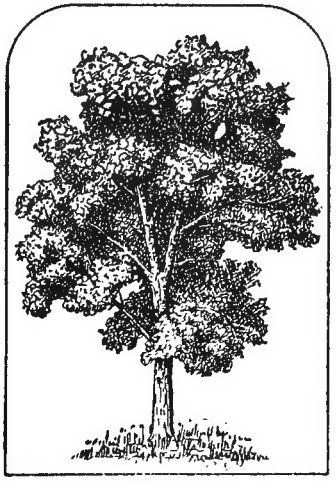
THIRTY IMPORTANT FOREST TREES OF MARYLAND



HOW TO KNOW THEM

MARYLAND STATE BOARD OF FORESTRY
F. W. Besley, State Forester

In Co-operation with the Forest Service
U. S. Department of Agriculture,

1922

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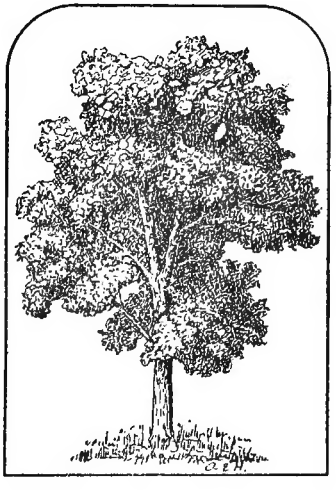

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PURPOSE OF THIS MANUAL

It is the purpose of this pocket manual to present what is considered the thirty principal trees of Maryland, as determined by occurrence and uses from a list of more than one hundred native species. The chief characteristic of each are set forth in plain illustrations and simple language that should enable easy field identification. The rapidly increasing interest in outdoor life, stimulated by the Scout movement, nature study in the schools, garden clubs, and similar organizations, has created a demand for such a manual as this.

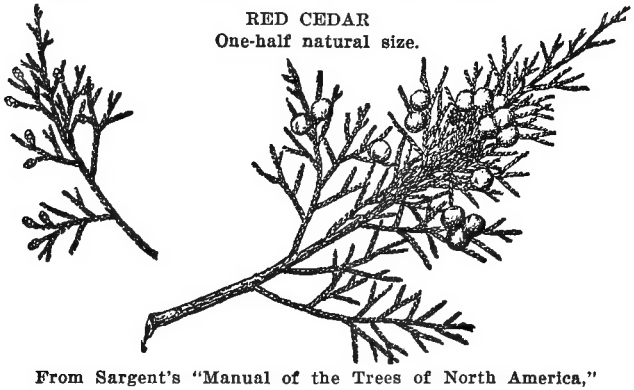
Acknowledgments

The subject-matter has been prepared by the State Foresters of Maryland, Virginia, North Carolina and Tennessee, who are each publishing similar manuals. The advice and help of the Forest Service of the United States Department of Agriculture, including the preparation of drawings from which most of the cuts were made, is gratefully acknowledged. A number of cuts illustrating leaves and fruit of hardwoods were kindly loaned by the Vermont Agricultural Experiment Station.

RED CEDAR (*Juniperus virginiana* L.)

A VERY valuable tree found in all classes and conditions of soils—from swamp to dry rocky ridges—seeming to thrive on barren soils where few other trees are found. It is scattered throughout the State except in the high mountains, but it is most important in the middle section.

There are two kinds of **leaves**, usually both kinds being found on the same tree. The commoner kind



RED CEDAR
One-half natural size.

From Sargent's "Manual of the Trees of North America," by permission of Houghton-Mifflin Company.

is dark green, minute and scale-like, clasping the stem in four ranks, so that the stems appear square. The other kind, usually appearing on young growth or vigorous shoots, is awl-shaped, quite sharp-pointed, spreading and whitened.

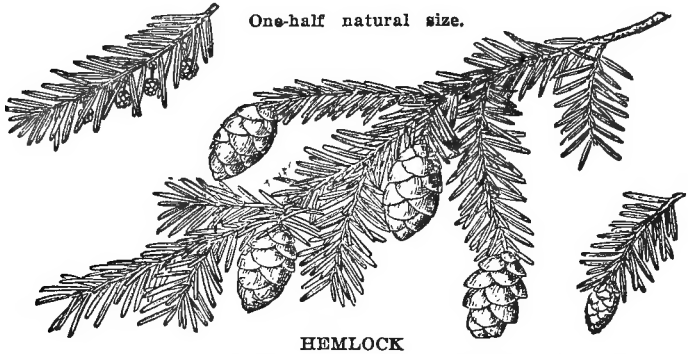
The two kinds of **flowers** are at the end of minute twigs on separate trees. Blooming in February or March, the male trees often assume a golden color from the small catkins, which, when shaken, shed clouds of yellow pollen. The **fruit**, which matures in one season, is pale blue, often with a white bloom, one-quarter of an inch in diameter, berry-like, enclosing one or two seeds in the sweet flesh. It is a favorite winter food for birds.

The **bark** is very thin, reddish brown, peeling off in long, shred-like strips. The tree is extremely irregular in its growth, so that the trunk is usually more or less grooved.

The heart **wood** is distinctly red, and the sapwood white, this color combination making very striking effects when finished as cedar chests, closets and interior woodwork. The wood is aromatic, soft, strong and of even texture, and these qualites make it most desirable for lead pencils. It is very durable in contact with the soil, and on that account is in great demand for posts, poles and rustic work.

HEMLOCK (*Tsuga canadensis* Carr.)

THE hemlock, sometimes known as hemlock spruce or spruce pine, is a large timber tree, attaining a height of 60 to 100 feet and a diameter of 2 to 4 feet. It is common along streams and on cool slopes throughout the mountains and extends somewhat into the adjoining regions. Its horizontal or ascending branches and drooping twigs, forming



HEMLOCK

From Sargent's "Manual of the Trees of North America," by permission of Houghton-Mifflin Company.

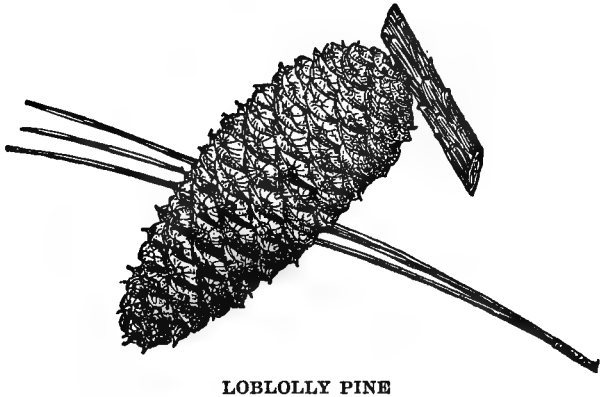
a pyramidal crown, make it one of our handsomest and most desirable trees for shade and ornament.

The **leaves** are from one-third to two-thirds of an inch in length, oblong, dark green and lustrous on the upper surface and whitish beneath, and, although spirally arranged, appear to be 2-ranked on the stem; they fall during the third season. The **cones** are oblong, about three-fourths of an inch long, light brown in color. The cone scales are broadly ovate and about as wide as they are long. The seed is small and winged, maturing in the fall and dropping during the winter.

The **wood** is light, soft, not strong, brittle and splintery. It is used for coarse lumber and for paper pulp. The **bark** on old trunks is cinnamon-red or dark gray and divided into narrow, rounded ridges, and is one of our chief sources of tannin.

LOBLOLLY PINE (*Pinus taeda* L.)

A fast-growing member of the yellow pine group, loblolly pine is a tree of the Coastal Plain, ranging southward from the southernmost county of Delaware. It is variously known locally as shortleaf pine, fox-tail pine and old-field pine. As the last name implies, it seeds up abandoned fields rapidly, particularly in sandy soils where the



LOBLOLLY PINE
One-half natural size.
From Sargent's "Manual of the Trees of North America," by permission of Houghton-Mifflin Company.

water is close to the surface. It is also frequent in clumps along the borders of swamps and as scattered specimens in the swamp hardwood forests.

The **bark** is dark in color and deeply furrowed, and often attains a thickness of as much as 2 inches on large-sized trees. The **leaves,** or needles, 6 to 9 inches long, are borne three in a cluster, and, in the spring, bright green clumps of them at the ends of branches give a luxuriant appearance to the tree. The **fruit** is a cone, or burr, about 3 to 5 inches long, which ripens in the autumn of the second year, and, during fall and early winter, sheds many seeds which, by their inch-long wings, are widely distributed by the wind.

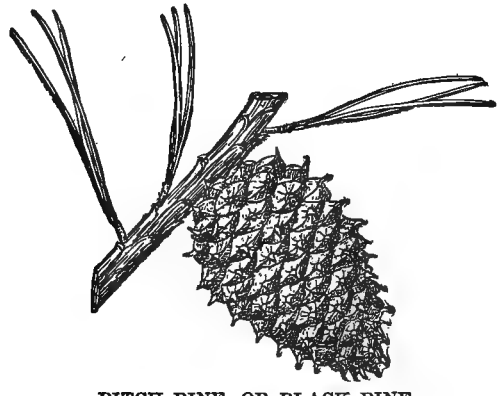
The resinous **wood** is coarse-grained, with marked contrast, as in the other yellow pines, between the bands of early and late wood. The wood of second-growth trees has a wide range of uses where durability is not a requisite, such as for building material, box shooks, barrel staves, basket veneers, pulpwood, lath, mine props, piling and fuel.

PITCH PINE, OR BLACK PINE

(*Pinus rigida* Mill.)

THE pitch pine grows on dry ridges and slopes and in cold swamps and bottoms in the mountains and outlying hilly regions up to about 3,500 feet elevation. It occurs scattered, or in small groups with hardwoods or other pines.

It attains a height commonly 50 to 75 feet and a diameter of 1 to 2 feet. The trunk is erect, and



PITCH PINE, OR BLACK PINE

One-half natural size.

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at heights of 20 to 30 feet branches into a close head made up of rather large branches and noticeably thick foliage. It has longer leaves and larger cones, or burrs, and generally a rougher and less straight trunk than the shortleaf pine with which it is often found.

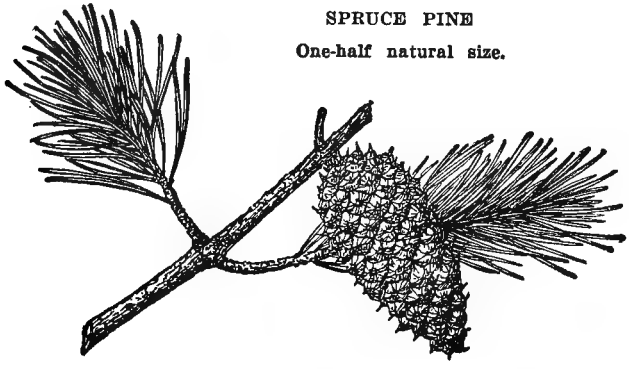
The **leaves,** which are found in clusters of 3 each, are 3 to 5 inches long, stiff, dark yellowish green in color and stand out straight from the twigs. They fall during the second year after forming. The **cones** are 1 to 3 inches long and light brown in color. They usually cling to the branches for several years, sometimes for 10 to 12 years. The **bark** on the stems and branches is rough. On mature trees it is dark gray or reddish brown, and irregularly divided into broad, flat, continuous ridges.

The **wood** is light, soft and brittle. It is sawed into lumber for general construction and is used for fuel. This tree is able to grow on very poor soil and has the capacity, when young, of sprouting successfully from the base of the stump when burned or cut back.

SPRUCE PINE (Scrub Pine)

(*Pinus virginiana* Mill.)

THE spruce pine, scrub or southern jack pine, is found in greatest abundance over the upper and hilly parts of the State. It occurs often in pure stands in old fields and is very persistent in gullying, broken and very dry soils. It is one of our slower-growing pines. The side branches usually persist for many years, even after dying, thus giving



SPRUCE PINE

One-half natural size.

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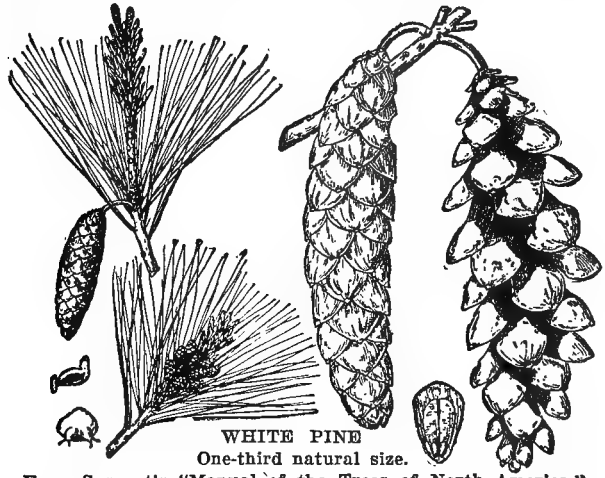
a scrubby appearance to the tree which is responsible for one of its common names.

The twisted and spreading **leaves** are borne two in a cluster. They vary from 1½ to 3 inches in length, are grayish green in color, and are shorter than those of any other pine native to the State. The **fruit** is a cone, or burr, averaging about 2 inches in length, narrow, and often slightly curved, with small prickles. Cones are produced almost every year, and, as they persist on the branches from 3 to 5 years, a tree top with many dry, open cones is characteristic of the species. The **bark** is thin, reddish brown, and broken into shallow plates. Even with age, the fissures in the bark are so shallow as to give a somewhat smooth appearance to the trunk of the tree.

Except in the occasional large-sized trees, the **wood** is very knotty because of the persistence of the side branches. It is light and soft, but fairly durable in contact with the soil, so that it is being used to some extent for posts, poles and piling. The lumber is increasingly used for rough construction, but it warps easily with alternate wetting and drying. It is much used for paper pulp and firewood.

WHITE PINE (*Pinus strobus* L.)

THE white pine occurs naturally throughout the mountains and extends into the adjacent region. It grows on high, dry, sandy and rocky ridges, but prefers the cooler or moister situations. Its straight stem, regular pyramidal shape and soft gray-green foliage make it universally appreciated as an ornamental tree. Its rapid growth and hardiness, and



WHITE PINE
One-third natural size.
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the high quality of the wood make it one of the most desirable trees for forest planting.

The trunk is straight, and, when growing in the forest, clear of branches for many feet. The branches extend horizontally in whorls (i. e., arranged in a circle on the stem), marking the successive years of upward growth. The **bark** is thin and greenish red on young trees, but thick, deeply furrowed and grayish brown on older trees. The tree commonly attains heights of 50 to 60 feet and diameters of 1 to 2 feet, though much larger specimens are still to be found.

The **leaves,** or needles, are 3 to 5 inches in length, bluish green on the upper surface and whitish beneath, and occur in bundles of 5, which distinguishes it from all other eastern pines. The **cone,** or fruit, is 4 to 6 inches long, cylindrical, with thin, usually very gummy scales, containing small, winged seeds which require two years to mature.

The **wood** is light, soft, not strong, light brown in color, often tinged with red, and easily worked. The lumber is in large demand for construction purposes, box boards, matches and many other products.

WHITE ASH (*Fraxinus americana* L.)

THE white ash is found throughout the State, but grows to best advantage in the rich moist soils of mountain coves and river bottomlands. It reaches an average height of 50 to 80 feet and a diameter of 2 to 3 feet, though much larger trees are found in virgin forest. The **bark** varies in color from a light gray to a gray-brown. The rather narrow ridges are

WHITE ASH

Twig, one-half natural size. Leaf, one-third natural size.

separated with marked regularity by deep, diamond-shaped fissures.

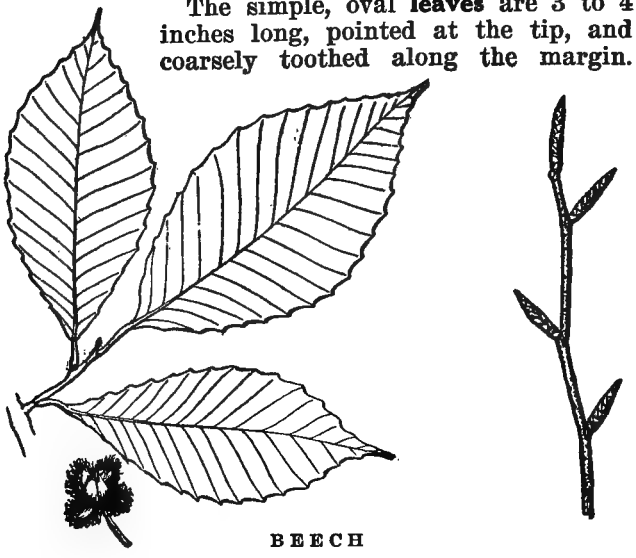
The **leaves** of the white ash are from 8 to 12 inches long and have from 5 to 9 plainly stalked, sharp-pointed leaflets, dark green and smooth above, pale green beneath. The ashes form the only group of trees in eastern America that have opposite, compound leaves with 5 or more leaflets. This fact in itself provides a ready means of identifying the group. The **flowers** are of two kinds on different trees, the male in dense reddish purple clusters and the female in more open bunches. The **fruit** of the ash is winged, 1 to 1½ inches long, resembling the blade of a canoe paddle in outline, with the seed at the handle end. The fruits mature in late summer and are distributed effectively by the winds.

The **wood** of the white ash is extremely valuable on account of its toughness and elasticity. It is preferred to all other native woods for small tool handles, such athletic implements as rackets, bats and oars, and agricultural implements. It is also used extensively for furniture and interior finish.

BEECH (*Fagus grandifolia* Ehrh.)

THE beech occurs throughout the State. It makes its best growth, however, in the moist coves in the mountains. It is widely found scattered with oaks and hickories on rich, well-drained bottoms, and in the mountains sometimes occurs in unmixed, dense stands. It is one of the most beautiful of all trees, either in summer or winter.

The simple, oval **leaves** are 3 to 4 inches long, pointed at the tip, and coarsely toothed along the margin.



BEECH
One-half natural size.

When mature, they are almost leathery in texture. The beech produces a dense shade. The winter buds are long, slender and pointed.

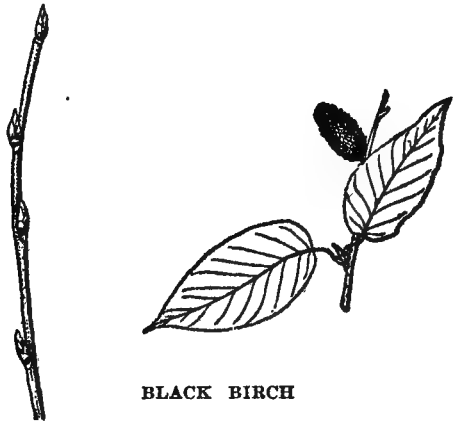
The **bark** is, perhaps, the most distinctive characteristic, as it maintains an unbroken, light gray surface throughout its life. So tempting is this smooth expanse to the owner of a jackknife that the beech has been well designated the "initial tree."

The little, brown, three-sided beech **nuts** are almost as well known as chestnuts. They form usually in pairs in a prickly burr. The kernel is sweet and edible, but so small as to offer insufficient reward for the pains of biting open the thin-shelled husk.

The **wood** of the beech is very hard, strong, and tough, though it will not last long on exposure to weather or in the soil. The tree is of no great economic importance as a lumber tree, though the wood is used to some extent for furniture, flooring, carpenters' tools, and novelty wares.

BLACK BIRCH (*Betula lenta* L.)

THE black birch, also known as sweet birch or cherry birch, occurs only in the highlands and mountain sections. It attains its best development in the mountain coves and on rich slopes where it reaches an average height of 70 feet and a diameter of 2 to 3 feet. The tree is moderately slow growing, but is of value for its products and protection to the soil in the high mountains.



BLACK BIRCH

Twig, one-half natural size. Leaf, one-third natural size.

The **bark** of the trunk is dark brown, almost black, dull and broken into large irregular, but not papery, plates. The small branches and twigs, also dark in color but lustrous and very aromatic, are frequently cut and distilled for the production of birch oil, much used as wintergreen flavoring.

The **leaves** are simple, alternate, oval or approaching oblong, 3 to 4 inches long, finely toothed and dark green, dull on the upper surface.

The **flowers** are of two kinds; the male catkins, usually 3 to 4 on a shoot, forming in the summer and blooming the following spring when the female catkins or "cones" open from the winter buds. The seeds ripen in late summer or autumn and fall with the loosened scales of the "cone."

The **wood** is heavy, very strong, hard and compact. The dark-brown color of the wood has given rise to the common local name of mahogany, or mountain mahogany. It is used for furniture, often being sold as "mahogany," and for flooring and interior trimming; locally it is prized as firewood.

RIVER BIRCH (Red Birch) (*Betula nigra* L.)

THIS is the only native birch found at low elevations in the South. It is at home, as the name implies, along water courses, and inhabits the deep, rich soils along the borders of streams, ponds, lakes, and swamps which are sometimes inundated for weeks at a time.

The **bark** provides a ready means of distinguishing this tree. It varies from reddish brown to cinna-

RIVER BIRCH
One-third natural size.

mon-red in color, and peels back in tough papery layers. These layers persist on the trunk, presenting a very ragged and quite distinctive appearance. Unlike the bark of our other birches, the thin papery layers are usually covered with a gray powder. On older trunks, the bark on the main trunk becomes thick, deeply furrowed, and of a reddish-brown color.

The **leaves** are simple, alternate, 2 to 3 inches long, more or less oval in shape, with double-toothed edges. The upper surface is dark green and the lower a pale yellowish green.

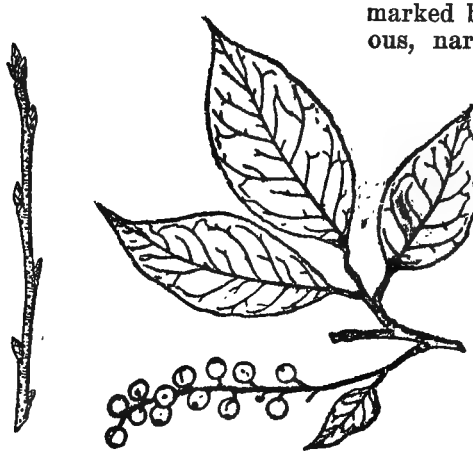
The **flowers** are in catkins, the two kinds growing on the same tree. The **fruit** is cone-shaped about 1 inch long, and densely crowded with little winged nutlets that ripen from May to June.

The **wood** is strong and fairly close-grained. It has been to some extent used in the manufacture of woodenware, in turnery and for wagon hubs. Since, however, this tree is scattered in its distribution and mostly confined to the banks of streams, it does not figure largely in commercial lumbering, but is cut chiefly for firewood.

BLACK CHERRY (Wild Cherry)

(*Prunus serotina* Erh.)

A medium-sized tree, up to about 70 feet high and 1 to 3 feet in diameter, black cherry as a tree is at its best in the high mountains. The forest-grown trees have long clear trunks with little taper; open-grown trees have short trunks with many branches and irregular spreading crowns. The **bark** on branches and young trunks is smooth and bright reddish brown, marked by conspicuous, narrow, white, horizontal lines, and has a bitter-almond taste. On the older trunks the bark becomes rough and broken into thick, irregular plates.



BLACK CHERRY
Twig, two-thirds natural size.
Leaf, one-third natural size.

The **leaves** are alternate, simple, oval to lance-like in shape, with edges broken by many fine incurved teeth, thick and shiny above, and paler beneath.

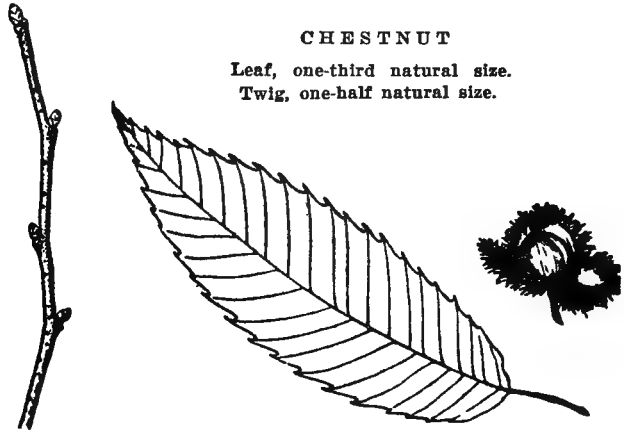
The **fruit** is dull purplish black, about as large as a pea, and is borne in long hanging clusters. It ripens in late summer, and is edible, although it has a slightly bitter taste.

The **wood** is reddish brown with yellowish sapwood, moderately heavy, hard, strong, fine-grained, and does not warp or split in seasoning. It is valuable for its lustre and color and is used for furniture, interior finish, tools, and implement handles. With the exception of black walnut, the cherry lumber has a greater unit value than any other hardwood of the eastern United States.

CHESTNUT (*Castanea dentata* Borkh.)

OVER the Southern States the chestnut is native to the hilly and mountain sections. It is one of our most useful trees and as such, has been called the "farmer's best friend."

The long-pointed **leaves** with their coarse teeth, each bearing a slender spine, are quite distinctive. They are simple, alternate, average 5 to 10 inches in



CHESTNUT

Leaf, one-third natural size.
Twig, one-half natural size.

length, and are dark green in color. The **flowers** are of two kinds on the same tree, the long, slender, whitish catkins opening in midsummer. The **fruit** is a prickly burr, which opens at the first frost, or earlier, and drops 2 or 3 shiny, brown, sweet, edible nuts.

The **bark** becomes broken into light-gray, broad, flat ridges, which often have a tendency toward a spiral course around the trunk.

The **wood** is light, soft, not strong, coarse-grained, and very durable in contact with the soil—qualities which make it particularly valuable for posts, poles, crossties, as well as for light building construction. The wood is rich in tannin, and in the southern Appalachians it is extensively cut and used for the extraction of this valuable commercial product.

A bark disease, known as the chestnut blight, is proving fatal to the chestnut, and has already practically exterminated the tree over much of northeastern United States. It has already reached portions of Virginia and North Carolina.

WHITE ELM (American Elm)

(*Ulmus americana* L.)

THE famous shade tree of New England, whose range, however, extends to the Rocky Mountains and southward to Texas. Within this vast area, it is generally common except in the high mountains and wet bottom lands. It reaches an average height of 60 to 70 feet and a diameter of 4 to 5 feet. The **bark** is dark gray, divided into irregular, flat-topped, thick ridges, and is generally firm, though on old trees it tends to come off in flakes. An incision into the inner bark will show alternate layers of brown and white.

Twig one-half natural size.

WHITE ELM
Leaf, one-third natural size.

The **leaves** are alternate, simple, 4 to 6 inches long, rather thick, somewhat one-sided, doubly toothed on the margin, and generally smooth above and downy below. The leaf veins are very pronounced and run in parallel lines from the midrib to leaf-edge.

The **flowers** are small, perfect, greenish, on slender stalks sometimes an inch long, appearing before the leaves in very early spring. The **fruit** is a light green, oval shaped samara (winged fruit) with the seed portion in the center and surrounded entirely by a wing. A deep notch in the end of the wing is distinctive of the species. The seed ripens in the spring and by its wing is widely disseminated by the wind.

The **wood** is heavy, hard, strong, tough, and difficult to split. It is used for hubs of wheels, saddle trees, boats and ships, barrel hoops, and veneer for baskets and crates.

Because of its spreading fan-shaped form, graceful pendulous branches, and long life, the white elm justly holds its place as one of the most desirable shade trees.

BLACK GUM (*Nyssa sylvatica* Marsh.)

THE black gum, often called sour gum, has been considered a weed in the forest. Weed-like, it finds footing in many types of soil and conditions of soil moisture throughout the State. In the lowlands it is occasionally found in year-round swamps with cypress, and in the hills and mountains on dry slopes with oaks and hickories.

BLACK GUM
One-half natural size.

The **leaves** are simple, 2 to 3 inches long, entire, often broader near the apex, shiny, and dark green in color. In the fall the leaves turn a most brilliant red.

The **bark** on younger trees is furrowed between flat ridges, and gradually develops into quadrangular blocks that are dense, hard and nearly black.

The greenish **flowers** on long slender stems appear in early spring when the leaves are about one-third grown. They are usually of two kinds, the male in many-flowered heads and the female in two to several-flowered clusters on different trees. The **fruit** is a dark blue, fleshy berry, two-thirds of an inch long, containing a single hard-shelled seed, and is borne on long stems, 2 to 3 in a cluster.

The **wood** is very tough, cross-grained, not durable in contact with the soil, hard to work, and warps easily. It is used for crate and basket veneers, box shooks, rollers, mallets, rough floors, mine trams, pulpwood, and fuel. In the old days, the hollow trunks were used for "bee gums."

SWEET GUM (Red Gum)

(*Liquidambar styraciflua* L.)

THE sweet gum is a large valuable forest tree. It occurs on rich river bottoms and in swamps subject to frequent overflow, as well as on drier uplands throughout the lower and middle parts of the State. It is usually abundant in second growth on old fields and in cut-over woods. The **bark** is a light gray, roughened by corky scales, later becoming deeply furrowed. After the second year the twigs often develop 2 to 4 corky projections of the bark, which give them a winged appearance.

SWEET GUM
Leaf, one-third natural size.
Twig, two-thirds natural size.

The simple, alternate star-shaped **leaf,** with its 5 to 7 points or lobes, is 5 to 7 inches across and very aromatic. In the fall its coloring is brilliant, ranging from pale yellow through orange and red to a deep bronze.

The **flowers** are of two kinds on the same tree, unfolding with the leaves. The **fruit** at first glance reminds one of the balls of the sycamore, but on closer inspection proves to be a head. It measures an inch or more in diameter and is made up of many capsules with projecting spines. It frequently hangs on the tree by its long swinging stem late into the winter.

The **wood** is heavy, moderately hard, close-grained, and not durable on exposure. The reddish brown heartwood, which suggests the name red gum, is not present to any appreciable extent in logs under 16 inches in diameter. The wood is extensively used for flooring, interior finish, paper pulp and veneers for baskets of all kinds. Veneers of the heartwood are largely used in furniture, sometimes as imitation mahogany or circassian walnut. This tree should be more widely planted for ornamental use.

PIGNUT HICKORY

(*Hicoria glabra* Britton) (*Carya glabra* Sweet)

THE pignut hickory is a medium to large upland tree, occurring plentifully on poor soil in the middle section and less frequently in the other parts of the State. It has a tapering trunk and a narrow oval head.

The **bark** is close, ridged and grayish, but occasionally rough and flaky. The twigs are thin, smooth and glossy brown. The polished brown winter buds are egg-shaped. the outer reddish brown scales falling in the autumn.

PIGNUT HICKORY
Leaf, one-third natural size. **Twig,** one-half natural size.

The **leaves** are smooth, 8 to 12 inches long and composed of 5 to 7 leaflets. The individual leaflets are rather small and narrow.

The **fruit** is pear-shaped or rounded, usually with a neck at the base, very thin husks splitting only half way to the base or not at all. The nut is smooth, light brown in color, rather thick-shelled, and has an edible kernel.

The **wood** is heavy, hard, strong, tough and flexible. Its uses are the same as those of the other hickories.

The small-fruited hickory (*Carya microcarpa* Nutt.), by some considered a variety of the pignut hickory, differs from it in having a round fruit and a bark which frequently separates into narrow plates.

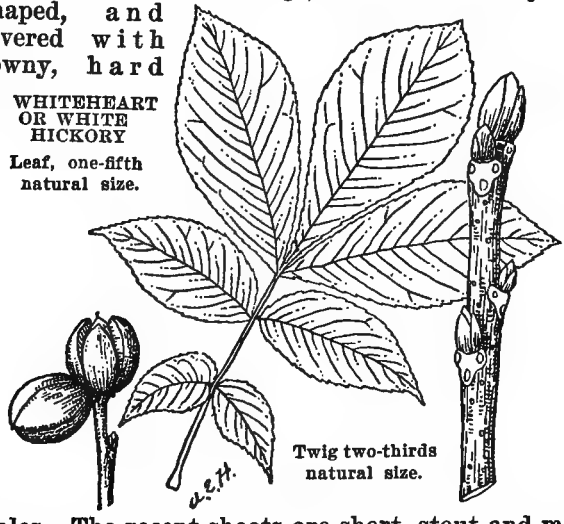
The pale-leaved hickory (*Carya pallida* Ashe) is found scatteringly in the upland woods. It has pale, delicate foliage. The leaves are woolly or hairy underneath, and when young are covered with silvery scales. The husks are thicker than those of the pignut.

WHITEHEART OR WHITE HICKORY
(Mockernut Hickory)

(*Hicoria alba* Britton) (*Carya alba* K. Koch)

THE white hickory, whiteheart, mockernut, or big-bud hickory is common on well-drained soils throughout the State. It is a tall, short-limbed tree averaging 60 feet high and 1 to 2 feet in diameter.

The **bark** is dark gray, hard, closely and deeply furrowed, often apparently cross-furrowed or netted. The winter buds are large, round or broadly egg-shaped, and covered with downy, hard scales. The recent shoots are short, stout and more or less covered with a downy growth.



WHITEHEART OR WHITE HICKORY
Leaf, one-fifth natural size.

Twig two-thirds natural size.

The **leaves** are large, strong-scented and hairy, composed of 7 to 9 obovate to oblong, pointed leaflets which turn a beautiful yellow in the fall.

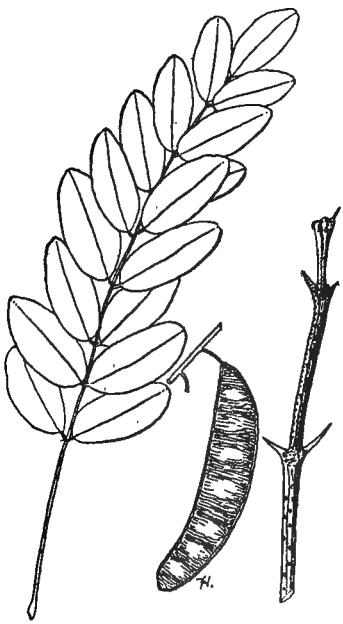
The **flowers**, like those of all other hickories, are of two kinds on the same tree; the male in three-branched catkins, the female in clusters of 2 to 5. The **fruit** is oval, nearly round or slightly pear-shaped with a very thick, strong-scented husk which splits nearly to the base when ripe. The nut is of various forms, but is sometimes 4 to 6 ridged, light brown, and has a very thick shell and small, sweet kernel.

The **wood** is heavy, hard, tough and strong; it is white excepting the comparatively small, dark-brown heart, hence the name white hickory. It is used for vehicle parts, handles and picker-sticks. It furnishes the best of fuel. This and the other hickories are very desirable both for forest and shade trees.

BLACK LOCUST (Yellow Locust)

(*Robinia pseudacacia* L.)

THE black locust occurs throughout the entire State and in all soils and conditions of moisture except in swamps. It is found as a forest tree only in the mountains, where it attains a height of 80 to 100 feet and a diameter of 30 inches. Throughout the other sections of the State it occurs generally in thickets on clay banks or waste places, or singly along fence rows. The twigs and branchlets are armed with straight or slightly curved sharp, strong spines, sometimes as much as 1 inch in length which remain attached to the outer **bark** for many years. The bark is dark brown and divides into strips as the tree grows older.



BLACK LOCUST
Leaf, one-third natural size.
Twig, two-thirds natural size.

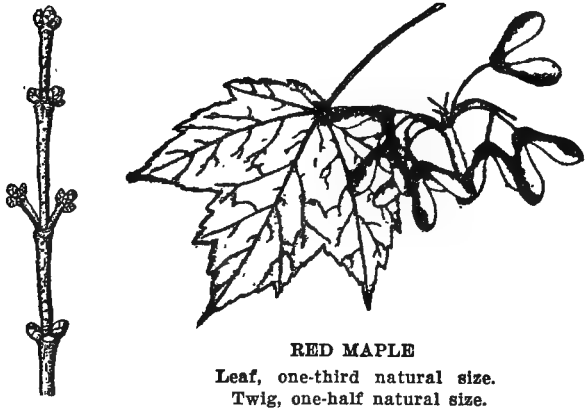
The **leaves** are pinnate, or feather-like, from 6 to 10 inches in length, consisting of from 7 to 19 oblong thin leaflets.

The **flowers** are fragrant, white or cream-colored, and appear in early spring in graceful pendant racemes. The **fruit** is a pod from 3 to 5 inches long containing 4 to 8 small hard seeds which ripen late in the fall. The pod splits open during the winter, discharging the seeds. Some seeds usually remain attached to each half of the pod, and this acts as a wing upon which the seeds are borne to considerable distances before the strong spring winds.

The **wood** is yellow in color, coarse-grained, very heavy, very hard, strong, and very durable in contact with the soil. It is used extensively for fence posts, poles, tree nails, insulator pins and occasionally for lumber and fuel.

RED MAPLE (*Acer rubrum* L.)

THE red maple, or swamp maple, is widely distributed throughout the State. It is usually a medium-sized tree, quick-growing and relatively short-lived. It is used as a shade tree, though much inferior for this purpose to the other maples, especially the sugar maple. The **bark** is smooth and light gray on young stems, and dark gray and rough on the old limbs and trunk.



RED MAPLE
Leaf, one-third natural size.
Twig, one-half natural size.

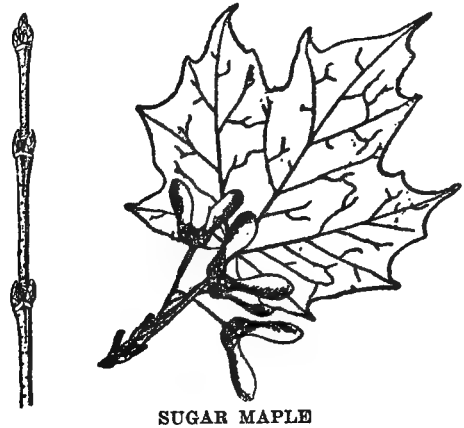
The **leaves** are 2 to 5 inches long and have from 3 to 5 pointed, saw-toothed lobes, which are separated by sharp angular sinuses or openings. The upper surface when mature is light green and the lower surface whitish and partly covered with pale down. In autumn the leaves turn to brilliant shades of red, orange and yellow.

The red **flowers** in dense clusters appear in early spring before the leaves, the buds turning a deep red sometime before they open. The winter buds are small, red and round or blunt-pointed. The **fruit** ripens in late spring or early summer. It consists of pairs of winged seeds, or keys, one-half to 1 inch in length, on long drooping stems, red, reddish brown or yellow in color.

The **wood**, which is commercially known as soft maple, is heavy, close-grained, rather weak and of a light-brown color. It is used in the manufacture of furniture, and for turnery, woodenware, and also for fuel.

SUGAR MAPLE (*Acer saccharum* Marsh.)

THE sugar maple, often called sugar tree, is common only on the cool slopes of our higher mountains. It is generally a rather slow-growing tree, but in the open it grows faster and has a very symmetrical, dense crown, affording heavy shade. It is therefore quite extensively planted as a shade tree. The **bark** on young trees is light gray to brown and rather smooth, but as the tree grows older it breaks up into long, irregular plates or scales, which vary from light gray to almost black. The twigs are smooth and reddish brown, and the winter buds sharp-pointed. The tree attains a height of more than 100 feet and a diameter of 3 feet or more. The sap yields maple sugar and maple syrup.



SUGAR MAPLE
Leaf, one-third natural size.
Twig, one-half natural size.

The **leaves** are 3 to 5 inches across, simple, opposite, with 3 to 5 pointed and sparsely toothed lobes, the divisions between the lobes being rounded. The leaves are dark green on the upper surface, lighter green beneath, turning in autumn to brilliant shades of dark red, scarlet, orange and clear yellow.

The **flowers** are yellowish green, on long thread-like stalks, appearing with the leaves, the two kinds in separate clusters. The **fruit,** which ripens in the fall, consists of a two-winged "samara," or "key," the two wings nearly parallel, about 1 inch in length and containing a seed. It is easily carried by the wind.

The **wood** is hard, heavy, strong, close-grained and light brown in color. It is known commercially as hard maple, and is used in the manufacture of flooring, furniture, shoe-lasts and a great variety of novelties.

BLACK OAK (*Quercus velutina* Lam.)

THE black oak, sometimes farther north called yellow oak or yellow-barked oak, usually grows to be about 80 feet in height and 1 to 3 feet in diameter. It is found commonly throughout the State on dry plains and ridges, but seldom on rich ground. The crown is irregularly shaped and wide, with a clear trunk for 20 feet or more on large trees. The **bark** on the very young trunks is smooth and dark brown but soon becomes thick and black, with deep furrows and rough broken ridges. The bright-yellow color and bitter taste of the inner bark; due to tannic acid, are distinguishing characteristics.

Twig one-half natural size.

BLACK OAK
Leaf, one-third natural size.

The **leaves** are alternate, simple, 5 to 10 inches long and 3 to 8 inches wide, shallow or deeply lobed, the shape varying greatly. When mature, the leaves are dark green and shiny on the upper surface, pale on the lower, more or less covered with down, and with conspicuous rusty brown hairs in the forks of the veins.

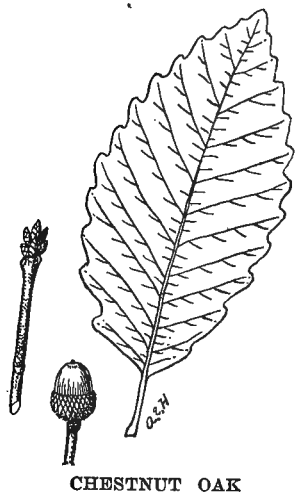
The **fruit** matures the second season. The light-brown nut is from one-half to 1 inch long, more or less hemispherical in shape, and from one-half to three-quarters enclosed in the thin, dark-brown, scaly cup. The kernel is yellow and extremely bitter.

The **wood** is hard, heavy, strong, coarse-grained and checks easily. It is a bright red-brown with a thin outer edge of paler sapwood. It is used for the same purposes as red oak, under which name it is put on the market. Its growth is rather slow.

CHESTNUT OAK

(*Quercus montana* Willd., formerly *Q. prinus* L.)

CHESTNUT OAK, also known as mountain oak and rock oak, has acquired these names from its leaf, which resembles that of the chestnut, and from its fondness for rocky or mountain ridges. It is found widely distributed throughout the mountains on dry gravelly and rocky slopes, ridges and stream banks, and less commonly in the upland part of the State in similar dry, rocky situations.



CHESTNUT OAK
One-third natural size.

It is noticeably a spreading tree of medium height; at 15 to 20 feet, the trunk frequently divides into several large, angular limbs, making an open, irregular-shaped head. The **bark** is dark reddish brown, thick, deeply divided into broad, rounded ridges, and is of high commercial value for the extraction of tannic acid.

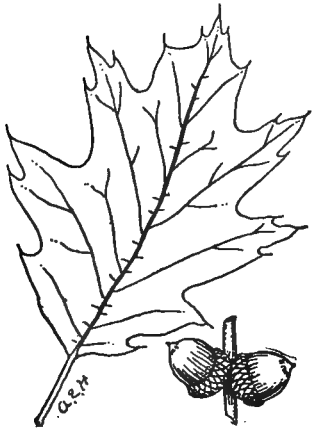
The **leaves** are simple, alternate, oblong, often rounded at the point, irregularly scalloped or wavy on the edge (not sharp-toothed as in chestnut), 5 to 9 inches long, and shiny yellowish green above, lighter and slightly fuzzy beneath. The **fruit** is an acorn about an inch long, oval, shiny brown, and enclosed up to half its length in a cup. It ripens in one season, and, like the acorn of the white oak, sprouts in the autumn soon after falling to the ground.

The **wood** is generally similar to that of the other upland white oaks, heavy, hard, strong, and durable in contact with the soil. It is extensively cut into crossties and heavy timbers for bridge, railroad, and other rough construction, and used for fence posts and fuel.

NORTHERN RED OAK

(*Quercus borealis maxima* Ashe,
formerly *Q. rubra* L.)

THE northern red oak occurs throughout the State, but is most common and of best quality in the higher mountains. It is not found in swamps. It usually attains a height of about 70 feet and a diameter ranging from 2 to 3 feet, but is sometimes much larger. The forest-grown tree is tall and straight with a clear trunk and narrow crown.



NORTHERN RED OAK
Leaf, one-third natural size.
Twig, one-half natural size.

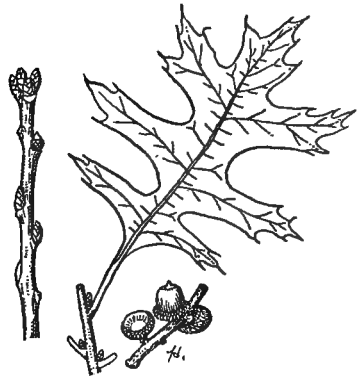
The **bark** on young stems is smooth, gray to brown, on older trees thick and broken by shallow fissures into regular, flat, smooth-surfaced plates.

The **leaves** are simple, alternate, 5 to 9 inches long and 4 to 6 inches wide, broader toward the tip, divided into 7 to 9 lobes, each lobe being somewhat coarsely toothed and bristle-tipped, and firm, dull green above, paler below, often turning a brilliant red after frost. The **flowers,** as in all the oaks, are of two kinds on the same tree, the male in long, drooping, clustered catkins, opening with the leaves, the female solitary or slightly clustered. The **fruit** is a large acorn maturing the second year. The nut is from three-fourths to 1¾ inches long, blunt-topped, flat at base, with only its base enclosed in the very shallow dark-brown cup.

The **wood** is hard, strong, coarse-grained, with light reddish-brown heartwood and thin lighter-colored sapwood. It is used for cooperage, interior finish, construction, furniture, and crossties. Because of its average rapid growth, high-grade wood, and general freedom from insect and fungus attack, it is widely planted in the higher portions of the State for timber production and as a shade tree.

PIN OAK (*Quercus palustris* Muench.)

PIN OAK is rarely found naturally except on the rich moist soil of bottomlands and the borders of swamps. It is usually not abundant in any locality but found scattered with other kinds of trees. It more commonly attains heights of 50 to 70 feet, with diameters up to 2 feet, but is sometimes larger. The tree commonly has a single, upright stem with numerous long, tough branches, the lower ones drooping, the middle horizontal, and the upper ascending. The many small bristling twigs and branches give the tree its name. The **bark** on young stems is smooth, shining and light brown; on old trunks light gray-brown and covered by small, close scales. Because of its beauty, its hardiness, and its fairly rapid growth, pin oak makes an exceptionally fine street tree.



PIN OAK
Leaf, one-third natural size.
Twig, one-half natural size.

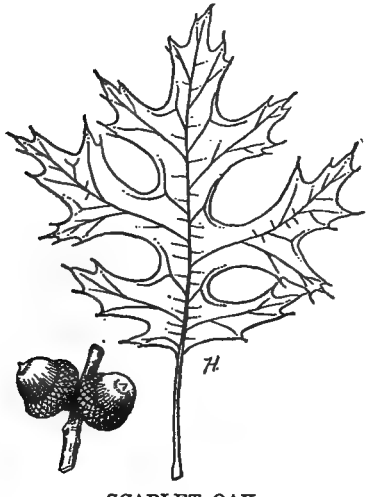
The **leaves** generally resemble those of scarlet oak, but the rounded openings do not extend quite so near to the midrib; they average somewhat smaller, being 3 to 5 inches long and 2 to 4 inches wide.

The **flowers** are of two kinds on the same tree, and appear when the leaves are about one-third grown. The **fruit,** taking two years to mature, is an acorn nearly hemispheric, about one-half inch long, light brown, often striped, enclosed only at the base in a thin, shallow, saucer-shaped cup.

The **wood** is heavy, hard, strong, and usually knotty. It is light brown, with thin, darker-colored sapwood. It is sold and has the same uses as red oak, although it is generally not so good in quality.

SCARLET OAK (*Qurcus coccinea* Muench.)

SCARLET OAK, also known as pin, Spanish or spotted oak, occurs usually on dry, rocky, or sandy soils, throughout the uplands of the lower mountains, but is nowhere very abundant or of first importance. It usually reaches a height of 60 or 80 feet, with a trunk diameter of 2 or 3 feet, and is sometimes larger. The branches droop at the ends and form a narrow, open crown and the trunk tapers rapidly.



SCARLET OAK
Leaf, one-third natural size. Twig one-half natural size.

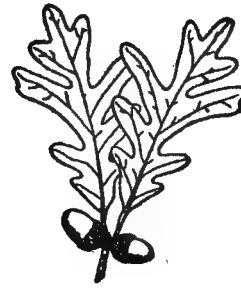
The **bark** on young stems is smooth and light brown. On old trunks it is divided into ridges not so rough as those of the black oak and not so flat-topped as those of the northern red oak. The bark is often mottled or spotted with gray. The inner bark is reddish.

The **leaves** are simple, alternate, somewhat oblong or oval, 3 to 6 inches long, 2½ to 4 inches wide, usually 7-lobed, the lobes bristle-pointed and separated by rounded openings extending at least two-thirds of the distance to the midrib, giving the leaves a very deeply "cut" appearance. The leaves turn a brilliant scarlet in the autumn before falling. The **flowers** are of two kinds on the same tree and appear when the leaves are two-thirds or one-half grown. The **fruit** takes 2 years to mature. The acorn is one-half to 1 inch long, reddish brown, often striped, and about half-enclosed in the cup.

The **wood** is heavy, hard, strong and coarse-grained . The lumber is sold as red oak and has the same uses. It is usually somewhat inferior in quality and sometimes known as pin oak. Scarlet oak is used considerably in ornamental planting.

WHITE OAK (*Quercus alba* L.)

WITHIN its natural range, which includes practically the entire eastern half of the United States, the white oak is one of the most important timber trees. It commonly reaches a height of 60 to 100 feet and a diameter of 2 to 3 feet; sometimes it becomes much larger. It is found in a wide variety of soils. When grown in a dense stand it has a



WHITE OAK

Twig, one-half natural size. Leaf, one-quarter natural size.

straight continuous trunk, free of side branches for over half its height. In the open, however, the tree develops a broad crown with far-reaching limbs. Well-grown specimens are strikingly beautiful.

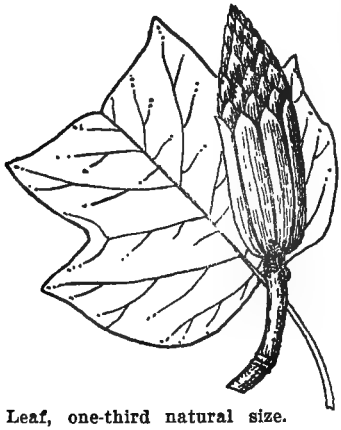
The **leaves** are alternate, simple, 5 to 9 inches long and about half as broad. They are deeply divided into 5 to 9 rounded, finger-like lobes. The young leaves are a soft silvery gray or yellow or red while unfolding, becoming later bright green above and much paler below. The **fruit** is an acorn maturing the first year. The nut is three-quarter to one inch long, light brown, about one-quarter enclosed in the warty cup. It is relished by hogs and other live stock. The **bark** is thin, light ashy gray and covered with loose scales or broad plates.

The **wood** is useful and valuable. It is heavy, strong, hard, tough, close-grained, durable, and light brown in color. The uses are many, including construction, shipbuilding, tight cooperage, furniture, wagons, implements, interior finish, flooring, and fuel. Notwithstanding its rather slow growth, white oak is valuable for forest, highway and ornamental planting.

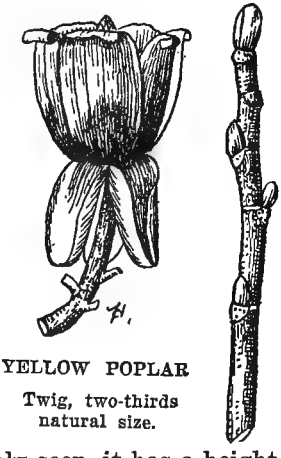
YELLOW POPLAR, OR TULIP TREE

(*Liriodendron tulipifera* L.)

YELLOW POPLAR, or tulip tree, received its names from the yellow color of its heartwood and its attractive tulip-like flowers. It is one of the largest and most valuable hardwood trees of the United States. It occurs commonly throughout the State, but reaches its largest size in the deep moist soils along streams and in the lower moun-



Leaf, one-third natural size.



YELLOW POPLAR

Twig, two-thirds natural size.

tain coves. As more commonly seen, it has a height of 60 to 100 feet and a diameter of 3 to 4 feet. Original-growth trees, however, attain heights of 150 to 190 feet and diameters up to 10 feet. Growing with a straight central trunk like the pines, and often clear of limbs for 30 to 50 feet, it has a narrow pyramidal head which in older age becomes more spreading. The tree has been extensively cut, but is reproducing rapidly and remains one of the most abundant and valuable trees in our young second-growth forests. It has been planted as on ornamental and shade tree.

The **leaves** are simple, 4 to 6 inches in length and breadth, 4-lobed, dark green in summer, turning to a clear yellow in the fall.

The greenish-yellow tulip-shaped **flowers** appear in April. The **fruit** is a narrow light-brown, upright cone, 2 to 3 inches long, made up of seeds, each enclosed in a hard bony coat and provided with a wing which makes it easily carried by the wind.

The **wood** is light, soft, easily worked, light yellow or brown, with wide cream-colored sapwood. It is extensively cut into lumber for interior and exterior trim, vehicle bodies, veneers, turnery and other high-grade uses.

SYCAMORE (*Platanus occidentalis* L.)

THE sycamore, also called buttonwood, is considered the largest hardwood tree in North America. It occurs throughout the State but is most abundant and reaches its largest size along streams and on rich bottomlands. It is one of the more rapid-growing trees. In maturity it occasionally attains a height of 140 to 170 feet and a diameter of 10 to 11 feet. It often forks into several large secondary trunks, and the massive spreading limbs form an open head sometimes 100 feet across.

SYCAMORE

Leaf, one-third natural size.

Twig one-half natural size.

The **bark** of the sycamore is a characteristic feature. On the younger trunk and large limbs it is very smooth, greenish gray in color. The outer bark yearly flakes off in large patches and exposes the nearly white younger bark. Near the base of old trees the bark becomes thick, dark brown and divided by deep furrows.

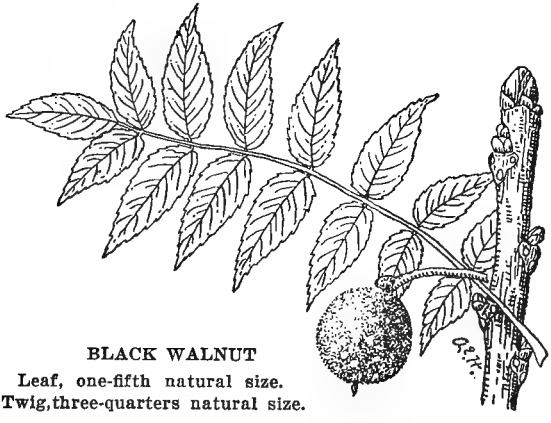
The **leaves** are simple, alternate, 4 to 7 inches long and about as broad, light green and smooth above, and paler below. The base of the leafstalk is hollow and in falling off exposes the winter bud. The **fruit** is a ball about 1 inch in diameter, conspicuous throughout the winter as it hangs on its flexible stem, which is 3 to 5 inches long. During early spring the fruit ball breaks up, and the small seeds are widely scattered by the wind.

The **wood** is hard and moderately strong, but decays rapidly in the ground. It is used for butchers' blocks, tobacco boxes, furniture and interior finish.

The European sycamore, or planetree, is less subject to disease than our species and has been widely planted in this country for ornament and shade.

BLACK WALNUT (*Juglans nigra* L.)

THIS valuable forest tree occurs on rich bottomlands and moist fertile hillsides throughout the State. In the forest, where it grows singly, it frequently attains a height of 100 feet with a straight stem, clear of branches for half its height. In open-grown trees the stem is short and the crown broad and spreading.



BLACK WALNUT
Leaf, one-fifth natural size.
Twig, three-quarters natural size.

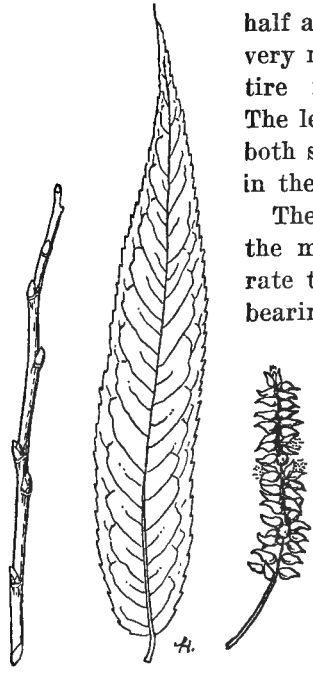
The **leaves** are alternate, compound, 1 to 2 feet long, consisting of from 15 to 23 leaflets of a yellowish green color. The leaflets are about 3 inches long, extremely tapering at the end, and toothed along the margin. The **bark** is thick, dark brown in color, and divided by rather deep fissures into rounded ridges.

The **fruit** is a nut, borne singly or in pairs, and enclosed in a solid green husk which does not split open, even after the nut is ripe. The nut itself is black with a very hard, thick, finely ridged shell, enclosing a rich, oily kernel edible and highly nutritious.

The **heartwood** is of superior quality and value. It is heavy, hard and strong, and its rich chocolate-brown color, freedom from warping and checking, susceptibility to a high polish, and durability make it highly prized for a great variety of uses, including furniture and cabinet work, gun-stocks, and airplane propellers. Small trees are mostly sapwood, which is light colored and not durable. Walnut is easily propagated from the nuts and grows rapidly on good soil, where it should be planted and grown for timber and nuts.

BLACK WILLOW (*Salix nigra* Marsh.)

THE black willow is common along streams throughout the State except in the high mountains. It rarely comes to be over 50 feet in height and is frequently found growing singly or in clumps along the water courses. In winter the easily separable, bright reddish-brown or golden, naked twigs are quite conspicuous.



BLACK WILLOW
Two-thirds natural size.

The **leaves** are from 3 to 6 inches long and less than one-half an inch wide; the tips are very much tapered and the entire margins finely toothed. The leaves are bright green on both sides, turning pale yellow in the early autumn.

The **flowers** are in catkins, the male and female on separate trees. The **fruit** is a pod bearing numerous minute seeds which are furnished with long silky down, enabling them to be blown long distances.

The **bark** is deeply divided into broad, flat ridges which separate into thick plate-like scales. On old trees it becomes very shaggy. In color it varies from light brown tinged with orange to dark brown or nearly black.

The **wood** is soft, light and not strong. A high grade of charcoal, used in the manufacture of gunpowder, is obtained from willow wood, and it is the chief wood used in the manufacture of artificial limbs.

There are many species, or kinds, of willows not easily distinguished. They are of high value in checking soil erosion and waste along stream banks, for which purpose they should be more extensively grown.

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NATURE PROVIDES

"If we would have Forests

We must prevent Fires"

FIRE CONSUM