

ORNAMENTAL TREES

By CHARLES W. BARR

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VALUE AND SELECTION OF A TREE¹

When one wishes to create beautiful scenes and pictures outdoors, the tree is indispensable. It furnishes the height that is necessary to relieve the flatness and bare appearance of the lawn or house; it can subtly lead the eye toward an interesting view, or stop the line of vision to give a nearby object of importance more attention; it may act as a background for an architectural structure or statue, or it may be used only for its aesthetic beauty of form and shadow.

A home, a park, a lake, or even a road is not inviting when there are no surrounding trees. Shrub masses and the brightly colored perennials create interest and beauty for the person strolling over the lawn or in the garden; but trees are necessary for the distant effects, because of their pleasing shade with its accompanying shadow, and for their interesting break upon the skyline. It is this vertical element that gives all pictures depth and relief from monotony.

All trees that are given the same horticultural name tend to assume a typical form, the same shaped leaf, the same flower and fruit. It is this standardizing of appearance that enables the garden designer to plan a definite picture by using selected trees. That is why the natural form is the best and most worthy of study. However, just as individuals of the same family differ in details but maintain a general resemblance, trees will vary according to the struggle they have had with the elements and with surrounding trees. Age, lack of food, shade, wind, and many similar factors play an important part in forming the

physical appearance of a tree. That is why a tree must be properly cared for if its full beauty is to be available for the garden. A gnarled wind-swept tree on the timberline is interesting to the artist because of its picturesqueness, but upon a well-kept lawn, or in a park, it is an oddity, an outcast, while a perfect specimen of the same species is admired and coveted as an important unit of the picture.

Everyone can go into the park, nursery, or arboretum and choose trees which appeal to him and say, "I want one of those on my lawn". To choose the proper tree for the particular location, however, requires knowledge as to how high a tree will grow, its soil requirements, ability to withstand exposure, and related factors. An imperfect knowledge of the trees planted may result in as poor a picture as the gnarled tree on the park lawn. In general, the following rules may be used as a guide, although particular problems may require special treatment: First, the important trees on a large lawn, or adjacent to a large building, should be tall, large-limbed, and heavily foliated types; second, the small private area should have small trees that will give a pleasing floral picture, or a fine foliage background for the other flowering plants; third, the brightly colored trees should be used sparingly and only as special accents; fourth, if there is room for only one tree, it should not be one with colored foliage, but a well-shaped tree with good green foliage.

PROPER PLACEMENT OF TREES IN THE SMALL GARDEN

Small flowering trees should have a place in the outdoor living room, whether formal or informal. They add height to the planting and furnish a delightful floral display that is impossible to obtain from shrubs

Nomenclature—"The naming of plants under rules of nomenclature is an effort to tell the truth. Its purpose is not to serve the convenience of those who sell plants or write labels or edit books; it is not commercial. Serving the truth it thereby serves everybody. In the end, nomenclature rests on the plants rather than on printed regulations."

—Liberty Hyde Bailey

Nomenclature means the naming of things under a system and, in this case, refers to the classification of trees by their botanical names. The many common names given to plants of all kinds are of local value only, as they do not identify the plant by a recognized system. For example, soft maple refers to several species of maple, huckleberry may mean several species of *Gaylussacia*, and shad-bush does not identify any particular tree, only a group.

In contrast to the common names are the botanical names, or binomials. They, immediately, place the tree within a certain group and at the same time separate it from all the other members. Furthermore, the botanical names can be used as identification tags for those plants all over the world. However, there is also confusion among the botanical names.

A basic principle in the naming of plants is priority of publication. As a starting

alone. In addition, their foliage is usually good, yet open enough to permit plants beneath them to receive some sunlight. Such trees as the Flowering crab, Flowering peach, and American redbud make glorious pictures in the corners of the outdoor living room, or as settings for a garden seat. They may also be placed near the entrance, or used as specimens if they are not located in the center of the lawn area. In such places, they break up the lawn unit and lose the careless informality which they assume when placed nearer the edge of the lawn in association with the border plantings.

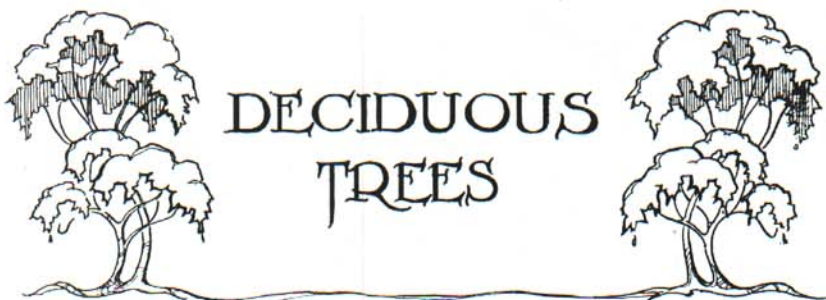
No matter how large or how small the grounds, a specimen tree must appear to be associated with some other object or planting. This does not mean that the branches should touch another planting or some architectural structure, but whenever a person looks at the tree, no matter from what direction, his eyes should see a part, or all of some other near-by vertical object at the same time. By such an association, a tree will not lose its individualism altogether but will appear as a distinctive unit of the design. A well-designed garden will lead the eye with easy transition from one scene to another, not force the eye to jump from picture to picture as it does in an art gallery. In such a garden, the specimen trees are standing free from adjacent plantings or buildings, but are not so far removed that they appear lost from all other objects.

No tree looks so lonely or forlorn as one in the center of a large open area—whether it is a plowed field or a large lawn. Thus, it is, with possibly one exception, always poor design to plant a specimen tree directly, or nearly, in the center of an area; for there, it has no association with any particular portion of the design and, as a result, appears lost. The exception is when the tree is used as a hub or central feature in a small circular garden. Under such circumstances it is permissible, but not advocated.

point upon which to base priority is used the first edition of Linnaeus' *Species Plantarum*, 1753. Since the system of nomenclature advocated by Linnaeus was not generally accepted until many years later there have been many changes in names necessary as research among the old accounts has progressed. Confusion also arose from the lack of comprehensive and careful rules concerning the naming of new discoveries.

To obtain order out of chaos, a code for nomenclature was adopted by a botanical congress held in Paris in 1867, but it did not please some American botanists. In 1904 a radically different code was accepted in Philadelphia by the Americans which was proposed for general acceptance at the International Botanical congress held in Vienna in 1905 and refused.

Other international meetings were held in 1910 and in 1930 when certain adjustments between these two codes were made. It seems, therefore, that there is a gradual movement toward universal acceptance of one system of names and one code of nomenclature. For that reason, the international rules of botanical nomenclature as given by Alfred Rehder of the Arnold Arboretum are used in this bulletin. For clarity, the names given in *Standardized Plant Names*, published in 1923, by the American joint committee on horticultural nomenclature have also been given in parentheses.



DECIDUOUS TREES

Genus Acer

MAPLES

Approximately 70 different maples, not counting minor varieties, may be used in North America, and they compose one of our most ornamental and valuable groups of trees for landscape planting. They have long been recognized as an important source for timber, but now they are also valued on the home grounds, in parks, and along the roadside for their ornamental qualities.

Maples are easily distinguished from other deciduous trees by their leaves, which have from three to seven lobes, or, as in the case of the Box Elder, are pinnately compound with three to five leaflets (or small leaves, composing each leaf structure). In addition, the maples have the leaves, or buds, placed directly opposite each other, or in pairs, along the twigs. They also have a more refined branching system of slender twigs than the other trees with this same bud arrangement.

The maples range in size from small shrub-like plants to large trees that are among the most imposing found in eastern United States. The highly colored forms, for the most part, came originally from China and Japan, where there are about 30 native species.

Acer ginnala

AMUR MAPLE

One of the most attractive of small shrub-like maples is the Amur maple. It grows as a low-branched graceful tree, 15-20 feet high, and when young the tree has a very graceful, symmetrical shape that is almost columnar.

The chief glory of this tree is its foliage. The leaves are a very dark lustrous green, 2-4 inches long, and have three lobes. The central lobe extends out very prominently, like a finger, with the other two smaller lobes balancing on each side of it. The foliage is dense, attractive and in the autumn turns a brilliant red.

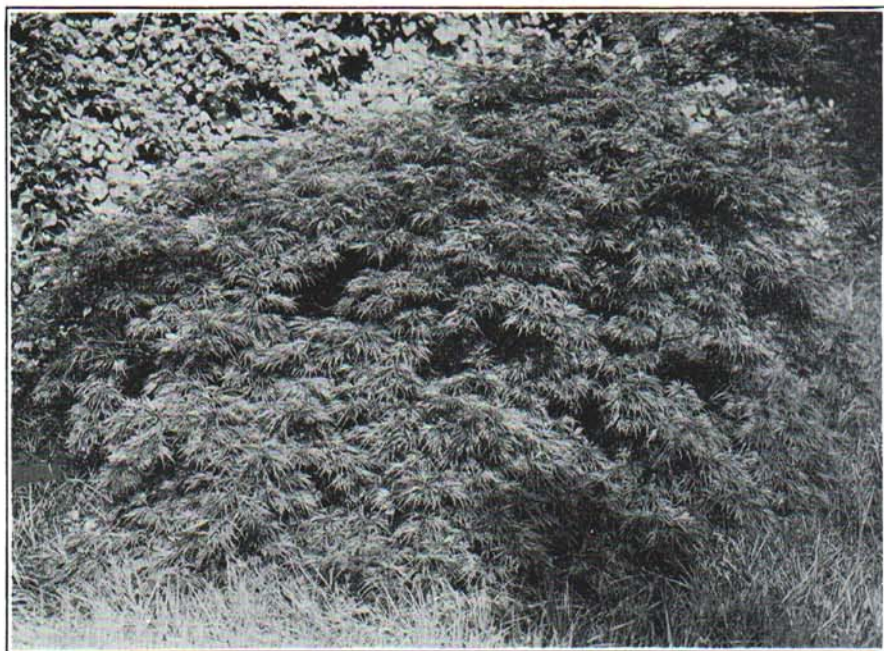
The Amur maple thrives in a well-drained moist soil. It is useful for screen planting and as a taller foliage plant in the shrub border about small home properties. Its bright red autumnal foliage and summer attractiveness make it one of the very best of the small maples to be used on the average home lot. The Amur maple may also be used effectively in masses in city parks.

Acer negundo

BOX ELDER, ASH-LEAVED MAPLE

This native tree received a great amount of favor in the early days of our country's history but has since been replaced by more desirable kinds. It is a medium-sized tree with a short trunk and stout, wide-spreading branches that form a rather open, irregular crown. The leaves differ from the ordinary maples by being composed of three or five leaflets. They do not appear until late in the spring but give a fair degree of shade during the summer. In autumn they assume a muddy yellow color and drop early. At this time the fruits, which hang in large clusters, are readily seen, and they help to give a very untidy appearance to the tree all through the winter months.

The Box Elder is a very adaptable tree, growing in moist, almost wet places as well as in the dry, poor soil found along the city streets. It seems to withstand dust, smoke, drouth and almost all of the natural troubles that would kill any ordinary tree. It is, however, short-lived, extremely dirty in its foliage, seeds, and general appearance; what is worse, it is generally infested with many different kinds of insects. This last reason is chiefly responsible for its bad reputation today, but upon the dry barren places of the Middle West, the Box Elder is very



—Photo, courtesy Arnold Arboretum

Fig. 1. Some Japanese maple varieties have finely cut foliage and make pleasing contrasts in the shrub border.

good for creating some shade and helping to re-establish shelter-belts. Whenever other maples will grow in the proposed location, they are to be preferred over the Box Elder.

Acer palmatum (*A. polymorphum*)

JAPANESE MAPLE

For many centuries, the Japanese people have cultivated and trained these Japanese maples. In fact, many of the Japanese have trees more than 100 years old that have been kept within 2-3 feet in height through a scientific method of starvation and tying of the branches. The trees are, for the most part, small in size and have attractively colored foliage.

There are varieties of this species available which range in color from yellow through salmon to crimson, or in combinations of several colors. They also differ in the way the leaves are cut. The typical form has five lobes, but there are varieties which have seven lobes, others with 11, and a few which are so finely cut that they appear feathery and have no distinct lobes.

All of these trees have well-rounded, openly branched crowns and usually retain their branches close to the ground. The species and green-leaved forms may grow as high as 20 feet, but the colored forms and varieties usually stay below 10 feet in height. They are half-hardy and should be planted only in sheltered but sunny places in the southern part of the state and given a moist, well-drained soil.

The colored forms will give a pleasing spot of color in the foreground of the shrub plants, or when mixed with some of the spreading types of evergreens. Care must be taken, however, not to use too many of the colored varieties as their color is strong and likely to become tiresome.

The most common variety is *Acer palmatum* var. *atropurpureum* (Blood-leaf Japanese maple, Purpleleaf Japanese maple) which has wine-purple foliage. Another good variety is *Acer palmatum* var. *ornatum* (*A. palmatum* var. *atropurpureum dissectum*), which is called in various nursery catalogs Purple Threadleaf Japanese maple and Purple Cutleaf Japanese maple. It has delicate, finely cut, red-purple leaves.

Acer platanoides

NORWAY MAPLE

The Norway maple is one of the most widely planted of all our trees. It is rapid of growth, has a long leafage period, deep roots, and a fine, symmetrical crown. All these features make it a highly desirable ornamental tree for the lawn or along the street. It will grow in almost any kind of soil, if not too wet, but prefers a moist, rich type.

This tree raises a sturdy, round head 60 or more feet in the air and makes an imposing appearance. Its foliage is dense and dark green. The

leaves have from five to seven lobes, are almost as broad as they are long, and in outline resemble very much those of the familiar Sugar maple, but are darker in color and much larger.

In early April, before the leaves unfold, the tree is clothed with many clusters of attractive yellow-green flowers that are very showy for this early season of the year. They last about two weeks.

A horticultural variety of the Norway maple is the Schwedler maple (*Acer platanoides* var. *Schwedleri*). This variety has the same admirable shape and density of foliage, but differs in having red as a dominating color. At the same time, when the red and yellow flowers are dying away, the young leaves appear and are bright red as they unfold. During the summer the leaves assume a green color but keep a noticeable red tinge until late in the season. It is a good tree to plant in parks and as a specimen on large lawn areas. The color is likely to become too obvious if it is planted on a small lawn where there are no other trees to offer a variation.

Acer rubrum

RED MAPLE, SWAMP MAPLE, SCARLET MAPLE

Like the Silver maple, this tree has its branches growing upward and outward in a graceful curve to form a narrow crown that is more open and less regular in outline than that of the Sugar maple. The Red maple will reach the height of 80-120 feet.

The upper branches of the Red maple are yellow-gray and very frequently seem to have the silvery-gray tone of the Silver maple, but the Red maple may be distinguished from the latter during the winter months by its bright red flower buds. These buds are clustered on short side-spurs, in much the same manner as those of the Silver maple, but they are much brighter in color. In addition its young twigs are a lustrous red while those of the Silver maple are more of a brown. The three or five-lobed leaves are 3-4 inches long, and their upper surface is very dark green and lustrous, while the lower surface is greenish-white in color. The foliage is moderately dense, but of good color, and in the latter part of August, long before the other maples begin to lose their summer appearance, it will begin to assume color tones ranging from pure yellow to bright scarlet.

From early April, when the bright scarlet flowers first make their appearance, to autumn when the scarlet leaves have fallen, this tree is beautiful and rightly deserves a great amount of praise. It is usually found growing on the borders of streams and in low, wet places, but readily adapts itself to the lawn area and to the street. It may be used as a shade tree, but is short-lived and will usually begin to get ragged and irregular in appearance after it is approximately 25-30 years old. The Red maple is a fast grower, very graceful in appearance, and has good foliage, which makes it useful for quick effects and for temporary plantings. In moist soil, it may be used for woodland plantings, on the farm, large estate, parks, or along the highway in company with Black ash, Sour gum, Swamp White oak, willows, and related species. In the majority of cases, greater success will be had if this tree is transplanted only in the spring.

Acer saccharinum (*A. dasycarpum*)

SILVER MAPLE, WHITE MAPLE

The Silver maple received its common name from the leaves, which have a silvery-white coating on their under surface. These leaves are very deeply five-lobed and in the summer make an interesting picture



Fig. 2. The Wier maple is a graceful tree for the large lawn area.

of light green and silver as the wind twists them, exposing, alternately, the upper and lower surfaces. The foliage is moderately dense, which helps to make the tree appear light and graceful and does not prevent grass from growing beneath its branches. In the autumn, the leaves turn a clear yellow or crimson.

The trunk of the Silver maple usually divides about 15 feet from the ground into three or four main branches. These secondary trunks arch upward in a very graceful curve and from them a great many slender twigs and branches droop downward in another pleasing curve. Throughout its entire structure the tree is

curving and has a decided gracefulness that is missing from many of our other large trees that reach more than 90 feet in height.

In Michigan, the Silver maple is usually found along the sandy banks of streams, or in other low, moist places, and does much better in such locations than upon lawns, although it will adapt itself quite readily to such conditions. It is a fast-growing tree and for this reason has been very popular among people who have no other trees about their home and need quick shade. It suffers, however, from the same faults that most fast-growing trees have, such as brittle branches that break with severe wind and ice storms, and a short life. The main branches are also subject to splitting in the crotches. In addition, its roots are of a surface type and likely to cause trouble with walks and other permanent structures that may be near them.

There is a horticultural variety called the Wier maple (*Acer saccharinum* var. *Wieri*) which grows from 60 to 80 feet high and makes a splendid specimen for the lawn area. Its branches are more drooping than others of the species, and its leaves are more deeply lobed and finely cut.

Acer saccharum

SUGAR MAPLE, ROCK MAPLE

The specific name *saccharum* means sugar, in allusion to its sugar-making qualities. All residents of Michigan should be familiar with this beautiful tree that has received such an important economic place, and it is of additional interest to note that the early French settlers in Michigan were taught by the Indians how to make maple sugar from this tree.

In wooded sections, the Sugar maple will frequently rise 50-60 feet without a branch and have a rather narrow crown 100 or more feet in height; in the open, however, its trunk generally divides 8 or 10 feet from the ground into several main branches, which form a narrow, oval head when the tree is young. As the tree ages, the crown gradually broadens and becomes a beautiful symmetrical, round-topped head with a wide spread. The foliage is extremely dense and has a pleasing light green color, which changes into beautiful shades of yellow and red in the autumn. Very frequently, the density of its crown and its wide-spreading root system make it difficult to grow grass beneath the tree. Where the soil is better, the roots very frequently grow quite deeply and, under such circumstances, the Sugar maple makes a superb shade tree. The tree is clean-cut and neat. It is excellent for bordering lanes or streets in small villages and towns, but it does not thrive in the smoky atmosphere and dry soil found along city streets. This tree was listed by the late E. H. Wilson, a noted plant explorer, as one of the tree aristocrats and it is, without doubt, one of the most beautiful of America's native trees.

Genus Aesculus

HORSE-CHESTNUT AND BUCKEYE

This group of trees can easily be distinguished by the thick branches and large triangular scars along the twigs where the leaves of the previous season grew. The genus includes the horse-chestnuts, which have large sticky buds at the ends of the twigs, and the buckeyes, which have large non-resinous buds at the tips of their branches. There are approximately 13 species known, 4 of which are native to America.

In London, one Sunday each year, between the middle and end of May, is called Chestnut Sunday and devoted to the celebration of the horse-chestnuts in blossom in Bushey park. These trees are in an avenue a quarter of a mile from the Hampton Court palace and were planted by Sir Christopher Wren in 1699. Today, many of the trees are fully 100 feet high and make a beautiful sight when in blossom.

Aesculus carnea

RED HORSE-CHESTNUT

The Red horse-chestnut is not yet commonly planted, but will receive, without doubt, more favorable attention in the future. It is a hybrid form, having flowers which vary from flesh color to deep red. These flowers are produced in panicles 5 to 8 inches long in late May or early June and make a very attractive picture. The leaves are similar to those of the Common horse-chestnut, in that a leaf is composed of five smaller leaflets arranged in a radial manner. (This is called a palmately compound leaf.) The dark green foliage is lustrous and does not appear as coarse as that of the Common horse-chestnut.

The Red horse-chestnut is a round-headed, symmetrical tree, 20 or more feet in height and makes a handsome specimen for the park, home lawn, and parkway. It will grow under any ordinary soil conditions.

Aesculus glabra

OHIO BUCKEYE

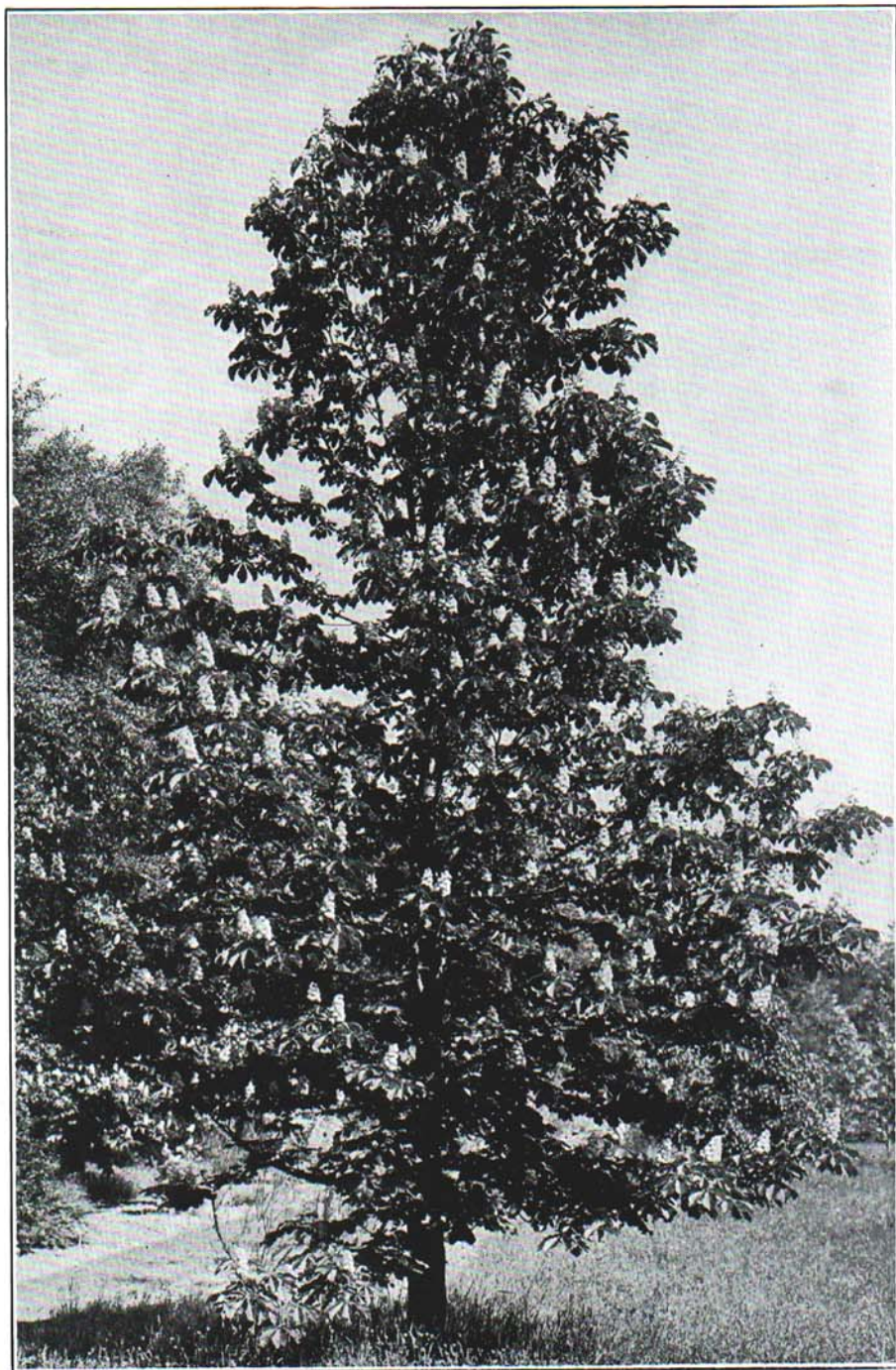
The Ohio buckeye is another small tree which is native from Pennsylvania to Alabama and Iowa. It is a slender-branched tree with a broad, rounded crown that ranges from 20 to 30 feet in height. The leaves are similar to those of the Common horse-chestnut, but are smaller and have only five leaflets instead of seven. They are yellow-green and turn a rusty yellow in the autumn. Unlike the remainder of this group of trees, the flowers of the Ohio buckeye are not very showy, because they are in small yellow-green terminal panicles. The tree blossoms in April or May.

The Ohio buckeye is found in the rich, river bottom lands and along streams where it helps to form the woodland growth. For landscape purposes, it is useful only in making low, dense, woodland plantings on estates, or in parks and for providing foliage in roadside beautification projects.

Aesculus Hippocastanum

COMMON HORSE-CHESTNUT

The Common horse-chestnut has been extensively used in the past as a street tree and also as a shade tree but has been losing favor because more desirable varieties have come upon the market. It is a very massive and symmetrical tree with much dignity and beauty, but its large, coarse-appearing leaves and dirty habits have been the cause of its falling into disfavor. The Common horse-chestnut is very late to come



—Photo, courtesy Arnold Arboretum
Fig. 3. The Common horse-chestnut is a beautiful tree when in flower.

into leaf in the spring and very early to lose its leaves in the fall, even this short foliage season is likely to be spoiled by a fungous disease, which attacks the leaves during humid periods and causes them to turn brown when dry conditions follow. The tree drops many coverings from the large leaf buds and fruit, and finally, its large leaves, so that all through the year it causes a great amount of debris to collect in the yard.

The chief glory of this tree is its flowers, which appear as tall, upright panicles at the ends of the branches late in May. The spikes are approximately a foot high and consist of large white flowers with a reddish center. Individually, as well as collectively, the flowers are beautiful and very showy.

A new variety, which may now be obtained from some nursery companies is the Baumann horse-chestnut, or Double White horse-chestnut (*Aesculus hippocastanum* var. *Baumannii*, or *A. hippocastanum* var. *florepleno*). This tree grows about 50 feet high, has the same desirable shape and density of foliage as the species, but has double white flowers instead of the usual type. This reduces the number of fruits and at the same time eliminates some of the debris which we object to from the species. For that reason, it is superior to the Common horse-chestnut.

Ailanthus altissima (*A. glandulosa*)

TREE OF HEAVEN, AILANTHUS

The Ailanthus has been in this country more than 100 years and was introduced from China by a Long Island nurseryman. It has risen into favor, fallen into disfavor and returned many times within the period of its existence in this country. It will grow and flourish under almost unbelievable growing conditions. In fact, the atmosphere seems never to be too smoky, the soil too barren or the rubbish heap too extensive to prevent this tree from growing. It is a large tropical-appearing tree with compound leaves 3 feet long, forming foliage that is extremely dense when the tree has been pruned. Under ordinary circumstances, however, the Ailanthus seems to be just a large, open, irregular tree with long, waving, frond-like leaves.

In the winter the Ailanthus is gaunt in appearance for the branching structure is extremely coarse and open, with few lateral twigs. Such a structure is necessary to support the large leaves, but it does make the tree stiff in appearance during the winter months. Nevertheless, the Ailanthus does make a wonderful addition to the small city garden and to such manufacturing districts that have growing conditions under which other trees are unable to survive.

The Ailanthus is divided as to sex; the female, or pistillate, trees are the ones that should be planted. The male, or staminate, trees give off an obnoxious odor when in flower.

Alnus glutinosa (*A. vulgaris*)

BLACK ALDER, EUROPEAN ALDER

For the small yard it is often difficult to find a tree that will not be too large or cast too dense a shadow, but for such conditions the Black alder will generally prove satisfactory if the soil is not dry. It is attractive at all seasons of the year, having small, coarse-toothed leaves and an open, fine branching system that will equal the charm and grace of any birch.

It is a slender, pyramidal tree, 50 feet high, but so slow growing that it generally is classed as a much smaller tree. During the winter, it has a decided red tone to its crown, owing to the purplish-red catkins that hang in clusters from most of its twigs and the reddish leafbuds. The Black alder should be planted in damp soil, where it will grow more rapidly and assume a denser crown. For that reason, it makes a pleasing appearance along the banks of a stream where it may act as a soil binder and give a graceful reflection upon the water.

The Cutleaf alder (*A. glutinosa* var. *laciniata*) has its leaves more deeply cut than those of the Black alder and is especially suitable for the small lawn area.

Amelanchier canadensis

SERVICE-BERRY, SHAD-BUSH, DOWNY SHADBLOW, JUNE-BERRY

In late April or early May, a drive along the country lanes of Michigan will enable one to become acquainted with the Service-berry. At that time its numerous white flowers offer a pleasing contrast to the bare twigs and branches in its vicinity. It is usually seen as a shrubby plant 10 or more feet high, at the edges of woodland strips bordering farm lands. Occasionally it assumes the outlines of a graceful, slender tree with several main stems or trunks.

The flowers are in loose, drooping clusters 3-5 inches long and are made up of long, slender petals. Individually, the flowers are open and loose in their construction, but due to the density of the clusters they make a beautiful early flowering display. The leaves are alternately placed along the twigs and as they unfold in the spring are silky on both sides and have a reddish tinge. The foliage is open, dark green in color during the summer and changes to yellow or orange in the autumn.

The flowers are followed by round, berry-like fruits which change from bright red to a dark purple. They are approximately one-half inch across when ripe and are sweet to the taste. The Indians and early pioneers used these as a source of food, but today the birds eat most of them.

There are more than one kind found in the woods of Michigan, but they all have the same general characteristics and may be used the same as the species under discussion. These trees grow anywhere,

with the exception of wet lands, and are used in the shrub border to give an early flowering effect and in the bird sanctuary as a source of food. The Service-berry may be used also for highway beautification projects, if it is used with other plants, but does not look well nor do well as a specimen. The safest time to transplant the tree is in the spring.

Genus Betula

BIRCH

There are nine birches native to America and 26 other species known. They all have unusual grace and beauty of outline, attractive foliage, and bark that offers interesting accents in the landscape planting. There are no trees that will grow farther north in North America than the birches, and so their hardiness in all parts of Michigan is assured. Many of the birches are difficult to transplant, but there seems to be a decided decrease in the death rate when they are planted in the spring when the buds are bursting open. At the best, they are mostly short-lived trees.

Betula lenta

SWEET BIRCH, CHERRY BIRCH

Many a country boy and woodsman has enjoyed chewing a twig from the Sweet birch. The shiny, reddish-brown bark is aromatic when bruised and has a pleasing flavor. The leaves also are aromatic when crushed.

The Sweet birch grows 60 or more feet high and has slender branches that spread horizontally to form a narrow, pyramidal crown. Its foliage is an attractive green and moderately dense. The leaves are 2-5 inches long with a finely toothed margin and appear alternately in pairs at each node.

The birches are not classed among the flowering trees, but this species is attractive in April or May when its catkins become bright yellow. These pendulous catkins are from three to four inches long and for a few days, give a flowering effect. This attractive feature, combined with excellent foliage and form, makes the Sweet birch a handsome tree for the park or lawn area. It may be used as a single specimen but is more at home when used in groups or masses, such as would be required at the borders of woodlands, in the park, or along the highway.

Betula lutea

YELLOW BIRCH

The specific name, *lutea*, means yellow, and refers to the tattered bark. The chief charm of the tree is found in this bark, which is silvery gray-yellow or a light orange color and rolls back in tattered fragments to expose a brightly colored inner-bark. This gives the tree a distinctive appearance which is much prized by many people.

In its natural habitat at the border of woodlands in rich moist soil, the Yellow birch often grows 100 feet high; under less favorable conditions it forms a broad round-topped tree, 40 feet high. Its crown is composed of many very slender twigs, which give it a graceful, feathery appearance. The alternate leaves have a reddish cast as they unfold, which changes to bronze-green and finally to dark green. In the autumn, the foliage turns clear yellow, as does that of the majority of birch trees.

Betula lutea may be used as a specimen on the lawn where it will keep a dense head for many years, but it thrives, as a rule, much better when used in groups at the edge of woodland plantings where it has association with other trees.



Fig. 4. The Yellow birch has tattered golden bark.

Betula pendula (*B. alba*)

EUROPEAN WHITE BIRCH, EUROPEAN BIRCH

This is a white-barked tree 40-60 feet high, which has been introduced to the United States from Europe and is not the one commonly found in the Michigan woods. The older trees usually have pendulous branches. The trunk is generally dark and rough near the base but gradually changes to a creamy white on the upper branches and peels off in thin layers. The leaves have a finely toothed margin and are 1-2 inches long. This tree is cultivated more in the United States for its many varieties than for itself. The more important varieties are as follows:

The Pyramidal White birch (*B. pendula* var. *fastigiata*, *B. pendula* var. *pyramidalis*) has its branches growing upright, much in the same manner as those of the Lombardy poplar, although the tree is not quite so narrow.

Young's Weeping birch (*B. pendula* var. *Youngii*) is a graceful tree 40 or more feet high, with its slender twigs hanging in a pendulous manner, similar to those on the Weeping willow. The primary branches, however,

spread and curve to form an irregular head. It will grow in comparatively dry places and makes a delightful specimen tree for the lawn area.

The Cutleaf Weeping birch (*B. pendula* var. *gracilis*) has pendulous branches like the preceding variety, but its leaves are lacinated, or cut in from the side. These finely cut leaves give the tree a light and airy appearance that makes an attractive contrast against a background of evergreens, or interesting accent when the tree is used as a specimen on the informal lawn that has perennials planted in front of the shrubs.

The Purple Leaf White birch (*B. pendula* var. *purpurea*) is similar to the regular European White birch but has dark purple leaves that are dull and unattractive. The weeping form may also be obtained with purple foliage.

Dalecarlia Birch (*B. pendula dalecarlica*) is the most commonly planted variety. It is a very graceful tree with leaves that are deeply lobed.

Betula nigra

RIVER BIRCH, BLACK BIRCH

The River birch has a tattered bark similar in character to that of the Yellow birch, but which is a dark red color and curls back to expose a pinkish or cinnamon-colored inner-bark instead of yellow. Like the majority of the birches, this tree is graceful and has a narrow, ovoid crown 40 or more feet high. It grows naturally in moist locations and as an ornamental tree for the lawn and park the River birch is of little value, but along river banks and beside ponds it makes a very beautiful addition to the general planting.

Betula papyrifera

CANOE BIRCH, PAPER BIRCH

The bark of the Canoe birch may be separated into thin papery sheets and the American Indian is known to have used this material for writing or painting his messages. In fact, the specific name, *papyrifera*, means paper bearing.

This is the white birch tree that is found growing in the woods as a single-trunked specimen, rather than a clump of main branches coming from a common base. It has one single trunk, which divides into a few large branches to form an open round-topped head, 60 or more feet high. In the open, the tree is much broader and lower than in the woods, where it assumes a more upright, slender crown in its struggle for light. The trunk is almost black near the ground but changes gradually into a dull creamy-white with little black streaks. The upper branches are waxy-white and furnish a striking contrast with its surroundings.

The Canoe birch grows on rich wooded slopes and on the borders of streams, but will grow on the open lawn if it is not too dry. When used as a specimen, the full grace and beauty of the bark is appreciated and it shows up especially well in contrast against a dark background of evergreens on the small home grounds. Varieties of the White birch or Gray birch are used in contrast against evergreens, but where there is room for a larger tree, none is so strikingly beautiful as the Canoe birch.

Betula populifolia

GRAY BIRCH, WHITE BIRCH

From New Brunswick to Delaware and west to Ontario, the Gray birch is found on abandoned farms and on the open hillsides. It is a short-lived tree and has the habit of springing from the old base to form a thicket-like clump of trees instead of a single specimen. For that reason, it is always used as an accent clump against evergreens, or some similar background, where its white bark will show off to greater advantage. It looks very well at the edges of woodlands, beside a quiet pond, or in the highway plantings. It has also proved to be an excellent nurse tree on exhausted sandy soil, or burnt-over lands.

This tree may be separated from the other white-barked trees by its habit of growing in clumps and by the triangular dark patches on the trunk. Its white bark is duller than that of the European White birch and does not tatter or roll like that of the Canoe birch.

Its leaves are triangular, dark green, with a fine-toothed margin. They are borne on slightly twisted stems which make them flutter in the least amount of wind, much in the same manner as the aspen. This constant movement also helps to make the tree a point of accent in a planting.

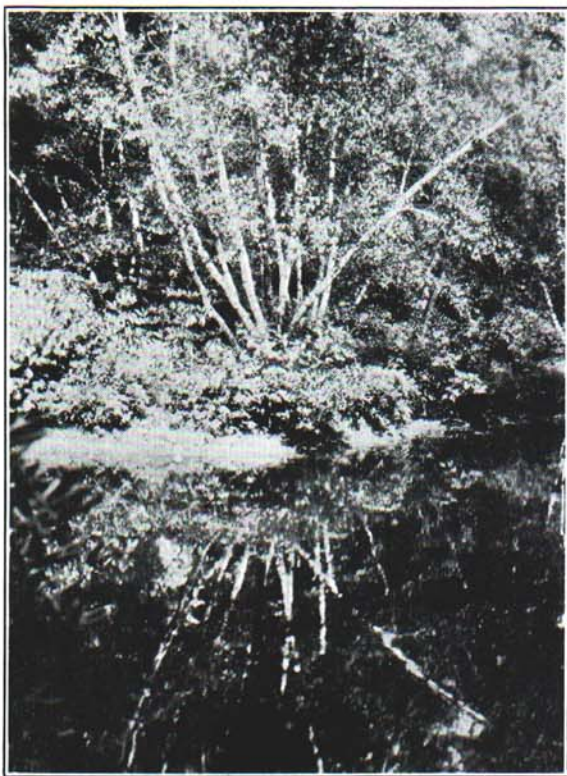


Fig. 5. *The quiet pool is always more inviting when a Gray birch is reflected on its surface.*

Carpinus caroliniana

AMERICAN HORNBEAM, BLUE BEECH

The American hornbeam is a small low-spreading tree, which should be a decided asset to the small home owner but has been overlooked by the majority of people. It is native to the state and is distinguished by its smooth, blue-gray trunk that is peculiarly fluted by swellings to make it appear somewhat like a muscular forearm of an athlete. The twigs are slightly zigzagged and probably more slender or thinner than any other tree found in the woodlands.

When used in the open, it will form a flat-topped crown, 20 feet high, which has a decidedly horizontal appearance. The leaves are oval and blue-green in color; they are long-pointed and have strongly impressed, parallel veins like those of the beech leaf.

The American hornbeam may be used as a specimen where it will show its lacy crown against the winter sky, or used against the summer house as an interesting foliage background. It may also be used effectively in the park or along the roadway.

The European hornbeam (*Carpinus betulus*) is very similar to our native tree but has several unusual varieties which will probably become more widely introduced into the trade in the near future. It is the tree that is used in so many of the European hedges. It is not as hardy as the American hornbeam.

Carya ovata (Hicoria ovata)

SHAGBARK HICKORY

The nut trees enable many people to combine utility with beauty. As a rule, those trees are rather open or loose in their crowns, but have a good form and offer an attractive appearance during the summer season. The Shagbark hickory is the only one of the hickory group that is much used about private residences. It varies somewhat in character but usually has a straight unbroken trunk that will rise as high as 70 feet. From this single shaft, the lateral branches come out at almost right angles to form a very symmetrical oblong crown.

This tree is easily recognized by the gray bark that hangs in loose strips from the trunk. These strips are long and give a very unkempt appearance, which has been incorporated in the common name, shagbark.

The foliage is dense, yellow-green and turns a rusty yellow in the autumn. It is composed of alternately arranged leaves that are pinnately compound with from five to seven leaflets. The terminal leaflet is the largest.

The Shagbark hickory is seldom offered by nursery companies, but may easily be grown from the seed, or transplanted when young from the wild. It may be used as a shade tree near the farm house, or planted along the parkway.

Catalpa speciosa

WESTERN CATALPA

The Western catalpa tree has an open, irregular crown about 50 feet high, formed by thick, crooked and scraggly branches. The crookedness of the branches is caused by the end of the branch dying back each autumn without forming a terminal bud. Upon the open lawn, this tree will have a broad crown with a short trunk, but in wooded areas it grows more narrow and attains a height of more than 100 feet.

It is very late in coming into leaf, but during the summer months has very thick foliage of large triangular leaves, 10-12 inches long and 7 inches across, with a heart-shaped base. The first severe frost will frequently turn these leaves a dirty yellow, but sometimes they persist with their usual green until a heavy killing frost, when they turn black and drop within 24 hours.

The flowers furnish the only excuse for planting this tree. They appear in late June or early July as large loose panicles and are white, bell-shaped flowers with yellow-spotted throats and purple bases. These flowers last for approximately one week and show off conspicuously against the bright green foliage but are quickly followed by the long, cylindrical fruits that are not very ornamental.

The Western catalpa will grow in almost any soil and under almost any condition, is a hardy, vigorous tree, and is very frequently used as a shade and street tree. It may be used in a park, where only its summer appearance is considered, but for private grounds it is unsatisfactory, because the leaves appear too late in the spring, the foliage falls too early in the autumn without any attractive fall coloration, its winter appearance is too ungainly to be attractive, and last, its fruits always give an untidy appearance.



—Photo, courtesy Arnold Arboretum

Fig. 6. *Western catalpa*.

Catalpa bignonioides

COMMON CATALPA

The Common catalpa resembles the Western catalpa, but is less hardy and has smaller leaves.

The Umbrella catalpa (*Catalpa bignonioides* var. *nana*) which is incorrectly called at times, *Catalpa bungei*, is a grafted specimen that is very frequently seen about old homesteads and in the front yards of city homes. It is the tree that has a dense round head on top of a straight trunk 5 or 6 feet high and is required to be pruned back each year until it looks like a post.

Celtis occidentalis

HACKBERRY

The Hackberry is a native tree which resembles in general form and foliage the American elm. It may be distinguished from the latter,



Fig. 7. The distinctive bark of the Hackberry.

however, by its bark which is broken into short, thin, corky ridges that are interrupted at intervals into small whorls, and by its fruits. The small round fruits have a thin flesh covering over small seeds and change in color from a dull orange to purple. They are produced in great abundance and persist upon the tree for a major part of the winter. The leaves are bright green and two to four inches long, with teeth upon the upper portion of the margin.

Like the American elm, the hackberry may be used as a large shade tree on the lawn or parkway but does not seem to be desirable as a street tree. The fruits are well-liked by birds, which makes the tree useful for conservation purposes and for parks. It will assume a much more beautiful appearance if placed in the

open as a specimen and will flourish in almost any type of soil.

Cercidiphyllum japonicum

KATSURA-TREE

While this country was engaged in the Civil War, the Katsura-tree was introduced from Japan. It is probably the cleanest and neatest appearing tree that the nursery companies have to offer for the estate lawn. It is generally a small tree 30-50 feet high, but will, in time, frequently rise to a much greater height. The trunk commonly divides into two or more branches, which gradually spread from the narrow upright head of the young tree to form a beautiful fan-shaped crown.

The twigs are extremely slender and interesting to anyone who observes them during the winter months. At each joint, or node, the twig swells out to form two opposite hip-like projections upon which the buds rest. These buds are long and narrow and have a magenta red color. They differ decidedly from those of our native trees. In April the leaf buds burst open to expose purplish leaves that are almost round with a heart-shaped base. When the leaves reach full size, all trace of the purple is lost and they are a beautiful, cool green, only to be changed again, late in the year, to a pure yellow. The leaves hang by short stems that have the peculiar habit of twisting upward in an attempt to put them on the upper side of the branches. The foliage is dense and refined in its appearance, owing to the smallness of the leaves and their good color.

The Katsura-tree demands a rich moist soil, but it is a highly interesting specimen for the park and large lawn.

Cercis canadensis

AMERICAN REDBUD, JUDAS-TREE

In open woodlands and along the wooded roadway, the American redbud is frequently found. Under such conditions, it is a narrow, open-branched tree without a great deal of form, but in the open it assumes a broad, flat crown that is rather twiggy and well-shaped. It is usually classed as a small tree, less than 20 feet high, when given room to grow naturally.

The name "redbud" is a descriptive name that alludes to the flowers. For several weeks in late April or early May, the tree seems to be covered with small flower buds one-fourth to one-half inch in length, which range in color from a dark purplish-red to a light lavender at the tip. These buds hug very closely to the twigs and branches and appear never to open, but they actually open for a couple of days just before they drop off. They then appear similar to pea blossoms.

This is a very delightful and ornamental tree to use as a specimen on the small lawn or in association with perennials. It may also be used for undergrowth plantings along the roadside or in the tall border planting. Like the Flowering dogwood, it should be transplanted only in the spring and, preferably, when very young. This does not prevent the owner from having a flower display because the trees blossom when only 4 or 5 years old.

The Chinese redbud (*Cercis chinensis*) has larger flowers, but it is not hardy in Michigan, except in very sheltered positions in the southern part of the state.

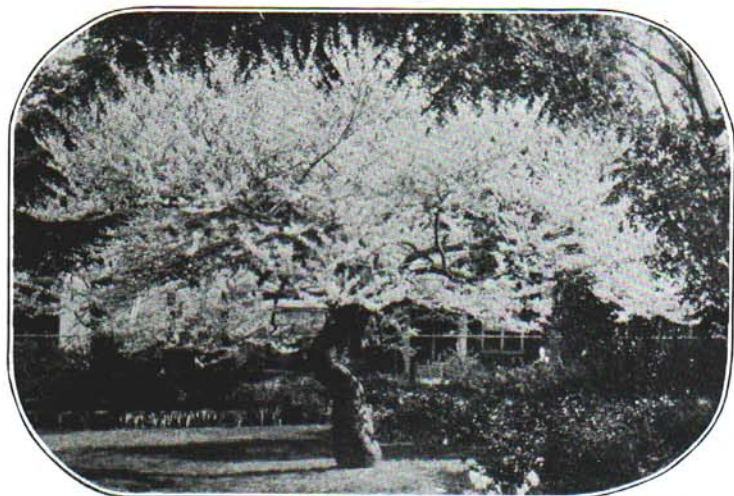


Fig. 8. When sunlight falls upon a Chinese Redbud in full bloom, a glorious picture is possible in any garden located in the milder sections of Michigan.

Cladrastis lutea (*C. tinctoria*)

YELLOW-WOOD

The common name "yellow-wood" was given to this tree because the wood yields a yellow dye. This is also incorporated into the horticultural name by the use of *lutea*. It is a native tree 50 or more feet high with a wide-spreading, fan-shaped crown. The trunk usually divides 6-7 feet from the ground into several main limbs. The bark on these limbs is a gray tone, slightly darker than that of the beech tree, and has slight horizontal wrinkles or ridges, in contrast to the smooth bark of the beech.

The leaves do not appear until late in the spring, but when the buds open they disclose bright green leaves that are large and pinnately compound. The foliage is a much fresher yellow-green color than the majority of trees and is always attractive during the foliage period. Against this background, in mid-June, appear a great number of wisteria-like clusters of slightly fragrant, white flowers that are frequently a foot long. Such a beautiful flowering display and foliage makes this a fine tree for the large home area. It may also be used in wet spots inasmuch as its natural habitat is in rich soil along the borders of streams. The Yellow-wood should be transplanted only in the spring.

Cornus florida

FLOWERING DOGWOOD

Every person who likes to hike in the woods during the spring months is familiar with this native tree. It is a low, bushy type, 15 or more feet high, with horizontally spread branches and has at the tip of each side shoot, three or four twigs which turn upward in a claw-like manner. At the tip

of each of these claws is a round pearly-gray, button-like flower bud. When these flower buds open they disclose what appear to be large white flowers, but what are thought to be petals are actually the protecting bracts. The true flowers compose the green center, but for the general landscape effects we consider the whole as a white flower. These flowers are distinctive in that the bracts are four in number and always have a brown-colored notch at their tip, which is caused by the tip dying during the winter months. The Flowering dogwood blossoms in April or May.

The foliage is very good and composed of opposite leaves, 3 to 5 inches long, which are thick in texture and dark-green on the upper surface.

The lower surface is slightly downy, lighter colored, and the venation shows prominent primary veins running parallel to each other to the margin. The foliage is mostly at the ends of the branches and turns a brilliant scarlet in the fall. In October, there may be found some small, bright red fruits in clusters of four or five nestled in the foliage. They are bitter, but aromatic and well-liked by the birds.

The Flowering dogwood is used against a background of tall evergreens at the edge of a woodland border or as a specimen tree in the flower garden. It combines very well with the redbud for mixed plantings in the large lawn and parkway. It may also be used in the bird sanctuary as a nesting site and for its scarlet fruits. It is slow-growing and rather difficult to transplant, but small loss will be incurred if transplanted with a large ball of earth and only in the spring. It should also be mulched well because its roots like a cool well-drained soil.

The Double Flowering dogwood (*C. florida* var. *plena*) is a much showier tree that has been developed recently, which has six or eight white bracts instead of the usual four. It will stay in flower longer than the species and is superior as a specimen tree in the small garden.

The Red Flowering dogwood (*C. florida* var. *rubra*) is the same as the native Flowering dogwood except that it has pink, or rose-colored flowers. It is generally used in combination with the Flowering dogwood to give a combination of red and white.



—Photo, courtesy Arnold Arboretum
 Fig. 9. The beauty of the Flowering dogwood is best displayed against a background of tall evergreens.

Genus Crataegus

HAWTHORNS

The hawthorns are found beside the pasture fence and in the open woodland area. Where they are exposed severely to the elements they have more densely branched centers to their crowns. If the cattle graze upon the branches of the hawthorns, the trees thicken their branching system. Thus, the hawthorns readily adapt themselves to external influence, and they seem to be able to grow in almost any type of soil. Therefore, they should be of great value for that quality alone, but they have other characteristics which are still more favored. All have very attractive white flowers in May which are followed by bright red, orange, or yellow fruits.



Fig. 10. The many native Hawthorns make attractive ornamental trees for the suburban and farm home grounds.

The foliage is dense and bright green on almost all of the species and has a beautiful fall coloration in almost every case.

There are a great many species and varieties of this genus which are very difficult to distinguish. However, in general, they are wide spreading trees with a dense crown of zigzag branchlets and thorny branches. They deserve wide planting in the park and estate plantings, in the garden of the small home and along the highway. They provide good shelter and nesting quarters for the small birds and should be included in every bird sanctuary. They must not be planted in the vicinity of the Red cedar or any of its varieties because the hawthorns are alternate hosts for one form of the Red Cedar-apple rust.

The older trees have long tap roots which are very difficult to handle

when native trees are moved. Thus, it is better to transplant only young hawthorns and only in the spring when they are in their fullest vigor. Nursery-grown stock may be transplanted with more favorable results.

The following hawthorns are the most commonly used and easily obtained from nurseries:

Crataegus arnoldiana—Arnold Hawthorn—This tree has dark-green oval leaves that are lustrous and have many shallow lobes. The foliage is good, and the white flowers are in showy clusters. Its greatest value, however, lies in the fact that it is the first to ripen its fruit, which is a brilliant red. The fruits appear from the middle of August to mid-September and are the size of a large cherry. This species is used as a specimen or in the large tree group for its beautiful early fruiting effect.

Crataegus crus-galli—Cockspur Thorn—In this country the *Crataegus crus-galli* has been widely used for hedges instead of the English hawthorn, but it has a tendency to become bare of foliage in its lower portion under such treatment. It has been one of the most widely cultivated of the native hawthorns and is very decorative on the lawn area. It flowers later than most of the species, and the glossy green foliage makes a brilliant display of orange and red in late fall. The foliage is less subject to fungous diseases than that of other native members of this group, and the fruit remains on the branches until spring without loss of color.

Crataegus intricata (*C. coccinea*)—Thicket Hawthorn—This tree is excellent for thicket planting along the roadside, seashore or estate. It is used in large plantations mostly but will make a very fine specimen with showy flowers, foliage, and fruits that appear in September and October, but do not last long.

Crataegus Oxyacantha—English Hawthorn—For many years this tree has been used for hedges in Europe and is one of the most adaptable species to shearing. It also makes a very beautiful specimen on the home lawn, parkway and in the border planting. The leaves are from one to two inches long, with three to five lobes, and in the autumn turn a bright red, vying with the small, but numerous, scarlet fruits. These fruits are showy until early February when they fall.

Crataegus Oxyacantha var. *Pauli*—Paul English Hawthorn—This hawthorn and its red-flowered forms are the only ones of their type easily obtainable from nursery companies. This one makes a very interesting tree because of its bright scarlet, double flowers. The Paul's New Double Scarlet hawthorn (*C. Oxyacantha* var. *splendens*) is not a different variety, but a form of the Paul English hawthorn that has double flowers, resembling small red roses. It makes a fine specimen for the lawn area and is one of the most showy of the garden forms.

Crataegus Oxyacantha var. *plena* (*C. monogyna* var. *albo-plena*) has double white flowers.

Crataegus phaenopyrum (*C. cordata*)—Washington Hawthorn—This is a more pyramidal tree, with nearly triangular leaves that have from three to five lobes. Its fruits appear in late September or October in large clusters and persist nearly all winter. It is one of the most satisfactory of all the hawthorns for brilliant fall color and bright fruits and is planted as a specimen or in groups.

Fagus grandifolia (F. americana)

AMERICAN BEECH

The American beech is one of the most graceful and well-shaped of the large trees native to Michigan. It forms a wide-spreading, rounded-crown, 60 or more feet in height,



Fig. 11. American beech.

with drooping branches and many slender, flexible twigs. When growing in groves, it has a straight, slender trunk surmounted by a narrow crown. This tree is distinguished immediately in the woods or in the open by its steel-gray, almost white, bark. In the winter, its twigs can be easily identified by their long, sharp-pointed buds that are an inch in length and formed by over-lapping, light brown scales.

The dark blue-green foliage is clustered at the ends of the many twigs to form an excellent foliage mass that makes a pleasing sight during the summer and turns a clear yellow in the autumn. The individual leaves are prominently veined with

parallel veins running from the mid-rib to the toothed margin.

The American Beech is frequently found growing on newly cut-over land where it will form a beautiful grove of light-colored trunks and arching branches. It will also make an excellent specimen tree on the large lawn, where the branching system can trace a delicate pattern against the winter sky. It may be used for high hedges, if allowed to be about 5 feet wide.

Fagus sylvatica

EUROPEAN BEECH

From the viewpoint of the landscape architect, the European beech is virtually identical with the American beech. It has the same general form, foliage and bark that may be slightly darker, but still a gray color. It has received much attention, however, for its many varieties that give special landscape effects. The following are the more commonly offered varieties:

Var. *atropunicea* (var. *purpurea*, var. *cuprea*, var. *atropurpurea*, var. *Riversii*)—Purple Beech—It has the same beautiful form as the species, but is covered with dark bronze-purple foliage that is rich and very striking, but not brilliant. It is exceptionally beautiful in the afternoon when the sun is going down, as the upper side of the leaves has a glossy surface that seems to reflect and glisten in the glow of the afternoon sun. One or two trees of this variety are effective on large lawn areas, but they should not be used on the small lawn as they are too dominating. River's beech and numerous other purple-leaved beeches are variants of this variety, differing in the deeper or lighter color of their leaves. Its hardiness in the upper portion of Michigan is questionable.

Var. *laciniata* (*F. sylvatica* var. *heterophylla*, var. *incisa*)—Fernleaf Beech, Cutleaf Beech—This is a tree having its dark, shiny leaves cut into narrow lobes that give a much finer foliage effect. It is very good to use as a specimen tree in the park, or similar place where its fine foliage is seen by many people.

Var. *pendula*—Weeping Beech—This tree is very irregular in outline because the branches vary in length and also in the angle which they make with the trunk. The main branches will grow in almost any direction, which, of course, influences the outline, but the smaller branches are always pendulous. Such an unusual specimen as this is only suitable to large grounds where it is in company with other trees and is used more as a horticultural specimen. It should be considered just as one would consider a freak in a circus and not as a factor for quiet beauty. Some of these Weeping beeches may be found in old cemeteries, for it was believed that all weeping trees symbolized grief.

Var. *purpureo-pendula*—Weeping Purple Beech—This is the same as the previous variety but has purple leaves and is used for a more spectacular effect.

Var. *tricolor*—Tricolor Beech—There is no other variety of beech that has the interest in foliage possessed by the Tricolor beech. Its leaves are mostly a dark maroon color, edged and spotted with large areas of rosy-pink and white. In the spring, especially, its foliage is covered by long, silky hairs, which help to give the foliage an added interest by reflecting the sunlight. The tree is slow-growing and may be used as an attractive small specimen for many years. It is different from all other trees in general cultivation and makes an attractive focal point in the small garden. It is probably hardy only in the lower portions of the state.

Genus *Fraxinus*

ASH

The ashes have opposite, pinnately compound leaves, and fruits that have one long, slender wing attached to them. Under winter conditions, the twigs of the genus can be identified by the rusty-brown to black buds and flattening of the twig in the area just below the buds.

Fraxinus americana

WHITE ASH

The White ash received its common name from the olive-green leaves that have their underside a silvery-white. The leaves form a moderately dense screen of foliage late in the spring and drop early in the autumn after turning yellow or purple, but never red.

The White ash is an open pyramidal tree, 50 or more feet high and is commonly found along stream beds and growing in the rich, moist loam of the valleys. Its branching system is coarse, but it is a good ornamental tree for parks where shade and the summer appearance are the essential factors. For the home grounds, however, it is coarse in appearance and has too short a leafage period. It has been used as a street tree but is not so good for such purpose as the Green ash or the Norway maple.

Fraxinus pennsylvanica var. lanceolata (F. lanceolata)

GREEN ASH

This is an excellent shade tree for the street, roadside or park. It is well-adapted to regions of slight rainfall and extreme cold but prefers moist situations along river banks. The foliage is similar to that of the White ash except that the leaves are green on the under side instead of white.

The Green ash grows 60 or more feet high, with a well-rounded, compact crown and may be planted as a specimen or in groups.

Ginkgo biloba

MAIDENHAIR-TREE

For those people who like interesting and unusual things in their garden the Maidenhair-tree should answer their every demand. Its ancestry has been traced to the beginning of the mammalian era, while the genus has been found to have existed in the days when coal was being formed. It is one of the oldest types of trees living today.

The tree varies considerably in its outline during the various stages of growth. When young, it has a distinct spire-like appearance, with the main branches radiating as if in whorls, tier above tier. At first, the lower branches are much longer than those in the upper portion of the tree, but with age they grow more evenly to form a conical crown, although round-headed trees are very common.

The leathery leaves are crowded at the ends of little, short spur-like branches and resemble the small leaflets on the Maidenhair fern. They are fan-shaped leaves with a wavy margin along the top and a small



Fig. 12. Maidenhair tree.

cleft in the middle of its tip to suggest two lobes. The venation is also unique, in that it has many forked veins running from the base but no cross veinlets. There are both male and female trees and care should be taken in purchasing them to obtain only the male tree. The female tree has small, round fruits about an inch in diameter, which resemble a yellow plum. When this fruit is ripe, it splits and gives off a very offensive odor which will cling to one's hands or clothing if touched.

This tree makes a handsome specimen for parks and estates. It may also be used as a street tree where dense shade is not desired. It is too large for a small garden.

Gleditsia triacanthos

HONEY-LOCUST, SWEET LOCUST

The first thing many people notice about this tree is the large number of branched thorns that grow around the trunk or lower branches.



Fig. 13. The branched thorns of the Honey-locust are very conspicuous.

Some individuals do not have thorns, but the majority do, and they are especially prominent when the tree is growing in poor soil. The fruits furnish another means of identification, as they are very conspicuous pods. These pods are a dark reddish-brown, 10 to 18 inches long and very leathery.

The Common honey-locust has an open, rounded crown which is light and airy at all times. The foliage is feathery in appearance and a lustrous dark green until autumn, when it turns a clear yellow. The leaves are bi-pinnately compound and 7 to 10 inches long.

This rapidly growing tree will attain 45 feet in height and is very ornamental on the house and park lawn or parkway. Its light foliage will cast some shade but is not dense enough to kill the grass, and the general informality of the whole tree is a pleasing change from the more massive kinds.

For those people who have children that are likely to be climbing in the tree, a thornless variety may be preferred. This may be obtained by ordering the variety *inermis*.

Gymnocladus dioica

KENTUCKY COFFEE-TREE

This native tree is sparingly branched and decidedly unusual in its appearance. It will grow 60, or more, feet high and yet have only a few stiff upright branches with no twig growth that is fine and dense like other trees. Therefore, in the winter it looks almost like the dead remains of a large tree when the small branches have fallen, but in the summer its bareness is hidden by a dense foliage of extremely large, tropical-appearing leaves. These leaves are bi-pinnately compound, from 1 to 3 feet in length and 1½-2 feet in width. It is because of this enormous leaf structure that the tree is so heavily constructed in its branching system.

The Kentucky coffee-tree makes a picturesque and unusual ornamental tree for the large lawn if the soil is rich and moist. It is too high in its branching and creates too much debris when losing its large leaves to be considered for the small grounds where there is room for only a few trees.

Genus Juglans

WALNUTS

The walnuts are frequently used about farm homes, but are not suitable for city places. The group may be easily distinguished from all other trees which have leaves that are pinnately compound and arranged alternately along the twigs, by the brown chambered pith within their branches and their large leaf scars. They also have large, wide-spreading crowns, which are open and well-proportioned.

Juglans cinerea

BUTTERNUT

When the Butternut is placed where strong prevailing winds do not blow it will make a beautifully shaped tree that is an admirable addition to the surroundings of any farm home. It has the disadvantage of being easily broken by strong winds, which accounts for its usual straggly and irregular appearance. It easily becomes diseased, and also has a short leafage period, which makes it satisfactory only for mid-summer appearance.

It is a large tree, reaching 50 feet or more, with a spreading round-topped crown and heavy branching system. It is distinguished by the gray bark on the trunk, which is split into ridges that are shallower and broader than those of the Black walnut. Its twigs also differ from those of the Black walnut by being greenish-gray and very hairy towards the tip and have several gray buds surmounting one another above the leaf scar. Between the scar, left by last year's leaf, and these buds is a protruding thick band of gray hairs that are packed so closely together as to form a pad easily seen by the naked eye.



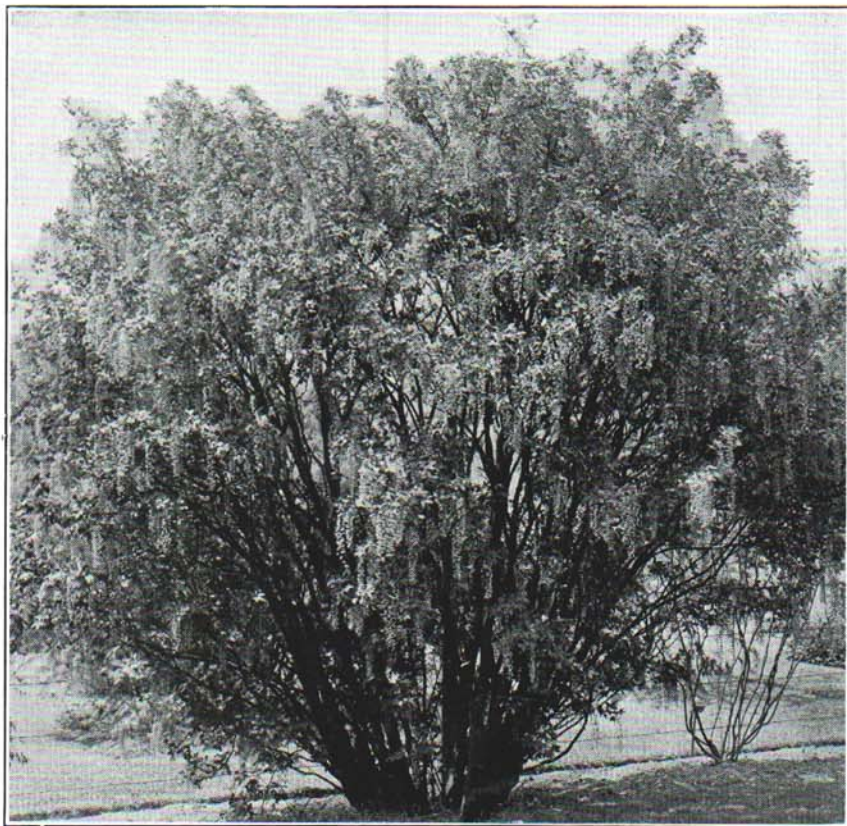
Fig. 14. A twig of the Butternut showing the large leaf scars and superimposed buds.

Juglans nigra

BLACK WALNUT

Like the Butternut tree, the Black walnut will form a beautifully shaped tree under good growing conditions, but is not used extensively as an ornamental because of its short foliage season and inability to transplant well. It is also subject to insect attacks. When planted in a rich, well-drained soil and a sunny place, it will have a dense mass of large, pinnately compound leaves that are yellow-green, but when grown in dry soil the foliage has a tendency to become sparse and lighter in color.

At its best, the Black walnut makes a tall, symmetrical tree, 60 or more feet in height, with a narrow, round-topped head. The bark on the trunk is almost black and deeply furrowed into rounded ridges, and its twigs do not have the downy pad above the scars, as found on the butternut twig.



—Photo, courtesy Arnold Arboretum

Fig. 15. The yellow flowers of the Scotch Laburnum make it a very desirable shrub-like tree.

Laburnum alpinum

SCOTCH LABURNUM

Usually the Scotch laburnum grows more as a shrub with many stiff upright branches spreading from a common base, but occasionally will assume a more tree-like habit. It will grow 15-20 feet in height. It is both a beautiful and unusual plant for the southern Michigan garden and may be used as a specimen in the small garden or as an accent in the shrub border of the larger garden.

The dull, light green leaves closely resemble the three-parted leaf of the clover. Against this foliage background in late June, hang many pendulous racemes of lemon-colored flowers that are pea-like in shape and hang in clusters, 15 or more inches long, in much the same manner as the flowers of the wisteria. This is a distinctive feature and should cause the laburnum to be well received by Michigan gardeners as there are only two flowering trees that may possibly be planted here which have yellow flowers at such a late period. The plant is stiff in its character of growth, but when planted with other shrubs this feature enables it to rise above the surrounding plants enough to show off the flowers. If a closer inspection of the flowers is desired, however, the laburnum will look well in the foreground of large plantings where the other plants act as a background to soften its stiffness.

The *Laburnum anagyroides* (*L. vulgare*), or Golden-chain, is very similar to the above species but is not as hardy, nor stiff growing, and blossoms approximately two weeks earlier.

Liquidambar styraciflua

SWEET GUM

For those wishing something different from the trees of Michigan, this native of the southern forests may prove desirable. It has leaves which are distinctly star-shaped; that is, they have five to seven long-pointed lobes which come out in a semi-radial manner, much as the conventional star. These leaves form a beautiful, dark, lustrous green foliage, that is luxuriant during the summer and furnishes a deep crimson color for the autumnal display.

In the southern forests the Sweet gum rises with a straight trunk for more than 100 feet, but in the northern gardens it will grow 40 to 60 feet high and have a symmetrical oblong crown that will become more rounded as the tree reaches maturity.

It prefers rich, moist soil, but will grow under good lawn conditions and give a very attractive and distinctive touch to the lawn area. The Sweet gum has good foliage, brilliant fall coloring, and answers all of the requirements demanded of a good foliage tree to be used as a specimen on the lawn. It should be transplanted in the spring with a large ball of earth and, also, should have its crown closely pruned at the time of transplanting.

Liriodendron Tulipifera

TULIP-TREE

The Tulip-tree is a native tree that every American should be truly proud to have in his possession. There is probably no other tree in Michigan that will rise with such a straight and stalwart trunk, or give such a stately appearance as the Tulip-tree. When young it has a very symmetrical pyramidal growth, which changes with age to an oblong crown 70-150 feet high.

The leaf of the Tulip-tree is three-lobed, with the central lobe having a decided broad notch cut out at its tip. There is no other tree that has this notch or portion cut out of its central lobe, which adds to the tree's distinctiveness. The foliage is a lustrous, dark green and turns a clear yellow in the autumn.

In May or June, after the leaves have fully developed, the tulip-like, greenish-yellow flowers, which have given the tree its common name, appear. On large trees they are often overlooked, but on smaller trees they are showy and very pretty. The petals are yellowish-green, and the inside of the cup is orange color towards the base. These flowers make young specimen trees on the lawn area especially attractive, and as the tree matures, its stateliness easily replaces the passing beauty of the flowers. The Tulip-tree may be used only on large lawn areas such as those found on large estates, public grounds and parks, so that its full form may be seen from a distance as well as near at hand. It is difficult to transplant, which somewhat reduces its value for highway planting, where trees do not receive a great amount of attention after they have been planted.

Genus Malus (Pyrus)

APPLE, CRAB

Within the limited space of this bulletin, it is clearly impossible to give all the known forms and varieties of this extensive group of trees, as there must be more than 50 species and varieties available from American nurseries. Of course, no one nursery offers all these trees, but their popularity is increasing, and the number offered by individual nurseries is increasing rapidly. Only the more commonly offered trees will be discussed here.

The most showy specimens are those belonging to the Asiatic group of flowering crabs. Their flowers range in color from beautiful white, or creamy white, to a rose, or deep pink. These trees cross-pollinate very easily to create many new hybrids that have additional points of beauty. This, plus the general similarity of the species, makes the identification very difficult, but the following description will attempt to give in broad outline the characteristics which influence their ornamental value.

The apples and crabs vary from low-spreading forms to small round-headed trees that are similar to the orchard apple tree. Most of the varieties are literally covered in late May by fragrant flowers, which are followed by a profusion of fruits that vary from a pale green to

orange red, and a single flowering crab planted in the corner of a small garden or at the edge of the lawn area, will always create a beautiful picture with the surrounding shrubs. Many people like the colorful picture that is created when a flowering crab is placed in the perennial garden where tulips and other bulbous plants can be used to give a special color combination with the flowers of the tree. Their greatest advantage, however, is when they are massed like dogwoods and hawthorns against a wooded background or along a drive. Such conditions are often found on the large estate, in the park and along the city parkway. All of the flowering crabs are worthy of a place somewhere in almost every landscape development.

They are hardier than the Japanese cherries and are used in our northern gardens to give the prolific bloom that cannot be obtained with the Japanese cherries. All of them are subject to apple scab and aphids, both of which are easily controlled. Aphids are controlled with a nicotine, or nicotine and soap, spray; the scab is controlled with lime-sulphur. The main thing to avoid when using the Flowering crabs is the Red cedar and its varieties. The Red Cedar-apple rust is very destructive and the two kinds of plants should never be used in the same garden.

Malus arnoldiana

ARNOLD CRAB

This is a seedling that was found in the Arnold arboretum and is probably a hybrid of *Malus floribunda* and *M. baccata*. It is a beautiful small tree, or large shrub, which has a broad rounded crown about 15 feet high. It is often quoted as "one of the most beautiful of flowering apples." It has flowers that are deep rose in the bud, fading to pink and finally to white as they open. They are one and three-quarter inches across and make a very beautiful display. The leaves are elliptical, somewhat irregularly toothed along the margin, and range from 2 to 3½ inches in length. This tree's long arching branches, broad habit of growth, combined with the prolific bloom and attractive small yellow fruits, make it one of the best of the group as an ornamental specimen tree.

Malus atrosanguinea

CARMINE CRAB

This is a wide-spreading, shrub-like tree, 10-15 feet high. Its flowers are in clusters of five to seven and change from a deep dull red in the bud, to deep rose, or rose-purple when open. They have red stems, an inch or more in length, and bright lemon-yellow anthers to contrast with the rose of the petals. The tree gives the appearance of a rosy-red mist when in full bloom, as the flowers, although otherwise similar in character to those of *Malus floribunda*, do not fade to white. It is one of the showiest of the darker colored crabs and is used as a specimen tree, or in masses.

Malus baccata

SIBERIAN CRAB

This is one of the larger flowering crabs, growing to the height of 30 feet and having a round, compact crown. It has white fragrant flowers that are tinged slightly with pink on the outside when they are unfolding. The Siberian crab is one of the older species and has been losing ground in favor of the hybrid forms which may still be used as a specimen where a large tree, similar to the ordinary apple, is desired. It is generally the first one to blossom.

Malus floribunda

JAPANESE FLOWERING CRAB

Probably the most commonly offered tree of this large group is the Japanese Flowering crab, which has an extremely showy flowering period for a small tree. Its small flowers appear as deep carmine in the bud, open as a light rose and fade to white. When the tree is in full bloom every branch is a solid mass of flowers, and they make a beautiful spot in the garden for about two weeks. The tree is round-headed, 15 or more feet high, and has many slender, arching branches. The flowers are followed by small purplish-red fruits, which are not very showy but are welcomed by the birds. As an ornamental tree it is one of the finest for the garden and bird sanctuary and has been in cultivation for nearly a century, so that it is not likely to lose favor soon.

Malus Halliana var. *Parkmanii*

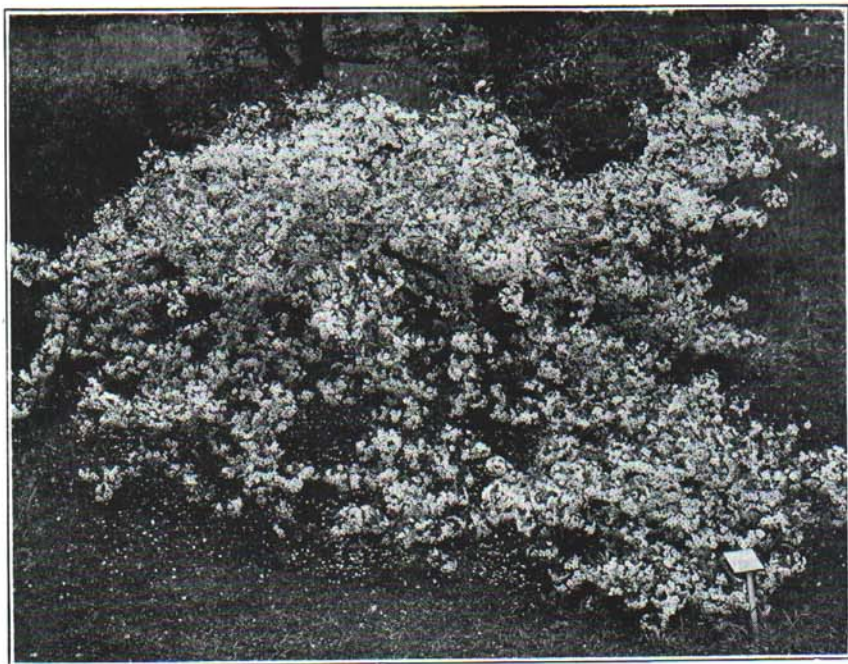
PARKMAN CRAB

If it were possible to choose a very few of the Asiatic crabs and claim them as the outstanding members, this one would surely be included. The Parkman crab has a tree-like habit, with ascending, spreading branches and a twiggy growth that gives it a shrub-like appearance. It grows 15 feet high and is covered during the flowering season with bright rose, semi-double flowers that fade slightly with age. The flowers are borne on drooping purple stems in clusters and are followed by pea-like fruits that are greenish-red and not particularly ornamental. When the tree is young it is rather irregular and awkward in appearance, but gradually assumes a more graceful, beautiful form. The Parkman crab was selected by the late E. H. Wilson as one of his outstanding Oriental introductions for floral beauty. It is not so hardy as the other species and should be used only in protected areas around Detroit.

Malus ioensis var. *plena*

BECHTEL'S CRAB

Not all of the beautiful crabs have been brought from China, as this double-flowered variety will verify. It is a variety of the Prairie crab that is native in the mid-western portion of the United States. There are other varieties appearing, but to the author this is still the most beautiful of all that he has seen. It is one of the last of the crab apples to bloom, blossoming in early June, and at that time seems to be loaded with pale pink, double roses, about two inches in diameter, whose delicate fragrance is like perfume. It grows as an erect, small tree, gaining, with many years of growth, possibly 15 feet in height and is well fitted to be used as a specimen tree in the formal garden, on the small lawn, near the house terrace,



—Photo, courtesy Arnold Arboretum

Fig. 16. The Sargent crab is the most useful of all the crabs for the small home owner and may be used in the foreground of the shrub border.

or any other place where its wonderful fragrance can be enjoyed. It is very susceptible to the Red cedar-apple rust.

***Malus pumila* var. *Niedzwetzkyana* (*M. Niedzwetzkyana*)**

REDVEIN CRAB

This tree is distinguished by having red as its basic color in every part of its structure. The leaves are reddish, the flowers are purplish-pink, the fruit has red flesh, and even the wood of the young twigs is tinged with red. The tree will attain a height of 25 feet but is not well-shaped and is used mostly as a color accent in the shrub border. When in flower it is beautiful.

The Purple crab (*M. purpurea*, *M. floribunda* var. *purpurea*) is another tree with purple-red foliage. It has single, deep pink flowers.

Malus Sargentii

SARGENT CRAB

The Sargent crab is one of the lowest of the flowering crab species. It forms a broad, densely branched crown that rests close to the ground and seldom exceeds 6 feet in height although it may grow to be twice as broad. It is the most useful of all crabs for the small home owner and may be used in the foreground of the shrub border. On larger grounds it may be used in masses on slopes and to form large shrub beds. The flowers are pure white, about an inch in diameter and in clusters of five or six. They are followed by small dark red fruits that persist for most of the winter.

Malus Scheideckeri

SCHEIDECKER CRAB

Another widely praised member of this group is the Scheidecker crab. It is an upright-branching, pyramidal tree, 10-15 feet high, which has a profusion of pale pink, double, or semi-double, flowers that are an inch in diameter. They appear as a dense mass of color and make a wonderful display in May. The fruits are yellow in color and three-fourths inch in diameter.



—Photo, courtesy Arnold Arboretum

Fig. 17. The Scheidecker crab has a great profusion of pale pink flowers.

Malus spectabilis

CHINESE FLOWERING CRAB

This is an upright tree, growing 15-20 feet high, with a vase-like crown that is very handsome when in bloom. It has coral red buds that open into sweet-scented, blush-colored flowers that are single, or semi-double. A double pink form *Malus spectabilis* var. *Riversii* has larger, more double flowers than the type. The leaves are also larger and broader. The double white form is *Malus spectabilis* var. *albi-plena*. All have outstanding beauty for small trees and may be recommended for specimen or general planting.

Malus hupehensis (*M. theifera*)

TEA CRAB

This is another tree which E. H. Wilson considered as one of his outstanding introductions. It is very irregular in outline, with upright-spreading branches that are often covered with blossoms for 15 feet, according to the plant's importer. It is exceedingly lovely when loaded with the white or delicately stained, pale pink flowers that are so thick that "it is impossible to thrust a finger on to the branch without touching a flower." The specific name of this plant is derived from the fact that in central China, where it is a feature of the thickets and margins of woods on the mountains, the peasants collect and dry the leaves and from them prepare a palatable beverage which they call "Red Tea."

Morus alba

WHITE MULBERRY

The White mulberry is a short-trunked tree that has a very wide-spreading, rounded crown. It grows 20-30 feet in height, depending upon the soil, and is generally very dense because of its bushy, or densely twigged branches. The foliage is very dark green and its individual leaves are rather variable in outline, ranging from a simple elliptical leaf to lobed forms possessing from one to five divisions.

This tree is particularly noted for its black, berry-like fruits. These fruits appear sometime in May as small white clusters and change, as they grow, through red to purplish-black. They ripen in July and are soft, juicy and sickening sweet, but many people enjoy them as a change from the general supply of horticultural products. The birds also enjoy them, and one of these trees should be included in every bird sanctuary or on the large lawn area, where people enjoy the visits of birds. Care must be taken not to place these trees near walks, driveways or other well-traveled thoroughfares, as the fruits are messy and stain clothes badly. The mulberry's well-shaped crown and dense foliage make it desirable for screen plantings and groups in parks and other large developments.

Its varieties, the Weeping mulberry (var. *pendula*) and the Russian mulberry (var. *tatarica*) have weeping, pendulous branches reaching to the

ground and are used by some people as specimens. The present fashions of landscape architecture, however, frown upon the general use of these weeping trees as they do not harmonize with the other plantings.

Nyssa sylvatica

TUPELO, SOUR GUM, PEPPERIDGE

From Maine and Ontario to Michigan and southward to Florida and Texas, the Tupelo is found growing in the wet and swampy woodlands. In Michigan it will average approximately 30 feet high, but in more southern locations it will attain 60 or more feet. In outline the Tupelo resembles the Pin oak, inasmuch as it has a narrow pyramidal crown with horizontally spread, upper branches and drooping lower ones. The Tupelo will vary in shape but the foregoing is the most common and typical form.

The foliage is a lustrous, dark green and is noted for its spectacular scarlet display in October. The individual leaves are crowded in sprays at the ends of the twigs and are 3-4 inches long, with a tapering tip and wedge-shaped base.

There is probably no other native tree that gives such an unmixed display of scarlet in the autumn. Like the majority of swamp-loving plants, it is much better when planted in masses than as a specimen. It is generally used in plantings near streams or along lake shores in sheltered places. The fruit of the tupelo is not showy, but is well-liked by the birds, making it a desirable tree for large bird sanctuaries.

Even with heavy pruning, the tupelo is difficult to transplant from its natural habitat, but nursery-grown specimens which have been transplanted several times can be used satisfactorily.

Phellodendron amurense

AMUR CORK-TREE

This ornamental tree has not been planted extensively in Michigan, but it is worthy of more attention. Small specimens have been growing on the campus of Michigan State College for several years, where they have withstood temperatures as low as 20 degrees below zero. The tree has also been reported hardy in Massachusetts, where similar weather conditions prevail.

The Amur cork-tree has many admirable qualities to make it an excellent shade tree. It has: (a) a broad, well-rounded crown with stout branches; (b) a dense mass of dark green foliage with leaves that are large, pinnately compound and in keeping with the size of the tree; (c) an attractive lemon-yellow autumnal coloration, and, (d) it has unusual orange-yellow bark that is deeply furrowed into broad corky ridges. The material of this bark is very similar to that from which ordinary corks are made.

The Amur cork-tree grows 45 feet high but is a little slow in establishing itself; it resists drouth and is not attacked by any serious insect pests. It should be watered well the first season because its root ball is small. This tree should make a very attractive specimen for residences of lower Michigan.

Phellodendron sachalinense—Sakhalin cork-tree is a similar species that is reputed to be equally hardy, if not hardier.

Platanus occidentalis

AMERICAN PLANE-TREE, BUTTONWOOD

Everyone is familiar with this large, massive tree and its mottled branches that add such a striking note to the winter landscape. This spotting of the trunk and branches is due to the older bark peeling off to expose, in irregular patches, the greenish-yellow inner bark, which later turns white with the coming of cold weather. Occasionally a large tree will shed so much bark that it resembles white, polished wood.

The leaves are similar to those of the maples, but are larger and have long, coarse teeth along their three lobes. The foliage is dense, bright green, and turns a brownish-tan in the autumn.

The American plane-tree is one of the most massive of the native trees found in the Northeast. It will rise more than 100 feet and makes a beautiful shade tree for the large lawn, park and parkway. It is capable of adapting itself to very poor growing conditions, although its native habitat is the rich bottom lands. It is susceptible, however, to attacks by some fungous diseases; for that reason, it has been sup-
planted in many sections by the European plane-tree.



Fig. 18. The mottled bark of the American plane-tree makes a distinctive note in the winter landscape.

Genus Populus

POPLAR

The poplar group may be classified into two divisions—the large poplar trees and the smaller trees which are more frequently known as aspens. The aspens have light and airy foliage that is continuously fluttering in the lightest breeze. These trees are generally found on the borders of woodlands and provide an interesting contrast because of their perpetual foliage movement and the reflection of the sun from their glossy leaf surfaces. The poplar division includes the tall, wide-

spreading trees that are frequently called cottonwoods and also the striking Lombardy and Bolleana poplars.

All of the poplar group has been in disfavor for a great many years because of their wide-spreading root system. Many cities have forbidden their being planted near sewers and drainage pipes. They do offer, however, a very striking note in landscape planting and may be used occasionally on large grounds as a special feature. They are short-lived and generally rather brittle of branch; hence, they are not recommended as permanent shade trees.

Populus alba

WHITE POPLAR

As a sample of the large poplars, the White poplar is typical. It may be distinguished by the greenish-gray bark of its upper branches and the downy-white under surface of its leaves. It is a large tree, growing 60 or more feet high, with a broad irregular crown.

The trunk remains smooth and light-colored on the White poplar longer than any other member of the group, and the upper branches are greenish-white, or gray with darker blotches. The twigs are covered with a white, cottony-down at their tip, which can be readily rubbed off, but often remains on the tree all winter.

The foliage is interesting as it flutters in the breeze, alternately flashing toward the sun the dark green upper surface and the downy white lower surface. The individual leaves are almost round in outline, with irregular shallow lobes sparingly toothed.

The White poplar is an attractive tree when grown in the country but gives a dirty appearance when grown in the city where the dust and soot collect upon the downy leaves and twigs. It also has spreading, suckering roots, which will interfere with nearby sewerage and drainage systems if there is an open joint in the pipe line. It can be used, however, to act as a soil binder on sandy or gravelly river banks, and as a large tree upon poor soil.

An outstanding variety of this species is the Bolleana poplar. (*P. alba* var. *pyramidalis*, *P. alba* var. *Bolleana*, *P. Bolleana*). It is a tall, narrow-pyramidal tree whose branches grow upright but are not as closely pressed toward the center as those of the Lombardy poplar. It also differs from the latter in its foliage, as the Bolleana poplar has leaves with three to five lobes, whose margins are lined with coarse, triangular teeth and whose under surface is snowy-white.

The Bolleana poplar is a valuable tree for vertical accents in large plantings or to emphasize the vertical lines of buildings. Its foliage is good and makes a pleasing contrast against dark-foliaged trees. For additional criticism, see the Lombardy poplar, *Populus nigra* var. *italica*.

Populus nigra var. italica

LOMBARDY POPLAR

This is a spire-like tree, rising 70 or more feet high, with closely placed upright branches. There are no drooping twigs, or any other part of this tree that deviates from the upright line. It has dark, lustrous green leaves which are triangular in outline and a light yellow-green on the underside.

Many people have described this tree as the "exclamation point of the landscape," because of its startling accent effect. In Europe it has been planted in double rows to line a road or small lane, but in this country we do not use these extensive formal developments, and the tree looks inappropriate when planted in such a manner. It is much more effective when used singly or in small groups as an accent in large plantings, such as those found on institutional grounds and large estates. It may also be used to accent the architectural line of a building.

The Lombardy poplar is an extremely narrow tree, fast-growing, and will adapt itself to almost any conditions, which makes it a very satisfactory tree for special effects. It is narrower than the Bolleana poplar, cleaner, and its suckering roots are less troublesome.

A somewhat similar tree is the Simon poplar (*Populus Simonii*), native to China, which was introduced into France about 1861 by M. E. Simon. It is a smaller tree, growing approximately 30 feet high, and has the same fastigate form. It is a very rapid grower and is used mostly for creating quick-growing windbreaks, but can be used as a vertical accent in the small garden.

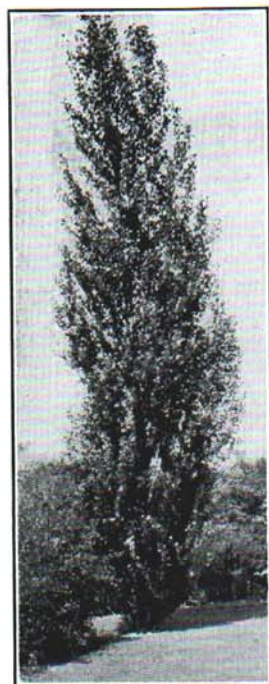


Fig. 19. The Lombardy poplar is frequently called the exclamation point of a garden.

Genus Prunus

PLUM, CHERRY

The large group of cherry trees is easily separated into two divisions on the basis of their popularity. First, there are the large number of native cherries and, second, the more widely planted Japanese cherries and ornamental plum trees. The native plants range from small shrub-like trees to large specimens and are seldom used for ornamental planting, although most

of them have good foliage and are well-formed. Their flowers, however, are white and not as showy as the pink Japanese forms. That is probably one of the most striking differences. The native trees have a great abundance of fruit which will vary from the clusters of red fruits of the Wild Red or Pin cherry (*Prunus pennsylvanica*) to the black fruits of the Choke cherry (*Prunus virginiana*) and the Black or Wild cherry (*Prunus serotina*). All of these trees are tolerant as to soil conditions but are improved in appearance when grown in moist, fertile soil. Their greatest value is in furnishing food for birds and as undergrowth plantings in the large state and municipal naturalistic developments and in roadside beautification projects.

The Japanese Flowering cherries are very beautiful and have received a great amount of attention from the American public because of the famous trees in Washington, D. C. They are well-formed, have excellent foliage and are much showier than our native trees, because of their pink flowers and more prolific bloom. In the ordinary landscape planting they produce their best effects when planted in small groups or masses against an evergreen, or similarly dark, background. Some of the larger forms are effective when used as specimens if they are not placed so far in the open that they lose their background association. Many of these Japanese Flowering cherries are hardy only south of Philadelphia, but varieties of *Prunus ser-rulata* on the Michigan State College campus have withstood temperatures as low as 20 degrees below zero.

Most of these trees prefer a moist, well-drained soil and full sun. A general rule may be made that the Japanese Flowering cherries will grow wherever the peach tree is hardy.

Prunus Persica (*Amygdalus Persica*)

PEACH

The flowering peach tree resembles closely the form and foliage of the common orchard peach. The main distinction, however, is its beautiful flowering display of pink flowers that are produced in such abundance as almost to cover the branches. The Double Red peach (var. *rubro-plena*) has semi-double red flowers. Double pink flowers may also be obtained by the purchase of the variety *duplex* (*P. Persica* var. *flore-pleno* and *P. Persica* var. *roseo-pleno*). Different forms of this variety have been singled out by a few nursery companies and given different names. The Double White peach (var. *albo-plena*) has a great profusion of semi-double, snow-white flowers before the leaves appear.

These trees are useful for spring effects in the city garden. They are generally placed in the corners of the flower garden or in the back of shrub borders but are secondary in importance to the longer-lived and better-foliaged flowering fruit trees like the flowering apples and Japanese cherries.

Prunus Sargentii (*P. serrulata* var. *sachalinensis*)

YAMA CHERRY

Most of these trees received from American nurseries are grafted specimens, and their branches go upward at a broad angle to the trunk, so that the trees have the form of a V. In its native country, the cherry will grow 80 or more feet high and probably specimens grown from seed would do almost as well in this country, but it is not known how high the grafted forms will reach.

The oval, dark green leaves have a delightful bronze cast when unfolding from the bud stage, but such subtle coloring is surpassed in the autumn by their coloration of yellow-orange and crimson. The chief glory of this tree, however, is its floral beauty, when it appears as a large rosy mass. The flowers are 1½ inches across, single or semi-double, and hang in clusters of two or three. They are followed by a sweet, round cherry about the size of a garden pea that is bright red at first but changes to black and is much sought by the birds.

This is an excellent specimen tree and is one of the finest of our ornamental flowering trees, but its varieties are still more showy and more commonly planted.

The double-flowering varieties have a longer flowering period, but their flowers are so heavy and hang on such slender stems that they are easily broken by the wind. Therefore, they should be planted in a sheltered place away from strong winds, but in the sunshine.

The following garden forms were considered by the late E. H. Wilson, who brought most of them to this country, as forms of variety *sachalinensis*, but Alfred Rehder, the author's authority, classifies them as varieties of *Prunus serrulata*.

The Shirofugen cherry (*P. serrulata* var. *albo-rosea*) has large double flowers that are deep pink when in bud but become almost white when they are open.

The Fugenzo cherry, or James H. Veitch (*P. serrulata* var. *fugenzo*) is the most popular of all. It is a deep rose color and one of the most showy of the double types.

Other outstanding varieties are: the Kwanzan (*P. serrulata* var. *sekiyama*) which has large, double, rich rose-colored flowers: the Double Pink Flowering cherry (*P. serrulata* var. *hisakura*) with beautiful pale pink, double flowers, and the Shujaku with double, rose-pink flowers.



Fig. 20. Fugenzo cherry. One of the most showy of the Japanese flowering cherries.

Prunus subhirtella

HIGAN CHERRY

The Higan cherry is a small tree-like shrub, 20 feet high, with low, sweeping branches and a regular, rounded crown. There is no other flowering cherry tree with single pink flowers that gives so great a floral display as this tree. The blossoms appear in such abundance before the leaves unfold that the tree looks like a pink mound without any supporting branches. The flowers remain in good condition for almost two weeks, when they turn white and fall.

This tree requires a rich, well-drained soil and full sunlight to give the best effect. It is excellent for giving a spring display in the foreground of large shrub borders or against a background of evergreens, but is not so hardy as the former.

The Autumn Flowering Higan cherry, or Jugatsu Zakura cherry (*Prunus subhirtella* var. *autumnalis*) is a variety growing 15 to 25 feet, with a vase-shaped crown. It has semi-double pink blossoms which appear a few days after those of the Weeping Japanese cherry and again in October when the flowers are usually smaller and produced in less abundance. This habit of blooming twice during the year gives the tree a unique value when one is planning garden pictures.

The Shidare-Higan cherry, or Weeping Japanese cherry (*Prunus subhirtella* var. *pendula*) is another tree that is offered by many nursery companies. There are two forms of this tree, and care must be taken when buying to be sure that the right type is purchased. The natural form, which was found growing in the Japanese courtyards and temple grounds, was that of an upright pyramidal tree, 20 or more feet in height, with crooked, arching branches from which long, slender twigs hung like those of the Weeping willow. The more common form found in this country is that of a rounded crown with weeping branchlets at the top of a straight trunk, six feet high. This is a grafted tree and gives about the same poor results as those of the Weeping mulberry or Camperdown elm.

The flowers of this tree are single, $\frac{3}{4}$ inch across, and vary in color from rosy-pink to nearly white.

A form of this Weeping Japanese cherry is offered by a few nurseries, which has double flowers and is called the Double Flowering Weeping cherry.

Genus *Quercus*

OAK

More than 200 species of oak are known, distributed through the colder and temperate regions of the northern hemisphere and in the mountains of the tropics. These trees range in size from low, shrubby plants to tall trees with massive trunk and heavy, spreading limbs. They also differ in their foliage from the small, entire, evergreen leaves of the Live oak which grows in the southern states, to the large, deeply lobed, deciduous leaves of Michigan's Red and White oaks.

Most of the oaks are stately trees with beautiful foliage. They offer many shades of green for foliage compositions, and the Red oak, Pin oak, and Scarlet oak are particularly beautiful in the autumn. That is why the oaks rank among our outstanding trees for lawn, roadside, and street planting. They are as beautiful when grown as single trees as they are when grouped together.

Generally the oaks grow best in a moderately moist, rich soil, including heavy clay. The Red and Scarlet oaks, however, will grow on drier, sandy soil.

Quercus alba

WHITE OAK

No other native tree of Michigan can equal the White oak as a magnificent heroic specimen. It will lend dignity to any large lawn area and will act as a fine sheltering shade tree near a large house or public building. It is much too large and magnificent to use in association with a small home or on a small lawn.

The White oak raises, with stout branches, a massive crown to the height of 80 or more feet and gives a feeling of strength and durability. Its large frame is well-covered in the summer with bright green leaves that are 5-9 inches long and divided into seven or nine lobes. These lobes are broad and round at the tip in contrast with those of the Black oak group, which have sharp-pointed lobes ending with bristles.

This tree is exceedingly difficult to transplant from the wild, because of its long tap root. Nursery specimens, therefore, are preferred for specimen planting, or young seedlings may be placed where the matured trees are desired and given protection from trespassing until large enough to be seen. The trees are rapid growers when young, so that it is not so long a process as one would believe to grow them from acorns.

Quercus borealis var. maxima (Q. rubra)

COMMON RED OAK

Second to the Pin oak in popularity is the Red oak. Its rapidity of growth, adaptability to various soil conditions, luxuriant foliage and bright autumnal coloration, and the ease with which it may be transplanted are the desirable qualities responsible for its widespread use. Like the White oak, the Common Red oak has a straight, towering trunk with heavy limbs, forming a massive crown 60 or more feet high.

On the parkway, park lawn and along the roadside, it can hardly be surpassed as an imposing specimen tree, with pleasing dark green foliage. It is also highly desirable for woodland plantings and offers a dark red autumnal coloring as an additional attraction in the late fall.

The luxuriant dark green leaves of the Common Red oak are 5-9 inches long and divided almost to the midrib into seven or nine lobes, which taper gradually from broad bases to long bristled points. The second pair of lobes from the tip is usually the longer.

Quercus coccinea

SCARLET OAK

The Scarlet oak grows 50 or more feet high and has an open, flat-topped crown, with the lower branches frequently drooping almost to the ground. Its foliage is a bright, shiny green and turns a brilliant scarlet in the fall. The individual leaves vary from 3 to 6 inches in length and have from five to nine bristle-tipped lobes that are cut in deeply toward the midrib.

This is a beautiful tree, which will grow in the light sandy soil that is found over a great portion of Michigan. The Scarlet oak retains its foliage long after the majority of trees have lost theirs, and finally in late autumn will assume such a brilliant scarlet that it seems to light up the whole landscape. It is rapid of growth, hardy, and has all the qualities of a desirable ornamental specimen tree.

Quercus palustris

PIN OAK

The Pin oak is the best of all oaks for the ordinary home lawn area. It has smaller, shinier leaves than the others and a beautiful pyramidal shape, with the lower branches in a pendulous manner, almost to the ground. When mature, it has a rounded crown, 60 or more feet high, but for 40 years at least it has the typical symmetrical outline formed by ascending upper branches and wide-sweeping lower ones.

The small leaves are only 3 to 5 inches long and have five or seven lobes, which taper into long, slender bristles at their tips. Its foliage is dense and is a lustrous dark green during the summer and a deep scarlet in the autumn.

Probably no other oak is so useful or so popular for various types of landscape planting as the Pin oak. It develops its greatest beauty when placed as a specimen on the open lawn, where the lower branches can droop in a graceful, natural manner. The Pin oak is also useful as a street tree in the residential sections, provided, it has been pruned in the nursery row to allow proper head room for the pedestrian. It may be planted advantageously along parkways and highways where the moisture content of the soil is greater than on the residential street.

Robinia pseudoacacia

COMMON LOCUST, BLACK LOCUST

Everyone is familiar with the Common locust and its open, narrow, oblong crown. Those specimens growing in the open places have been frequently broken and deformed by the prevailing winds and borers. When the tree is planted at the edge of a woodland planting, however, it makes a beautiful specimen, with yellow-green foliage and an excellent floral display. In addition, the pinnately compound leaves give a light and airy appearance that would be a delightful addition to any lawn area, if it were not for the tree's bad habit of suckering and its ability to sprout up freely from the scattered seeds. For those reasons, it is more useful as a binder on sand and gravel banks and in naturalistic woodland plantings.

The flowers appear in late May or early June in long, fragrant racemes. Individually, they are white and shaped like the flowers of a pea, to which they are related. The flowers are followed in September by pods, 2-4 inches long, which are not very ornamental, and which persist throughout the winter.

The species has its branches lined with many stiff triangular thorns, but if a specimen is desired without these protective agents, the Thornless locust (*R. pseudoacacia* var. *inermis*) should be purchased.

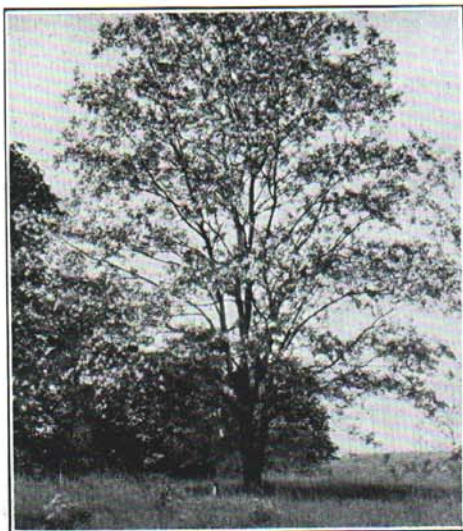


Fig. 21. Common locust.

Genus Salix

WILLOW

The willows are slender-branched trees or shrubs, which inhabit moist localities and are useful as specimens and soil binders along stream banks. They are dioecious and hybridize so easily that botanists find great difficulty in classifying them; because only the pictorial value of the willow is considered here, only a few of the more widely cultivated species will be discussed.

Willows may be distinguished generally by the slenderness of their branchlets, the lack of a terminal bud, the lateral buds which cling closely to the twigs and have one cap-like scale, and by their small leaves, which are usually narrow and tapering.

In addition to the willows mentioned in succeeding paragraphs there are many native species that may be used for planting along stream banks and along the highway. These trees vary from small shrub-like forms to regular tall trees. By study of their associations in the wild, one may easily discover whether they are suitable for the particular purpose under consideration.

Salix babylonica

BABYLON WEeping WILLOW, WEeping WILLOW

The Babylon Weeping willow has a short trunk, divided into several large, spreading limbs to form a well-rounded crown.

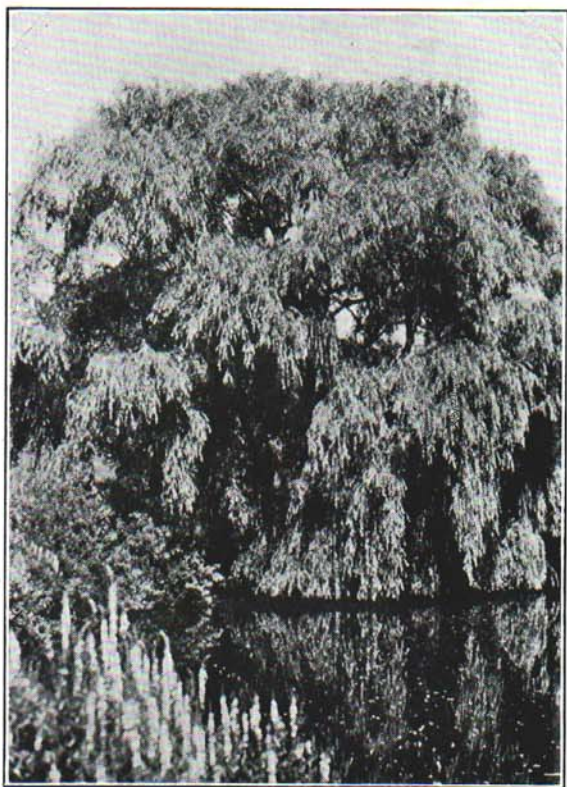


Fig. 22. *Babylon Weeping willow*. A weeping willow and quiet water always make an attractive picture.

Its striking character of growth, however, is furnished by the long, slender, flexible twigs that sometimes hang straight down for several yards to form a swaying screen of foliage, from the top of its crown to the ground. The dark green leaves are from 3 to 7 inches long and turn yellow in the autumn.

The unusual character of this tree makes it very difficult to use properly, especially if an attempt is made to place it near other plantings. As a result, the Babylon Weeping willow is used only as a specimen at the edge of a stream or pond, where it makes a beautiful, quiet effect upon the landscape.

This tree is only half-hardy north of New York, N. Y., but the following hardier species will furnish a similar picture in northern places:

Salix blanda, the Wisconsin Weeping willow, and *Salix elegantissima*, the Thurlow Weeping willow.

Salix pentandra

BAY WILLOW, LAUREL WILLOW

Many times a high screen is desired upon small places, as well as on large landscape developments, and the willow is frequently overlooked when consideration is being given for various kinds of screen plantings. The Laurel willow is one of the best for use as a high hedge or for screening out objectionable views in the park, on the farm, or other large place.

It is an upright growing tree, 40 to 60 feet high, which has glossy dark green foliage. The leaves are elliptical, with a long tapering point, and are light-colored on the underside. This willow will grow in almost any type of soil and will stand pruning.

Salix alba var. vitellina (S. vitellina)

GOLDEN WILLOW

The outstanding characteristic of this tree is the bright yellow color of the young branches, which is especially noticeable during the winter when the dark green foliage is off the tree. During the summer, the foliage is dense and pleasing. The slender, tapering leaves have a white coating on the underside which seems to become brighter after the leaves have fallen.

The Golden willow grows 50-70 feet high and is used principally along river banks, where the yellow twigs show to good advantage and its spreading roots help to bind the soil. The following varieties of *Salix alba* are frequently used as specimens on large lawns:

Var. *chermesina* (*S. vitellina* var. *britzensis*), Bronze Golden willow, grows 20-30 feet high and has bright red bark.

Var. *tristis* (*S. alba* var. *vitellina pendula*), Weeping Golden willow, is a weeping tree similar to *S. babylonica*, but has bright yellow twigs.

Sassafras albidum molle (S. officinale, S. variifolium)

COMMON SASSAFRAS

Along the roadside and at the edges of cultivated fields, where the brush is cut occasionally, the shrub-like growth of the Common sassafras is frequently seen. If it is not disturbed, however, the sassafras will grow into an irregularly shaped tree 50 or more feet high, with deeply furrowed bark and a thicket of suckering growths about its base. The sassafras is very easily distinguished from other trees by its leaves, which vary in their outline from a simple oval, 4-6 inches long, to others that resemble a mitten, and those with three deeply cut lobes. Many times, everyone of these forms can be found adjoining each other on one branch. The foliage is an attractive dark green and turns a brilliant scarlet, red, or pure yellow in the early autumn.

The young twigs are green, and many people enjoy chewing them for their flavor. These young twigs taste very much the same as the tea which is brewed from the bark sold on the market early in the spring.

Of all native trees, it would be difficult to find one that could equal the Common sassafras for brilliance and beauty in its autumnal coloration. During the summer the foliage is pleasing, but not striking, when the tree is used at the edge of a woodland planting; with the turning of the leaves the tree creates a picture that is well worth waiting for in the landscape scheme of a large farm unit, estate, or park. In addition to the color, the female trees have a brief, but interesting, display of brightly colored fruits in September. These fruits are light blue, cherry-like in character, and are borne in small, erect clusters on bright red stems. The combination of blue and red produces an unusual ornamental effect, but the birds will not allow the fruits to hang very long.

The Common sassafras has fleshy roots which make it difficult to transplant; only small specimens should be considered for transplanting. If the tree is transplanted in the spring, it will have a much better opportunity to re-adapt itself.

Sophora japonica

JAPAN PAGODA-TREE, CHINESE SCHOLARTREE

The northern limit of this plant's range would have climatic conditions similar to those found at Detroit. Under such conditions the Japan pagoda-tree assumes a shrub-like character of growth, with a wide-spreading crown and will grow 20 or more feet in height. The foliage is very fine and remains green until late in the autumn. Individually, the leaves are pinnately compound, 7 to 9 inches long, and have many dark, glossy, green leaflets that are not more than 2 inches long.

Late in July or early in August the tree is covered at the tips of its branches with flower clusters about 15 inches long and much branched. The flowers are pea-like, creamy white, and produce a pleasing combination with the light, delicate foliage. The tree makes a distinct change from the ordinary plant materials found in most gardens.

The Chinese scholartree thrives on well-drained sandy soil and will withstand city conditions better than the average tree. It may be used as a lawn specimen, especially when the lawn is informal, edged with perennials. Trees or large shrubs which blossom so late in the summer are very difficult to find and, for that reason, more attention should be given to this plant.

E. H. Wilson, who was keeper of the Arnold Arboretum, told of seeing many beautiful specimens of *Sophora japonica* growing as trees in temple grounds around Peiping. The first specimens of the Chinese scholartree to reach Europe were gathered by surgeons of the East India company's ships.

Sorbus americana

AMERICAN MOUNTAIN ASH

The outstanding beauty of this tree lies with its brilliant red berries that make the tree glow with color in late October. These brilliant fruits are about $\frac{1}{4}$ of an inch in diameter, but gathered in such large clusters that their color can be seen hundreds of feet away. It is really an attractive and ornamental tree at all seasons of the year, but is noticed especially at the time of fruiting. The American Mountain ash is used chiefly as a specimen tree on the small home lot, estate or park, but is also good in the bird sanctuary as a food supply for migrating birds. It appears to produce more fruit in the northern part of Michigan than in the southern.

Early in June this tree has many small white flowers which appear in large ornamental flat clusters 4 to 6 inches across. They are produced at the ends of the branches and show up well against the light yellow-green foliage. The leaves are pinnately compound and composed of many small leaflets which give a refined foliage effect for the private lawn area.

This tree prefers a moist soil but will grow under moderately dry conditions. A similar tree is the European Mountain ash, or Rowan tree (*Sorbus aucuparia*). Its fruits are slightly larger and showier than those of the American Mountain ash, but for general landscape purposes, the two are considered to be the same.

Tilia glabra (T. americana)

AMERICAN LINDEN, BASSWOOD

The American linden is a dense, round-headed tree, 60 or more feet high, with branches that will sweep to the ground if they are not pruned. Then, it makes a very massive, compact specimen tree that could act as a definite frame for a view in any park design. If the lower branches are pruned the American linden will make a good street or lane tree for suburban and country districts, but it will not withstand dry conditions and, therefore, is not suitable for city areas.

The leaves are 4-6 inches long, with a heart-shaped base, that is usually lopsided. That is, one lobe will curve downward much farther than the other. The foliage is dense, dark green, and turns yellow in the field.

Attention should be drawn to the curious method of seed dissemination used by the American linden. The small, pea-like fruits are in clusters and attached by a common stem to a curious ribbon-like leaf, which is, in turn, attached to the twig. Such an elaborate structure is such that when the fruit is ripe the whole unit will fall, and the leaf-like bract will act as a parachute to carry the seeds beyond the area of the parent plant. These seeds appear after fragrant, yellowish-white flowers. These flowers are not noticed by the passerby but furnish a sweet scent to the garden when the air is still.

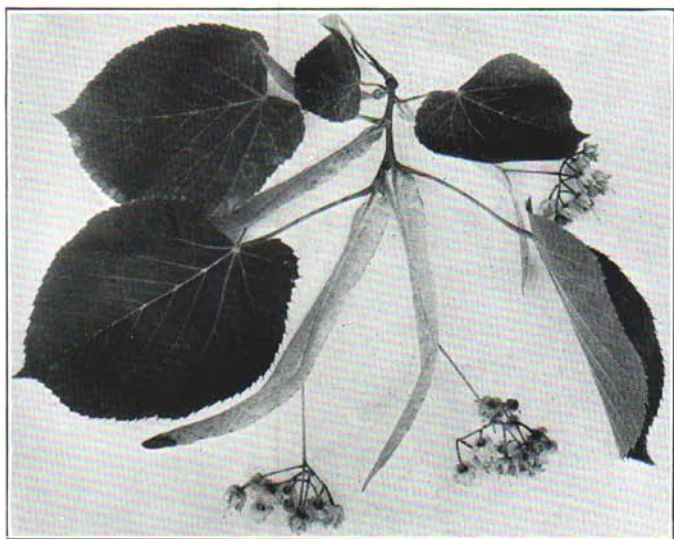


Fig. 23. American linden. These curious fruiting bodies and lop-sided leaves are characteristic of the lindens.

Tilia vulgaris

COMMON LINDEN

For city parks, private grounds, and residential streets, the Common linden is much better suited than the American linden. It is very hardy and capable of withstanding the drier soil and sooty atmosphere of the city.

The Common linden is a graceful massive tree, 100 feet high, with a well-rounded crown. Its dark green foliage consists of heart-shaped leaves whose under surface varies from green to almost a bluish-white. A fungous growth, which has the appearance of black soot, is usually found on the leaves but does not disfigure the foliage, only makes it appear darker.

Ulmus americana

AMERICAN ELM

Probably no tree is as highly prized by the American people living in the northeastern section of the United States, as the American elm. It will vary somewhat in shape, but the typical form has a straight trunk for 20 or more feet and then divides into many large, arching limbs which form a beautiful wide-spreading crown with a regular fan-shaped outline. It will grow up to 100 feet and always gives a graceful, stately appearance.

The foliage is dense, but since the crown is so high from the ground it does not prevent sunlight from reaching the ground on all sides of the trunk. The leaves are 3-6 inches long and are characterized by their conspicuous veins that run in parallel lines from the mid-rib to the fine teeth along the margin and by their unequal bases. The base of the leaf is heart-shaped, but one lobe is always longer than the other so that they form an oblique line with the mid-rib.

For large lawns, in the park, cemetery, and estate, the American elm makes a fine, aristocratic specimen and has few equals. The elm-vaulted streets of the small New England town have always been remembered by tourists and cherished by the residents, but in localities where there is a great amount of smoke and carbon monoxide from automobiles, the American elm has been dying out. It is much better when planted along the broad country lanes and open highways and similar locations. Because of the fibrous root system it is easy to transplant large specimens for immediate effects.

The introduction and rapid spread of the Dutch elm disease, which has already affected many thousand trees in the vicinity of New York City, should make one hesitate to plant any of the elms extensively until the disease is exterminated or under control.

The Moline elm (*U. americana* var. *molini*) is a grafted variety whose crown assumes a symmetrical, oval outline. It is a good, quick-growing elm that is useful for more restricted areas, such as are found on narrow streets.



Fig. 24. The graceful American elm deserves a great amount of praise.

Ulmus procera (U. campestris)

ENGLISH ELM

In smoky, dry places, the English elm is replacing the American elm as the avenue and park tree. It has not the graceful, arching crown of the American elm, but is more pyramidal when young and spreads into a massive tree with an oblong crown as it reaches maturity; the leaves are smaller than those of the American elm but have the same parallel venation, oblique base and dark green color; and the young twigs of the English elm frequently have corky ridges.

The English elm withstands the adverse conditions of the city very well, but is not so hardy as the American Elm.

Ulmus pumila

DWARF ASIATIC ELM

Of recent years, the Chinese elm has been highly advertised by many nursery companies as being a remarkable addition to our list of trees. Its outstanding qualification was fast growth. There are two elms native to China, however, which were greatly mixed up in their classification when introduced into the horticultural trade of this country. The fast-growing tree was introduced in 1905, through J. G. Jack, who sent specimens to the Arnold Arboretum. Through lack of information, or because of its small leaves, it was named *Ulmus pumila* and was given the common name Dwarf Asiatic elm by the committee which published the book, "Standardized Plant Names" for the American nurserymen. But the late E. H. Wilson, an authority on Chinese plants, maintains that both names are misnomers as the tree grows as high as the American elm.

The tree which is classified as the Chinese elm in "Standardized Plant Names" is *Ulmus parvifolia*, which is found wild in parts of Japan, Korea, and China. It is not the fast-growing tree that is advertised by the nurserymen, however, but is a more refined type, having slender twigs, small, oval leaves and thin, light gray, smooth bark. Also, it blossoms in August or September, while *Ulmus pumila* blossoms in the spring.

The Dwarf Asiatic elm (*Ulmus pumila*) will attain a height of 15-20 feet in 4 years under good growing conditions and may be used as a shade tree about a newly-built home when quick effects are desired. It cannot be classified, however, as a permanent tree, as it has the undesirable habit of breaking during wind and ice storms.

It has a rounded, wide-spreading crown that forms a very large mass. It will probably attain a height of 60 feet, although American authorities say 45 feet. The bark of the trunk and large branches is black and exceedingly rough in appearance, while the twigs are smooth and a greenish-gray in color.

TREES FOR SPECIAL PURPOSES

Specimens for Small Places

American Hornbeam (*Carpinus caroliniana*); **American Mountain-Ash** (*Sorbus americana*); **American Redbud** (*Cercis canadensis*); **Amur Maple** (*Acer ginnala*); **Arnold Hawthorn** (*Crataegus arnoldiana*); **Chinese Scholartree** (*Sophora japonica*); **Dwarf Asiatic Elm** (*Ulmus pumila*); **European Alder** (*Alnus glutinosa*); **Flowering Crabs** (*Malus* species); **Flowering Dogwood** (*Cornus florida* and varieties); **Flowering Peach** (*Prunus Persica* and varieties); **Higan Cherry** (*Prunus subhirtella*); **Norway Maple** (*Acer platanoides*); **Red Horse-chestnut** (*Aesculus carnea*); **Tricolor Beech** (*Fagus sylvatica* var. *tricolor*); **Washington Hawthorn** (*Crataegus phaenopyrum*); **White Birch** (*Betula pendula* varieties).

Specimens for Large Places

American Beech (*Fagus grandifolia*); **American Elm** (*Ulmus americana*); **American Linden** (*Tilia glabra*); **American Plane-tree** (*Platanus occidentalis*); **Amur Cork-tree** (*Phellodendron amurense*); **Canoe Birch** (*Betula papyrifera*); **European Beech** (*Fagus sylvatica* and varieties); **Horse-chestnut** (*Aesculus Hippocastanum*); **Japanese Flowering Cherries** (*Prunus serrulata* varieties); **Katsura-tree** (*Cercidiphyllum japonicum*); **Maidenhair-tree** (*Ginkgo biloba*); **Oaks** (*Quercus* species); **Sugar Maple** (*Acer saccharum*); **Tulip-tree** (*Liriodendron*); **Wier Maple** (*Acer saccharinum* var. *Wieri*).

Specimens for the Woodland Border

American Beech (*Fagus grandifolia*); **American Elm** (*Ulmus americana*); **American Redbud** (*Cercis canadensis*); **Common Locust** (*Robinia pseudoacacia*); **Downy Shadblow** (*Amelanchier canadensis*); **Flowering Dogwood** (*Cornus florida*); **Oak** (*Quercus* varieties); **Sassafras** (*Sassafras officinale*); **Sugar Maple** (*Acer saccharum*); **Sweet Birch** (*Betula lenta*); **Tupelo** (*Nyssa sylvatica*); **Yellow Birch** (*Betula lutea*).

Specimens for the Bird Sanctuaries

American Mountain-ash (*Sorbus americana*) fruit; **Choke-cherry** (*Prunus virginiana*) fruit; **Common Locust** (*Robinia pseudoacacia*); **Downy Shadblow** (*Amelanchier canadensis*) fruit; **Flowering Crab** (*Malus* species) fruit and cover; **Flowering Dogwood** (*Cornus florida*) fruit; **Hackberry** (*Celtis occidentalis*) fruit; **Hawthorn** (*Crataegus* species) fruit and cover; **Red Mulberry** (*Morus rubra*) fruit; **Shrub-like Willows, Tupelo** (*Nyssa sylvatica*) fruit and cover; **Wild Black Cherry** (*Prunus serotina*) fruit.

Specimens for their Flowers

American Mountain-ash (*Sorbus americana*); **American Redbud** (*Cercis canadensis*); **Cherry** (*Prunus* species); **Chinese Scholartree** (*Sophora japonica*); **Crab** (*Malus* species); **Downy Shadblow** (*Amelanchier canadensis*); **Flowering Dogwood** (*Cornus florida*); **Hawthorn** (*Crataegus* species); **Horse-chestnut** (*Aesculus* species); **Scotch Laburnum** (*Laburnum alpinum*); **Yellow-wood** (*Cladrastis lutea*).

Specimens for the Boundary Planting

American Redbud (*Cercis canadensis*); **Amur Maple** (*Acer ginnala*); **Chinese Scholartree** (*Sophora japonica*); **Crab** (*Malus* species); **Downy Shadblow** (*Amelanchier canadensis*); **Gray Birch** (*Betula populifolia*); **Hawthorn** (*Crataegus* species); **Higan Cherry** (*Prunus subhirtella*); **Japanese Maple** (*Acer palmatum* and varieties); **Scotch Laburnum** (*Laburnum alpinum*).

Specimens for Dry and Sandy Soil

Amur Maple (*Acer ginnala*); **Chinese Scholartree** (*Sophora japonica*); **Common Locust** (*Robinia pseudoacacia*); **Downy Shadblow** (*Amelanchier canadensis*); **Flowering Peach** (*Prunus Persica*); **Gray Birch** (*Betula populifolia*); **Hawthorn** (*Crataegus species*); **Honey Locust** (*Gleditsia triacanthos*); **Lombardy Poplar** (*Populus nigra* var. *italica*); **Red Oak** (*Quercus borealis* var. *maxima*); **Scarlet Oak** (*Quercus coccinea*); **Simon Poplar** (*Populus Simonii*); **Tree-of-Heaven** (*Ailanthus altissima*).

Specimens for Wet Soil

American Plane-tree (*Platanus occidentalis*); **European Alder** (*Alnus glutinosa*); **Green Ash** (*Fraxinus pennsylvanica* var. *lanceolata*); **Ohio Buckeye** (*Aesculus glabra*); **Red Maple** (*Acer rubrum*); **River Birch** (*Betula nigra*); **Silver Maple** (*Acer saccharinum*); **Sweet Gum** (*Liquidambar styraciflua*); **Tupelo** (*Nyssa sylvatica*); **White Poplar** (*Populus alba*); **Willow** (*Salix species*); **Yellow Birch** (*Betula lutea*); **Yellow-wood** (*Cladrastis lutea*).

Specimens for Hedges

American Beech (*Fagus grandifolia*); **Cockspur Thorn** (*Crataegus crus-galli*); **Common Honey-locust** (*Gleditsia triacanthos*); **European Hornbeam** (*Carpinus betulus*); **Golden Willow** (*Salix alba* var. *vitellina*); **Laurel Willow** (*Salix pentandra*).

Specimens for Streets

American Elm (*Ulmus americana*)—for wide streets; **English Elm** (*Ulmus procera*); **European Linden** (*Tilia vulgaris*); **European Plane-tree** (*Platanus orientalis*); **Green Ash** (*Fraxinus pennsylvanica* var. *lanceolata*); **Maidenhair-tree** (*Ginkgo biloba*)—narrow streets, male form only; **Moline Elm** (*Ulmus americana* var. *Molini*); **Norway Maple** (*Acer platanoides*); **Pin Oak** (*Quercus palustris*); **Red Maple** (*Acer rubrum*)—for narrow streets; **Red Oak** (*Quercus borealis* var. *maxima*); **Tree-of-Heaven** (*Ailanthus altissima*)—smoky areas, pistillate form only.

Specimens for Highway and Parkways

American Beech (*Fagus americana*); **American Elm** (*Ulmus americana*); **American Hornbeam** (*Carpinus caroliniana*); **American Linden** (*Tilia americana*); **American Plane-tree** (*Platanus occidentalis*); **Choke-cherry** (*Prunus virginiana*); **Common Honey-locust** (*Gleditsia triacanthos*); **Downy Shadblow** (*Cercis canadensis*); **Flowering Dogwood** (*Cornus florida*); **Hackberry** (*Celtis occidentalis*); **Hawthorns** (*Crataegus species*); **Maples** (*Acer species*); **Oaks** (*Quercus species*); **Ohio Buckeye** (*Aesculus glabra*); **Sassafras** (*Sassafras officinale*); **Shagbark Hickory** (*Hicoria ovata*); **Sweet Birch** (*Betula lenta*); **Tulip-tree** (*Liriodendron tulipifera*); **White Ash** (*Fraxinus americana*); **Wild Red Cherry** (*Prunus pennsylvanica*); **Willows** (*Salix species*).

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