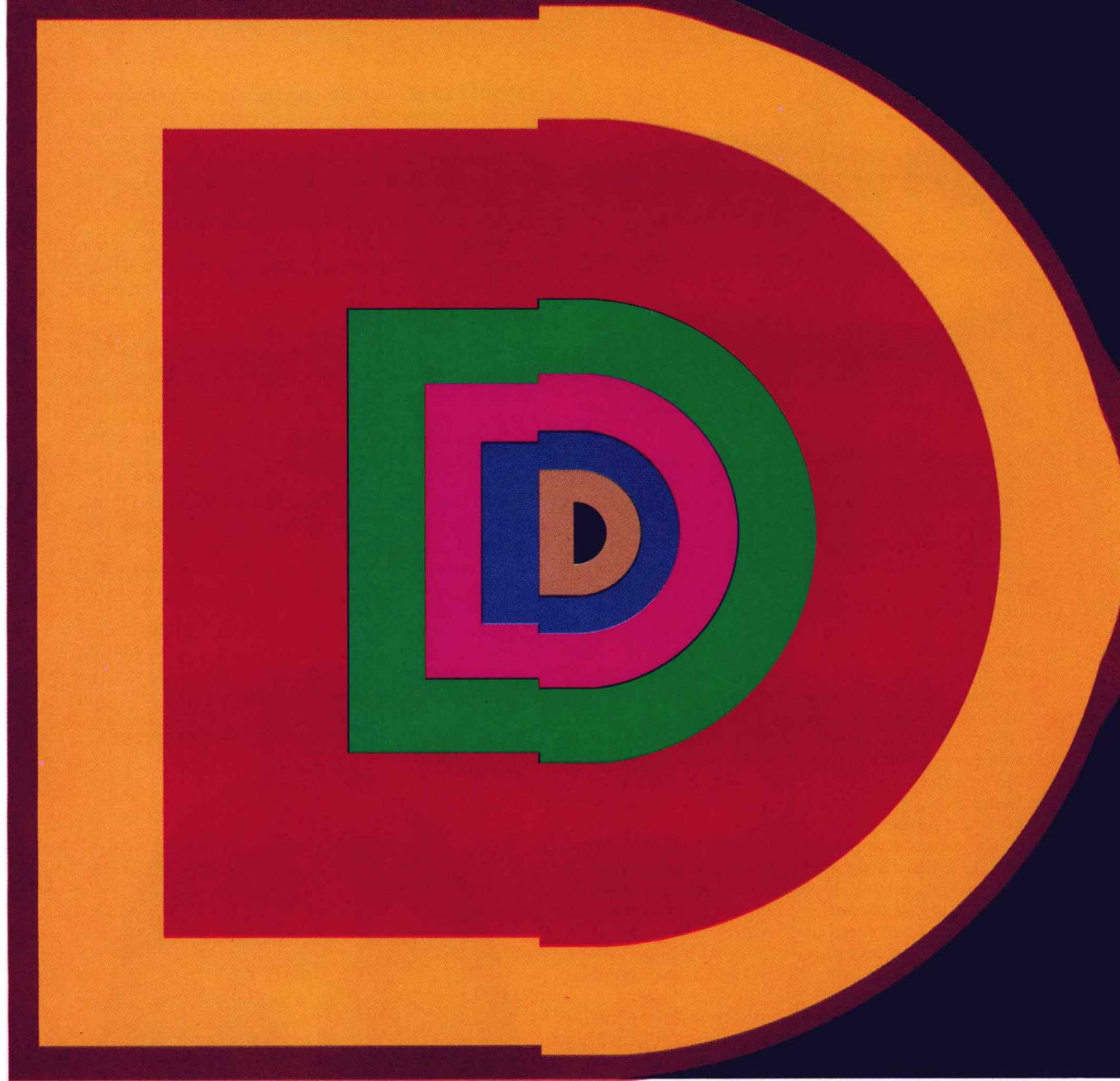
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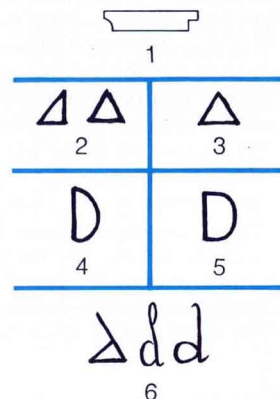
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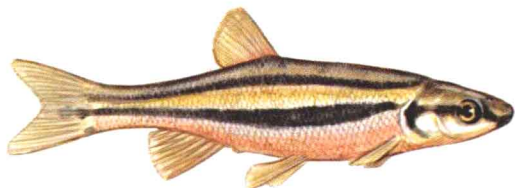
The letter D

may have started as a picture sign of a door, as in Egyptian hieroglyphic writing (1). The earliest form of the sign in the Semitic writings is unknown. About 1000 B.C., in Byblos and in other Phoenician and Canaanite centers, the sign was given a linear form (2), the source of all later forms. In the Semitic languages the sign was called *daleth*, meaning "door."

The Greeks changed the Semitic name to *delta*. They retained the Phoenician form of the sign (3). In an Italian colony of Greeks from Khalkis (or Chalcis), the letter was made with a slight curve (4). This shape led to the rounded form found in the Latin writing (5). From Latin the capital letter came unchanged into English. In Greek handwriting the triangle of the capital letter was given a projection upward. During Roman times the triangle was gradually rounded (6).



DACE



The southern redbelly dace lives in springs and clear streams.



The cutlips minnow occurs in the northeastern United States.

DACE AND MINNOW. The most abundant of all freshwater fishes are the small minnows called dace. Many species seldom reach a length of 2 inches (5 centimeters). Dace have remarkable lips, which they thrust forward to seize their food—chiefly insects and crustaceans. The young of other fishes feed on these fish that seem never to grow up. Man's supply of edible fish, therefore, depends upon them.

The commonest American variety is known as the black-nosed, or striped, dace, also called the brook minnow. It is about 4 inches (10 centimeters) long. A black stripe runs from the tip of its nose to the base of its tail. The back is olive green; the underside, silvery white. At spawning time, in spring or early summer, the male's fins are tinged with red and the black stripe is bordered with bronze. This dace is found from New England to Minnesota and south to northern Alabama and Virginia.

The common shiner is a favorite bait of bass fishermen. It has a deep, flat body with silvery sides and an olive-green back. It reaches a length of from 5 to 8 inches (13 to 20 centimeters). During the spawning season the male's fins turn red, its back becomes an iridescent blue, and its sides glow with many colors. It is found east of the Rocky Mountains except in Texas and the south Atlantic states.

The adult creek chub measures from 7 to 10 inches (18 to 25 centimeters) long. It is dusky blue with a black spot at the base of the tail. This spot is bordered with red in the male. In the spawning season the male's head turns orange and shows hornlike growths. This dace is found from Maine to Wyoming and south as far as Alabama.

Dace belong to the carp family Cyprinidae (see Carp). Members of this family have jaws without teeth, smooth-edged scales, and hairlike ribs that extend the length of the body. The scientific name of the black-nosed dace is *Rhinichthys atratulus*; of the common shiner, *Notropis cornutus*; of the creek chub, *Semotilus atromaculatus*.

The name minnow is also given to the mudminnow, a hardy fish of the family Umbridae that is found in Europe and North America. Mudminnows are about 3 to 6 inches (7.5 to 15 centimeters) long.

DAEDALUS. In Greek mythology Daedalus was a clever craftsman. He was said to be the first sculptor to make statues having open eyes and with arms standing out from the body. He was also credited with inventing the awl, the bevel, and other tools. In ancient times many wooden temples and statues in Greece and Italy were believed to be his work.

A pupil of Daedalus was his nephew Perdix. When the boy invented the saw and the potter's wheel, Daedalus supposedly became so jealous that he pushed Perdix from the Acropolis in Athens.

After Daedalus fled to Crete, where King Minos ruled, he built the mazelike labyrinth to enclose the Minotaur. Daedalus later offended King Minos, and he and his son Icarus were imprisoned. Daedalus made wings of feathers and wax so they could escape by flying over the sea. Icarus soared too near to the sun. Its heat melted the wax and he drowned.

DAGUERRE, Louis-Jacques-Mandé (1789–1851). The first practical photographic process that produced lasting pictures was invented by Louis-Jacques-Mandé Daguerre, a French painter and physicist. The photographs that result from his process are called daguerreotypes.

Daguerre was born in Corneilles, France, near Paris, in 1789. He worked first as a tax collector and then became a successful stage-scene painter for the opera. In 1822 he opened the Diorama, an exhibition

Daguerre perfected the photographic process with which a daguerreotype was made of him in 1848.



Courtesy of the Gernsheim Collection, the University of Texas at Austin

of enormous pictorial views that changed in effect as the lighting was altered. He opened a Diorama in London, as well, but it was destroyed by fire.

Daguerre began experimenting, hoping to discover a practical photographic process. The French inventor J.-N. Niepce had been working toward the same end since 1814, and from 1829 the two combined their efforts. After Niepce died in 1833, Daguerre continued refining their techniques and on Jan. 9, 1839, announced the daguerreotype process at a meeting of the Academy of Sciences. For his discovery he was appointed an officer of the Legion of Honor, and the French government published his process and granted him 6,000 francs annually. Daguerre improved his invention and then returned to painting. He died on July 10, 1851, at Bry-sur-Marne, France.

Although Daguerre preferred landscapes for his subjects, daguerreotypes were also used to shoot still lifes, and they made portrait photography a prosperous industry. It was especially popular in the United States. (See also Photography.)



Sven Samelius

The common, or garden, dahlia is one of many popular varieties.

DAHLIA. The Aztecs cultivated the dahlia, which grows wild in Central America and Mexico, and Spanish explorers brought the flower to Europe. It was named for Anders Dahl, a Swedish botanist.

Wild dahlias are flat, with a yellow center and eight single scarlet rays. Modern varieties may be globe-shaped and double, or with many petals. Their color may be white, yellow, orange, red, or purple. The plants grow from 18 inches to 20 feet (46 centimeters to 6 meters) high. They bloom in late summer or autumn.

Dahlias may be grown from seed or cuttings, by grafting (to perpetuate rare varieties), or by division of the tuberous roots. Amateur gardeners commonly use the last method. After frost kills the tops, the tubers should be divided and then stored in a cellar.

Dahlias form a genus of the family Compositae. Thousands of varieties of dahlias have been developed from hybrids of *Dahlia pinnata* and *D. coccinea*.

DAIRY INDUSTRY. Milk and milk products, such as butter, cheese, and ice cream, are processed and distributed to the public by dairy plants. The production of milk on dairy farms and the processing of milk and dairy products make up the dairy industry. Plants where butter and cheese or milk and cream are prepared for sale may also be called creameries.

Dairying begins on the farms that raise the milk cows. A typical dairy farm in the midwestern United States may have 60 cows, but a dairy farm in Florida or California may have 500 or more animals. Most milk in the United States is marketed through farmer-owned cooperatives. The milk that is produced on dairy farms is collected at county receiving stations for shipment to dairy plants (see Milk).

Milk must meet quality standards and must be produced, processed, and handled in an approved manner in approved facilities and equipment. Dairy farms operate under the rules of sanitation imposed by the health boards of the cities and states they supply. Grade A milk, milk intended to be consumed as fluid milk or cream, is approved for interstate shipment through a voluntary program called the Interstate Milk Shippers Agreement, which is supervised by the Food and Drug Administration (FDA).

Milk and milk products make up about an eighth of all the food eaten by the people of the United States. The annual production is about 140 billion pounds. There are more than 300,000 farms with dairy cows in the United States, but only about 200,000 of these sell milk; the remainder use the milk as animal feed and for their own domestic consumption. There are about 150,000 people employed in the processing and delivery of dairy products (see also Cattle).

How Fluid Milk is Processed

Milk must be moved rapidly from the farm to the consumer and kept cold so that it will not spoil. On the dairy farm, milk is collected and quickly refrigerated in stainless steel bulk tanks. It is transported to the processing plant by refrigerated tank trucks where it is automatically pumped into temporary holding tanks. It is then weighed, and samples are sent to the laboratory where tests are made for odor and flavor, bacteria, sediment, and milk protein and fat content. Milk of inferior quality may be rejected. Although dairy farms are routinely inspected by health officials, a farm from which any substandard milk came will be examined at once.

In order to determine the constituents of milk, it is necessary to test for milkfat, protein, and nonfat solids in the milk sample. Milkfat, or butterfat, was formerly determined using the Babcock test, developed at the University of Wisconsin in 1890. More recently, milk constituents are measured automatically by sensitive infrared equipment.

This article was contributed by W.R. Gomes, Professor of Dairy Science, University of Illinois at Urbana-Champaign, College of Agriculture, Urbana.



Dairy workers fit milking machines onto milk cows. After the milk is taken from the cows it is transported to county receiving stations for shipment to dairy plants.

Pasteurized and Homogenized Milk

From the temporary holding tanks the milk flows through stainless steel pipes to clarifiers, or filters, and then into pasteurizers. It may be homogenized before or after pasteurization. Pasteurization kills harmful bacteria with heat. The process is named for the French scientist Louis Pasteur, who first developed it to prevent spoilage of other food products (*see* Pasteur). Several methods are available for pasteurization of milk. The batch method involves the heating of milk or milk product in a vat for 30 minutes at 145° F (63° C). The most widely used method for pasteurizing milk is the high-temperature, short-time (HTST) method. In the HTST procedure the milk is heated to 161° F (71.6° C) for 15 seconds. If products are to be stored under refrigeration for long periods of time, as with half-and-half used for coffee, the product may be processed by ultra-high temperature (UHT) pasteurization at 280° F (138° C) for 2 seconds. UHT pasteurization can be used to sterilize milk that is to be stored for a long time at room temperature. In each type of pasteurization, the milk is rapidly cooled to preserve its flavor.

Almost all of the milk sold today is pasteurized. Pasteurizing does not affect milk's nutritive value.

Pasteurizing reduces two vitamins, thiamine and ascorbic acid, but these can readily be obtained in other foods. Cream used in making butter is pasteurized before churning, the process that produces the butter. Ice cream is always pasteurized. Much of the cheese produced is made from pasteurized milk.

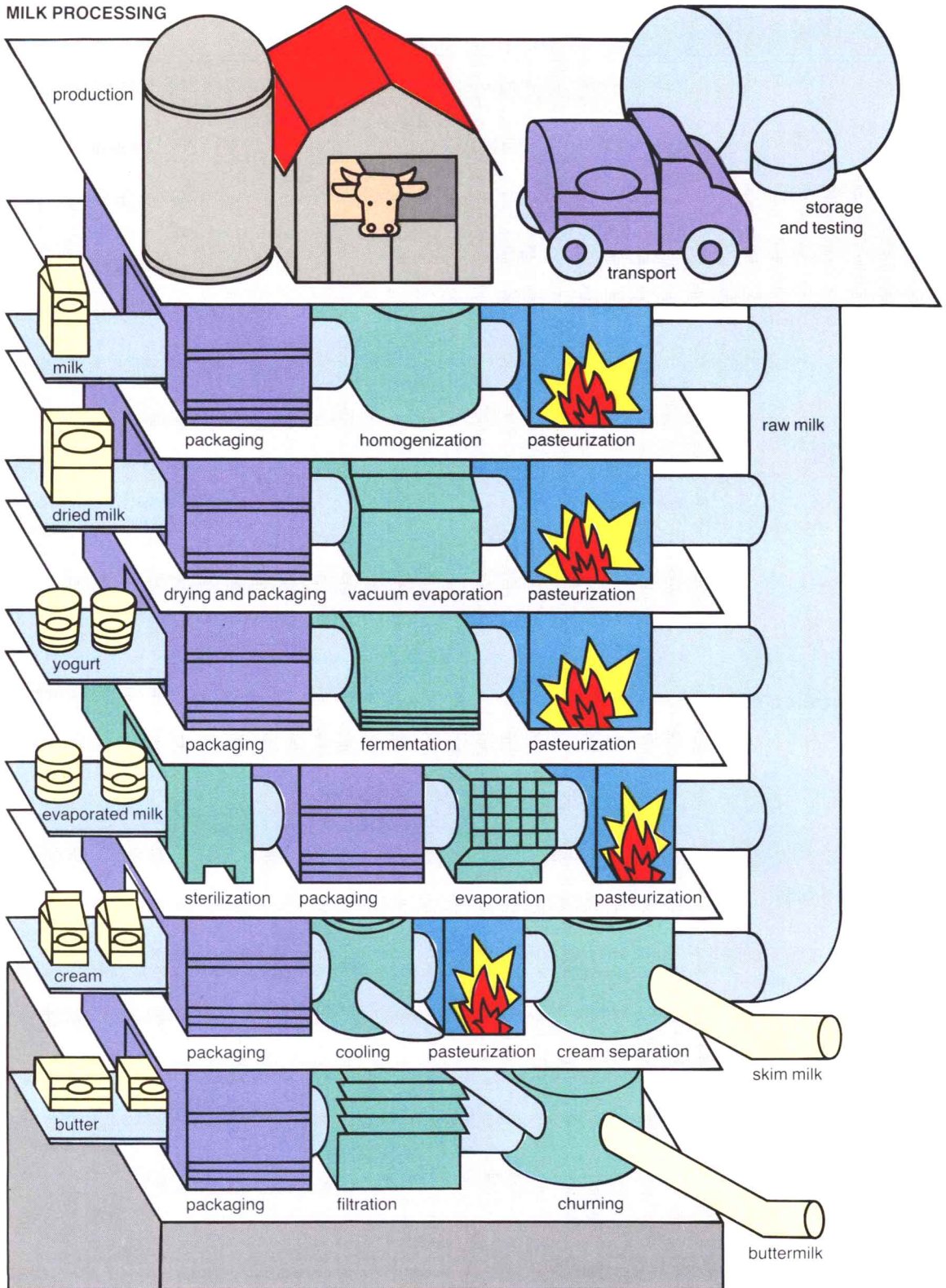
In the homogenizer the milk is forced under high pressure through many tiny holes. This breaks up the fat globules into minute particles measuring about 1 micron (about 0.00004 in) in diameter. They do not rise to the top as cream, making the shaking of milk, as was once common, unnecessary.

Cream and Skim Milk

A dairy company may separate cream from whole milk and bottle it at the milk-processing plant. Or it may separate the cream at one plant and ship it to the milk plant for pasteurization. Milk remaining after

The manufacture of milk products (opposite page) begins in the milking parlors of dairy farms. After the milk is collected from the cows, it is quickly refrigerated and transported by refrigerated trucks to receiving stations. The milk is tested for disease organisms and stored briefly before being shipped by refrigerated tank trucks to a processing plant. At the plant the milk is tested for odor and flavor, bacteria, sediment, and milk protein and fat content. The milk is then filtered and pasteurized. Then, depending on the desired product, the milk is processed in various ways.

MILK PROCESSING



What Does The Label Mean?

Fresh Milk

Raw milk is milk as it comes from the cow. When sold as whole milk, the United States Public Health Service Milk Code states that it must contain at least 8.25 percent milk solids other than fat and 3.25 percent milk fat.

Pasteurized milk has been heated to kill bacteria that might cause disease.

Homogenized milk has been especially treated so that the cream will not rise.

Lowfat milk contains not more than 2.0 percent milk fat and at least 8.25 percent milk solids other than fat. Some lowfat milk is supplemented with 0.5 to 1.5 percent additional nonfat milk solids.

Skim milk has had the milk fat removed. No more than 0.5 percent milk fat is allowed. Nonfat milk solids range from 8.25 to 10.0 percent.

Sterile milk is homogenized, sterilized, and packaged as ultra-high temperature (UHT) milk or canned whole milk. Canned whole milk is produced chiefly for export.

Cultured Milk

Cultured milk has been fermented by harmless bacteria that produce lactic acid during the process. The bacteria may be allowed to develop naturally or may be cultivated ("cultured") artificially and then introduced into the milk. The milk has the same food value it had before souring; it may be slightly more digestible to persons with delicate digestive systems.

Sour milk has been fermented by lactic acid bacilli.

Buttermilk is fresh milk soured by lactic acid bacilli. Butter granules are sometimes added.

Acidophilus milk has been fermented by the bacteria strain called *Lactobacillus acidophilus*.

Yogurt is milk fermented chiefly by *Lactobacillus bulgaricus*.

Concentrated Milk

Concentrated milk is homogenized, pasteurized milk with about two thirds of the water removed. It is reconstituted with water. Lowfat milk and skim milk may also be concentrated.

Frozen milk concentrate is concentrated milk quickly frozen and held at -10° to -20° F (-23° to -29° C) until ready for use.

Evaporated milk is homogenized whole milk with about 60 percent of its water removed by heating in a vacuum cooker. Its food value is about the same as that of fresh whole milk.

Sweetened condensed milk is evaporated milk with 42 percent sucrose, or table sugar, added. Since the sugar acts as a preservative, the milk, when sealed in cans, can be stored without further heat treatment.

Dry milk is milk evaporated to a powder. Whole milk powder has had only the water removed. Nonfat milk solids have had both water and fat removed.

Fortified Milk

Fortified lowfat milk has 0.5 to 1.5 percent nonfat milk solids added.

Vitamin D milk has 400 units of this vitamin added to each quart.

Flavored Milk

Chocolate milk is made by adding chocolate syrup or cocoa powder to whole milk.

Chocolate drink is made by adding chocolate syrup or cocoa powder to partially skim milk.

Fruit flavored dairy drinks are made by adding artificial fruit flavors to partially skim milk.

Cream

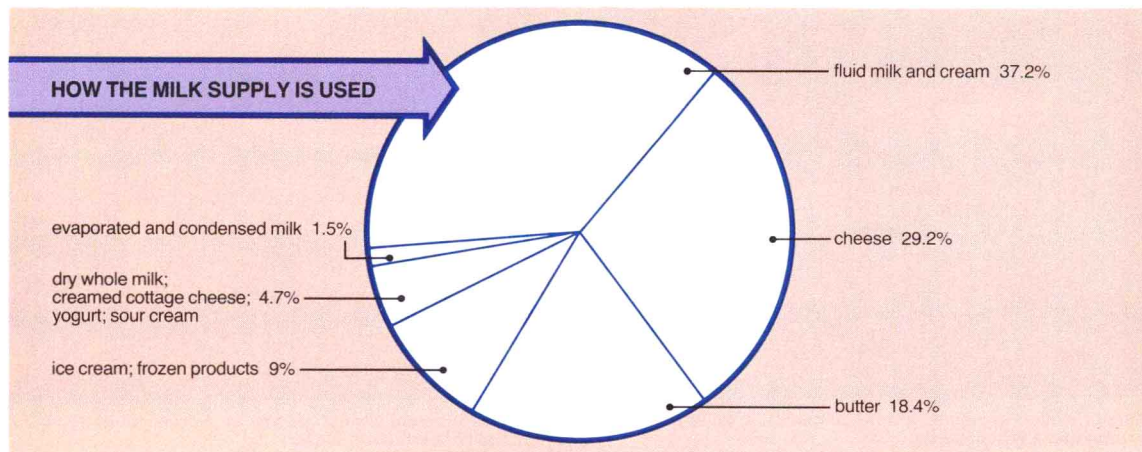
Light cream contains 18–30 percent milk fat. It may also be called coffee cream or table cream.

Whipping cream is either light (30–36 percent milk fat) or heavy (36 percent or more milk fat).

Half-and-half has about 10–12 percent milk fat.

Sour cream is cultured homogenized cream ripened or cultured until it is thick, smooth, and pleasant tasting.

This list tells what dairy companies mean by the labels they put on bottled or packaged milk and cream. Today milk is marketed in many forms. Dairies protect the public health, improve the keeping quality of dairy products, and make maximum use of milk by-products. They also preserve surpluses and facilitate distribution and storage.



the cream has been removed is skim milk. The dairy may sell it for cattle feed, convert it into powdered skim milk, or package it for sale for human use as liquid skim milk.

Before the power cream separator came into use, between 1880 and 1890, the gravity method of cream separation was used. Pans of milk stood on the shelves of the dairy house for 24 to 36 hours until the cream rose and could be skimmed off by hand. This method left from 10 to 20 percent of the fat in the skim milk. Centrifugal cream separators today leave less than 0.01 percent fat.

The cream separator works on the principle that the heavier a whirling body, the greater the force acting on it to move it from the center. From a tank at the top of the cream separator the milk flows down into a large bowl, or drum, making from 5,000 to 9,000 rotations per minute. The cream, being lighter, stays in the center and is drawn off through a tube. The heavier skim milk, forced to the outside, is carried through another tube to a pasteurizer.

Packaging and Delivering Milk

From the coolers the milk flows to the packaging machine. Milk may be packaged in plastic containers or in cardboard cartons that are coated with paraffin wax to make them leakproof. Filled containers then go to a refrigerated room to remain until the delivery trucks pick them up. Every day workers in the dairy plant sterilize the stainless steel and glass piping and all the machines through which the milk has flowed. About one third of the labor time in a dairy plant may be spent in cleaning the equipment. Modern distributors prepare many products in addition to milk, lowfat milk, cream, and skim milk. Dairies also make butter, ice cream, and cheese (see Butter; Cheese; Ice Cream).

By-Products

Some by-products of dairying have industrial uses. Lactose, or milk sugar, is used in the fermentation process that produces penicillin. Lactose is also a base for pills and is used in infant foods.

The milk protein called casein is produced from skim milk. Much of the total production of casein goes into the coating of fine book and magazine papers. This page, for example, has been sprayed with a casein solution. Casein glue is important in wood-working, and casein paints have special uses. A small amount of casein is used to make plastic buttons and costume jewelry.

History of Dairying

Sanskrit records mentioned milk 6,000 years ago. The Bible describes the Promised Land as "a land flowing with milk and honey." The Greek physician Hippocrates recommended milk as a medicine some 2,300 years ago. Christopher Columbus brought cattle to the New World on his second voyage. It has been said that one reason for the high death rate among those who traveled to the New World on the Mayflower was that they had no fresh milk to drink. Cows were brought from Europe to the Jamestown colony in 1611 and to the Plymouth colony in 1624.

Cheese was an important item in the diet of the Vikings, who from about the 8th to the 10th century sailed the seas on long voyages. Cheese was an article of commerce in ancient Rome. Monks developed the art of cheesemaking in Europe in the Middle Ages.

The modern large-scale dairy industry developed with the growth of cities and fast, refrigerated transportation. In 1841 Thomas Selleck, a New York and Erie Railroad stationmaster, asked a farmer to try shipping milk by rail 60 miles (97 kilometers) to New York City. On the day of the "big haul," 60 gallons (227 liters) in a wooden churn were successfully shipped to the city.

A few years later wooden containers for shipment were replaced by metal cans. Sometimes the cans were packed in ice to keep the milk cool. Mechanical refrigeration began to be used between 1880 and 1890. In 1892 Nathan Straus established the first infant milk depot in the United States. He offered sterilized milk for sale at five cents a quart or one cent a glass. The glass milk bottle was invented by Hervey D. Thatcher in 1880.



One of the most common varieties of daisy has white petals surrounding a yellow center.

DAISY. The “day’s eye,” as the daisy was known in Old English, is like a tiny sun surrounded by white rays. The common field, or oxeye, daisy is a species of *chrysanthemum* native to Europe. Its scientific name is *Chrysanthemum leucanthemum*. Tradition says that it was carried to America in hay brought to feed the horses of General John Burgoyne’s army during the Revolutionary War. The painted daisy (*Chrysanthemum coccineum*) has white, crimson, or lilac flowers. These two daisies are related to pyrethrum, from which an insecticide is made.

The petals of the English daisy (*Bellis perennis*) are white tinged with pink. The black-eyed Susan, also known as the yellow daisy (*Rudbeckia hirta*), is a common wild flower. The striking white Shasta daisy is a hybrid developed by Luther Burbank. (See also *Chrysanthemum*.) Michaelmas daisies are species of asters. All daisies are members of the family of plants called *Compositae*.

DAKAR, Senegal. The capital of Senegal and one of the chief seaports on the West African coast, Dakar is near Africa’s most westerly point and is one of tropical Africa’s leading industrial and service centers. Its industries include peanut oil, fish canning, flour milling, brewing, truck assembly, and petroleum refining. The city’s business activities are international in their range. Peanut cultivation was stimulated in Dakar in 1885 with the opening of West Africa’s first railway, which ran from Saint-Louis to Dakar. Peanuts were grown near the railroad’s right-of-way. Peanut oil refining became an important industry during World War II because of local and North African needs for vegetable oil, a product that had previously been refined mostly in France.

There are sea and history museums on the islet of Gorée, near Dakar Point, and archaeology and ethnography museums in Dakar. There is also a vil-



The mosaic-covered library building at Dakar University is one of the newer buildings in Dakar.

lage of working craftsmen. The only park and zoo are in Hann. Along a road cut into the cliff around Cape Manuel there are excellent views of the harbor and islands. Dakar has some good beaches.

Since World War II Dakar has undergone much urban expansion. The city has several contrasting districts. In the southern district are public buildings, hospitals, the Pasteur Institute, and embassies. The business district is to the north and is focused on the central Place de l’Indépendance. North and east are the port, the naval arsenal, the fishing harbor, and facilities for shipping peanuts. Industry, markets, and sports stadiums were built in the central business district and its northwestern fringes after 1939. Yoff Airport is north of the city and is an important stopping point for flights between Europe and South America.

European settlement of the area began in 1617 when the Dutch occupied Gorée. The French captured the islet in 1677 but did not occupy the mainland until 1857. In 1866 French steamships began to call there to take on coal. In 1904 Dakar replaced Saint-Louis as the federal capital of French West Africa. During World War I the port grew in importance and volume of trade, and by the 1930s Dakar had replaced Rufisque, to the east, as a peanut-shipping port. Population (1979 estimate), 978,553.

DALEY, Richard J. (1902–76). As the mayor of Chicago from 1955 until his death in 1976 and as chairman of Chicago’s Cook County Democratic Central Committee from 1953 to 1976, Richard Joseph Daley was one of the most powerful politicians in the United States. He easily won re-election to office in five successive campaigns from 1959 to 1975, and during his mayoralty Chicago was the scene of an unprecedented building boom, improvement in city services, and urban renewal programs.

Daley was born in the Bridgeport area of Chicago on May 15, 1902. He was graduated from De La Salle Institute in 1918 and worked in the stockyards for several years before studying law. While studying, he worked as a clerk in the Cook County Controller’s