10

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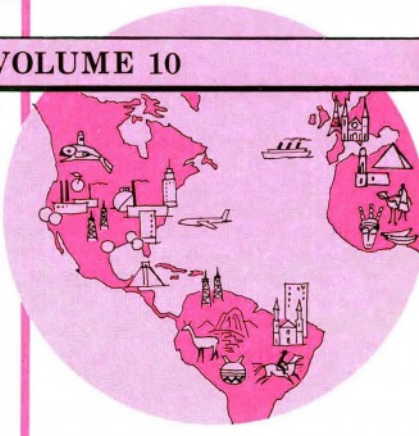
"Let knowledge grow from more to more and thus be human life enriched"

HERE AND THERE IN VOLUME 10

AT ODD TIMES when you are just looking for "something interesting to read," without any special plan in mind, this list will help you. With this as a guide, you may visit faraway countries, watch people at their work and play, meet famous persons of ancient and modern times, review history's most brilliant incidents, explore the marvels of nature and science, play games—in short, find whatever suits your fancy of the moment. This list is not intended to serve as a table of contents, an index, or a study guide. For these purposes consult the Fact-Index and the Reference-Outlines.



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FLOTSAM, JETSAM, AND LAGAN. Cargo that is found in the sea is either flotsam, jetsam, or lagan. Goods floating on the water which come from a shipwrecked vessel are flotsam. Jetsam consists of goods thrown overboard to lighten a ship in distress which sink and remain under the water. Lagan is cargo thrown overboard and sunk but marked with a buoy so that the owner can find it when he returns.

No matter how long flotsam, jetsam, or lagan remains in the water it belongs, by maritime law, to the original owner. The finder may hold it for salvage; that is, the owner is entitled to claim it if he pays a proper reward to the finder. If the owner does not claim his goods within a reasonable time, they then belong to the finder. In England, however, such cargo belongs to the crown if it is not claimed within a year and a day.

Flotsam, jetsam, or lagan which comes ashore is called wreck. In the United States, wreck belongs to the owner of the shore unless the original owner claims it. In England, however, such wreck belongs to the crown.

With the invention of the airplane in the 20th century, the question arose as to whether nonmaritime property found in peril at sea would be a proper object of salvage. The answer was given in the United States by judicial decision and in England by statute that salvage can be claimed for aircraft rescue on navigable waters. In fact, the tendency in the United States has been to award salvage with respect to any kind of property found afloat—even money recovered from a body.

FLOUNDER. About 500 food fishes of the flatfish group are flounders. Most of the fish that is sold in the United States as "fillet of sole" is usually flounder. The true English sole is not found in American waters.

The summer flounder, or plaice (*Paralichthys dentatus*), is found along the Atlantic coast from Maine to South Carolina. It is most abundant in shallow sandy bottoms around Long Island. The usual length is 15 to 20 inches.

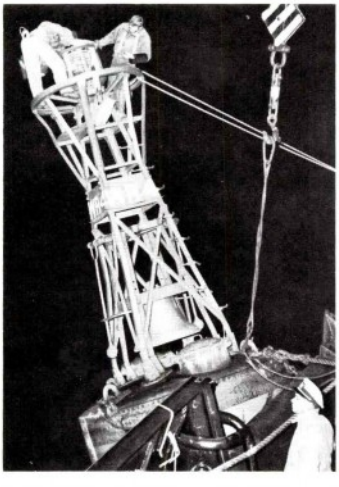
The winter flounder (*Pseudopleuronectes americanus*) is found on sandy and muddy bottoms from Chesapeake Bay to Labrador. This fish rarely reaches a length of 15 inches and seldom weighs more than one and a half pounds.

Other East coast flounders are the dab, gray sole, yellowtail, and lemon sole. The common Pacific coast species are the petrale sole, starry flounder, and rex sole.

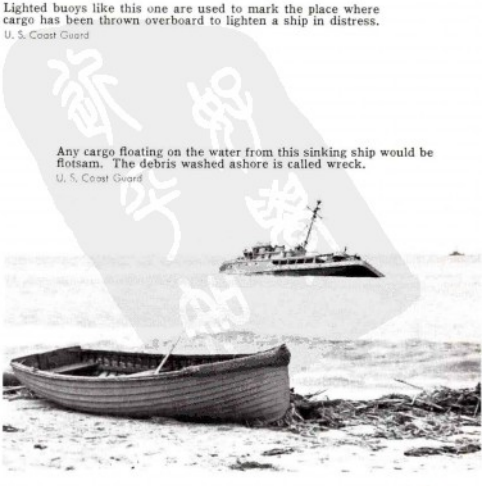
The Flounder's Traveling Eye

As is true of other flatfish, one of the flounder's eyes travels to the other side of its head as the fish develops (*see* Flatfish). When the fish is full grown, both of the winter flounder's eyes are on its right side. The summer flounder's eyes, however, are on its left side. A fish with eyes on the right is called a dextral fish. One with eyes on the left is known as a sinistral fish.

The flounder is one of the most important and popular food fishes. In the United States alone the annual catch of flounder averages 122½ million pounds. (*See also* Fish.)



Lighted buoys like this one are used to mark the place where cargo has been thrown overboard to lighten a ship in distress.
U. S. Coast Guard



Any cargo floating on the water from this sinking ship would be flotsam. The debris washed ashore is called wreck.
U. S. Coast Guard

Pillsbury Mills, Inc.

This modern flour mill is at Springfield, Ill. The concrete cylinders are grain elevators. The wheat is stored in them until it is needed for grinding into flour.

FLOUR— How It Is Made from Grain

FLOUR AND FLOUR MILLING. Bread is one of man's most important foods. Grain from the fields must be changed into flour before bread can be made from it. The process of grinding the kernels into flour and separating the fine flour from the coarser portions is called *milling*.

The word "flour" ordinarily means wheat flour. Other flours are named for the cereals from which they are made, such as "rice flour" and "rye flour."

Wheat flour contains *gluten*. This is a substance which does not occur to the same extent in other cereal grains. Gluten makes dough elastic so that it will retain the bubbles of gas which are formed by yeast or baking powder and thus rise and become light.

How Flour Comes from Wheat Grains

A kernel of ripe wheat is a hard, oblong little berry with a crease down one side. On the outside of the berry is a brownish husk called *bran*. This consists of layers of woody fiber. Within this husk lies the central part of the wheat kernel, called the *endosperm*. It is composed chiefly of gluten and starch. Only this part of the wheat kernel is used for making white flour. In one end of the kernel is the wheat heart, or *germ*. If the grain were planted this would sprout to produce the new plant. In milling, the bran and most of the germ must be removed from the starchy white kernel in order to obtain the fine white flour, with superior baking qualities, that most people prefer.

One hundred pounds of wheat will usually give about 70 to 75 pounds of flour. The amount varies, depending upon the percentage of flour-forming material in the grain and upon the ability of the milling machines to separate it from the bran and seed germs. About 13 ounces of flour are needed to make a one-pound loaf of bread. (*See also* Wheat.)

Enriched Flour

When the bran and germ are removed to make white flour, an excellent source of iron and of the vitamins thiamine, riboflavin, and nicotinic acid is lost. By 1941 there was evidence that the diets of many families were inadequate. In that year government standards were established and the milling and baking industries began to enrich their products by adding certain amounts of the missing substances.

In 1943 War Food Order No. 1 made enrichment mandatory. When the order was withdrawn in 1946, 19 states had enacted laws requiring enrichment. Now more than half of the states and Puerto Rico have passed laws requiring enrichment. In other states most bakers enrich their bread voluntarily. Almost all family flour sold in grocery stores is enriched.

About 85 per cent of all white bread and rolls produced by commercial bakeries are also enriched.

Classes of Flour

White flour may be divided into five classes, depending upon the type of wheat from which the flour is milled and the use that is made of it. They are bread flour; pastry flour; family, or all-purpose, flour; durum flour; and cake flour. Bread flour is used in rolls, Vienna bread, and the wrapped white bread sold in markets. Cookies, piecrust, crackers, and biscuits are made from pastry flour. Family flour is used in home baking. Spaghetti, noodles, and macaroni are made from durum flour. Cake flour is the most finely ground of all. It comes from soft wheat and makes the lightest cakes.

Bread flours are made from hard wheat that contains at least 11.5 per cent protein. Macaroni flours, from durum wheat, are even higher in protein. Pastry flours are made from soft wheat containing 10 per cent or less protein. Cake flours have the lowest protein content.

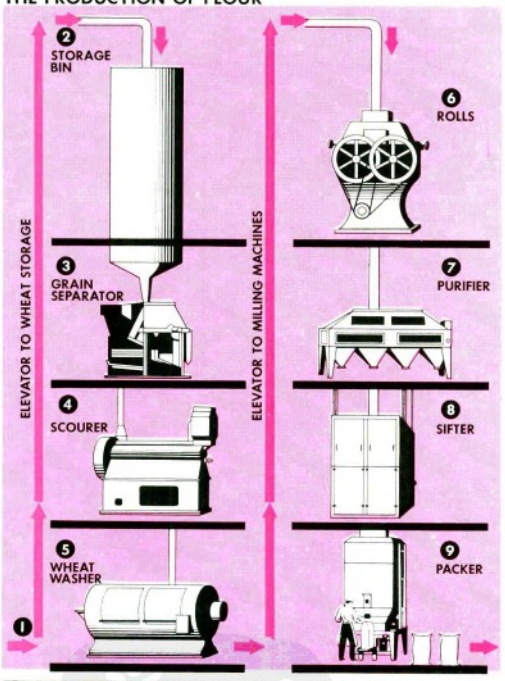
Before grain is milled a chemist takes samples of various kinds of wheat. He analyzes and classifies them. He then blends the wheats so that the flour milled from the combination will be best for the purpose for which it is to be sold.

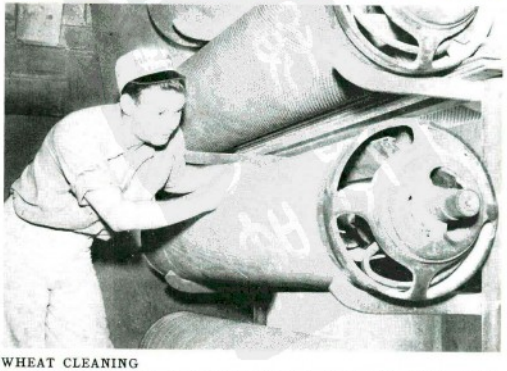
The Process of Milling

Flour mills are usually eight or nine stories high. They are arranged so that the first part of the process is done on the top floor and the next on the floor just beneath. In this way gravity can be used to convey the grain from one machine to another.

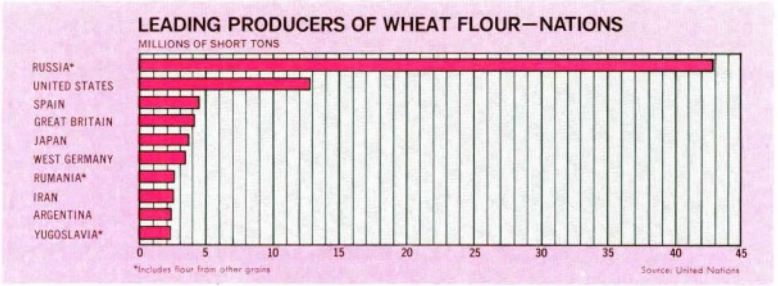
When the grain first comes to the mill it may contain dirt, particles of straw, and other seeds. These must all be removed before the grinding begins. This is done by sifting and shaking the grain and fanning it with strong currents of air. A special machine equipped with magnets removes cockleburs.

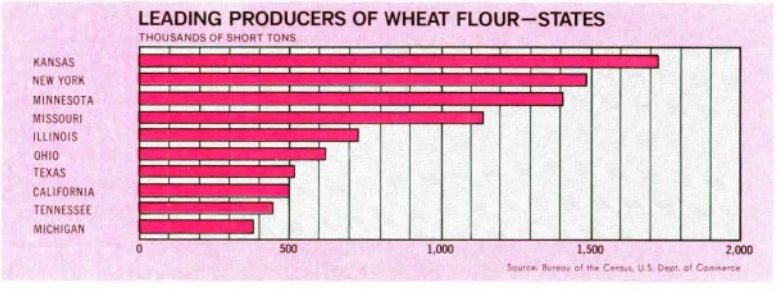
The wheat is then scoured bright and clean in great revolving cylinders. Next, the kernels are moistened with water or with steam to toughen the coats of bran so that





WHEAT CLEANING
All wheat must pass through separator screens like these as well as other scouring and cleaning machines before going to the mill to be made into flour.





GRINDING WHEAT
The stock goes through a series of pulverizing machines like this. Each roll grinds the stock a little finer than the one before. After grinding, the stock is sifted.

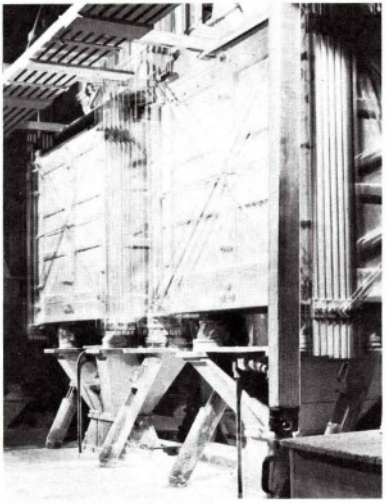
when the kernels are crushed these coats may be more easily separated from the flour. This process is called *tempering*.

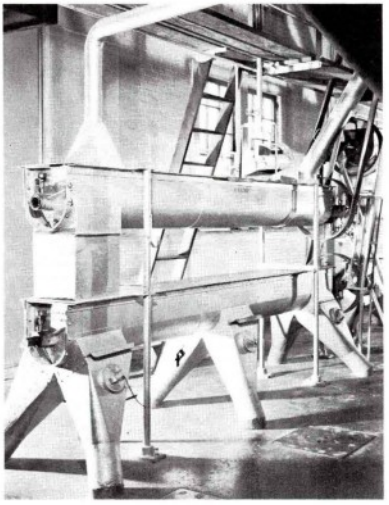
After the grain is tempered, it passes into what are known as the first break rolls. These rolls have rough corrugations which break the grains into coarse pieces called *stock*.

The stock then passes through a series of pulverizing rolls. Each grinds the stock a little finer than the one before.

After each grinding some of the floury portion is extracted. This is done by sifting, or bolting, the stock, separating the broken particles into three groups: fine particles, which are flour; coarse particles, called *sizings;* and particles that are neither fine nor coarse, which are called *middlings*. The giant sifters, or bolters, are equipped with layers of vibrating screens through which the flour passes. These bolting screens are made of silk, woven with 110 to 130 threads to the inch.

The sizings which are sifted out by the bolters are reground between smooth rollers. The middlings go to large purifiers where strong air currents and agitation remove much of the bran. The machine performing this task is called a middlings purifier. The process of sifting and grinding is repeated over and over until all the wheat has been reduced to flour or to its by-products.





SIFTING AND TEMPERING

The vibrating machines at the left are sifters, or bolters. They contain silk sieves stacked on top of each other. Before sifting, the grains have been tempered in machines such as the one at the right to moisten the bran coats for easy separation.

Bleaching of Flour

Most flour has a yellowish tinge which gradually disappears if it is stored and occasionally turned to expose it to the air. A great deal of storage space would be needed to mature flour in warehouses. Chemistry has made maturing in storage unnecessary. By treating flour with a harmless bleaching agent the yellow color is removed.

In the final milling process a machine feeds the flour into containers. It is then ready to go to the bakery or the grocery store or to be shipped abroad. Although only 30 minutes may have elapsed from the time the wheat reached the mill until it is ready for shipment as flour, it may have gone through as many as 175 siftings and separations.

History of Milling

As early as the Old Stone Age, people made a coarse flour by pounding the grain. The mill used by these primitive people was simply a hollow in a rock where grain was pounded with a smaller, rounded stone. The resulting bits of grain were mixed with water, patted into shape, and baked on a hot stone.

A great improvement in hand mills came when grinding was substituted for pounding. Grinding was done in a saddlestone mill, so called because the lower stone looked like a saddle. The millers of ancient Babylon and Egypt used the saddlestone type of mill. Early American Indians also used this primitive method for milling their grain.

In the 3d century B.C. a revolving mill called a *quern* was developed. This was made of two disks of stone, one on top of the other. The grain was fed through a hole in the center of the upper stone. The upper stone was rotated on the lower one by means of a handle, grinding the grain. At first the revolving stone was pushed by slaves. Later, oxen turned it. In some parts of the world such primitive equipment is still used.

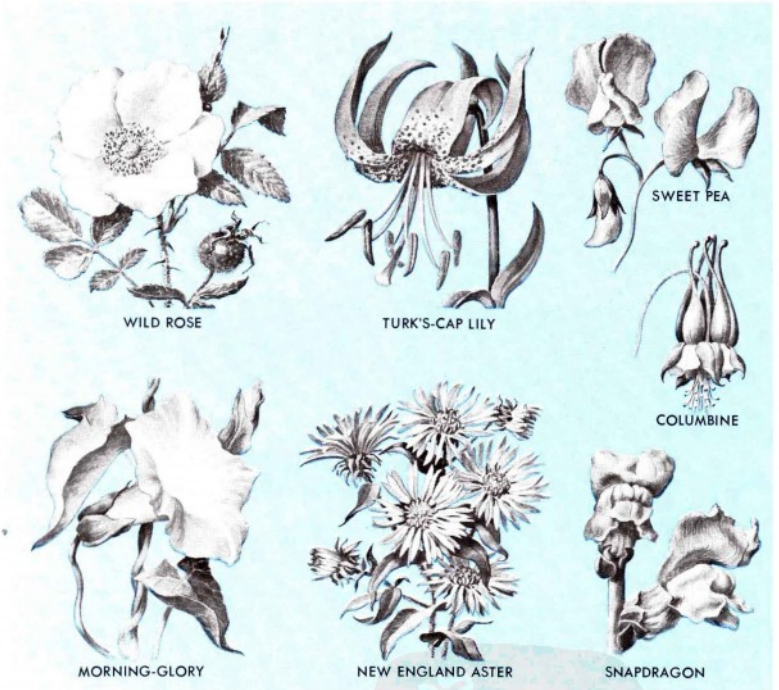
Early Milling in America

Early in the history of the American Colonies wheat growing became an important industry. Grist mills soon were scattered throughout the country. The first power mill to grind wheat in America was built in New Towne (now Cambridge), Mass., in 1632. In 1786 James Watt built the first flour mill run by steam.

The *roller process* by which nearly all grain is ground today was brought to the United States from Hungary in 1870 and patented. Hence the flour produced by this method was called patent flour. (*See also* Bread and Baking.)

THIS ARTICLE IS IN THE FACT-INDEX

Flour beetle



Petals have many forms. The wild rose is simple. The Turk's-cap lily is backward-curved. The sweet pea is butterfly-shaped. The morning-glory is funnel-shaped. The aster is a composite. The columbine is hollow-spurred. The snapdragon is lip-shaped.

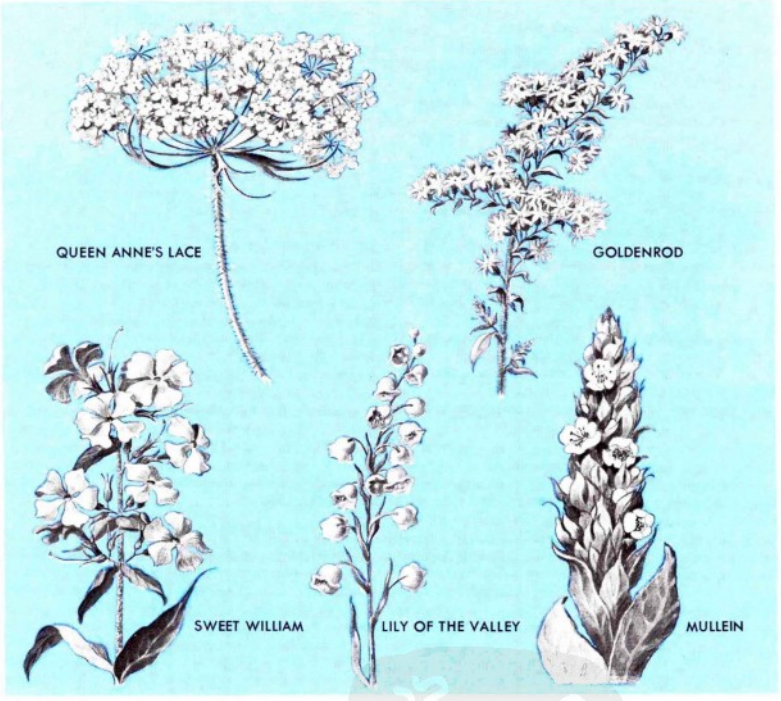
FLOWER—The Plant's Seed Maker

FLOWER. Most plants pass on life to future plant generations by seeds. It is the work of a flower to make seed. All its beauty serves this one purpose. Color and perfume attract insects and hummingbirds to aid in the flower's pollination. Some flowers are so formed that they admit certain insects and no others. The chief seed-making parts are the stamens, pistil, and ovary. Many interesting flower shapes have developed which protect these parts.

The Chief Parts of a Flower

A flower's beauty and perfection of form may be enjoyed more fully if one understands its structure and how each part helps in the work of seed making. A typical flower has four sets of organs. From the outside to the center, they are: *sepals*, *petals*, *stamens*, and *pistils*. The leaflike sepals make up the *calyx*, or "cup." The petals form the *corolla*, or "little crown." The calyx and the corolla together form the *perianth*. When present, the *bract* is a small leaf below the flower. *Awns* are stiff bristles which terminate some flower parts.

The flower rises from the *axil* of the bract; that is, the angle between the bract and the stem. Bracts are sometimes the most conspicuous feature of a flower and may be mistaken for petals. This is true of dogwood, poinsettia, and Indian paintbrush. Sometimes one great bract forms a hood, called a *spathe*, as in the jack-in-the-pulpit, the calla lilly, and the skunk cabbage. The top of the stem, to which the parts are attached, is the *receptacle*. The stem is also called a *pedicel*.



DIFFERENT KINDS OF FLOWER CLUSTERS

The arrangement of the flower heads on the stem is called the *inflorescence* of the flower. Queen Anne's lace is an *umbel*, or umbrella-shaped cluster. The top of the main stem branches into many small stems called *pedicels*, all of equal length and ending in a flower. Goldenrod is a *panicle*. Each of many branching pedicels ends in a flower. Sweet William is a *cyme*. The main stem, as well as the pedicels, is topped by a flower. Lily of the valley is a *raceme*. The main stem bears flowers on pedicels in succession toward the top. Mullein grows in a *spike*. The flowers are attached directly to the stem without pedicels.

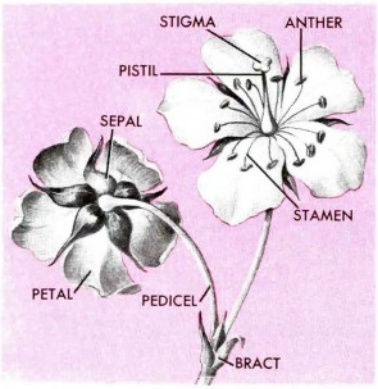
Sepals and Petals

The sepals are the lower, or outermost, part of the flower. They fold over the tender, closed bud and protect it from cold and other injuries while it is developing. Usually sepals are green. In many flowers, however, they are as colorful as the petals and increase the flower's attractiveness to insects. Tulips, irises, and the yellow pond lily, or spatterdock, are examples.

The petals attract insects and hummingbirds to help in the work of pollination. By their fragrance and color they advertise their sweets—the nectar in the heart of the flower. This is the reward the flower offers its helpers. Glands at the base of the petals secrete nectar. Oil in the petals gives the flower its perfume (*see* Perfumes).

Many flowers have petals of the same size and shape arranged in a circle. They are said to be *regular*. The wild rose is typical. The petals of the morning-glory and petunia are joined, forming a funnel-shaped corolla. Each portion is regular in shape, but the petals are united. Such flowers are *sympetalous*. Pictures in this article show several common types of *irregular* flowers. Many irregular flowers are pollinated only by a certain kind of insect. The snapdragon can be sprung open only by the heavy bumblebee (for picture in color, *see* Bee).

The simplest flowers have no sepals or petals at all. The small flowers of grasses consist commonly of three stamens surrounding a single pistil (*see* Grasses). They are said to be *naked*. Some flowers are *apetalous;* that is they have no petals.



THE PRINCIPAL PARTS OF A FLOWER
Every flower part serves some purpose in the making of seeds. The colorful, fragrant petals attract insects for pollination.

Some flowers are tiny but grow in showy clusters. In the largest family of flowering plants, called *Compositae*, tiny florets are set so closely together in a solid head on a *receptacle* that one mistakes them for a single flower. A dandelion is a composite. In other composite flowers, such as the daisy and sunflower, perfect seed-producing flowers are found only in the center. The rim is made up of "ray" flowers (*see* Sunflower). Garden flowers in this group are the aster, zinnia, dahlia, chrysanthemum, and marigold. The family includes many weeds, such as ragweeds and thistles.

Stamens and Pistils

Inside the ring of petals are the *stamens*. Each stamen has a stem, which is called the *filament*. At the top of the filament is the *anther*. The pollen grains form in sacs, usually two in number, inside the anther.

Finally, inside the ring of stamens is the *pistil*. It is shaped like a vase, with a neck and oval base. The neck is known as the *style*. On top of the style is a *stigma*, which has a sticky surface. Its purpose is to catch and hold the pollen. The base of the pistil is the seedcase, called the *ovary*. Inside the ovary are one or more eggs, the *ovules*, which become the embryo plant. Some flowers—the lotus, buttercup, the strawberry, for example—have many pistils. The pistils may be separate from one another or they may be closely united. A simple pistil, or one of the segments of a compound pistil, is called a *carpel*.

A DANDELION AND ITS FLOWERS
A dandelion blossom is really a bouquet of many flowers. Such a bouquet is a *composite*. From left to right are a dandelion head in bloom, an individual flower, and a head "gone to seed."

How Flowers Are Attached to the Base

The parts of a flower are attached to the receptacle, or base, in three different ways. If they are attached at the base of the ovary, the flower is *hypogynous*, meaning "growing on the lower side of the ovary." The tiger lily is an example of this type. In the second form the receptacle is cup-shaped and encloses the ovary. The sepals, petals, and stamens are attached to the rim, surrounding the pistil but free from it. The flower is said to be *perigynous*, meaning "around the ovary." The cherry blossom is perigynous. In a third type the ovary grows fast to the receptacle, and the parts grow from its top. The flower is *epigynous*, meaning "growing upon the ovary." An example is the apple blossom.

How Fertilization Takes Place

When ripe pollen from an anther of the same kind of flower catches on the stigma, each pollen grain sends out a tiny threadlike tube. The tube grows down through the style and pierces one of the ovules in the ovary. This process is called *fertilization*. Each ovule must receive the contents of the pollen tube before it can develop into a seed. It usually takes the tube from two to five days to reach the ovule, but the time may vary from a few hours to six months.

Insects Pollinate Flowers

A seed cannot grow until pollen is transferred from the stamen to the pistil. This transfer is called *pollination*. Since flowers cannot go after pollen, they depend upon some carrier to bring it to them. Flowers are pollinated by flies, moths, wasps, bees, and sometimes by hummingbirds. The flowers attract these helpers by their color, fragrance, and nectar. Some flowers open in the evening and invite night-flying insects to their banquet table. Such flowers are usually white or pale yellow, the colors which show best at dusk.

To reach the nectar, insects must crawl over the pistils and anthers into the heart of the flower. Their bodies become covered with pollen dust. As they move from flower to flower, they transfer the pollen of one to the stigma of another. Flowers which require the help of insects are called *entomophilous*, meaning "insect-loving." Some flowers can be pollinated only by a single kind of insect. The fig, yucca, and red clover are examples (*see* Clover; Fig; Yucca).

Certain flowers depend upon the wind to bring pollen to them. They are called *anemophilous*, or "wind-loving." Most trees, the grasses, sedges, and many other plants depend upon wind pollination. Wind-pollinated flowers have no sepals or petals, for the wind has no need for nectar and fragrance. They are dull in color. They produce enormous quantities of pollen. The wind scatters pollen indiscriminately, so that only a small percentage falls on the stigmas of the same kind of flower.

Avoiding Self-Pollination

A few kinds of flowers are self-pollinating; that is, they can be fertilized with their own pollen. In most cases, however, nature takes great care to prevent self-pollination. Cross-pollination usually produces more vigorous plants. This requires the transfer of pollen from one plant to the stigma of another plant of the same species.

Flowers avoid self-pollination in several ways. In some cases the stamens and pistils mature at different times. In other flowers the stamens are shorter than the pistils and hence do not deposit pollen on their own stigma. Wind-pollinated flowers usually bear the stamens and pistils in separate flowers. Alders, birches, walnuts, and hickories bear catkins with pistillate flowers on some branches and catkins with staminate flowers on other branches. Corn has the pistils and stamens on different parts of the same plant (*see* Corn). The tassel bears the staminate flowers; the ear bears the pistillate flowers. These are known as *monoecious* ("of the same household") plants. A few trees, such as cottonwoods and willows, carry the separation even further, with the staminate flowers on one tree and the pistillate on another. These are known as *dioecious* ("of two households") plants.

How Fruit Develops

After fertilization of the ovule has taken place the petals, sepals, stamens, and usually the upper part of the pistil fall off. Now, as the ovules grow into seeds (embryo plants), the ovary, or seedcase, also changes. In some plants it turns into a fleshy covering, called *fruit*. The ovary wall separates into two layers. The inner layer becomes a hard shell, called a stone, or pit, which encloses the seed. The outer layer forms the pulpy portion of the fruit. The peach, plum, cherry, and apricot are examples of such fruits.

In the case of berries the entire ovary becomes a fleshy mass in which the seeds are embedded. In the apple, pear, and quince, the ovary and its seeds become the core of the fruit. The pulpy part, which is eaten, is the modified calyx.

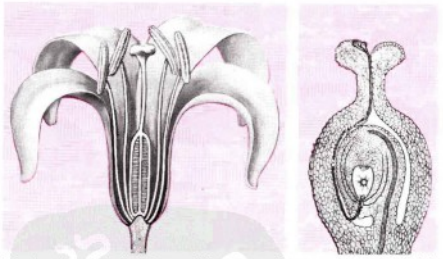
The ovaries of many plants develop into so-called dry fruits—capsules, pods, nuts, and acorns. Like the fruits and berries, they protect the seeds and help scatter them when they are mature (*see* Seeds). Another kind of dry fruit is the *achene* (also spelled *akene*). In this case the ovary wall becomes a coating of the single seed. It does not open at maturity, as the pods and capsules do, to release the seed. Achenes are developed by flowers which produce but one ovule, such as the individual flowers of the composites. The style of the pistil sometimes remains attached to the achene as a long, feathery tail which carries the seed away on the wind (*see* the picture of the dandelion in this article).

The Origin of Flowers

At least 250,000 species of flowering plants are known. All of them descend from a primitive ancestor

HOW FERTILIZATION TAKES PLACE

The lily has three petals, three sepals (which look like petals and are the same color), six stamens, and an ovary in three parts.



The drawing at the left shows a lily cut open down one side. At the right is the vase-shaped pistil, cut open and shown under a microscope. The sticky stigma at the top has caught a pollen grain. The grain has sent a tube down through the neck of the vase (the style), into the ovary, and then upward into the center mass, called the ovule. The male cell, carried by the tube from the pollen grain, joins the female cell in the ovule. Now the egg is fertilized and will become a seed.

FLOWERS OF THE BEECH TREE
Many tree flowers have stamens and pistils but no sepals or petals. Their pollen is scattered by the wind.

which no longer exists. The most primitive modern flowers are the members of the buttercup order, *Ranales*. A step higher is the rose order, *Rosales*.

The simplest flowers are the least skillful in making seed. Many stamens mean a great deal of pollen is wasted. A large number of pistils means that many will fail to become pollinated and produce seed. All members of the buttercup order, which includes the little buttercup itself and the splendid magnolia and water lilies, and all the roses have many pistils and stamens. The most highly specialized and most successful flowers are the composites.

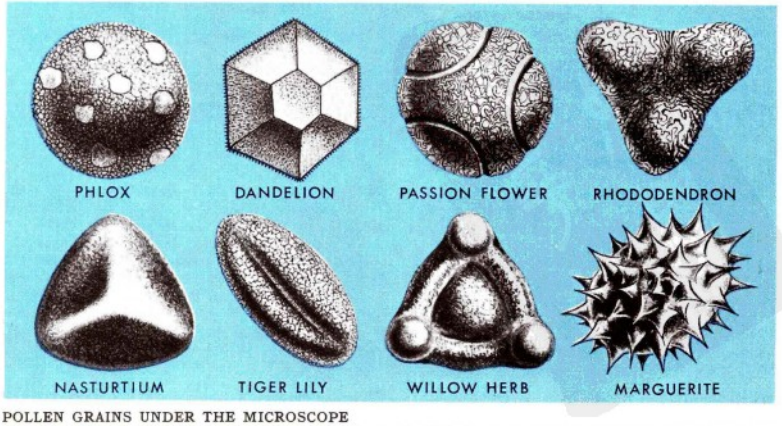
Two Kinds of Flowering Plants

Flowering plants belong to the phylum *Tracheophyta*, or vascular plants (*see also* Botany Reference-Outline, section "Classification of Plants"). Throughout this article thus far the flowers and seed making of only one group of this phylum, the *angiosperms*, have been described. These are flowers which enclose their seeds in an ovary.

Another group of flowering plants, called *gymnosperms*, has naked, or exposed, seeds. These plants include the conifers, or cone-bearing trees, such as the pine, fir, spruce, cypress, and cedar (*see* Trees). Cones take the place of flowers.

Cones are of two kinds—staminate and pistillate. They are usually borne on different branches of the same tree. The staminate, pollen-producing cones are small and last only a few weeks in the spring of the year. The pistillate cones are the large familiar ones. The ovules, usually two in number, are located on the upper surface of each scale. The ovule consists of an embryo sac surrounded by a covering which later becomes the seed coat. In the covering is a tiny opening called the *micropyle* (little gate).

In late spring the pistillate cones stand upright with the scales opened wide to catch the wind-blown pollen. When pollen lodges between the scales they close. Thus protected within the closed cone, the pollen sends out a pollen tube which enters the ovule through the micropyle. When the seeds in the cone are fully grown, it again opens, releasing the matured seed. All gymnosperms are wind-pollinated. (*See also* Flowers, Garden; Flowers, Wild.)



POLLEN GRAINS UNDER THE MICROSCOPE
The pollen grain of each flower has a shape quite different from the pollen of any other flower. Some botanists believe that the distinctive shape explains why the grain can adhere to and pollinate the stigma of its own kind of flower and no other.

GARDEN FLOWERS— Creations of the Plant Breeder

A new rose is being created. The plant breeder is dusting pollen from one kind of rose onto the stigma of another kind to bring about fertilization.

FLOWERS, GARDEN. All the familiar garden flowers of today have been developed from wild flowers. They were chosen for cultivation because of their beauty. By careful selection and cross-pollination of the finest plants, their blooms have been made even more beautiful. Some of them now bear little resemblance to their wild ancestors.

About 10,000 species of plants are cultivated for their ornamental flowers alone. Almost all the countries of the world have contributed to the modern garden. The hollyhock has come from China. It still escapes from gardens and grows wild along railroad embankments and other sunny places where it is undisturbed. Japan is the home of the wistaria and chrysanthemum.

The wild tulip blooms from the Mediterranean eastward into Asia. Turkish gardeners were the first to collect fine specimens and develop the garden tulip. The crocus grows wild in the Alpine meadows of Switzerland, and the foxglove is abundant in English fields. Tropical Africa is the origin of many well-loved flowers. Among them are the gladiolus, geranium, and African violet.

The Oriental poppy grows wild in Iran. The strawflower, bottle brush, and crape myrtle have come from Australia. South America is the home of the petunia, fuchsia, verbena, scarlet sage, spiderflower, nasturtium, and canna. Mexico has contributed the zinnia, marigold, dahlia, and poinsettia.

Flowers First Raised for Food

Flowers were first cultivated for food. In prehistoric Mexico people ate the starchy roots of dahlias. The rootstalks and the nutlike seeds of the East Indian lotus are still eaten by the Chinese.

Pot marigold grows wild in central Europe. It was grown in gardens originally as a "pot herb" to season meats and "sallets" (salads). Medieval cookbooks contain quaint recipes for "a sirrup of violets" that was poured over puddings and cakes; for a "tarte of marigoldes, prymroses, or couslips"; for "ices of violets, jessamines, and orange flowers"; and for "rose pie." In Elizabethan England violets were eaten raw with onions and lettuce or mixed in broth. Hibiscus buds were used in soups and curries.

Flowers Grown for Medicinal Uses

Many flowers were cultivated for their medicinal properties. The foxglove is the source of digitalis, a heart stimulant. From the aconite, or monkshood, was derived a potent drug and poison. A purgative was made from the Christmas rose. Camomile blossoms were boiled as a medicinal tea.

The common garden pyrethrum is a species of chrysanthemum from whose dried flower heads is made an insecticide. People once made a cleansing lather from soapwort. Roman women cleansed their skin with lily sap, a fact that may explain why the lily is considered a symbol of purity. Sweet scabious was so named because it supposedly cured scabies, a skin disease. Orrisroot, the rootstock of a kind of iris, was used as a perfume. Many other flowers were used in sweet-smelling toilet waters and powders.

The Earliest Gardeners

Flowers were raised for their beauty alone in ancient China, Egypt, Sumer, Babylonia, and Assyria. The Elamite city of Susa had fine gardens hundreds of years before the Christian Era. Under the Persians, who made the city the capital of their empire, it be-