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FOREST-TREES of MAINE

AND HOW
TO KNOW
THEM.

Prepared and Published
BY THE
MAINE
FORESTRY DEPARTMENT.
Edgar E. Ring,
Forest Commissioner

FOREST TREES

— *of* MAINE —

and how to know them

Prepared and Published by the
MAINE FORESTRY DEPARTMENT

E. E. RING
Forest Commissioner

WATERVILLE
SENTINEL
1908

ERRATA.

- Page 13. For *Picea marina* B.S. & P. read *Picea mariana* B.S. & P.
- Page 17. The cut of the balsam fir has been accidentally inverted and should be reversed to show the cone in its natural position.
- Page 18. The cut given as the white cedar is for the species mentioned in the foot-note.
- Page 20. For *Juglans cineres* L., read *Juglans cinerea* L.
- Page 36. For *Betula papyifera* Marsh, read *Betula papyrifera* Marsh.
- Page 42. For *Quercus coccinea* Moench, read *Quercus coccinea* Moench.
- Page 48. For *Sassafras verifolium* (Salisb), Otto Kuntze read *Sassafras variifolium* (Salisb) Otto Kuntze.
- Page 51. For *Gleditsia trascanthos* L., read *Gleditsia triacanthos* L.
- Page 55. For *Acer saccharum* Marsh, read *Acer saccharum* Marsh.
- Page 56. For *Acer saccharum* Marsh, read *Acer saccharinum* Marsh.

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FOREST TREES OF MAINE

Hedrick

11 Feb 18

INTRODUCTION

For a long time there has been a demand for a book giving a simple, yet comprehensive description of the trees of Maine, hence this pocket manual has been prepared and it is hoped will to some degree serve the purpose for which it is intended.

Simple as the work may appear to be, considerable time and thought have been put into its preparation. The descriptions given are the common names and by them the characteristics of the tree can readily be told and the various species easily distinguished one from another.

Acknowledgments

The descriptive manuscript has been prepared by Prof. Gordon E. Tower, instructor in the Forestry Department at the University of Maine, and it bears the stamp which individualizes his work.

For the majority of the cuts illustrating the foliage and seed production credit is due Director J. L. Hills, of the Vermont Experiment Station, who originally used the cuts in an illustrated bulletin of "The Trees of Vermont."

FOREST TREES OF MAINE

The cuts illustrating the winter twigs and buds were kindly loaned by Hon. F. W. Rane, State Forester of Massachusetts, and used by him in his hand-book on "Massachusetts Forest Trees."

By permission of Houghton, Mifflin & Co. six cuts are used from Sargent's "Manual of the Trees of North America."

It is the intention of the Forest Commissioner that this book shall be placed in the hands of the students of the higher grades of the public schools. It is earnestly hoped that teachers will endeavor to awaken an interest on the part of the pupils in the study of the different trees which make the great wealth of our state.

If there can be created in the people an innate love of Nature, the fundamentals of practical forestry will solve themselves as naturally as water flows down hill. Meanwhile, we have a pleasant task in bringing these conditions about. The more one knows about trees, the more he wants to know; and the natural outcome will be better economic and aesthetic conditions.

Copies of this book will be mailed free to all who apply for the same, so long as the limited edition lasts.

EDGAR E. RING.

Forest Commissioner.

FOREST TREES OF MAINE

PINES

The Important Distinctions

WHITE PINE (<i>Pinus strobus</i> L.)	RED PINE (<i>Pinus resinosa</i> Ait.)	PITCH PINE (<i>Pinus rigida</i> Mill.)	JACK PINE GRAY PINE (<i>Pinus banksiana</i> Lamb.)
Leaves In clusters of five, 3 to 5 inches long, slender, flexible, of bluish green color.	Leaves In clusters of two, 5 to 6 inches long, flexible, dark green.	Leaves In clusters of three, 3 to 5 inches long, stout, not flexible, dark yellow green.	Leaves In clusters of two, three-fourths to one and one-fourth inches long, stout, flat, light yellow green at first, later becoming dark green.
Cones Four to six inches long, and borne on a long stalk, without prickles.	Cones Two to two and one fourth inches long, borne on short stalks without prickles.	Cones One to three and one-half inches long, borne on short stalk having prickles on the cone scales.	Cones One and one-half to two inches long much curved inward without prickles. Prickles minute.

PINE LEAF CLUSTERS

a, Pitch; c, Red; d, White. All one-half natural size.

NOTE.—All of our pines have winged seeds.

FOREST TREES OF MAINE

WHITE PINE (*Pinus strobus* L.)

When growing in the open, the young tree is symmetrical and conical in outline. In the forest it has a narrow head, and the trunk is commonly free of branches for a considerable portion of its length. The old forest trees have a broad and somewhat irregular head. The branches are horizontal, and in regular whorls, usually of five each. Very old trees often

WHITE PINE CONE

With scales open and seeds gone. White Pine needles grow in clusters of five.

become very irregular and picturesque. The trunk tapers gradually, and the tree often attains a height of one hundred feet. Commonly it is from seventy to eighty feet tall, and having a diameter of one to three feet.

The bark of young trees is smooth and thin green tinged with red. On old trees, it is from one to two inches thick, very dark, and divided into broad flat ridges by shallow fissures.

The leaves are in clusters of five, and are from three to five inches long. They are bluish green, being whitish on one side.

FOREST TREES OF MAINE

WHITE PINE — *Concluded*

The cones are four to six inches long, cylindrical and borne on a long stalk. They open early in September to discharge the small winged seed, which matures in August of the second season.

The white pine occurs in all localities in the State. It grows in moist situations, on uplands, and on sandy soil, but makes the best development on fertile, well-drained soils. On sandy soil it often forms pure, or nearly pure forests or groves.

The tree grows rapidly both in height and diameter, making an average height growth of one foot each year.

WHITE PINE

Embryo and Mature cones. One-half natural size.

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

The wood is light in color, and durable except in contact with the soil. It is soft, not heavy, and is easily worked. The wood is used for building purposes and for cabinet making. The second growth white pine is now used extensively in this State for the manufacture of box boards.

At one time white pine was very abundant in the State, and it was for this reason that the appellation "Pine Tree State" was given to Maine. It was also because of the abundance and value of the white pine that this tree was chosen as the emblem of the State.

FOREST TREES OF MAINE

RED PINE (Norway Pine) (*Pinus resinosa* Ait.)

The young trees have the branches extending to the ground and form a conical outline. These drop off later, and in old age the head is rounded, flattened, stout and picturesque. The branches are generally horizontal. It attains a height of sixty to eighty feet, and a diameter of two to three feet. The trunk is tall, straight and tapers slowly.

The bark is about one inch thick, divided into broad, flat ridges by shallow fissures, and further broken up in to thin, reddish brown scales, loosely attached.

The leaves are arranged in clusters of two, five to six inches long, dark green, soft and flexible.

RED PINE—One-half natural size.

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

The cones are much like an egg in shape, about two inches long, and borne on short stalks. They mature in the fall of the second season, shedding their seeds early in autumn, and usually remaining on the branches until the next summer.

The red pine, though common, is found only locally throughout the State, growing on dry, rocky ridges, or light, sandy soil, usually in groves scattered through forests of other species.

The wood is a little heavier than white pine, close grained, hard, strong, and has a pale red color. It is used for piles, buildings and bridge construction.

Owing to the reddish appearance of the bark, and the pale red color of the heart wood, the name "red pine" is an appropriate one, much more so than Norway pine, which is misleading, and for this reason the use of the latter should not be encouraged.

FOREST TREES OF MAINE

PITCH PINE (*Pinus rigida* Mill.)

On the young trees, the branches are horizontal, rigid, produced in remote regular whorls, forming an open narrow crown. In old age, the branches are stout, contorted, and form a low, broad, rounded head. It attains a diameter of one to two feet, and a height of only thirty to forty feet, often being very much shorter than this. The trunk tapers rapidly and generally is straight. Very often the tree produces fruit when only a few feet high.

The bark is rough even on young stems and branches. On old trees, it is irregularly divided into continuous broad flat ridges, and is deep gray or reddish brown in color.

PITCH PINE.—One-half natural size.

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

The leaves are in clusters of three, and are from three to five inches long. They are dark yellow green, stiff, standing at right angles to the branch.

The cones are one to three inches long, borne on short stalks, hardly noticeable, and are often produced in clusters. A sharp, rigid curved prickle is produced on the tip of each scale. The cones often remain on the trees ten to twelve years.

The pitch pine grows on sandy plains, and on the dry gravelly soil of the uplands. It is quite common in the southwest part of the State, and on the sand plains near Brunswick it is the only species found on areas of considerable extent.

The wood is light, soft, coarse grained, brittle but durable. It is used for fuel, for the production of charcoal and to some extent for lumber of the poorer grades. It is sometimes used for box board lumber.

The wood is very resinous, and at one time quite large quantities of tar and turpentine were obtained from it.

FOREST TREES OF MAINE

JACK PINE (Gray Pine) (*Pinus banksiana* Lamb.)

The spreading branches are long and flexible and form an open head of symmetrical outline. The tree is only about twenty to thirty feet tall, and ten to twelve inches in diameter. Fruit is very often produced when the trees are only a few years old.

The bark is thin and irregularly divided into rounded ridges, the surface being covered with small, thick scales. It is dark brown in color, having a slight tinge of red.

The leaves are in clusters of two, widely distributed on the branches. They are stout, and flat, or nearly so, yellow green at first, becoming dark green and three-fourths to one and one-fourth inches long.

The cones are rather slender, one and one-half to two inches long, conical in shape, and are without a stalk. They are very much curved, but usually borne in an erect position with reference to the branch. The scales have minute prickles which are often deciduous. The cones usually remain closed for several years, and often do not fall for twelve or fifteen years.

The Jack pine grows on sterile, sandy soil, and on barren lands. It extends southward to the shores of Schoodic peninsula in Frenchman's bay, and has been found at the outlet of Alamoosook pond, south of Bucksport. It is not common in this State.

The wood is not strong, and is soft, light, and close-grained. It is used for fuel, and to some extent for posts and railroad ties. Of late years, it has been used for box board lumber.

FOREST TREES OF MAINE

TAMARACK (Hackmatack, Larch) (*Larix laricina* K. Koch.)

In the forest, the tree is generally tall, having a regular, narrow, pyramidal head, the branches being small and horizontal. The trunk of old trees tapers very rapidly, and gets to be eighteen to twenty inches in diameter and fifty to sixty feet tall.

The bark separates on the surface into thin scales of a reddish brown color.

The leaves are linear from three-fourths of an inch to one and one-quarter inches long, triangular in shape, and borne in clusters of ten and more. They are bright green and turn a dull yellow in September or October just before they fall. The tamarack is the only one of our conifers that sheds all its leaves every fall.

TAMARACK.

Branchlet and cone. One-half natural size.

The cones are small, nearly spherical, about three-fourths of an inch long, light brown, and borne on stout stems. They open in the fall to liberate the small winged seed and usually remain on the tree until the second year.

The tree is most commonly found in cool, swampy places although it grows on well drained soil. It is found in practically every part of the State.

The wood is rather coarse-grained, hard, heavy, strong and durable. It is used for ship knees, railroad ties and posts.

About twenty-five years ago, the larch-saw fly killed the tamarack, and there are now very few trees of commercial size. A nice young growth has since sprung up which will soon be large enough for lumber.

In Maine, the name Juniper is quite commonly applied to this tree, but since it is the common name of another tree which is a true juniper, the use of this name should be discouraged.

FOREST TREES OF MAINE

SPRUCES

The Important Distinctions

BLACK SPRUCE (<i>Picea mariana</i> B.S. & P.)	RED SPRUCE (<i>Picea rubra</i> Dietr.)	WHITE SPRUCE (<i>Picea canadensis</i> B. S. & P.)
Leaves Blue-green; not glossy.	Leaves Yellow-green; very shiny	Leaves Blue-green; not glossy.
Cones One-half to one and one-half inches long. Cone scales stiff and rigid when ripe. Cones nearly spherical when open. Usually remain on tree many years.	Cones One to two inches long. Cone scales stiff. Generally fall the first year.	Cones About two inches long. Cone scales flexible at maturity. Usually fall the first year.

SPRUCES.

Branch, cones and cone-scales.

NOTE.—The seed of all spruces is winged.

FOREST TREES OF MAINE

BLACK SPRUCE (*Picea mariana*^a B. S. & P.)

The branches are comparatively short, usually pendulous, with a tendency to curve up at the end, and forming an open, irregular crown. It grows to a height of thirty to forty feet and a diameter of six to twelve inches. In sphagnum bogs, trees fifty to eighty years old get to be only six to eight feet tall and about one inch in diameter.

The bark on the trunk is grayish brown and the surface is broken into thin scales.

The leaves are one-fourth to three-fourths of an inch long and are pale blue green in color.

The cones are one-half to one and one half-inches long shaped like an egg and becoming nearly spherical when opened. The cone scales are stiff. The cones usually stay on the trees for several years and frequently for as many as twenty years.

The black spruce, though common in the State is not an important species. It sometimes grows on upland soils, but is usually found along streams, on the borders of swamps and in sphagnum bogs.

The wood is not strong and is soft and light. It is but little used, except to some extent for the manufacture of paper pulp.

Formerly the black spruce and red spruce were considered to be the same species. Now that they are classed separately, the black spruce is not considered a valuable species for commercial purposes.

FOREST TREES OF MAINE

RED SPRUCE (*Picea rubra* Dietr.)

The slender spreading branches form a somewhat conical and narrow head in youth and middle age. When there is plenty of light, the branches are very persistent, but soon drop off from trees in crowded stands. It produces a long trunk often having but a slight taper. In this State it gets to be a tree of considerable size, attaining a height of sixty^{feet} to eighty feet and a diameter of one to two feet, occasionally exceeding these both in height and diameter.

The bark is about one-half inch thick and is broken into thin, reddish brown scales of irregular shape.

The leaves are dark green often with a slightly yellow tinge and are very shiny. They are about half an inch long.

The cones are oblong in shape and usually from one to two inches long. When ripe, they have a reddish brown color and are quite shiny. The cone scales are stiff like the black spruce. The cones begin to drop off in the autumn or early winter and are all gone from the branches by the next summer.

The red spruce is found in all parts of the State where the soil conditions are suitable for its growth, and is the most abundant of our conifers. It grows on the well-drained upland soils, and on the mountain slopes, preferring north slopes, where, sometimes, it is almost the only species.

Pure stands of this species are common.

The wood is soft, light and close-grained, but is not as durable as pine when exposed to the weather.

The growing scarcity of white pine makes the red spruce one of our most valuable trees for the production of lumber. It is used for joists, sills, scantlings and heavy construction timbers, and is the principal wood used in the manufacture of paper pulp. It is also valuable for the sounding boards of musical instruments. The lumber is sawed to some extent for box boards. Oars, barrel staves and headings are also manufactured from it.

FOREST TREES OF MAINE

WHITE SPRUCE (*Picea canadensis* B. S. & P.)

The long and rather thick branches, densely clothed with stout, rigid lateral branches, are curved upward, and form a somewhat open, irregular head, having a broad base. It grows to a height of sixty to seventy feet, and a diameter not greater than two feet.

The bark is composed of thin, irregular light gray plate-like scales tinged somewhat with brown on the surface.

The leaves on the lower side of the branches are twisted in such a manner as to bring them all on the upper side. They are pale blue at first, becoming a dark blue green or pale blue later. The foliage emits a peculiar and characteristic odor which offers a ready means of distinguishing it from the other species. It is because of this odor that it is so commonly called the "cat spruce" by lumbermen, and sometimes "skunk spruce."

The cones are slender, cylindrical in shape, and usually about two inches long. When ripe, they are pale brown and shiny. The cone scales are thin and elastic, and give easily when the cone is clasped in the hand. The cones fall off in the autumn or during winter.

The white spruce is a widely distributed species in Maine, but is not as abundant as the red spruce. It inhabits the borders of swamps and the banks of lakes and streams.

The wood is light, soft, straight grained, but not strong. It is used to some extent for pulp and also for lumber.

Both the white and black spruce produce long flexible roots that are very tough and pliable and are used by the Indians for tying together pieces of birch bark for canoes, and for various other purposes.

FOREST TREES OF MAINE

HEMLOCK (*Tsuga canadensis* Carr.)

In early age, the lower branches are horizontal or pendulous, those above being ascending. They form a pyramidal head having a broad base. The lower branches are persistent unless shaded by other trees. The terminal shoot is pendulous. In the forest the trunk very often is free of branches for two thirds of its length and the tree then has a small round head. It generally attains a height of sixty to seventy feet when growing in the forest and a diameter of two to three feet.

The bark is divided into narrow rounded ridges covered with thick scales, and varies in color from cinnamon-red to gray, tinged somewhat with purple.

The leaves are oblong, generally rounded at the apex, from one-third to two-thirds of an inch long and so arranged that the sprig appears flat. They are dark yellow-green in color with a lustrous upper surface, the lower being whitish.

HEMLOCK.

Spray and cone. One-third natural size.

The cones are about three-fourths of an inch in length, oblong in shape, light brown, and suspended on slender stalks, often one-fourth of an inch long. The seed is winged, matures in the autumn, and falls during the winter. The cones generally remain on the branches until the next spring.

The hemlock is found in nearly every part of the State, but is most abundant in the northern sections. It grows on rocky ridges, in narrow rocky gorges, on north slopes where it is often the only tree, and is scattered through the forests of pine or hard woods. Moist, cool and shady places is what it prefers.

The wood is not strong, is coarse, cross-grained, brittle, light, soft, and difficult to work. It is liable to be "shaky" and decays rapidly when exposed to the air. It is sawed into coarse lumber for outside finishing, and is used to some extent for pulp.

The bark is valuable for tanning.

FOREST TREES OF MAINE

BALSAM FIR (*Abies balsamea* Mill.)

Until the tree is about twenty years old the branches are produced in regular whorls usually of five. At this period, they are slender and horizontal and form a strikingly symmetrical head, having a broad base. In old age, the top branches are short and crowded, and form a slim, regular and spire-like head. The tree grows to a height of sixty to seventy feet and a diameter of twelve to twenty inches.

The bark on young trees is of a pale gray color, smooth, thin, and prominently marked by chambers filled with resin or balsam. On old trees the bark is quite thick, broken into irregular plates covered with thin scales and has a reddish brown color.

BALSAM FIR
Branchlet and cone.

The leaves are one-half an inch to one and one-fourth inches long, dark green, the lower side silvery white, the upper shiny, the tips being occasionally notched, but only on the top branches. They spread out at nearly right angles to the branch giving it a flattened appearance.

The cones are cylindrical, two to four inches long and dark purple in color. They are erect on the branches and fall to pieces soon after ripening.

The balsam fir is very abundant in the State, being found everywhere except in the extreme southwest part, extending all along the coast as far as Portland. On swampy land, it frequently forms a large part of the forest, while on well-drained hillsides, it occurs either singly or in thickets in the spruce forests.

The wood is of poor quality, coarse-grained, soft, light and decays rapidly. It is sawed into lumber chiefly for packing boxes, and is used to a limited degree for paper pulp. Owing to the fact that the wood imparts no flavor or odor, it is used for the manufacture of butter pails and tubs.

FOREST TREES OF MAINE

WHITE CEDAR (Arbor Vitae) (*Thuja occidentalis* L.)

The head is compact, narrow and pyramidal in shape. The branches are horizontal, short and turned upward. It is from fifty to sixty feet tall and usually two to three feet in diameter. The trunk is often very strongly buttressed.

The bark has shallow fissures, which divide it into flat narrow ridges. It is reddish brown in color, tinged very often with orange.

The leaves are usually only about one-eighth of an inch long, scale like, and so arranged as to make the small branches flat in shape. They have a pleasing aromatic odor, and to some a rather pleasing taste.

WHITE CEDAR.—One-half natural size.

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

The cones are small, being only about half an inch long, usually with only four fertile scales. They mature in one season. The seed is small and winged.

The white cedar is generally found on swampy ground where it often forms dense stands. It is found to some extent in other localities where the soil is very moist. It is widely distributed in the State but is most abundant in the northern and eastern sections.

The wood is soft and light, coarse-grained, brittle, very durable and has a fragrant odor. It is used for railroad ties, shingles, poles and fence posts.

NOTE —Another species of white cedar (*Chamacyparis thyoides* Britt.) occurs in southern Maine only near the coast, but is not abundant. This tree grows in cold swamps which are flooded for several months of the year.

FOREST TREES OF MAINE

RED CEDAR (*Juniperus virginiana* L.)

The red cedar is very variable in its habit. The young trees have slender horizontal branches, and a narrow, compact, conical head, which in the old trees becomes broad and much rounded. It attains a diameter of eight to twelve inches, and in this State probably does not exceed a height of thirty feet.

The bark on the trunk is light brown, tinged with red, and separating into long narrow shreds on old trees.

The leaves are scale-like, about one-sixteenth of an inch long, dark bluish green, and remain on the tree five and six years, growing hard and woody the third

RED CEDAR

Two-thirds natural size.

season. Sometimes they are awl shape, especially on young trees, and on vigorous branches.

The fruit is berry-like, globular, pale green at first, becoming dark blue when ripe, and is about the size of a pea.

The red cedar is not a common species in this State. It grows on poor soils, gravelly slopes, rocky ridges, and on moist ground. It gets the name "red cedar" from the red color of the heart wood.

The wood is brittle, fine-grained, light, easily worked and durable. The heart wood has a dull red color. It is of value for fence posts, pails and cabinet making but in this State is of little commercial importance. It is this wood which is used in the manufacture of pencils.

FOREST TREES OF MAINE

BUTTERNUT (*Juglans cinerea*^a L.)

The butternut frequently has stout, spreading limbs extending horizontally from the trunk to form a low, broad, rounded head. It is a tree thirty to forty feet high and having a diameter of one to two feet.

The bark of young trees and of the branches is smooth and light gray. On old trees, it is broadly ridged on the trunk and of a light brown color.

The leaves are fifteen to thirty inches long, alternate, and have eleven to seventeen leaflets. The nuts are about three inches long, cylindrical, covered with sticky hairs, and produced in drooping clusters.

BUTTERNUT
Winter twig.
One-half
natural size.

BUTTERNUT
Leaf and fruit. One-third natural size.

The butternut occurs to some extent throughout the southern section of the State. It grows on rich, moist soil and on rocky hills. Not abundant.

The wood is coarse-grained, light, soft and not strong, and is used for furniture and interior finishing of buildings. It takes a good polish.

FOREST TREES OF MAINE

HICKORIES

The Important Distinctions.

BITTERNUT	SHAGBARK	PIGNUT
(<i>Carya cordifolia</i> C. K. Schn.)	(<i>Carya ovata</i> C. K. Schn.)	(<i>Carya glabra</i> C. K. Schn.)
Bark on Trunk Broken into thin plate-like scales light gray; not as rough as shagbark.	Bark on Trunk Broken into long, thick plates, loosely attached to tree; light gray; very rough.	Bark on Trunk Frequently broken into short plates; dark gray
Leaves Five to nine leaflets.	Leaves Usually five leaflets, rarely seven.	Leaves Five or seven, rarely nine
Winter Buds Bright yellow; two pairs of scales.	Winter Buds Three or four outer scales; dark brown. Often have long rigid points and fall before leaves begin to develop. Terminal bud shaped like an egg.	Winter Buds Outer scales dark reddish brown, shiny, usually falling early in autumn. Terminal bud elliptical.
Fruit Thin husk; thin and brittle shell; very bitter kernel.	Fruit Husk thick; shell usually thick; kernel sweet.	Fruit Varies much in shape and size. Husk usually thin, shell either thick or thin, kernel sweet or bitter.

FOREST TREES OF MAINE

BITTERNUT (Swamp Hickory) (*Carya cordifolia* C. K. Schn.)

The tree produces a broad head or crown with stout spreading branches and grows to a height of about fifty feet. The trunk has a gradual taper and gets to be one and two feet in diameter.

The bark separates into thin, plate-like scales on the trunk. It is of a gray color, tinged with yellow. The young branches are bright green and smooth.

The leaves are alternate, compound, six to ten inches long. There are seven to

BITTERNUT HICKORY

Leaf and fruit. One-third natural size.

BITTERNUT

Winter twig.
One-half
natural size.

nine leaflets which are smaller and more slender than those of other species.

The fruit is about one inch long, and has a thin husk that separates along well defined lines when ripe. The nut usually has a thin and brittle shell and the kernel is very bitter.

The bitternut prefers low, wet woods, although it is found on high rolling uplands. Found only in southern Maine.

The wood is close-grained, strong, heavy, hard and tough. It is used for hoops and fuel.

FOREST TREES OF MAINE

SHAGBARK (Shell bark) (*Carya ovata* C. K. Schn.)

A tree with a narrow cylindrical head that in the forest is often very short, leaving the straight, gradually tapering trunk free of branches for a considerable distance. It is the tallest of the hickories, usually attaining a height of from fifty to seventy feet and a diameter not greater than two feet.

The bark is light gray on the trunk and separates into long thick plates often a foot or more in length. These are only slightly attached and give the trunk a shaggy appearance.

The leaves are compound, alternate, eight to fourteen inches long, the leaflets ordinarily five in number, rarely seven.

SHAGBARK HICKORY
Leaf and young fruit. One-third
natural size.

SHAGBARK
Winter twig.
One-half size.

The fruit has the thick outer coat deeply grooved at the seams. It separates along definite lines when ripe. It is globular in shape and is borne singly or in pairs. The kernel is sweet. The fruit ripens in fall.

The shagbark hickory grows near streams or swamps, or on low hills, preferring the deep, rich, moist, but well-drained soil. Found in the southern part of the State, but not abundantly.

The wood is very strong, close-grained, heavy, hard, tough and flexible. It is used in the manufacture of agricultural implements, for making carriages and wagons, especially the spokes and rims of the wheels, and for ax and tool handles. The nuts are sold in the markets.

FOREST TREES OF MAINE

PIGNUT (*Carya glabra* C. K. Schn.)

A tree having a tall, slender trunk, one to two feet in diameter, spreading and often contorted branches, and rather narrow cylindrical head. A fairly tall tree growing to a height of fifty to sixty feet.

The bark of the trunk on old trees is comparatively smooth, sometimes broken into plates like that of the shagback but only five to six inches long. It is gray to dark gray in color.

The leaves are alternate, eight to twelve inches long, compound, usually having five to seven rather small narrow leaflets.

The fruit varies greatly in shape, being round, pear-shaped, or egg-shaped.

The size also varies, usually being small.

PIGNUT.

Winter twig.

One-half natural size.

PIGNUT HICKORY

Leaf and fruit.

One-third natural size.

The outer covering is generally thin, and when ripe, separates along well defined lines. The shell is either thick or thin and the kernel sweet or bitter. The fruit is borne singly or in pairs and ripens in October.

The pignut inhabits dry ridges and hillsides. Found in the southern section of the State.

The wood is close-grained, hard, heavy, and strong, and is also tough and flexible. It is used in the manufacture of agricultural implements, for wagons and as handles for axes and tools.

FOREST TREES OF MAINE

POPLARS

The Important Distinctions.

ASPEN (<i>Populus tremuloides</i> Michx.)	LARGE TOOTH ASPEN (<i>Populus grandidentata</i> Michx.)	BALSAM POPLAR (<i>Populus balsamifera</i> L.)
Bark Often with horizontal bands of circular wart like outgrowths. Very bitter.	Bark Smooth; not bitter.	Bark Smooth or roughened by dark excrescences.
Leaves Circular outline. Edges finely toothed; shiny upper surface. One and one-half inches long.	Leaves Broadly egg-shaped edges irregularly and coarsely toothed. Upper surface not shiny. Three to four inches long.	Leaves Egg-shaped, but narrower than large tooth aspen. Edges finely toothed. Upper surface shiny. Three to five inches long.
Winter Buds Slightly sticky, shiny, conical.	Winter Buds Not sticky; edges of bud scales fringed with whitish hairs. Broadly egg-shaped.	Winter Buds Very sticky; egg-shaped, shiny.

NOTE.—The white poplar (*P. alba*) and the Carolina poplar (*P. carolinensis* Willd.) are two introduced species planted to some extent. The first is easily recognized by its leaves which are green above and white-cottony beneath. The Carolina poplar has a long, narrow crown and the upper surface of the leaves is very shiny. The Swamp Cotton wood (*P. heterophylla* L.) has been found here but is rare.

The poplars can be readily started by cuttings.

FOREST TREES OF MAINE

ASPEN POPLAR (*Populus tremuloides* Michx.)

A graceful tree with slender branches far apart and often contorted. Head round and narrow. It grows to a height of sixty to seventy-five feet and a diameter of ten to sixteen inches.

The bark is smooth, often roughened by horizontal lines of wartlike outgrowths. It is pale green with dark brown patches. On the trunk of old trees it is ash gray, dark at the base where it is divided into broad, flat ridges. It has a very bitter taste similar to quinine.

AMERICAN ASPEN

Leaves and flowers; 1 staminate, 2 pistillate. One-third natural size.

The leaves are alternate, more or less rounded, finely toothed, dark green and shiny above, and one and one-half to two inches long. The leaf stalk is slender and flattened.

The flowers are in catkins which appear before the leaves.

The fruit ripens about June. The seeds are very small and light and are carried long distances by the wind.

The aspen is a rapid growing tree, and is very abundant in the State. It sometimes forms nearly pure stands, and is very common in mixture with other species. It is found on many different kinds of soil, but makes the best growth on a sandy and fairly moist soil. Frequently it is the first species to start when the forest is removed, and especially after burns.

The wood is close-grained, but soft, and rots very easily. It is used for box boards, excelsior, and for the manufacture of pulp for our book paper. It is also cut for fuel.

FOREST TREES OF MAINE

LARGE TOOTH ASPEN (*Populus grandidentata* Michx.)

The large tooth aspen is much like the aspen in habit. It is a rapid grower, and attains a height of sixty to eighty feet and a diameter of ten to twenty inches.

The bark is smooth, and of a greenish gray color. At the base of old trees, it is dark and divided into broad, irregular, flat ridges.

The leaves are three to four inches long, broadly egg-shaped, and have a dark green upper surface. The edges are coarsely and irregularly toothed. The petiole, or leaf stalk, is flat.

LARGETOOTH ASPEN

Leaves and flowers; pistillate above, staminate below.
One-third natural size.

The flowers are in catkins, appearing in April before the leaves.

The fruit ripens in May about the time the leaves begin to come out. The seed is small and light and is carried along ways by the wind.

The large tooth aspen is a very common tree, usually growing in mixture with the aspen, and like it, growing in various soils and in different situations, but making the best development in a rich sandy and fairly moist soil. It grows with other species either scattered through the forest or in small groves.

The wood is like that of the preceding species, and is used for the same purposes.

FOREST TREES OF MAINE

BALSAM POPLAR (Balm of Gilead) (*Populus balsamifera* L.)

In habit, the tree is somewhat different from the two preceding. The branches are stout, erect, and more or less contorted at the ends, and form an open, rather narrow head. It gets to be seventy to eighty feet tall, and fifteen to thirty inches in diameter.

The bark on young trees is smooth, or sometimes roughened by dark outgrowths and is light brown with a reddish tinge. On the trunk of old trees, it is gray and separated into broad, round ridges.

BALSAM POPLAR (Balm of Gilead.)

The leaves are egg-shaped, three to five inches long, but not as wide as the preceding species. They are deep dark green and shiny on the upper surface, light green and more or less rusty on the under side. The edges are finely toothed.

The flowers are in catkins which appear early in the spring. The seed ripens the last of May or early in June and is attached to a cottony mass so that it is often carried long distances by the wind.

The balsam poplar inhabits the borders of swamps and the low bottom lands along rivers that frequently become overflowed. It is a widely distributed tree, and is common throughout the State.

The wood is like that of the other trees, and used for the same purposes.

FOREST TREES OF MAINE

BLACK WILLOW (*Salix nigra* Marsh.)

The black willow is usually not a very tall tree growing to a height of thirty to forty feet and attaining a diameter of one to two feet or greater. The branches are stout, upright and spreading and form a broad, handsome, open head with an irregular outline. The small branches are bright reddish brown to pale orange in color.

The bark is deeply divided into broad flat ridges and separates 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.

BLACK WILLOW

The leaves are three to six inches long, narrow, with long tapering tips and finely toothed edges. They are a bright light green, and somewhat lustrous above and turn light yellow in the fall.

The flowers are produced in catkins at the end of the shoot and are from one to three inches long. They appear with the leaves.

The black willow occurs along the banks of streams and lakes throughout the State and is the largest and most conspicuous of our native willows. The species is not of any great commercial importance.

The wood is soft, light and weak.

FOREST TREES OF MAINE

HORNBEAM OR IRONWOOD (*Ostrya virginiana* K. Koch.)

The ironwood is a small tree with either an open or round topped head. In height it is from twenty to thirty feet with a diameter ranging from six to ten inches. The branches are long and slender and the ends are somewhat drooping. The small branches are very tough and for this reason the tree is not easily injured by the wind.

The bark separates easily into thin, narrow scales, becoming finer and stringy on older trees. On the trunk, it is light brown, tinged with red.

The leaves are either egg-shaped or nearly oblong, alternate, sharply toothed, base often unequal, and two to three inches long. They are much like those of the blue beech. They are tough so that the wind does not injure them easily.

The flowers are in catkins which are in clusters usually of three, some appearing in the fall and some in the spring.

The fruit closely resembles that of hops, hence the name "hop hornbeam." It ripens in September.

The ironwood is a fairly rapid grower, especially in good soil. It grows on slopes and ridges having a dry, gravelly soil, and is often found in the shade of other species. While it is a common tree, it is not very abundant.

The wood is very close-grained, heavy, very strong, tough and is exceedingly hard when seasoned. It is used for levers, mallets and tool handles.

HORNBEAM OR IRONWOOD
Leaves and fruit. One-third natural size.

FOREST TREES OF MAINE

BLUE BEECH (*Carpinus caroliniana* Walt.)

The blue beech is a small, slow growing tree ten to twenty-five feet tall and four to ten inches in diameter. The branches are crooked and irregular, forming a compact, broad, roundish and flat head. The trunk is irregularly ridged longitudinally.

BLUE BEECH

Leaves and fruit. One-third natural size.

BLUE BEECH

Winter twig. One-half natural size.

The bark is smooth, and of a grayish-blue color.

The leaves are alternate, egg-shaped, or oval, two to three inches long, and sharply toothed.

The flowers are produced in catkins which appear in the spring.

The fruit hangs at the end of a leaflike body, and is borne in open clusters.

The blue beech is quite common inhabiting wet woods and the borders of swamps and streams.

The wood is close-grained-compact, strong, tough and durable.

FOREST TREES OF MAINE

BIRCHES

The Important Distinctions.

BLACK BIRCH (<i>Betula lenta</i> L.)	YELLOW BIRCH (<i>Betula lutea</i> Michx)	GRAY BIRCH (<i>Betula populifolia</i> Marsh)	WHITE BIRCH (<i>Betula papyrifera</i> Marsh)
Bark Without luster, dark to almost black. Smooth, or broken into irregular plates. Strongly aromatic on young branches.	Bark Bright silvery gray or light orange in color, separating into thin, ribbon-like strips. Aromatic on young branches	Bark Outer, chalky or grayish white; inner orange color. Does not separate into papery layers.	Bark Outer, cream white and shiny; inner bright orange color. Separates into thin, papery layers.
Leaves Egg-shaped or nearly so. Edges sharply toothed.	Leaves Egg-shaped or nearly so. Edges sharply and doubly toothed. Smaller than preceding	Leaves Triangular or nearly so. Edges doubly and coarsely toothed. Long pointed. Upper surface shiny.	Leaves Egg-shaped Edges generally doubly toothed. Not long pointed and upper surface not shiny.
Flowers Three to four catkins on a shoot; not clustered.	Flowers Three to four catkins on a shoot; not clustered.	Flowers Catkins singly or in pairs on the shoot.	Flowers Catkins in clusters of three.

FOREST TREES OF MAINE

BLACK BIRCH (Cherry Birch) (*Betula lenta* L.)

A rather handsome tree with a tall dark stem, spreading, slender, horizontal branches, pendulous at the ends, and forming a graceful, open, narrow head, in the open becoming round and symmetrical. It grows to a height of sixty to seventy feet and a diameter of one to two feet, and sometimes exceeding these dimensions.

The bark on the trunk is dark to almost black, on old trees separating into large and thick irregular plates. On young trees and branches it is smooth, shiny, dark brown, tinged with red. The bark of young trees is aromatic, having a very pronounced wintergreen flavor.

The leaves are three to four inches long, aromatic, egg-shaped or somewhat oblong, sharply toothed, upper surface dark green, dull, lower surface, light yellow-green.

The flowers are produced in catkins, the winter shoots containing three to four. They open just before the leaves unfold in the spring.

SWEET OR BLACK BIRCH

Leaves and fruit. One-third natural size

The black birch inhabits the banks of streams, or the moist, rich upland soil. It is widely distributed, but not of a very common occurrence.

SWEET BIRCH
Winter twig. One-half natural size.

The wood is hard, heavy, strong, and can be beautifully polished. It is used for fuel, and is very much prized for furniture. An oil having some medical value can be obtained from the wood by distillation, and is generally known as wintergreen oil.

The name "cherry birch" is applied to this tree because of the resemblance of the bark on old trunks to that of the sweet cherry.

FOREST TREES OF MAINE

YELLOW BIRCH (*Betula lutea* Michx.)

The yellow birch is the largest of the native birches growing to a diameter of two and three feet and a height of seventy to eighty-five feet. The spreading branches are somewhat pendulous, and form a broad round-topped head in the open, but small and irregular in the woods. The trunk usually divides into two or three limbs at some distance from the ground.

The bark on the branches and on the stems of young trees is very shiny, silvery gray or light orange in color, separating into loose, thin, often ribbon-like layers. On old trees, it is divided into large thin plates, not shiny, and gray or blackish. The young twigs are aromatic like the black birch but to a less degree.

The leaves are egg-shaped, or nearly oblong, alternate, the edges doubly toothed, the upper side dull dark green and three to five inches long.

The flowers are in catkins. In winter there are three to four on the shoots but not in clusters. They open in the early spring.

The yellow birch is one of the largest of our deciduous leaved trees. It is common in the State and in some sections is quite abundant. It grows on rich soil and inhabits the moist uplands.

The wood is hard, strong, heavy and will take a good polish. It is used for furniture, flooring, wheel-hubs and fuel. The yellow birch is one of our valuable timber trees.

The tree is very subject to a fungus disease that causes a rotting of the wood.

**YELLOW
BIRCH**

Winter twig. One-half natural size.

FOREST TREES OF MAINE

GRAY BIRCH (*Betula populifolia* Marsh.)

The gray birch is a small tree from twenty to thirty feet tall and commonly four to eight inches in diameter. The branches are short, slender, frequently pendulous, and somewhat contorted. These extend to the ground when the tree is not too much crowded, and the head is long, narrow, pointed and open. In the forest the head is short and often somewhat irregular, and the stem is tall and slender.

The bark is close and firm, and does not easily separate into thin layers. The outer part is grayish, grayish-white or chalky, the inner portion being orange color.

The young shoots are brown and the small branches are dark colored.

The leaves are two

GRAY BIRCH

Leaves and fruit. One-third natural size.

and one-half to three inches in length, long-pointed, triangular, alternate, coarsely toothed, upper surface dark green and glossy. The slightest breeze causes them to flutter like those of the poplars hence the scientific name *Betula populifolia* which means "birch with poplar leaves."

The flowers are produced in catkins. Those which appear in the fall are usually solitary. They open in early spring before the leaves.

GRAY BIRCH

Winter twig and buds. One-half natural size.

The gray birch is short lived and not a valuable tree. It is very abundant in the southern sections of the State, growing well on the poorest, sandy soils, yet by no means confined to them, sometimes being found on the moist ground bordering swamps and ponds. It is this tree that springs up so often in old fields and often prepares the way for the more valuable white pine.

The wood is light, soft, often coarse-grained and is liable to check in drying.

Used a great deal for fuel and to some extent for spools and shoe pegs.

FOREST TREES OF MAINE

WHITE BIRCH (Paper Birch) (*Betula papyrifera* Marsh.)

The white birch is from sixty to seventy feet tall growing to a diameter of one to two feet and occasionally larger. When young, the branches are short, slender, and spreading, somewhat drooping, and forming a narrow, regular head. In the forest the trunk is free from branches well up from the ground, and the tree forms an open, narrow and round-topped head.

WHITE OR PAPER BIRCH

Leaves and fruit.

One-third natural size.

The bark on the trunk and limbs separates freely and easily into thin, papery sheets. The outer surface is white the inner part being bright orange. On young stems and large limbs it is creamywhite and shiny.

The leaves are alternate, egg-shaped, short-pointed, two to three inches long, doubly toothed, the upper surface dark green and dull.

The flowers are in catkins those appearing in the fall being sterile and mostly in clusters of three. They open in early spring before the leaves.

WHITE
OR PAPER
BIRCH
Winter twlg
and buds.
One-half
natural size.

The white birch is a common tree in all parts of the State except in the southwest section. In some

FOREST TREES OF MAINE

WHITE BIRCH—Concluded.

localities, it is found in pure, or nearly pure stands covering small areas, but never forming a large part of the forest. It grows along streams and on the borders of lakes and ponds, thriving best in a rich, moist soil.

The wood is close-grained, light, hard, strong, and tough. It is used for shoe lasts, pegs, flooring, and for spools, being the best and most valuable wood for the latter purpose. The bark is used by the Indians to make canoes, baskets, etc.

The tree gets the name of "paper birch" because of the use to which the bark was put by the early settlers, and that of "canoe birch" because the bark is used by the Indians to make their birch bark canoes.

FOREST TREES OF MAINE

BEECH (*Fagus ferruginea* Ait.)

The beech grows to a height of sixty to seventy feet and a diameter of one and one-half to three feet. In the open, the branches are spreading and drooping, and the tree has a broad, compact head. In the forest, the short branches form a narrow head, and the trunk is free of branches for one-half to two-thirds of its length. Shoots often spring up from the roots.

The bark is of a blue-gray color and smooth.

BEECH

Leaves and fruit. One-third natural size.

BEECH

Winter twig and buds
One-half natural size.

The leaves are from three to five inches long, oval, coarsely toothed, and long pointed.

The winter buds are long, slender, and sharp-pointed.

The fruit consists of a burr having four parts and contains one and two triangular edible nuts.

The beech is common in our forests, and sometimes forms nearly pure stands. It grows on ridges having shallow soil and on rocky slopes making its best development on rich upland soil.

The wood is strong, hard and tough but not durable, and can be polished easily. It is used for chairs, plane-stocks, flooring and fuel.

FOREST TREES OF MAINE

CHESTNUT (*Castanea dentata* Borkh.)

In the forest, the chestnut has a tall, straight trunk free of limbs, and a small head. When not crowded the trunk divides into three or four limbs and forms a low, broad top. It reaches a height of sixty to seventy feet and a diameter of fifteen to thirty inches, occasionally exceeding these dimensions.

The bark on the trunk of old trees is divided into broad, flat ridges by shallow, irregular fissures. On young stems, it is smooth and dark gray.

The leaves are coarsely toothed, alternate, five to eight inches long and yellow-green.

CHESTNUT

Leaf and fruit. One-third natural size.

The fruit is a prickly burr of four parts, usually containing two or three nuts.

CHESTNUT of the State, but is not abundant there. It makes its best growth on rich, well-drained soil. The chestnut occurs in the southwest part of the State, but is not abundant there. It makes its best growth on rich, well-drained soil.

The wood is soft, light, durable and strong, and splits easily. It is used for interior finishing and is in much in demand for telephone poles, railroad ties and fence posts. The durability of the wood is due to the tannic acid which it contains.

The nuts contain a sweet meat and are gathered in large quantities for the market. The tree is a rapid grower. It has been planted occasionally as far north as Bangor and does very well.

FOREST TREES OF MAINE

OAKS

The Important Distinction

RED OAK (<i>Quercus rubra</i> L.)	SCARLET OAK (<i>Quercus coccinea</i> Moench.)	YELLOW OAK (<i>Quercus velutina</i> Lam.)
Bark Slightly ridged but never extremely rough. Dark gray to black; inner bark reddish.	Bark Ridges small, irregular dark gray. Inner bark, pale reddish or gray.	Bark Deeply fissured. Ridges brazed, rounded very dark. Inner bark, usually deep orange color or bright yellow.
Leaves Lobed, each with sharp tip. Upper surface dull, dark green.	Leaves Lobes sharp pointed. Upper surface bright green and shiny.	Leaves Lobes sharp pointed. Upper surface dark green, shiny.
Fruit Two years to mature. Acorn two to four times longer than cup.	Fruit Two years to mature. Acorn about twice as long as cup.	Fruit Two years to mature. Acorn about twice as long as cup.
Winter Bud Conical, smooth, chestnut brown.	Winter Bud Small, smooth, light brown.	Winter Bud Large, decidedly angled, coated with matted, wool-like hairs.
NOTE.—In addition to the above, we have the scrub oak (<i>W. nana</i> Sug.) in the south part of the state.		
WHITE OAK (<i>Quercus alba</i> L.)	BURR OAK (<i>Quercus macrocarpa</i> Michx.)	SWAMP WHITE OAK (<i>Quercus bicolor</i> Michx.)
Bark Light gray to nearly white. Ridges broad and flat.	Bark Grayish, deeply furrowed, flaky.	Bark Grayish-brown, deeply fissured; broad flat ridges, flaky.
Leaves Lobes rounded, no bristles. Bright green, shiny or dull on upper surface.	Leaves Lobes rounded, no bristles. Dark green, shiny on upper surface.	Leaves Slightly lobed, or coarsely toothed, no bristles. Dark green, dull on upper surface.
Fruit One year to mature. Two to four times as high as cup.	Fruit One year to mature. usually solitary. Acorn about twice as long as cup, sometimes only slightly longer.	Fruit One year to mature. Acorn three times as long as cup.
Winter Buds Broadly egg-shaped, rather blunt pointed, dark red-brown.	Winter Buds Broadly egg-shaped, sharp, or blunt pointed, reddish brown, coated with soft hairs.	Winter Buds Roundish, blunt pointed, brown.

FOREST TREES OF MAINE

RED OAK (*Quercus rubra* L.)

The red oak grows to a height of fifty to sixty feet and a diameter of two to three feet, sometimes attaining a larger size. It forms either a narrow or broad head, and the branches are stout, horizontal or upright.

The bark on the trunk of old trees is dark gray or nearly black, and is divided into rounded ridges, but does not get very rough. On younger trees and branches it is smooth and light gray. The inner bark is reddish.

The leaves vary in shape, are five to eight inches long, and alternate. They are dull, dark green above, yellow green below.

The flowers appear in May, while the leaves are only partly grown.

The fruit ripens the second year. The acorn is large, three-fourths

to one and one-fourth inches long, and two to four times longer than the cup.

The red oak is the most common and most abundant species of oak in Maine, being found in all parts except perhaps the extreme North. Found in various soils and situations, but making its best growth on rich upland soil.

The wood is hard, strong and heavy. It is used for furniture and interior finishings.

RED OAK

Leaf and fruit. One third natural size.

RED OAK

Winter twig and buds. One-half natural size.

FOREST TREES OF MAINE

SCARLET OAK (*Quercus coccinea* ^{Wang.} Moench.)

The scarlet oak is a smaller sized tree than the red oak, growing to a height of thirty to fifty feet and one or two feet in diameter. The branches are slender and form an open, narrow head.

The bark on the trunk of old trees is separated into irregular ridges by shallow fissures. is dark gray with a reddish inner bark.

The leaves are alternate, three to six inches long with a variable outline. The upper surface is bright green and shiny, the lower being paler and less shiny.

The flowers appear in May, the leaves at that period being partly developed.

The fruit ripens the second year. The acorn is about one-half inch long, and about twice as long as the cup, being from one-third to one-half enclosed by it.

The scarlet oak occurs only in one section of the State, being found in the valley of the Androscoggin river. It grows on the dry soil of ridges or uplands.

The wood is hard, strong, heavy but coarse-grained. Used to a limited extent for the same purposes as the red oak.

In the fall, the leaves turn a deep scarlet, and it is this feature which is responsible for the common name of the tree.

SCARLET OAK
Winter twig and buds.
One-half natural size.

FOREST TREES OF MAINE

YELLOW OAK (Black Oak) (*Quercus velutina* Lam.)

On the black oak the branches are slender, and the head is narrow and open. Very often there are numerous small dead branches clinging to the tree, differing from the other two species in this respect. It grows to a height of fifty to sixty feet and a diameter of one and two feet.

YELLOW OAK

Leaf and fruit. One-third natural size.

The bark is smooth and dark gray or brown on young stems. On old trees, it is divided by deep fissures into broad, rounded ridges, and is dark to almost black. It is rougher than that of the red oak. The inner bark is a bright orange color or bright yellow and is a distinguishing feature. It is used for tanning.

The leaves are alternate, five to six inches long, the upper surface glossy, dark green, and like the red and scarlet oaks varying much in shape and general outline, being in fact the most variable of the three.

The flowers appear in May, the leaves being at that time only partly grown.

The fruit matures the second season. The acorn is one-half to three-fourths of an inch long, about twice as long as the cup and nearly one-half enclosed by it.

The black or yellow oak is confined to the coast regions of southern Maine. It grows on dry ridges and gravelly uplands.

The wood is hard, heavy, strong and coarse-grained. But little used except for fuel.

FOREST TREES OF MAINE

WHITE OAK (*Quercus alba* L.)

In good situations, the white oak is a large sized tree, attaining a height of sixty to seventy feet and a diameter of three to four feet. In poor soils, it fails to develop as well, being of much smaller size. When not crowded by other trees, the bole is short, the limbs large and diverging, and the head broad and rounded. In the forest, it has a long bole, little if any divided, and a narrow head until old age.

The bark on the trunk is separated into thin irregular flakes and varies from a light or ashy gray to nearly white. It is valuable for tanning.

The leaves are usually seven lobed, alternate, four to seven inches long, bright green above, pale green or whitish beneath. They sometimes remain on the tree during the winter.

WHITE OAK

Leaves and fruit.

One-third natural size.

The flowers come out in May, the leaves being half grown at that time.

The fruit ripens in September of the first year. The acorn is about three-fourths of an inch long, from two to four times longer than the cup, and about one-fourth enclosed by it.

The white oak is not common in the State, being confined largely to the southern part where it grows on sandy land, gravelly ridges, or rich uplands and moist bottom lands. It makes the best growth on the rich, rather heavy upland soils.

The wood is close grained, strong, heavy, hard, tough and durable. It is used for shipbuilding, carriage making, agricultural implements, interior finishing, furniture and flooring. At one time, it was used a great deal for railroad ties, but it is now too valuable for that purpose.

The white oak gets its name from the color of the bark.

WHITE OAK

Winter twig and buds.

One-half natural size.

FOREST TREES OF MAINE

BURR OAK (*Quercus macrocarpa* Michx.)

The burr oak has a broad top of wide spreading branches, and the trunk is often clear of limbs for two-thirds or more of its length. It attains a height of sixty to seventy feet, and a diameter of two to three feet, somewhat exceeding these dimensions in the better situations.

The bark is grayish, deeply furrowed, and is broken into plate-like irregular scales.

The leaves have rounded lobes but mostly not as deeply cut as the white oak. The upper end of the leaf is widest and is very coarsely toothed rather than lobed. They are alternate, dark green and shiny on the upper surface, the lower, pale green or silvery white.

The flowers appear in May at the time when the leaves are partly formed.

The fruit matures the first year and is usually solitary. It varies much in size and shape. The acorn is about three-fourths of an inch long, and about one-half enclosed by the cup.

The burr oak extends southward from Nova Scotia and New Brunswick to the valley of the Penobscot river. It grows in low, rich bottom lands, and is rarely found on dry soil.

The wood is very durable, hard, heavy, strong and tough. It is used for the same purpose as white oak.

FOREST TREES OF MAINE

SWAMP WHITE OAK (*Quercus bicolor* Michx.)

The swamp white oak is a somewhat smaller sized tree than the other two oaks, growing to a height of about fifty feet and a diameter of two to three feet. The limbs are small, usually pendulous, and the head is narrow, open and round-topped.

The bark on old trees is deeply furrowed, divided into broad flat ridges, flaky, and of a grayish brown color. On young trees and branches it is smooth and separates into papery scales, hanging loosely.

The leaves are alternate, four to six inches long, very coarsely toothed or slightly lobed, upper surface dark green, shiny, the lower, pale white or tawny.

The flowers appear in May when the leaves are not more than half grown.

The fruit matures the first season and is usually solitary. The acorn is about one inch long, and about three times as long as the cup and about one-third enclosed by it.

The swamp white oak grows in moist, fertile soil, on the borders of swamps, and along streams. It is nowhere abundant, generally being widely scattered in small groves, and occurring only in the southern part of the State.

The wood is strong, tough, heavy and hard and is used for the same purposes as the white oak.

It owes its name to the fact that it resembles the white oak and grows in swampy places.

SWAMP WHITE OAK
Leaf and fruit. One-third
natural size.

SWAMP
WHITE
OAK
Winter
twig and
buds. One
half nat-
ural size.

FOREST TREES OF MAINE

WHITE OR AMERICAN ELM (*Ulmus americana* L.)

The American elm is a tree of graceful and often varied habits. The trunk often divides into numerous limbs which form a spreading round-topped head with graceful, drooping branches. It attains a height of sixty to seventy feet and a diameter of two to four feet.

The bark on the trunk is separated into broad ridges by deep fissures and is of an ashy gray color.

AMERICAN ELM

Winter twig and buds. One-half natural size.

WHITE ELM

Leaves and fruit. One-third natural size.

The leaves are alternate, two to five inches long, coarsely double toothed margins. The upper surface dark green and somewhat rough and having a one sided base.

The flowers appear in April before the leaves.

The fruit consists of a small winged seed

which ripens about the last of May before the leaves have fully developed.

The American elm is one of our largest and most graceful trees, and is of common occurrence throughout the State. It prefers the rich bottom lands, the moist soil along the streams and low hills of rich soil.

The wood is rather coarse-grained, hard, heavy, strong, tough and hard to split. It is used for wheel hubs, baskets, flooring and cooperage.

FOREST TREES OF MAINE

SASSAFRAS (*Sassafras ^{ai}verifolium* (Salis.) Otto Kuntze)

The sassafras is a tree of small size and often is hardly more than a shrub. It grows to a height of twenty to twenty-five feet and a diameter of four to six inches, exceeding these dimensions under favorable conditions. The branches are short, stout, somewhat contorted. The trunk is seldom straight, and the head is narrow and flattened.

The bark on the trunk of old trees is divided into irregular,

broad flat ridges, and is dark red-dish brown. On young trees it separates into fine shallow fissures and is greenish or yellowish green on the twigs. The bark of all parts, especially on

SASSAFRAS

Leaves and young fruit. One-third natural size.

SASSAFRAS
Winter twig and buds.
One-half natural size.

the young twigs has strong but pleasing aromatic properties. The outer coating of the roots possesses the aromatic properties in even greater degree than does the bark of the stem and branches.

The leaves are alternate, and four to six inches long. They vary in outline, some being entire, others with three lobes. The leaves are dark green, turning in autumn to yellow, or orange tinged with red.

The flowers are in open clusters, greenish-yellow and open when the leaves begin to appear.

The fruit is a small, dark blue and shiny berry. It ripens in the fall.

The sassafras is found in the southwest part of the State. It grows on rich and well drained sandy soil.

The wood is coarse-grained, brittle, soft, not strong, very durable and aromatic. It is used for posts, cooperage and in the construction of light boats.

The bark of the roots is very aromatic and oil of sassafras which is distilled from it and the roots is used in the manufacture of perfume soap and other articles.

FOREST TREES OF MAINE

WILD RED CHERRY (Bird Cherry) *Prunus pennsylvanica* L.)

The wild red cherry is a tree of small size, seldom growing to a height much greater than twenty-five to thirty feet and a diameter of six to ten inches. It has slender, horizontal branches and a narrow, somewhat rounded head.

The bark on the trunk of old trees is dark red-brown and broken into thin plates. That on young trees is smooth and reddish brown. The inner bark is aromatic and very bitter.

WILD RED CHERRY

Leaves, flowers and fruit. One-third natural size.

The leaves are alternate, narrow to oblong, rather sharp pointed, finely and sharply toothed on the edges, bright green and shiny above, three to four inches long, bitter and aromatic.

The flowers are white, in clusters of four or five and appear in May when the leaves are only about half grown.

The fruit is bright red, about the size of a pea, globular in shape, and ripens from July 1st to September 1st.

The wild red cherry is common in the State but of little value except as a protection and cover for the soil on burned areas where it often takes possession, being the means of preparing the way for a more valuable growth. It is a tree that prefers moist soil.

The wood is coarse-grained, soft and light.

FOREST TREES OF MAINE

WILD BLACK CHERRY (*Prunus serotina* Ehrh.)

The wild black cherry has small horizontal branches and a narrow head. It is naturally of larger size than the wild red cherry, attaining a height of forty to fifty feet and a diameter of ten to twenty inches.

The bark on the trunk is red brown and rather shiny on young trees, darker and broken into small irregular plates on old trees. The inner bark has a bitter taste.

The leaves are alternate, varying from nearly egg-shaped to rather narrow egg-shape, finely toothed, dark green and shiny on the upper surface, thick and somewhat leathery and two to five inches long.

The flowers are produced in many-flowered racemes four to five inches long, appearing the last of May or early June when the leaves are half grown.

The fruit is in drooping racemes, dark purple or almost black when ripe, about the size of a pea and globular in shape. It ripens from August to October.

The wild black cherry is one of our most valuable timber trees when it grows to a sufficient size. It is hardy and grows on a variety of soils under varied climatic conditions, and is a rapid grower. The tree makes the best growth on rich, moist land. It is widely distributed in the State but not abundant.

The wood is rather hard, close-grained, light, strong, and can be polished easily. It is used for cabinet making and for interior finishing.

BLACK CHERRY

Leaves and fruit. One-third natural size.

BLACK CHERRY

Winter twig and buds. One-half natural size.

FOREST TREES OF MAINE

HONEY LOCUST (*Gleditsia triacanthos* L.)

The honey locust is a tree with slender spreading branches, somewhat pendulous that form an open, broad, flat-topped head. A characteristic feature is the simple or usually three forked spines occurring on the branches and trunk. It attains a height of forty to fifty feet and a diameter of eight to twenty inches.

The bark is divided into long, narrow ridges by deep fissures and the surface is broken into small scales that are persistent.

The leaves are twice compound, seven to eight inches long and having from eighteen to twenty-eight leaflets, the upper ones being from four to five inches long.

The flowers are borne in slender clusters or in racemes from two to two and one-half inches long and often more than one cluster in a place. They are produced in the axils of leaves of previous years and appear in June when the leaves are about fully grown. The staminate and pistillate are produced in different racemes on the same tree.

The fruit is a pod twelve to eighteen inches long, two or three in short racemes on stalks, one to one and one-half inches long. The walls are thin and tough. On drying the pod becomes twisted.

The honey locust is not a native of Maine, but like the common locust has been planted to some extent in the southern part of the State and is now quite common in the town of Paris, occurring wild there. Naturally it grows on the borders of streams or in moist, fertile soil and is sometimes found on dry gravelly hills.

The wood is coarse-grained, hard, strong, and very durable in contact with the soil. It is used for fence posts, wheel-hubs, fuel and in construction.

FOREST TREES OF MAINE

LOCUST (*Robinia pseudacacia* L.)

The locust is a rapid grower, frequently attaining a height of twenty feet in ten years, but increasing much more slowly thereafter. It reaches a height of twenty-five to forty feet and a diameter of eight to twenty inches. The branches are small, brittle, erect, sometimes slightly many-angled, and at first are armed with spines which disappear as the tree grows older. The top is narrow and oblong.

The bark on the trunk of old trees is dark brown, deeply furrowed and broken into small scales.

The leaves are compound, eight to fourteen inches long, and have from seven to twenty leaflets.

The flowers are borne in loose racemes four to five inches long and appear in June. They are showy and very fragrant.

The fruit is a smooth, flat, dark brown pod about three inches long, containing from four to eight seeds.

The locust is not a native of this State, but has been planted to quite an extent and in some localities is quite abundant. It occurs in the south part, especially in the southwest, being found on different soils, preferring, however, the rich land.

The wood is heavy, close-grained, very hard and strong and very durable in contact with the soil. It is used extensively for fence posts and also for construction, turnery, shipbuilding and for fuel.

FOREST TREES OF MAINE

MAPLES

The Important Distinctions.

STRIPED MAPLE (<i>Acer pennsylvanicum</i> L.)	SUGAR MAPLE (<i>Acer saccharum</i> Marsh)	SILVER MAPLE (<i>Acer saccharinum</i> L.)	RED MAPLE (<i>Acer rubrum</i> L.)
Bark Marked with whitish stripes running lengthwise of trunk. Reddish-brown or dark green.	Bark Gray on old trunks. Rough and deeply furrowed. Smooth and slightly fissured on young trees.	Bark Dark gray with reddish tinge on old trees; somewhat furrowed. Separates into thin scales. On young trees, smooth, gray with faint tinge of red.	Bark Dark gray on old trees. Ridged and broken into plate-like scales. Light gray and smooth on young trees.
Leaves Roundish, edges finely and sharply toothed, three-lobed at apex.	Leaves Three to five lobes margins sparingly toothed, sinuous.	Leaves Five lobes, rarely three. Lobes long and narrow, irregularly and sharply toothed. Under surface silvery white.	Leaves Three to five lobes Lobes irregularly doubly toothed. White on under surface.
Winter Buds Terminal nearly one-half inch long. Bright red.	Winter Buds One-fourth inch long, sharp-pointed, purple.	Winter Buds One-eighth inch long, blunt-pointed, bright red.	Winter Buds One-eighth inch long, blunt-pointed, dark red.
Flowers In slender racemes, bright yellow, appearing after leaves are full grown.	Flowers In clusters, on long, slender, hairy stalks. Greenish-yellow. Appearing with the leaves.	Flowers In clusters on very short stalks; greenish yellow or pinkish. Come long before leaves.	Flowers In clusters on moderately long slender stalks. Scarlet or yellowish red. Appear before leaves.

FOREST TREES OF MAINE

STRIPED MAPLE (Moose Wood) (*Acer pennsylvanicum* L.)

The striped maple or moose wood never gets to be of large size, growing to a height of twenty to twenty-five feet and a diameter of four to eight inches. The branches are slender and upright, and the top narrow and often short.

The bark on the trunk is marked by whitish lines running lengthwise, which turn brown after a time. It is reddish brown or a dark green. That on the small branches is bright reddish brown.

The leaves are three lobed

STRIPED MAPLE
Leaf and fruit. One-third natural size.

STRIPED MAPLE
Winter twigs and buds.
One-half natural size.

toward the apex, opposite, pale green, from five to six inches long and about as broad. In the fall they become light yellow.

The flowers are bright yellow in slender drooping racemes opening the last of May or in June when the leaves are fully grown.

The fruit is winged, fully grown in July, bright red at first, but changing to brown late in autumn.

The striped maple is of common occurrence in the State. It is a shade-loving tree, and is usually found growing with other hard woods and sometimes with conifers on rich, moist soils or rocky slopes. It is of little value except for its beauty.

The wood is close-grained, light and soft.

FOREST TREES OF MAINE

SUGAR MAPLE (Rock Maple) (*Acer saccharum* Marsh.)

In the forest the sugar maple grows to a height of sixty to seventy feet, and a diameter of twenty to thirty inches, the trunk often without branches for quite a distance and forming a short, somewhat spreading top. In the open, the branches begin eight to ten feet from the ground, forming an egg-shaped head when the tree is young, and a broad rounded top when older.

The bark on young trees and large branches is smooth or slightly fissured and pale. On the trunks of old trees it is deeply furrowed and is of a light gray color, sometimes rather dark.

The leaves are opposite, three to five lobed, sparingly toothed, three to five inches long, dark green above and pale green below. In the fall they are of various shades of deep red, scarlet, orange or yellow.

SUGAR MAPLE

The flowers are pendulous, borne on long, slender, hairy stalks and are produced in clusters. They are greenish yellow and appear with the leaves.

Leaf and fruit. One-third natural size.

SUGAR MAPLE

Winter twig and buds. One-half natural size

The fruit is a winged seed and ripens in the fall. The sugar maple is found throughout the State and in some sections is very abundant. It grows on moist, rocky slopes, preferring, however, the rich moist soils of uplands where it makes its best development.

The wood is heavy, close-grained, strong, hard, tough and can be polished. It is used for furniture, flooring, tool handles, and to some extent for canoe paddles.

Maple sugar and syrup are made largely from the sap of this tree.

FOREST TREES OF MAINE

SILVER MAPLE (Soft Maple) (*Acer saccharum* ⁱⁿ L. Marsh.)

Usually the silver maple grows to a height of sixty to eighty feet and a diameter of two to three feet, and having a trunk separating into three or four upright, secondary stems, destitute of branches for some distance. The branches are long and slender, often pendulous.

The bark on young trees is smooth, gray, slightly tinged with red. On old trees it is furrowed more or less, separates into large thin scales and is reddish brown in color. On the twigs it is chestnut brown and shiny.

SILVER MAPLE

Leaves and fruit. One-third natural size.

The leaves are opposite, deeply five-lobed and the edges are irregular and sharply toothed. The upper surface is pale green, the lower, silvery white. They turn a pale yellow in the fall.

The flowers are on very short stalks and in clusters. They are greenish yellow or

sometimes pinkish, opening early long before the leaves appear.

The fruit is winged and ripens about May before the leaves appear, falling a little later and germinating at once.

The silver maple is a common tree in the State, except along the coast, and is abundant in some localities. It grows largely on sandy banks along streams.

The wood is softer than that of the hard maple, close-grained, not durable, and easily worked. It is used for tool handles, and to some extent for flooring, furniture and fuel. The sap is sometimes used for the production of maple sugar and syrup.

FOREST TREES OF MAINE

RED MAPLE (*Acer rubrum* L.)

The red maple is a medium sized, slender tree that becomes fifty to sixty feet high, and one to two feet in diameter. The branches are upright, forming a somewhat narrow head. Usually the trunk is not divided.

The bark on young trees is smooth and light gray. On old trunks, it is dark gray, ridged and broken into plate-like scales. On the twigs it is red and shiny on trees of all ages.

The leaves are opposite, three to five lobed, margins irregularly doubly toothed, three to five inches long, upper surface light green, lower, white. In the fall, they turn scarlet or scarlet and orange.

The flowers are produced in clusters on moderately long stalks. They are a bright scarlet or yellowish red, opening before the appearance of the leaves.

The fruit is winged and ripens in the spring or early summer and germinates as soon as it falls.

The red maple is a rapid grower and is the most common and abundant of the maples in this State. It is a swamp tree usually found in wet places along streams or on the border of swamps.

The wood is close-grained, heavy, not very strong, and easily worked, not durable and will take a good polish. Used for furniture, woodenware, turnery, gunstocks and fuel.

RED MAPLE

Leaf and fruit. One-third natural size.

RED

MAPLE

Winter twig and buds.

One-half natural size.

FOREST TREES OF MAINE

BASSWOOD (Linden) (*Tilia americana* L.)

The basswood usually is a good sized tree, growing to a height of fifty to seventy feet and a diameter of two to three feet. The branches are slender, somewhat pendulous, comparatively small and numerous, forming a broad and rounded head.

The bark on the trunk of old trees is deeply and irregularly furrowed. On young trees, it is smooth or slightly fissured and has a grayish appearance.

The leaves are alternate, broadly egg-shaped, toothed, upper surface dark green, lower, yellow green and shiny, and five to six inches long.

The flowers are greenish yellow, borne on a slender stalk which is attached to a rather long, yellowish, leaf-like body. They are fragrant, contain a bundle of honey and open in July.

The fruit is spherical, gray, woody, and about as large as a pea, and remains attached to the leaf-like body when it

BASSWOOD

Leaf and fruit. One-third natural size.

BASSWOOD falls. The basswood is a common tree in our forests. It is found on the poor soils, but does not make a good growth in such situations, preferring, instead, the rich land.

The wood is light, soft, tough and easily worked. It is used for lumber, pulp, cheap furniture and woodenware.

Bees make an excellent grade of honey from the flowers.

FOREST TREES OF MAINE

ASHES

The Important Distinctions.

BLACK ASH (<i>Fraxinus nigra</i> Marsh.)	WHITE ASH (<i>Fraxinus americana</i> L.)	RED ASH (<i>Fraxinus pennsylvanica</i> Marsh)
Leaves Have seven to eleven leaflets which are without stalks except the one at the end.	Leaves Have seven to nine leaflets, usually seven, which are borne on stalks	leaves Having seven to nine leaflets borne on stalks.
Winter Buds Black or very dark terminal bud. Less than one-fourth inch long, sharply pointed.	Winter Buds Brown, terminal, one-eighth inch long, blunt pointed.	Winter Buds Brown, terminal, one-eighth inch long, and as if cut off, and coated with rusty or dull red hairs.
Winter Twigs Olive green, smooth.	Winter Twigs Olive green, smooth and shiny.	Winter Twigs Greenish gray, somewhat covered with downy hairs.

NOTE.—The flowers and fruit of these three ashes are so much alike that they have no striking characteristics by which to distinguish them from one another. The fruit of all is winged, that of the white ash often remaining on the tree until sometime in winter.

FOREST TREES OF MAINE

BLACK ASH (*Fraxinus nigra* Marsh.)

The black ash is a rather tall, slender tree, with slender branches and a short, narrow head except in the open when the top may be broad and rounded and much longer. It grows to a height of fifty to sixty feet and a diameter of ten to twenty inches. The trunk is often without branches well towards the top.

The bark is gray to dark gray with more or less parallel ridges. On the shoots of the season it is smooth and olive green.

BLACK ASH

Leaf and fruit. One-third natural size.

The leaves are twelve to fifteen inches long, opposite and have seven to eleven leaflets which are four to five inches long, without stalks except the end one and have remotely toothed margins. The upper surface is dark green.

The black ash is quite a prominent tree in Maine. It grows almost entirely on rich, moist ground or in cold, wet swamps and along the banks of streams.

The wood is coarse-grained, heavy, somewhat soft, not strong, tough and durable. It is used for interior finishing, cabinet work, barrel hoops, and baskets.

FOREST TREES OF MAINE

WHITE ASH (*Fraxinus americana* L.)

The white ash ordinarily is a somewhat larger tree than the black ash, growing to a height of sixty to seventy feet and a diameter of fifteen to thirty inches and sometimes even exceeding these dimensions. The branches are stout, and upright or spreading, forming a narrow top in the forest, and a broad, round head in the open.

The bark is broken into broad, flat, parallel ridges by deep furrows, and is a dark brown or deep gray in color. On the season's shoots, the bark is olive green, smooth and shiny.

The leaves are opposite, and consist of seven to nine, usually seven leaflets, and are eight to twelve inches long. The leaflets are three to five inches long, borne on short stalks, edges remotely

WHITE ASH

Leaf and fruit. One-third natural size.

WHITE ASH

Winter twig and buds. One-half natural size.

toothed and dark green and often shiny on the upper surface.

The white ash is one of our valuable timber trees and is found quite commonly in the State. For its best growth, it demands the rich, rather moist soil of low hills, but is often found along streams.

The wood is hard, strong, heavy and tough. It is used for agricultural implements, tool handles, oars, furniture and interior finishing.

FOREST TREES OF MAINE

RED ASH (*Fraxinus pennsylvanica* Marsh.)

The red ash has stout, upright branches and these form an irregular, compact head, or broad and rounded in the open. It seldom exceeds a height of fifty or sixty feet and a diameter of sixteen to twenty inches.

The bark on the trunk of old trees is furrowed like that of the white ash. It is more regularly ridged, however, and the furrows are not as deep. In color, it is dark gray, or brown. The branches of the season are greenish gray and covered with numerous hairs which often remain until the next season.

RED ASH

Leaf and fruit. One-third natural size.

The leaves are ten to twelve inches long, opposite and having seven to nine leaflets. These are four to six inches long, remotely toothed, and yellow green on the upper surface.

The red ash is common in Maine but is not found as abundantly as the white and black ash. It is sometimes mistaken for the former. It grows near the banks of streams and lakes on rich, moist soil.

The wood is hard, heavy, fairly strong, coarse-grained, and brittle. It is used in the same way as white ash but is not as good a wood.

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