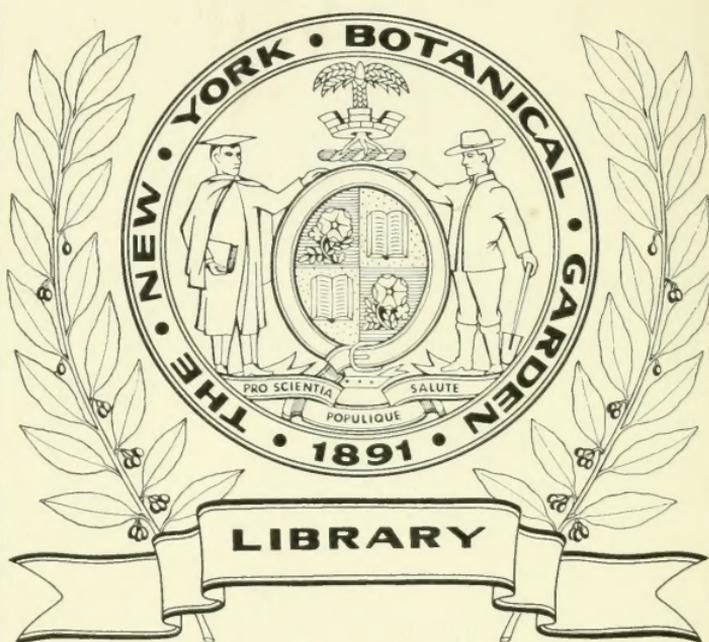




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COMMON
TREES
of
New York

By JOSEPH S. ILLICK

A handy pocket manual of the
Common and Introduced
Trees of New York

Presented to the Schools of New York
By the
Charles Lathrop Pack Forestry Trust

Published and Distributed
By
The American Tree Association
Washington, D. C.

1927

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*“If the Nation Saves the Trees
The Trees will Save the Nation”*

—CHARLES LATHROP PACK

With acknowledgments to the United States Forest Service for the use of 14 Cuts, and to Dr. H. D. House, State Botanist of New York for helpful assistance in recording the local distribution of trees within New York. Helpful information on tree distribution was also found in “Trees of New York State” by Dr. H. P. Brown, of the New York State College of Forestry at Syracuse.

TEN COMMANDMENTS OF THE TRAIL

By HENRY WELLINGTON WACK, F. R. G. S.
(Copyright, 1926)

By Courtesy of Nature Magazine.

- FIRST.** Use the By-Ways—not the Highways.
- SECOND.** Don't go Walking to beg a Ride. The Auto-riding Hiker is a Fraud.
- THIRD.** Everything belongs to Somebody. Then respect all Private and Public Property. Be not the Author of its displacement, disfigurement or disappearance.
- FOURTH.** Keep off Prohibited Ground. Neither fish nor hunt on Posted Land. Trespassers create bad will toward all Nature Lovers, Campers and Sportsmen.
- FIFTH.** Leave Gates, Fences, Signs, Stakes, growing grain and crops as you found them. Walk around, never across, all planted fields.
- SIXTH.** Pluck no wild flowers—they belong to all. Leave them for all to enjoy. Pick no cultivated Fruit. Resist the boyhood call of the Melon Patch!
- SEVENTH.** Clear away twigs, leaves and pine needles down to moist earth, before laying a Camp Fire one foot square. Keep cook fires low, and less than one-fifth the size of the clearing. Large fires prevent cooking, but destroy forests. Only small fires are safe, quick and comfortable to cook with. Put camp fires out with Water, not with a kick. See that the peat or humus around the fire is not burning underground to destroy the woodland after you have left. A single spark may fly a hundred feet and burn a million trees. Arson is no greater crime than stupidity or neglect on the Trail.
- EIGHTH.** Leave campsites clean; Burn all garbage; replace cut Firewood and Supplies found in camps. You are the Guest of an absent Host—not the vandal of a present opportunity. Leave a note of thanks in a wilderness shelter you have used. Put it in order before you depart.
- NINTH.** Silence, or speech in whispers, is the sign of trail experience and good woodmanship. Only fools and asses bray in a Forest.
- TENTH.** When you leave a beautiful Woodland or descend from a Mountain, stop, turn around, and gaze reverently awhile. Then thank God for the boon our Forests are to all Mankind. Treat Life's Trail responsibly and keep it clean. To the seeing eye and the generous soul, Nature's beauty—her mysteries and charm—forever call us to her Trails!

This handbook aims to open the pathway to the delightful study of trees, and to help fashion a right attitude toward the green and glorious out-of-doors. It was prepared to satisfy a growing demand, particularly among the young folks of the State, for interesting and helpful information about the common trees.

Each year a greater number of boys and girls go out into the fields and forests to take part in some outdoor program of education. To be able to participate in such a wholesome and practical program of education is to enjoy one of the greatest educational privileges ever made available to the young folks of any land.

The inspirational and descriptive sections of this book are offered to its readers to study, because a true appreciation of trees and a correct working knowledge of them will go far to guarantee a sound program of forest conservation, one of the most vital economic problems now confronting the American people.

All the common trees native to this State and a number of introduced trees are described in this handbook. A few of the less common trees had to be omitted. Whoever becomes acquainted with the trees treated in this handbook will have a good working knowledge of the trees of the State and be prepared to appreciate their importance in everyday life.

FOREWORD

By CHARLES LATHROP PACK,

President of the American Tree Association

WASHINGTON, D. C.

ALL GOOD THINGS must be known to be appreciated. There are many things so common in our daily lives that we accept them with little thought. So much a part of our existence they are that they become, perhaps, little known and often less appreciated. Trees run this risk.

Shading us, protecting us, purifying our water supply, furnishing the homes that are built from them, providing the paper we use and serving us in thousands of ways, trees deserve to be known and to be appreciated. Without them existence would be worth little.

Our country is the greatest in the world. In wealth, in standards of living and in comforts it stands alone. Nature endowed it with boundless resources. We have taken this wealth and built a great nation. The trees in our forests have been our greatest resources; they have made possible what has been accomplished.

When our forefathers came to this vast land it was covered with nearly nine hundred million acres of forest. Today only one-fifth of this immense resource remains. A quarter of a billion acres of this original forest are growing young trees, many of little value. More than eighty million other acres whose destiny is to produce forests alone, are producing nothing. Of what remains to us of our forests, we are using four times as fast as we are allowing or helping Nature to replace.

That is the situation with our forest. One tree or one hundred trees do not make a forest. But one tree stands for the forest. We send one man to our Congress to speak for thousands. We can plant a tree in our dooryard and let it speak for millions.

This is the problem of today. It is a problem that the citizens of tomorrow will have brought home to them. They will need to know the trees to meet it.

This little book is the personal story of the trees that grow commonly in the soil of our State. It is the story of the trees whose forefathers peopled the great majority of the acres of our State. They are your trees; citizens of your State; companions of your life; servants of your comfort.

Knowledge of trees is more than a duty of good citizens. It is a joy to the one who has this knowledge. The tree is a

living thing. It grows as we grow. It pushes upward as we should push upward in life. It spreads its branches outward, as we should spread the branches of our minds, broadened by experience in life. The tree is a constant lesson to humanity,—a lesson in erectness, in courage, in dignity and in steadfastness. It serves us in thousands of material ways, so should we know it that it may serve us in human ways as a guide and a friend.

Throughout our great country our future citizens are everywhere widening their acquaintance with trees. Through various organizations, as well as the schools, they are discovering the happiness that this knowledge brings.

This little book will serve as a letter of introduction to the common trees in your yard, on your street, in the woodlot on the edge of the city and in the young forest beyond. You can use it freely and many times. It will give you the knowledge that leads to appreciation, and this will lead to enjoyment even beyond expectation.

TREES AND NEW YORK

By J. R. SIMMONS,

Secretary-Forester, New York State Forestry Association

YOU are about to read a little book the like of which has not been presented to the people of New York; a text in popular form which undertakes as its subject the *unit* upon which forestry is based, and without which unit in the aggregate of natural resources, New York would never have been called the Empire State. That unit is the *tree*.

If you have never before understood the basic reasons for the great conservation movement that is in progress today in this and other states, or why the leaders in this field have given so great a portion of their time, means and mental and physical strength to this cause, you are about to be enlightened through a medium that goes directly to the underlying principle in a scientific and entertaining manner. Here will be found an intimate story in the nature of a life history of every variety of local tree that yields timber, that feeds and shelters a bird, that produces grateful shade for man, or that graces a pleasing landscape.

The more thoughtful of the people have entered upon a campaign for the perpetuation of forests. The term forests is very broad, but has served the purpose to the extent of developing constructive programs somewhat in advance of a needed popular study of species and their uses. Something

in the nature of immediate programs of work have been a necessity to save our rapidly diminishing forests.

Now the time is at hand for a popular text covering in detail the life, habits and uses of trees, those materials out of which our structure of forest conservation is to be built.

You will begin the study of this book as a public duty, and will find it a personal pleasure; you will learn about the trees of your State, and will appreciate more fully the heritage you possess; you will join that tree-planting army which you have already heard more or less about, and will have increased the scope of your usefulness as a good citizen.

A timely word at all times in favor of conservation is a habit worth cultivation and one which will not in any sense upset the economics or politics of the commonwealth. Read, therefore, and be prepared to say that word, in an intelligent and convincing manner. And then, "Say it with trees!"

FORESTRY IN NEW YORK—PAST, PRESENT AND FUTURE

By NELSON COURTLANDT BROWN, *Acting Dean*

New York State College of Forestry at Syracuse University

WHEN Hendrik Hudson first cruised up the river which now bears his name, and the early Dutch settlers pushed westward along the Mohawk Valley, they found one of the finest primeval forests to be seen anywhere. The entire State of New York was then covered with a magnificent primal forest—great stands of beautiful white pine thronged the Hudson Valley and central and southwestern parts of the State. The great Adirondack and Catskill regions were crowned with heavy forests of red spruce, white pine, and hemlock. Interspersed with them, and throughout the remainder of the State, were beech, birch and maple. In the southern and central parts of the State there were chestnut, many varieties of oaks, ash, elm, basswood, etc.

In 1850 New York was the great center of lumber production and Albany was the greatest lumber market. The heavy cutting went on until in 1926 New York State was the 27th on the list of lumber producing states. It then spent yearly from sixty to eighty million dollars for freight to bring lumber from the South and Northwest. It could and should grow most of its needed forest products within the State.

On the other side of the picture there are four million acres in "slacker" or idle lands which should be planted with growing forests. Agricultural economists tell us that we have abandoned farm lands from 1880 to 1920 at the rate of 100,000 acres per annum. From 1920 to 1927 the rate of abandonment was 260,000 acres per annum. This means that it does not pay to farm some of the land that was cleared by the early settlers. This also means that these idle lands should be growing trees—should be made productive so that the economic welfare and prosperity of the State be continued into the future—also that the beauty of the landscape and our hillsides may be preserved.

The Conservation Commission at Albany a long time ago saw the future of forestry in New York State, and began the policy of growing and selling little trees at cost to the people of the State to plant on these idle acres. A few years ago they distributed them in great numbers—as many as 10,000,000 in a single year. Now in 1927 there are 30,000,000 little trees available for the schools, Boy Scouts, villages, counties, lumber companies and others to plant on these idle acres. There is not a county in the State that has not thousands of acres of land that should be planted, outside of the crowded metropolitan centers. There were in 1926 in this State's tree nurseries 90,000,000 little trees that will be available for planting in the future. These are white pine, Norway or red pine, European and American larch, Norway spruce, Scotch pine, white cedar and balsam fir. Many schools and Boy Scout organizations have enlarged the Arbor Day idea from planting one or two trees, etc., about the school grounds to planting several thousand trees on some idle land about the villages or along the streets or in vacant lots, to make a more pleasing picture for passing motorists, to provide welcome shade in the hot summer days, and to perhaps grow Christmas trees or much needed wood or lumber.

Two husky young boys can often plant from eight hundred to a thousand trees in a single day. Many schools in Otsego, Chenango, Albany, Onondaga and other counties have already done splendid work in planting trees. Every school in the State should help in this great conservation movement. The boys and girls will grow up with the trees and understand and appreciate what the forestry movement means to the welfare of the people of the State. It is something that young and old alike can do.

Let everybody help to plant more trees!

HISTORIC TREES OF NEW YORK STATE

By J. R. SIMMONS,

AN HISTORIC TREE is one near which, or "beneath whose shade" some event of importance in the life of the State or Nation took place. But we have come to consider that this definition should include those trees that have been associated with noted personages; that commemorate honored dead; or that have grown to such great size that they evidently deserve to be classed as historic on account of the things they have seen and heard. Historic trees, indeed, are our only living witnesses of all that has transpired on this continent since Columbus discovered America.

From the branches of an Elm that still stands in the City of Rome, N. Y., near the geographical center of the State, *the American flag was first unfurled in battle.* This tree adequately measures up to the general definition, and in addition to this it possesses size, symmetry and great beauty.

The Witenagemot Oak, signifying "an assemblage of the wise," is typical of the second division of historic trees—those associated with noted people. This tree is near Schaghticoke, Rensselaer county, and marks the spot where the Board of Indian Commissioners, headed by Governor Andros and the militia of the King of England, assembled to confirm the link of friendship between Indian tribes and to strengthen the alliance between the Fort Albany Militia and their scouts.

The trees planted in various parts of the State as memorials for heroes of the Great War typify the historic trees of a third division. A good example is furnished by the four parallel rows on the Eastern Parkway in Brooklyn. But many other planted under the auspices of the American Tree Association might be named as evidence that the tree has come to be recognized as one of the most beautiful and most permanent of monuments, and that trees planted for heroes are classed as historical. Most of them bear a bronze marker.

Tree which for sheer size and beauty have become historic, and which make up the fourth division, are best represented by the Gowanda Elm, New York's greatest tree, and by the enormous Balm of Gilead Tree at Balmville near the City

of Newburgh. The Gowanda Elm is 39 feet in circumference near the ground, and perfectly cylindrical and without limbs up to 50 feet from the ground. At that height it is 20 feet around. The tree is 100 feet high and contains 17,000 board feet of lumber—sufficient to make 1,800 barrels. The old Balm of Gilead at Balmville, N. Y., is 25 feet in circumference, and is recorded in the annals of New York as far back as 1640 at which time a spring of sparkling water issued from its base.

New York contains no less than twenty-five trees or groups of trees that should be recorded as historic. If to these we might add all of the memorials that have been planted during recent years our records would fill an entire volume. The writer on historic trees, therefore, faces a difficult problem, for who would wish to offend by omission of its name and place, one of these faithful friends of a Nation!

For the purposes of this book we shall seek to set down in concise form a record of New York's outstanding trees. To those that have been omitted we can but express an apology that is reverent and humble, and that differs entirely from any expression of regret that we might wish to offer to those persons who are now related to the trees in the way of ownership.

But to the owners we would say, "Let us have any records in your possession, to the end that we may assist in their preservation and foster a national regard for historic trees."

As a matter of record mention should be made of two very interesting contests conducted in this State for the purpose of locating the largest trees and those known as historic.

The first contest was organized by the State College of Forestry at Syracuse and the New York State Forestry Association in 1921, and the results published in *New York Forestry* by the New York State Forestry Association, Albany, N. Y.

The second contest covered historic trees, and was conducted by the College of Forestry.

The attached list indicates the result of the original contest, the prize for the largest tree going to the Gowanda Elm:

HISTORIC TREES OF NEW YORK

<i>Name of Tree</i>	<i>Location</i>	<i>Historic Connections</i>
Balm of Gilead.....	Balmville	Marked fork in roads, 1640.
Caledonia Elm.....	Caledonia	Marked meeting place of Iroquois on Albany-Niagara Trail.
Canandaigua Balm of Gilead.....	Canandaigua	From a riding whip planted by Mary Kibbe, daughter of a pioneer. One of the largest trees in N. Y. Girth, 28 feet.
Council Elm	Johnstown.....	Site of Indian Council, 1772.
Fort Stanwix Sapling.....	Rome.....	American flag first flown from tree, 1776.
Gowanda Elm	Gowanda.....	New York's largest tree.
Hitchcock Button-wood	Lebanon Springs	Sprang from cutting set by Capt. Jas. Hitchcock on journey to this place "to drink medicine waters."
King Philip Oak	Schaghticoke	Associated with King Philip's Wars.
Lafayette Tree.....	Geneva	Spot where Lafayette was welcomed.
Monument Tree	Cobleskill	Massacre by Brant, 1778.
Pioneer Elm	Ballston Lake.....	Site of cabin of first white settlers.
Seythe Tree.....	Schaeffer Farm, Seneca county.....	Contains scythe blade of J. W. Johnson of Waterloo, killed in Civil War.
Smithfield Presbyterian Oak.....	Smithfield.....	Service held here by Whitfield, 1770.
Sir Wm. Johnson Walnut	Lake George	Johnson made Commandant under tree.
Tree in Five Places.....		Stands at corner of Oswego and Cayuga counties and at corner of three townships.
Tree of Peace.....	Schaghticoke	Planted by Governor Andros and Indian Commissioners.
Twelve Apostles.....	74th St., Brooklyn.....	These trees bear dates cut in 1710.
White Plains Oak.....	White Plains.....	Commemorates purchase from Indians.
White Plains.....	Sycamore.....	Stands near Washington headquarters.
Washington Tree.....	Pauling	Site of Washington headquarters.

LARGEST TREES OF NEW YORK

<i>Name and Address</i>	<i>Species</i>	<i>Circumference</i>
Charles J. Richards, <i>The Gowanda News</i> , Gowanda, N. Y.....	Elm	34 ft., 2 in.
W. S. Funnell, Editor of <i>Inquirer</i> , Hempstead, L. I.....	Cherry.....	14 ft., 4 in.
W. G. Markham, Avon, N. Y.....	Elm	18 ft.
Dr. F. H. Wisewell, Phelps, N. Y.....	Linden	40 ft. (3 trees)
H. D. Pixley & Son Co., Utica, N. Y.....	Elm	17 ft., 6 in.
David M. Krick, 414 Plane St., Newark, N. J. (Stony Brook, N. Y.).....	White Oak	21 ft., 6 in.
George Spraggon, 129 Main St., Geneva, N. Y.....	Elm	25 ft. (3 in. from base)
H. V. Pratt, Wayland, N. Y. (Tree at Italy Hollow)	Elm	24 ft., 10 in. (3 ft. up)
Orville B. Ackerly, 243 West 34th St., N. Y. C. (Stony Brook Tree).....	Elm	19 ft., 7 in.

<i>Name and Address</i>	<i>Species</i>	<i>Circumference</i>
A. E. McCall, <i>The Bath Plaindealer</i> , Bath, N. Y.....	Elm	21ft., 6 in.
James T. Fleming, Lafayette, N. Y. (Fulton Chain)	Pine.....	15 ft., 4 in.
Mrs. Louisa C. Lockwood, 36 South Broadway, White Plains, N. Y.....	Sycamore	13 ft., 9½ in. (Historic)
Charles P. Russell, Williamson, N. Y....	Balm of Gilead.....	18 ft., 7 in.
John L. Weyant, Yorktown, N. Y.....	White Oak.....	15 ft.
M. F. White, New Berlin, N. Y.....	Elm	13 ft., 4 in.
Henry Treen, Waterville, N. Y.....	Elm	12 ft.
Katharine G. Hanby, Sodus, N. Y.....		15 ft., 4 in.
Marjorie J. Jones, 7 Marvin St., Clin- ton, N. Y.....	Elm	19 ft., 2 in.
Mr. Clare DeWitt, Montour Falls, N. Y.	Oak	14 ft.
William C. Gallagher, Slaterville Springs, N. Y. (McLean Tree).....	Elm	(Historic)
Wm. B. Krum, 207 First St., Ithaca, N. Y.	Elm	16 ft., 6 in.
	Willow	14 ft., 8 in.
	Basswood	8 ft., 2 in.
	Maple	10 ft., 6 in.
	Buttonwood	12 ft., 8 in.
	Horsechestnut.....	8 ft.
	Locust	9 ft., 2 in.
Herman Haupt, Jr., E. Seatucket, L. I.	Black Walnut	13 ft.
E. W. Blue, District Forest Ranger, Old Forge, N. Y. (Oneida Co.).....	(Tree Dead)	32 ft.
O. Partridge, Gerry, N. Y.....	Elm	20 ft.
Mrs. A. H. Cropsey, Middleport, N. Y..	Choke Cherry	11 ft., 2 in.
H. T. Field, Oneida, N. Y., "Elm Brook Farm"	Elm	18 ft.
John E. Dilger, 909 Main St., New Rochelle, N. Y.....	Walnut	11 ft.
	Elm	14 ft.
O. H. Westfall, Marion, N. Y.....	Maple	18 ft.
Reuben E. Robie, Savona, N. Y.....	Elm	21 ft.
C. T. Young, Ransomville, N. Y.....	Elm	17 ft.
J. P. Reed, Clermont, N. Y.....	Cottonwood	17 ft.
Elizabeth M. French, 653 W. Onon- daga St., Syracuse, N. Y. (Mes- sengers Bay)	Elm	17 ft., 10 in.
H. F. Pellman, Hamburg, N. Y.....	Elm	15 ft.
Geo. M. Salisbury, Phelps, N. Y.....	Willow	20 ft.
Mrs. B. Johnson, 125 Seneca Street, Syracuse, N. Y.....	Elm	24 ft., 7 in.
Karl E. Lay, Irving, N. Y.....	Elm.....	18 ft.
Mrs. Mary Cuddeback Britting, Hu- guenot, N. Y.....	Chestnut	20 ft. (base)
Robert Atkins, Esopus, N. Y.....	Chestnut	26 ft. (dead)
Lewis E. Coe, Livonia, N. Y.....	Elm	22 ft., 5 in.
Miss Isabel Conklin, The Palatine, Newburgh, N. Y. (Salisbury Mills)...	Willow	18 ft.
W. L. Loope, Millerton, N. Y.....	Oak	13 ft., 9 in.
Mrs. Raymond G. Miller, R. F. D. No. 1, Greenwich, N. Y.....	Elm	14½ ft.
G. M. C. Roberts, Henrietta, N. Y., for E. T. Brown.....		26 ft.
Clifford Van Tassel, Tarrytown, N. Y..	Oak	14 ft., 8 in.

EXPRESSIONS OF OPINION

TREES

FEW subjects more quickly excite the interest of boys and girls at school than trees. Every child seems to have a natural aptitude for this study, born perhaps from an instinctive love of outdoor life in which trees play so important a part. That this should be the fact should prove an inspiration to teachers to cultivate in our youth an appreciation of the tremendously essential part trees play in our complex life. "Plant trees!" should become a byword in the classroom, and every effort should be made to stimulate and encourage and enhance this natural interest. The conservation of trees is vital to our well-being. To denude our forests means disaster from any number of sources; that is a patent fact. The preservation of our natural playgrounds is contingent upon the conservation of our trees. Apart from our dependence upon our trees for protection against flood, for surety of a lumber supply, for certainty of a yield of sufficient water for domestic and transportation needs, we must ever be mindful of the asset trees constitute in the beautification and adornment of our immediate environment and our proximate and distant horizons.

ALFRED E. SMITH,
Governor of New York State.

FORESTS AND THE STATE

TREES, which are indispensable to human comfort and well-being the world over, are intimately associated with the home. In masses they form the forests that yield timber for building, for furniture and a variety of other uses, pulp for the making of paper, and wood for purposes almost beyond numbering. Upon this practical basis, the value of our tree can be measured in terms of the number of dollars' worth of products that they will yield. If wisely utilized, they can be made to supply our needs without destroying the initial estimated value.

Today we see our forests with clearer vision than in the past. They are the protection, the home, and the sustenance of a wonderful variety of wild life. In their shade is the source of waters, the home of wild flowers, shrubs, countless birds and other forms of animal life. Measured by their indirect influence upon the lives of those who enjoy the recreational advantages that trees afford, and this includes almost our entire population to a greater or less degree, the total value of our shade and forest trees cannot be adequately computed by ordinary monetary standards. This recreational value is perennial and perpetual. Its blessings are bestowed upon us year after year in increasing measure as we seek them, and will continue through generation after generation in so far as our trees and forests are protected and multiplied. If we will but know our trees, learn to love them, and stimulate this interest in others, the future of our forests is secure. We can pass on to the next generation no greater heritage than these forests, properly conserved and augmented by intelligent reforestation.

FRANK PIERREPONT GRAVES,
*President of the University of the State of
New York and State Commissioner of
Education.*

EVERY BOY SHOULD KNOW TREES

Every regular Dad should want his boy to know trees; in order to help the boy, Dad must know the different varieties of trees; any book that will help Dad to this information should reflect itself in the boy if

Dad is, as he should be, a chum and companion to the boy.

Regular Dads teach their boys thru long walks in God's great out-of-doors laboratory, many of Nature's mysteries.

Trees, as forest cover for wild life; trees, as protectors of our hillsides from erosion; trees, as retarders of the run-off from the rains; trees, as helping to keep our streams more even in their flow; trees, as keeping more water all the time in our streams. Therefore, more and better swimming holes, better skating, better fishing.

Let's be regular Dads and each year go into partnership with Sonny in planting trees on some idle acre.

To the tomorrows, made better for the children of the tomorrows, by idle acres set to work growing trees for Sonny, is a part of my mission, for I want to be a regular Dad. How about you, Daddy?

JOHN D. CLARKE,

President, New York State Forestry Assn.

FORESTS FOR RECREATION

One of the fundamental things in forestry and in deriving the greatest pleasure from out-door recreation is to be able to identify what we observe. THE COMMON TREES OF NEW YORK ought to be a great stimulus to all the people who are interested in out-door life, in having some sort of a pocket guide that will enable them to identify our common trees.

This publication will also do much to interest and instruct people along forestry lines, because when we have identified a tree we will commence to think of why we get different species of trees on different characters of soil and we will want to learn why trees grow in mixture and why some trees develop one way and other trees grow along other lines. It is going to open up a great new field of Nature study to a great many people, and it is not only going to result in their obtaining knowledge in this, to them, new Nature field, but it is going to interest them more in outdoor life and make them think of the uses of forests, the protection of forests from fire and from disease and no doubt lead them to the study of the growth of trees, the question of reforesting idle lands and other things that go along with real forest development.

C. R. PETTIS,

Supt. Division of Lands and Forests,
(*Mr. Pettis died on January 29, 1927*)

EVERYBODY SHOULD LOVE TREES

"In the corner of my dooryard is a maple tree said to be the largest maple in the State. You would be surprised how many persons stop to look at that tree and wonder about its age. The tree men who repaired it recently said it was two hundred and fifty years old.

"Have you ever thought about the story such a tree could tell if it had the power of vocal expression? It would speak about George Washington and the Continental Army passing along that roadside. It would speak about the British Army. It would tell marvelous tales of the Indians. There is romance as well as war associated with its shade. Unnumbered thousands of birds have nested in its branches.

"Everybody should be a friend of the woods. Good health is to be had by walking under the trees. Good eyesight is to be developed by gazing into their branches. Good thoughts will be cultivated by the calm and peace of the forest.

"We should plant trees along the highways. We should shade our homes with beautiful trees. They are an inspiration to everybody."

HON. ROYAL S. COPELAND,
U. S. Senator from New York.

THE WOODS

WHERE is the boy with spirit so low who upon hearing the name Robin Hood does not long to go to the woods; and where is the girl who upon hearing the name Gene Stratton Porter, does not wish to go out among the beauties of nature. There is only one way for boys and girls to satisfy this longing for the out-of-doors and that is to get ready, go out into the open, and there fill up on the many good things that nature holds ever ready to give to us.

The forest is much more than a grouping of trees. It is a complex community of living things. Associated with the trees are shrubs, wild flowers, ferns, fungi, mosses, and many other plants. And among this varied plant life live the birds, the deer, the rabbits, the snakes, the squirrels, and a long list of other animals. All these living things are a part of the forest. To know the forest fully means that we know these wonderful creatures of a great creation. Blessed is the boy and the girl who can go out into the woods and learn the many interesting and useful lessons that a woods environment makes available.

There is no better place for summer play than among the trees. A tree environment is the best place to seek adventure, to become handy and hard, to see beauty, to think quietly, to walk reverently, to become acquainted with trees, flowers, and ferns, and to study the feathered folks and their furred friends. But we cannot have these privileges unless we care for our forests. It is a sad story, but only too true, that the forests have been swept with haste from the face of the civilized world. Few original forests, except those out of reach, are now left.

It is time to begin a constructive occupancy of the earth. To exist as a Nation, to prosper as a State, and to live as a people, we must have forests. But to have them we must do our part in rebuilding the wrecked and wasted forest areas that now abound everywhere. Forest fires must be stopped. More and better trees must be produced. Existing forests must be handled more wisely. Idle forest land must be put to work. Unless these and many other necessary things are done, forest restoration will not move forward. Our forest slogan should be, "Let's have good forests and get them now." If you want to do an act of kindness—*Protect the Forests*. If you want to do an act of faith—*Plant Forest Trees*. If you want to prove that you are unselfish—*Devote Yourself to the Woods*.

THE TREES

TREES are much more than columns of wood that lift their heads toward the sky. They are living and friendly creatures of a great and wonderful creation. They are glorious nature-made objects, surpassed only by him who walks among them in living beauty and thinking grace. They are the earth's fairest cloak, designed primarily for a life of service and to broadcast happiness and bring comforts to the people of the earth.

The botanist tells us that "a tree is a woody perennial plant having a single main stem commonly exceeding 10 feet in height and usually devoid of branches below, but bearing a crown of branches and foliage at the summit." This may be a good descriptive definition of a tree, but it does not really tell us what trees are. To really know trees we must have a knowledge of more than the length of their trunk, the position of their crown, and the distinctive characteristics of their bark, branches, twigs, buds, leaves, flowers, fruit and other structural features. Trees are living things, and in their lives are more interesting and worthwhile lessons than in their structures. The lives of trees unfold to us beautiful messages and fashion an attitude of tree appreciation without which tree knowledge is soulless.

There is a human as well as a material side to trees. They do so many things that man doeth. To say that they breathe, eat, drink, grow, reproduce, work, and rest is naming only a few of their common functions. They have habits, possess peculiarities, and are adaptive to the environment in which they live. All these attributes place them among the most interesting living things on the face of the earth.

Many a time have I been impressed with the quiet and natural ways of trees and their clean and normal lives. It will ever be to our credit if we too can grow, live and give in the same quietness and naturalness. Then, too, they stand erect, reach high, root deep, and do many good deeds. In many ways the acts of trees are worthy patterns for all of us. If our lives give shelter, pleasantness, and relief as do the trees, they will bring blessings and comforts in growing abundance.

TREES ARE OUR FRIENDS

TREES LIVE TO GIVE. Whenever we look at a tree we should think it has some gifts for us. If the gifts are not wood or food, shade or shelter, they may be one of a long list of other good things we need in our everyday life. Trees are such commonplace things that we often overlook their full service to us. Let us pause just long enough to list a few of the things our tree friends do for us:

Trees make a great contribution to the world's beauty. They pay beauty dividends every day. No place is complete without them. A home without trees is charmless. A road without trees is shadeless. A park without trees is purposeless. A town without trees is cheerless. A country without trees is hopeless.

Trees give us shade and shelter. Beneath their friendly branches man has found refuge from the scorching sun and the angry winds. Today, as in ages past, man seeks the shade of friendly trees to write and enjoy what others have written. Some of the world's greatest thoughts were born in the soft shades of friendly trees. Wherever I see trees shading occupants of benches in our city parks as they shelter the lambs that gather at their feet in the pasture, I think of their friendliness.

Trees help purify the atmosphere. They give out enormous quantities of oxygen through the tiny openings in their leaves. In this way they help make and maintain the pure air we need to keep us alive.

Trees help supply us with wholesome water. The best drinking water comes from the springs that flow from tree-covered watersheds. The pure water that trickles out from among the roots of trees is a great factor in maintaining the health of our people.

Trees safeguard us against drought and protect us against raging floods. They increase the low water runoff in summer and decrease the high water runoff in early spring.

Trees feed, shelter, and give homes to the wild animals of the forest, particularly the birds.

Trees give us rich food. Every boy and girl remembers the delicious chestnuts, walnuts and hickory nuts from trees. The cherries, apples, pears, and the tasty persimmons are also among our favorite fruits.

Trees enrich the soil. Their leaves, upon falling to the ground, are a big factor in maintaining the fertility of our soil. Tree-enriched soils make possible the production of many of the necessary crops of life.

Trees give us a wonderful environment for play. There is no better place to play and rest than among the trees. The lap of a tree is the most comfortable and attractive resting place on the face of the earth. Clean, outdoor play grounds make clean young hearts. The right use of leisure is as vital to good citizenship as the right use of toil.

Trees supply us with wood, which is one of the most necessary things of life. We use it every day. We cannot get along without it. It is essential to our welfare and our life.

Not all the good things that trees do for us have been listed. There are many other ways in which they help us. Enough benefits have been recorded, however, to convince every boy and girl and their teachers, that trees are truly among our best helpers and greatest benefactors.

WITHOUT TREES

WITHOUT TREES this would be a dreary and uncomfortable world. Trees are among nature's best gifts, but they are so common that we do not half appreciate their shade and beauty. We partake of their food and wood as a matter of course. Oft it is with trees, as with friends; we do not appreciate their real value until we have lost them. What would we think and how would we feel if some powerful dragon would rush through our streets and about our countryside and over-night destroy all the trees. Then, as never before, would we think of their gifts and realize how intimately they serve us.

Without trees man would be without many indispensable things of life. Without trees the birds, squirrels, and many other wild folks would be homeless. Without trees many

of the choicest wild flowers and ferns would be without a sheltering canopy. Without trees the whole balance of nature would be destroyed and human life imperiled.

Man cannot get along without trees. Apart from their practical value, they make for better manhood and womanhood by inspiring cleaner thoughts and higher ideals. The spiritual value of loving them and being with them is beyond estimate. If we want to continue as a happy people and a prosperous nation we must see to it that we have plenty of thrifty and healthy trees. This is our civic and social duty. Treeless lands are as cheerless as creedless countries are hopeless.

THE PARTS OF A TREE

WHEN we look at a tree we can recognize in its makeup three principal parts. They are the roots, the stem, and the crown. The roots comprise that part of a tree that is usually found below the ground. Our common trees have two general type of root systems, namely, shallow-rooted and tap-rooted. Such trees as the spruces, the hemlocks, and the pines have roots that tend to spread and lie close to the ground. These shallow-rooted trees are, as a rule, not windfirm. Other trees, such as the hickories, the oaks, and the walnuts develop a long taproot. These trees are firmly anchored and rarely uprooted.

Roots have three main lines of work. They anchor the trees to the ground, absorb water from the soil, and transport water to the stem. Without roots, trees could not stand up, and without roots trees would starve for they supply water and food to the stem, branches, twigs, leaves, and other parts of the crown. The principal work of the big roots near the stem is to help the trees stand up, while the fine root hairs at the end of the rootlets are the ones that absorb the water from the soil.

The stem of a tree, also called trunk and bole, is the main axis extending from the roots to the crown, or to the tip in case of an unbranched stem. Tree stems show a wide range in form. They range from long to short, straight to crooked, and from erect to prostrate. An examination of a cross-section of a stem will show three principal parts—bark, wood, and pith. In the central part of the stem is the pith. About it is the wood, which in many trees can be divided into the darker heartwood and the lighter sapwood. Between the wood and the bark is a thin layer known as the cambium. This is the most vital part of a tree, for it is here that all new wood and bark are made up. When a tree

is girdled, the ring of cambium is severed. This kills the tree, for the thin cambium layer is the life-giving part of the stem. The most valuable part of a forest tree is the stem, for in it is produced the wood that is used so extensively by man. The principal functions of the stem are (1) support of the tree crown; (2) transportation of food and water; and (3) storage of food. During the winter months considerable food is stored in the stem for use early in spring when growth starts.

The bark may be divided into two parts—the outer or dry bark, and the inner or living bark. The bark of some trees is very valuable. Some of their products are tannin, cork, dye, and other important commercial products. The bark is very helpful in identifying many of our common trees. The beech can always be recognized by its smooth gray bark, the shagbark hickory by its shaggy bark, and the paper birch by its white bark which peels off in thin papery scales. Other trees also have very distinctive features.

The crown of a tree is made up of many parts such as branches, twigs, buds, leaves, flowers, and fruit. The branches and twigs have many markings, such as lenticels (breathing pores), leaf-scars, and bundle-scars, which are helpful in recognizing trees. The buds are either opposite or alternate in their arrangement. They are among the best tree features to use for the identification of trees in winter. In summer the leaves have the most distinctive characteristics. In using them in tree identification work, it is helpful to classify them into four major groups: (1) those with opposite leaves; (2) those with alternate leaves; (3) those with simple leaves; and (4) those with compound leaves. If this simple classification method is followed, tree identification becomes easy and interesting.

THE FOOD OF TREES

WE KNOW that trees grow. They get bigger from year to year. In order that they can grow they must feed. The raw material out of which trees make their food comes from two sources—the soil and the air. The rootlets with their many small root-hairs absorb water and with it many food substances are held in solution. During the growing season there is a continuous flow of sap from the roots through the stem to the leaves, where it is converted into nutritious tree food. When the sunlight plays upon the granules of leaf green, tree food is manufactured. To make the food, water is brought from the stem through the leaf stalks into the leaves. Then a complex chemical process takes

place. This is the reason why leaves have been called the laboratory of the trees. The principal product derived from this process, known by the technical name of photo-synthesis, is starch. As rapidly as the food is manufactured in the leaves, it makes its way down through the cells of the twigs, branches, and the stem. A continuous stream of nutritious sap is moving downward. The thin layer of cambium cells which encircle the tree then draws upon this food supply to build up new wood, bark, and other tree tissue. When there is an excess of food material it is stored in the roots, stems, branches, and twigs for later use.

It is interesting to know that in making the starch, oxygen is a by-product. This explains why it is healthy to have green growing plants about us in daytime. Leaves prepare food only in daytime, and their output is the greatest in full sunlight, and is almost negligible during dark nights. This is the reason why we find the most luxuriant tree growth in moist, sunny, and warm regions. It is also worth knowing that during the periods of the year when the leaves are not manufacturing food, the trees live upon a food supply stored up during the long and light days of summer time.

THE ENEMIES OF TREES

TREES have many enemies. They are fighting for their lives all the time. There are 200,000 known kinds of insects that attack trees. It is estimated that caterpillars, beetles, borers, and other insects cause a loss of one hundred million dollars every year. Birds help us a lot in holding the insects in check. But they cannot wage war unaided. We must take a hand in this serious insect problem.

When we think of tree enemies we must not overlook tree diseases, such as blights, rusts, and rots. They too are a serious menace. These diseases affect the tree's health, just as human diseases affect our health. Not many years ago the chestnut was the foremost tree in many eastern states. Now middle-size to large chestnut trees are very scarce. There is a good reason for this. In 1904 the deadly chestnut blight was imported from China. In twenty years it travelled over practically the entire range of the chestnut, killing trees by the millions. So far no practical method of control has been found. As a result of its destructive work the chestnut tree is rapidly vanishing.

There are thousands of other tree diseases continuously at work holding back the growth of trees. And decay is always hard at work destroying the wood that the trees have built up. Trees must be kept strong and healthy so they can

throw off disease. To accomplish this we must keep our forests clean. Unless we do this we will pay an ever increasing price for lumber, and later on we will have no more forests to draw on.

The greatest enemy of our trees is fire. The carelessness of man is responsible for nearly all forest fires. With this in mind, let us consider a few of the things forest fires do.

1. Forest fires destroy the beauty of the woodlands.
2. They destroy animal and plant life.
3. They destroy tree seeds and seedlings that would grow into valuable stands of timber.
4. They kill an enormous number of promising young, middle-aged and old trees.
5. They consume large quantities of felled timber and other forest products.
6. They destroy the leaf litter on the forest floor.
7. They impoverish the forest soil. Many bare and sterile hillsides are the result of repeated forest fires.
8. Forest fires open the way for the destructive work of insects, fungi, erosion, floods, and drought.
9. They frequently destroy buildings, crops, and fences, and occasionally homes.
10. They may also be responsible for the loss of human lives.

There is no end to the damage forest fires do. They bring no good to anyone. In their wake we find waste and impoverishment. To prove our citizenship we must begin right now to battle this red foe.

Every boy and girl should become a tree protector, and it would be well for the grown-ups to turn a heedful ear to the lessons of forest protection. If we want to continue as a nation of wood users we must become a nation of wood growers. To do this effectively we must wage a constant warfare against the foes of our friends—the trees. **PREVENT FOREST FIRES—IT PAYS** is a slogan that should be repeated over and over again until it becomes a household word, for everybody loses when our forests burn.

WHAT FORESTRY IS

FORESTRY is the art of handling forest land in such a way that it will be of the greatest service to man. This implies a good working knowledge of forest trees, for they are the principal members in the make-up of the forest. A

correct working knowledge of trees will go far to guarantee a sound program of forest conservation, which is one of the most vital problems confronting the people of our state.

WHEN TREES GROW

MOST PEOPLE believe that trees grow from early spring when the leaves begin to come out until the first frost when they start to show their autumn color. That this widespread belief is not correct is now known. For instance in the latitude of southern Pennsylvania our native forest trees make 90 per cent of their height growth in 40 days of spring and early summer.

Not all trees begin to grow at the same time. Some begin early in spring, while others delay starting their growth until late April or early May. The Wild Black Cherry starts about the first of April, while the Tulip Tree or Yellow Poplar does not begin until late in April, and the Norway Spruce waits until early in May. The fact that the different trees start their growth at different times may not seem strange, but where is the person who is not amazed to learn that the Sweet Buckeye has its whole height growth for the season completed in some regions by the tenth of May. For ten years the author has watched different specimens of this tree in Pennsylvania, and with no single exception all the height growth for the year was finished by May 10. This means that the height growth took place in 35 days in spring-time.

An even greater revelation of this growth study was the fact that growth takes place by leaps and bounds. Periods of rest often occur between periods of growth. These rest periods may be long or they may be short. In this respect trees are not different from boys and girls who are willing to have long rest periods scattered freely among their working hours.

Several years ago, the author tagged a chestnut oak tree and measured its growth carefully. It began growing on April 17, and grew regularly until May 23. Then it began a rest period of 32 days. On June 24 it started to grow again and continued until July 13. If you figure out this tree's height growth you will find that at the beginning of the season it grew for 36 days, then rested for 32 days, and thereafter grew again for 20 days. During the first growth period it grew 10 inches—an average of about one-third of an inch per day, and during the second period $13\frac{1}{2}$ inches—an average of more than three-fifths of an inch per day.

This was one of the most interesting tree studies ever undertaken by the writer of this handbook. He hopes that many boys and girls will continue this study and help add to our tree knowledge.

DO TREES BREATHE?

THAT TREES BREATHE is a firmly established scientific fact. Year after year, during night and day, in summer and in winter, trees inhale oxygen and exhale carbon dioxide. Trees breathe from the time they are seeds until they die.

The leaves are often called the lungs of a tree. It is true most of the oxygen enters through little openings on the leaves. Most of these tiny openings are on the lower leaf surfaces. They have been given the technical name of *stomata*. On the leaves of some trees there have been counted as many as 100,000 openings on a square inch. These little doorways open to let in oxygen and to let out carbon dioxide. Not all the oxygen is inhaled through the leaves, for some is taken in through little openings on the twigs known as lenticels. They can readily be recognized as pale to brown dots. On some trees, such as the birches, cherries, and sumacs, they are large and easily visible to the naked eye, while in other trees they are small and obscure.

Trees also transpire, that is, give off water. We may call it perspiring or "sweating." When an excess amount of water is delivered to the leaves it is given off through small stomata, the same openings through which the trees breathe. This excess water is given off as an invisible vapor. Scientists have estimated that a big oak may transpire as much as 150 gallons of water during a single day of summer.

HOW TO TELL THE AGE OF TREES

SOME TREES reach a great size and become very old, while others remain small and die young. A definite age limit cannot be set for each kind of tree, but for general use our common trees may be said to be long-lived or short-lived. Of our native trees, the White Oak, Button-wood, White Pine, and Hemlock are long-lived trees, and the Poplars, Willows, some Cherries, and a few Oaks are short-lived. Some of the Sequoias of California exceed the 3,000-year mark, and the big Cypress Tree of Tule growing in the state of Oaxaca, Mexico, has been estimated from 4,500 to 5,000 years and is sometimes spoken of as "the oldest living thing in the World."

It is not always easy to tell the age of a tree. Sometimes accurate written records are available. In other cases it may be possible to get a reliable verbal statement from one who knows exactly when a specific tree or a group of them was planted. In the absence of accurate records or reliable statements, the best way to tell the age of a tree is to count the annual rings on the cross section of the stem near the ground, and add to this count the number of years it took the tree to grow to the height at which the count was made. In case of a felled tree, the stump section is a good place to make the count. The number of rings on the top section, plus the number of years it took the tree to grow to the height of the stump, gives the total age of the tree, for each ring usually represents a year's growth. To determine the age of standing trees an instrument is in use known as an increment borer. By means of this borer a small core about $\frac{1}{8}$ of an inch in diameter is taken from the stem, and rings thereon are counted. The results furnish a good basis for estimating the age of trees. It has proved very valuable to foresters in studying the growth of standing forest trees.

There is another method that is helpful in telling the age of such trees as White Pine, which develop their lateral branches in distinct whorls or stories one above another. The distance between these whorls of branches normally represents a year's growth. If the branches have fallen off or been removed, one can often see the circle of branch scars on the stems. By counting the number of sections between these separate stories of branches one can estimate very closely the age of the trees in question. The age of young hardwood trees can also be told by counting the rings of terminal bud-scale scars upon the twigs and the slender stems. The portion of the twigs from the tip to the first ring of bud-scale scars is one year's growth. The distance between the first and second rings is another year, and so on as far down the stem as these scars remain visible.

Telling the age of trees is fascinating pastime. After you have been successful in telling the age of a few trees you will find yourself questioning the age of others. You will not have gone far in your study of the age of trees until you will be convinced that the age of young trees like that of children is far more easy to tell than that of grown-up trees.

WHERE TO STUDY TREES

THE BEST PLACE to study trees is right where you are— if a tree happens to be near. If you are in a city and it is not convenient for you to go out into the woods, you can study the trees on the home grounds, along the streets, or in the parks. Do not forget to get acquainted with the tree that may stand near your front door. Other satisfactory places are fence rows, stream banks, waste places, abandoned fields and woodlots. But the best place of all to get an acquaintance with trees is out in the great forest stretches on the mountain tops and in mountain valleys. Out there the trees are so plentiful and look so natural.

HOW TO STUDY TREES

THE FIRST THING one usually wants to know about a tree is its name. Each tree has two kinds of names—the common name and the scientific name. One of our best known trees has the common name of WHITE OAK. Its scientific name is *Quercus alba*. Some trees have five to ten or more common names. Whoever knows the common and scientific names of a tree has mastered the first step in tree identification.

There are a number of common ways to get acquainted with trees. Some students are fortunate enough to have good teachers who know the trees. When this is true, tree identification is very easy. But there are other less fortunate ones who must study them from books. The study of trees is one of the purest delights of outdoor life. It is so pleasant, so fascinating, and so stimulating that it becomes a pastime of rare delight. To know trees is to love and protect them. In teaching our boys and girls about trees we will place in their possession an unafraid attitude towards the out-of-doors and thus instill into them the duty of preserving tree homes for our cheery bird friends "Whose habitations in the treetops e'en are half-way houses on the road to Heaven."

Fortunate are the boys and the girls who can tell the names of trees, know the quality of their fruit, the fragrance of their flowers, the form of their leaves, the flavor of their twigs, the color of the bark, and the properties of their wood; especially whether the wood is tough or brittle, easy or hard to chop and split into firewood.

THE PINES

THE PINES are the most important group of evergreen forest trees native to New York. In addition to the six native species, a large number have been planted within the State for ornamental purposes and for reforestation. The six pines native to New York are White Pine, Pitch Pine, Red Pine, Jack Pine, Short-leaf Pine, and Jersey or Scrub Pine.

The Pines can be distinguished from the other forest trees by their long needle-like leaves, which are grouped in clusters of 2, 3 or 5. Their leaves persist for 2 to 3 or more years. This places them among the evergreen trees, which contribute so much to the beauty of our rural landscape at all seasons of the year, especially in winter.

In studying the evergreen trees of New York it is well to remember that Spruces have short, stiff, 4-sided needles which are attached to the twigs by a short brown stalk. The Balsam Fir and the Hemlock have short flat needles which appear to be arranged in two lateral rows. A close examination of the twigs shows, however, that they are arranged spirally about the twigs. Those of the Hemlock are marked with two white lines on the lower surface and attached to the twigs by short stalks, while those of the Balsam Fir are pale green below and without stalks. The leaves of the Arbor Vitæ and White Cedar are scale-like, while the Red Cedar has both scale-like and awl-like leaves. The American Larch is the only native conifer that sheds all of its leaves each autumn. Its short needle-like leaves occur singly on the twigs of last season's growth and in clusters of ten or more on the spurs of the older growth.

The following table will be helpful in getting acquainted with the New York Pines:

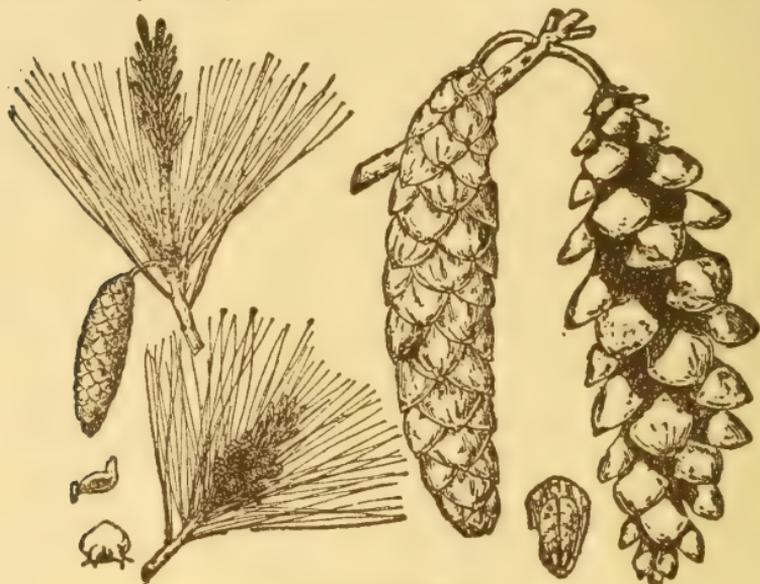
Five needles in a cluster.....	White Pine
Usually three needles in a cluster.....	Pitch Pine
Two or three needles in a cluster.....	Short-leaf Pine
Two needles in a cluster:	
a. Needles slender, 5 to 6 inches long.....	Red Pine
b. Needles, slender, twisted, spreading, 1½ to 3 inches long.....	Jersey or Scrub Pine
c. Needles curved and twisted, ¾ to 1¼ inches long.....	Jack Pine

WHITE PINE

Pinus Strobus, Linnaeus

THERE is no tree in the World that surpasses the White Pine in beauty, stateliness, individuality, and usefulness. Reliable records show that the first American house was built of White Pine.

It is the only evergreen tree native to eastern North America



WHITE PINE
One-third natural size.

that has soft, slender, flexible, straight, bluish-green leaves grouped in clusters of five. They are 3 to 5 inches long and persist for 2 years.

The cones are 5 to 10 inches long, short-stalked, narrowly cylindrical, rarely hang long on the trees. The cone-scales are thin, flat, and without prickles.

The trunk is straight, when grown in dense stands is clear of branches for many feet from the ground. The lateral branches occur in whorls of 3 to 7 arranged in horizontal layers. Upon falling they leave distinct circles of branch-scars. The wood is soft, light brown, straight-grained, easily worked. It is used for a wider range of purposes than any American wood.

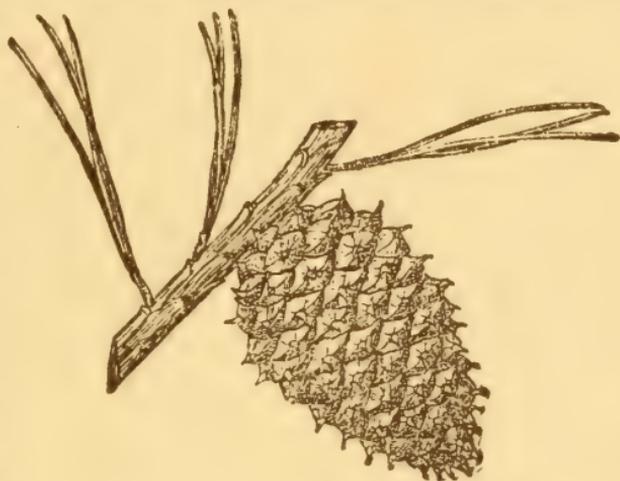
The White Pine is native only to eastern North America. It is found from Newfoundland west to Manitoba and Minnesota, southward to New Jersey, Pennsylvania, and Illinois and along the mountains to Georgia. Formerly it made up a large part of the forests throughout New York, but in many places it has been completely cut out. It is generally distributed in the northern part of the State and in the Adirondacks up to 2,500 feet. In recent years it has been planted widely in all parts of the State. White Pine is the most important forest tree in eastern North America and probably in the World.

PITCH PINE

Pinus rigida, Miller

PITCH PINE has more common names than any other eastern pine. Some of them are Jack Pine, Hard Pine, Yellow Pine, Nigger Pine, and Black Pine. In pioneer days it was called Torch Pine and Candlewood Pine because the early settlers used pine knots from this tree for torches in their cabins, and for traveling out-of-doors at night.

The leaves are 3 to 5 inches long, rather rigid, and occur in bundles of three. Sometimes two needles occur in a bundle. It is the only eastern pine that produces dense mats of needles along the main stem. This unusual growth is often seen on open-grown specimens.



PITCH PINE
One-half natural size.

The cones are egg-shaped, 2 to 3½ inches long, sometimes occur in clusters and persist for many years. Trees loaded with thousands of cones are common.

The bark is reddish-brown to black and breaks up into irregular plates which peel off in thin scales. It becomes thick early, which makes this tree the most fire-resistant evergreen in eastern North America. The twigs are golden brown, angled in cross-section, stout and brittle. The crown is usually irregular in outline and ragged in appearance.

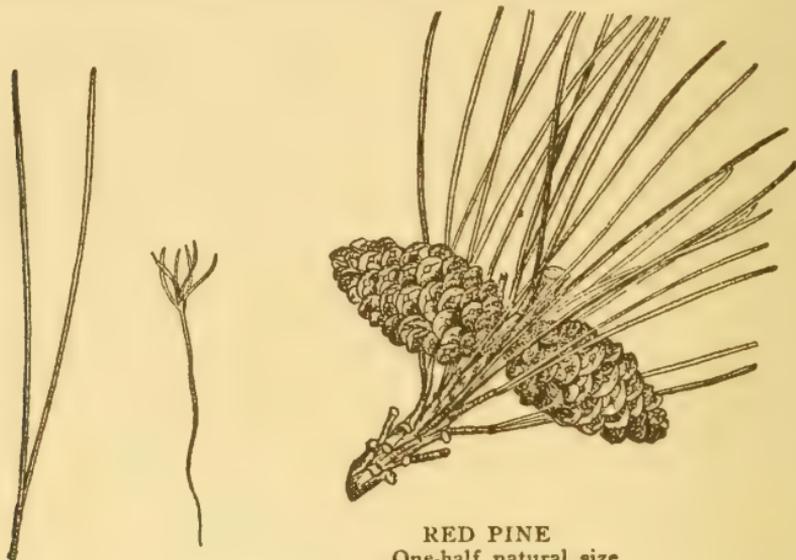
The wood is rather brittle, coarse grained, pale brownish-red with wide sapwood. It is used for railroad ties, mine timbers and general construction work.

Pitch Pine is found from New Brunswick to Lake Ontario and south to Virginia and along the mountains to Georgia. This tree is generally distributed throughout New York on dry sandy soil below 1,500 feet. It is very common on Long Island, Staten Island, the hills of the Hudson Valley, the plains between Albany and Schenectady, and around Oneida Lake. It extends northward to Plattsburg. It is an ordinary tree, rarely exceeds 70 feet in height and 2½ feet in diameter and well adapted to mountain soils. On exposed and windswept places it is usually small and stunted. It deserves good care and protection, for it produces a fair grade of wood.

RED PINE

Pinus resinosa, Aiton

THE RED PINE, also called Norway Pine, is one of the most important pine trees native to North America. It has already won a front-rank place. As it becomes better known its real merits will be more fully appreciated.



RED PINE
One-half natural size.

The leaves are straight, slender, flexible, 4 to 6 inches long and occur in pairs. They are usually tufted at the end of the branches and persist for 3 to 5 years.

The cones are egg-shaped, about 2 inches long, usually without stalks. It has no spines or prickles on the cone-scales.

The bark is thick, reddish-brown, marked with shallow furrows, peels off into thin scales. The twigs are stout and orange brown.

The wood is rather hard, pale red, with thin light sap-wood. It is used for nearly all purposes for which White Pine is used.

The Red Pine is a tree of the Northwoods. It is found from Nova Scotia south to central Pennsylvania and west to Minnesota. Recently a new outpost of this tree was found in Pendelton county, West Virginia. This is the most southern station where it occurs naturally. In New York this tree occurs locally throughout the Adirondacks and across the northern part of the State. It extends southward to the Helderberg and Catskill mountains and westward to the Genesee valley and the Finger Lake region. It is usually found in open groves or scattered with other trees.

The Red Pine rarely exceeds 70 to 80 feet in height and 3 feet in diameter. It has few enemies, grows rapidly, and if given care and protection will produce large quantities of high quality wood. It is one of our most attractive evergreen trees.

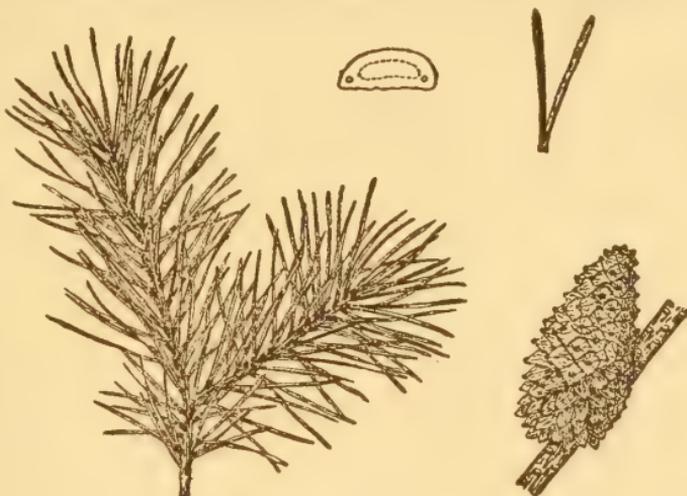
JACK PINE

Pinus Banksiana, Lamb.

THE JACK PINE, also called Gray Pine and Scrub Pine, is a slender trunked tree of the Northwoods, where it covers vast areas of barren lands and extensive sand dunes.

The leaves are needle-shaped, $\frac{3}{4}$ to $1\frac{1}{4}$ inches long, rather stout, generally curved and twisted, and occur in clusters of two.

The flowers appear in May and June. The staminate are arranged in crowded clusters at the base of the season's growth; the pistillate occur in clusters of 2 to 4 on the new growth.



JACK PINE
One-half natural size.

The fruit is an oblong, conical, strongly curved cone $1\frac{1}{2}$ - 2 inches long, without stalks, usually stands erect, and may persist for years. The cone scales are thick at apex and armed with small prickles, which usually fall off early.

The twigs are slender, at first yellowish green, later dark purplish brown. On main stem the bark is dark brown, slightly tinged with red, and peels off into narrow scales.

The wood is light, soft, weak, pale brown to orange. Sapwood is thick and whitish. It is used for pulpwood and manufactured into ties, slack cooperage, and lumber.

The Jack Pine is a small forest tree, rarely exceeding 50 feet in height and 18 inches in diameter. Exceptional specimens reach a height of 70 feet. It is found from Nova Scotia westward to British Columbia and south through New England to New York, northern Illinois, Michigan, and central Minnesota. Its east and west range is 2,500 miles and its north and south extension is 1,500 miles. This tree is found locally in the sandy, barren soils of northern New York. It is nowhere abundant, but is rather common along the lower Ausable in Essex and Clinton counties.

The Jack Pine is usually found on dry sandy soil and rocky ridges. It grows rapidly in youth, is well adapted to reclaim sandy waste areas, and serves well as a nurse tree for more valuable species.

OTHER NEW YORK PINES

THE SCRUB PINE (*Pinus virginiana*, Mill.) is a small to medium-sized tree. It usually reaches a height of 30-40 feet and a diameter of 18 inches. It is a pioneer tree often found in abandoned fields and waste places, where it prepares the way for other more valuable trees.

The leaves occur in pairs. They are $1\frac{1}{2}$ -3 inches long, twisted, spread widely from each other. The cones are narrow, conical, sharp-pointed, 2-3 inches long, and persist for many years. The cone scales bear slender prickles. The twigs are smooth, purplish, tough, usually flexible. On older trunks the bark peels off in thin scales.

The Scrub Pine is found from southeastern New York and north-central Pennsylvania to Georgia and Alabama and west to Texas. In New York it is reported only in the sandy soils in the western and southern parts of Staten Island. It prefers rolling uplands between the mountains and the lowlands.

* * * * *

The Shortleaf Pine, also called Yellow Pine and Hard Pine (*Pinus echinata*, Miller), is primarily a tree of the southland, where it makes its best growth at elevations of 400 to 1,500 feet, but it occurs as high as 3,000 feet. In New York this tree occurs in sandy, rocky, or barren soils of Staten Island. Formerly was found northward to Westchester county.

The Shortleaf Pine has many characteristics in common with Pitch Pine, but the older trees can be distinguished by their cinnamon red bark, which divides in large rectangular blocks and peels off in numerous thin scales. Younger specimens can be identified by their pale bluish white to purplish brown twigs, which are circular in cross-section. The twigs of Pitch Pine are heavier, golden brown, and angular in cross-section. It is a very valuable timber tree.

* * * * *

The Scotch Pine (*Pinus sylvestris*, Linnaeus) is a native of Europe. It has been planted widely in the eastern United States. During the last 25 years it has been used extensively for reforestation purposes in New York and other eastern states. It is also common throughout the State as a specimen tree in ornamental plantings.

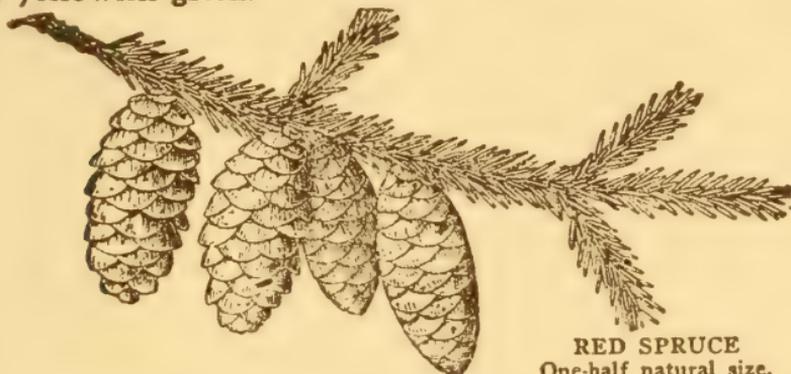
The Scotch Pine can be distinguished from other pines by its reddish bark on the upper third of mature stems, and by its bluish-green needles, which occur in twos and are $2\frac{1}{2}$ - $3\frac{1}{2}$ inches long. Its conical, often lopsided, cones $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long, and usually pointed backwards, are also distinctive. This introduced tree is easy to plant, grows rapidly, and yields good wood. Locally it is used as a Christmas tree.

RED SPRUCE

Picea rubra, (DuRoi) Dietrich

THE RED SPRUCE, also called Swamp Spruce and Spruce Pine, is a small to medium-sized tree. It rarely exceeds 50 feet in height and 18 inches in diameter.

The leaves are about $\frac{1}{2}$ inch long, 4-sided, blunt-pointed, and yellowish-green.



RED SPRUCE
One-half natural size.

The cones are about $1\frac{1}{2}$ inches long, elongated, ovoid, and short-stalked. The cone-scales are reddish-brown, usually with smooth margins.

The bark is thin, close-fitting, and peels off into small reddish-brown scales. The twigs are light reddish-orange-brown, and usually coated with fine pale hairs.

The wood is soft, usually white. It is used extensively in the manufacture of paper pulp and sounding boards for musical instruments.

The Red Spruce occurs from Newfoundland west to Minnesota, south to New Jersey and Pennsylvania, and along the Alleghenies to Georgia. This tree is common throughout northern New York and the Catskill region, and locally abundant southward to Hudson highlands and westward to the central part of the State. Wet, boggy places are its favorite home.

Closely related to the Red Spruce is the Black Spruce—*Picea mariana* (Miller) BSP. The Black Spruce can be distinguished from the Red Spruce by its blue-green foliage and its smaller cones, which are usually more persistent. The cone-scales are jagged along the margin while those of the Red Spruce are usually smooth. The Black Spruce is a transcontinental tree, extending from Labrador to Alaska and south to northern New Jersey, central Pennsylvania, and Wisconsin. It is common in swamps and bogs across the northern part of New York, and found locally southward to Dutchess, Sullivan, and Delaware counties, and westward to Cattaraugus county. It prefers wet, swampy places, and is cut extensively for Christmas trees.

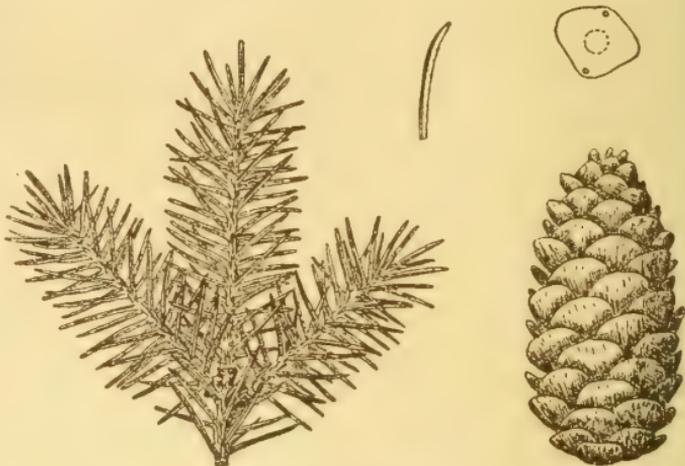
WHITE SPRUCE

Picea canadensis, (Mill.) BSP

THE WHITE SPRUCE, also called Cat Spruce, is a vigorous and handsome tree of the Northwoods. It is distributed widely, has a rather broad pyramidal crown, and reaches a height of 50 to 60 feet and a diameter of 1 to 2 feet.

The leaves are awl-shaped, 4-sided, bluish-green needles, about $\frac{3}{4}$ of an inch long. They persist for several years and are ill-scented when bruised.

The fruit is a slender, oblong, cylindrical, stalkless cone from 1 to 2 inches long.



WHITE SPRUCE
One-half natural size.

The bark on old trunks is thin and light grayish-brown. It separates in thin scales. The twigs are grayish-green to orange-brown. The buds are light brown, broadly ovate, blunt-pointed, about $\frac{1}{8}$ to $\frac{1}{4}$ of an inch long.

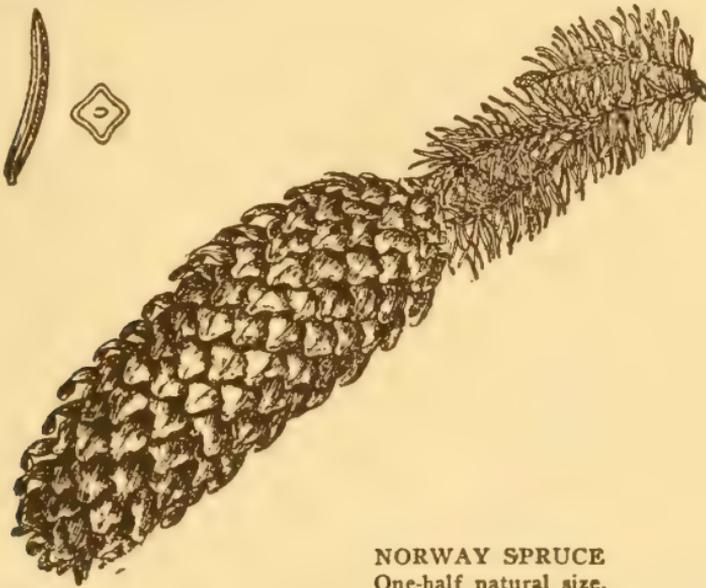
The wood is soft, weak, straight-grained and light yellow. It weighs about 32 pounds per cubic foot when dry, and is used chiefly for pulpwood.

The White Spruce is a transcontinental tree. It is found from Labrador and Newfoundland to Alaska, and south through New England to New York, Michigan, Minnesota, and northern Montana. In New York this tree is common in moist woods in the northern counties. Locally it is abundant. It is common in most sections of the Adirondacks, found southward to Washington county, but not reported from Catskill region. Low damp woods, banks of streams and borders of lakes are its favorite home. It grows best where the winters are cold. Under favorable growing conditions it makes a good growth and develops an attractive form. It is used locally in large quantities as a Christmas tree.

NORWAY SPRUCE

Picea Abies, (Linnaeus) Karsten

THE NORWAY SPRUCE is not a native of New York, but it has been planted so extensively for ornamental and forestry purposes that it may be regarded as a naturalized tree. During the last 25 years many Norway Spruce trees have been planted in all parts of New York for ornamental and reforestation purposes.



NORWAY SPRUCE
One-half natural size.

The leaves are $\frac{1}{2}$ to 1 inch long, 4-sided, dark green, sharp-pointed, and attached to twigs by short and slender stalk-like projections of bark.

The cones are 4 to 7 inches long, cylindrical without stalks or very short-stalked, usually hang down from end of branches. The cone-scales are thin, broad, reddish-brown, finely toothed along margin. No other New York spruce tree has such large cones.

The bark on old trunks is roughened by rather large reddish-brown scales. The twigs are light reddish-brown, roughened by projecting leaf-bases. On older trees they often assume a characteristic drooping or weeping habit.

The wood is light, soft, white, straight-grained, easily worked. Heartwood and sapwood are not distinguishable from each other. It is used for paper pulp, interior finish, crates, and baskets.

The Norway Spruce is native to middle Europe. It is the principal tree in the famous Black Forest of Europe, and prefers rich moist soil, and is rather tolerant of shade. It has been said that "the Norway Spruce is the best paying forest tree in the world."

AMERICAN LARCH

Larix laricina, (DuRoi) Koch

THE AMERICAN LARCH, also called Tamarack, is a northern tree. It stands out prominently among its associates because it sheds all of its leaves in autumn.

The leaves are flat, soft, slender and about one inch long. On the twigs of last season's growth they occur singly; on the spurs of older twigs in clusters of ten or more.

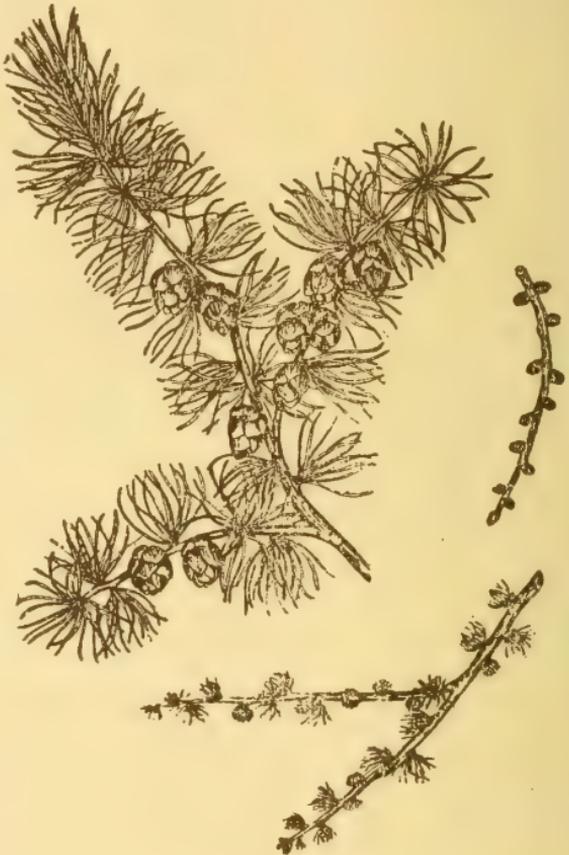
The cones are among the smallest of any American tree. They average two-fifths of an inch in length, bear about 12 scales, and often persist for many years.

The glossy brown twigs are without foliage in winter and covered with numerous stubby spurs. The bark on older trunks is reddish-brown and breaks up into small roundish scales.

The wood is heavy, hard, and durable in contact with the soil. It is used for posts, poles, ties, and in ship building.

The American Larch is found from Newfoundland south to northern New Jersey and Pennsylvania, and west to Minnesota and through British Columbia to Alaska. It occurs in swamps and other wet places throughout northern New York, southward to Dutchess county, central New York, and westward to Cattaraugus county. It rarely exceeds 50 feet in height and 2 feet in diameter. Wet places are its favorite home.

The European Larch (*Larix decidua*, Miller) has been planted rather widely in New York. The latter has larger and usually erect cones, stouter and yellower twigs, and longer and more abundant leaves.



AMERICAN LARCH

One-half natural size.

BALSAM FIR

Abies balsamea, (Linnaeus) Miller

THE BALSAM FIR, also called Balsam, Fir and Blister Pine, is the favorite Christmas tree of the American people, and one of our most beautiful evergreen trees. Most people who have seen it have a lasting impression of its rare beauty.



BALSAM FIR
One-half natural size.

The leaves are flat, stalkless, blunt-pointed, $\frac{3}{4}$ of an inch long, deep green on upper surface, pale green with two white lines on lower surface. They are spirally arranged, but appear to be in two flat rows. It is a common practice to fill pillows and cushions with the fragrant leaves.

The cones are 2 to 4 inches long, cylindrical in outline, stand erect on twigs. The cone-scales fall off shortly after maturing and leave only a bare cone-axis.

The bark is smooth, grayish-brown, and dotted with projecting balsam blisters. Upon puncturing them a clear balsam flows forth. The twigs are rather stout, grayish-brown and smooth. The buds are egg-shaped, blunt-pointed, glossy, one-sixth of an inch long, clustered at end of twigs.

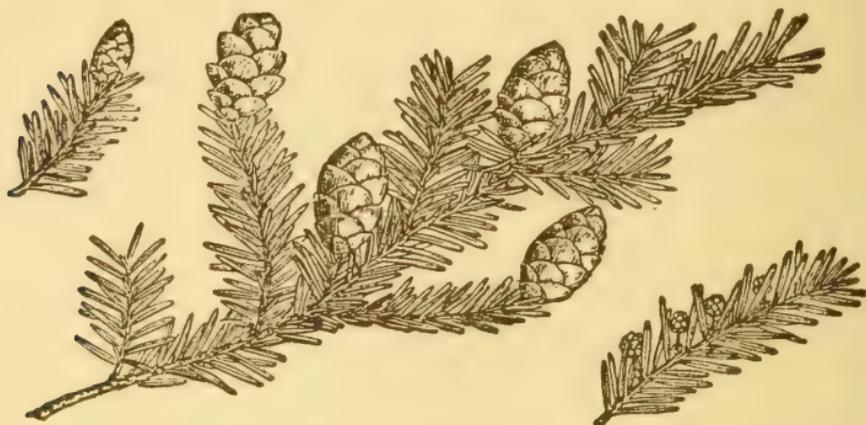
The wood is soft, pale brown, not strong nor durable. It is used chiefly for crates, boxes, and pulp.

The Balsam Fir is a tree of the Northwoods. It is found from Labrador to Manitoba and Minnesota, south to Pennsylvania and along the mountains to Virginia. In New York this tree occurs chiefly in swamps and peat bogs. It is common throughout the Adirondacks, the northern counties, and higher Catskills. It extends south to Dutchess and Delaware counties, and westward to Ontario and Cattaraugus counties. This tree is planted in all parts of the State as an ornamental tree.

HEMLOCK

Tsuga canadensis, (L.) *Carriere*

THE HEMLOCK, also called Spruce Pine and Hemlock Spruce, is an important forest tree with a very pleasing and graceful appearance. As an ornamental tree it has few equals and as a timber tree it stands in the front rank.



HEMLOCK
One-half natural size.

The leaves are flat, $\frac{1}{2}$ of an inch long, rounded or notched at apex, dark green and glossy above, with two white lines on lower surface, joined to the twigs by short and slender woody stalks. They are spirally arranged, but appear as if arranged in two flat rows alongside the twigs. A third row of small leaves point forward on the top of the twigs.

The cones are oblong, light brown, $\frac{3}{4}$ of an inch long, short-stalked. They often persist throughout the winter. The cone-scales are about as wide as long.

The outer bark is reddish-brown and scaly; the inner is cinnamon-red. If one takes a pocket knife and bores into the inner bark and finds it cinnamon red he has a positive distinguishing characteristic of this tree. The twigs are very slender, grayish-brown, at first hairy, and rough when needle-leaves are shed.

The wood is hard, weak, brittle, liable to splinter and difficult to work. It is used for coarse lumber, boxes, crates and pulp, and the bark is rich in tannin.

The Hemlock is found from Nova Scotia to Minnesota and south to New Jersey and Pennsylvania and along the mountains to Alabama. It is common on moist sites in nearly all parts of New York except Long Island and Staten Island. It is a shade-loving tree and not very windfirm. It usually reaches a height of 60 to 80 feet, but may become 100 feet high and 4 feet in diameter.

ARBOR VITAE

Thuja occidentalis, Linnaeus

THE ARBOR VITAE, also called White Cedar and Cedar, is one of the most widely planted evergreen trees in North America. It develops a conical symmetrical crown and usually reaches a height of 25 to 50 feet.

The leaves are scale-like, $\frac{1}{8}$ of an inch long, closely over-



ARBOR VITAE
One-half natural size.

lap one another, are aromatic when crushed, marked with glandular dots. They are arranged in pairs. Each succeeding pair alternates with the next pair.

The cones are oblong, $\frac{1}{2}$ of an inch long, with 6 to 12 blunt-pointed, reddish-brown scales.

The trunk usually divides near the base. The bark is grayish to reddish-brown, usually furrowed, and peels off into thin shred-like strips.

The Arbor Vitae is found from Southern Labrador west to Manitoba and Minnesota and south to North Carolina. This tree is common on wet calcareous soils throughout northern New York. Locally it forms part of impenetrable "cedar swamps." It is rare southward to West Chester county, and westward to Lake Erie. More than 50 garden varieties of Arbor Vitae are known. Some of them, such as White Arbor Vitae and the Golden Arbor Vitae, are distinguished by their color. Among the commonest forms are the pyramidal, the globose, the juvenile, and the pendulous form. Closely related to the native Arbor Vitae is the Oriental Arbor Vitae planted extensively throughout eastern North America.

WHITE CEDAR

Chamaecyparis thyoides, BSP

THE WHITE CEDAR is exclusively a tree of the Coastal Plain. In the southern part of its range it occurs in the swamps with bald cypress and swamp hardwoods, but more often is found in pure stands. Its straight trunks often stand in very close formation.

The leaves are small, scale-like, bluish-green, 4-ranked, overlapping and entirely cover the slender twigs.

The cones are nearly round, about $\frac{1}{4}$ of an inch in diameter. They mature in one year and contain from 4 to 8 winged seeds. The cone-scales are distinctly shield-shaped.

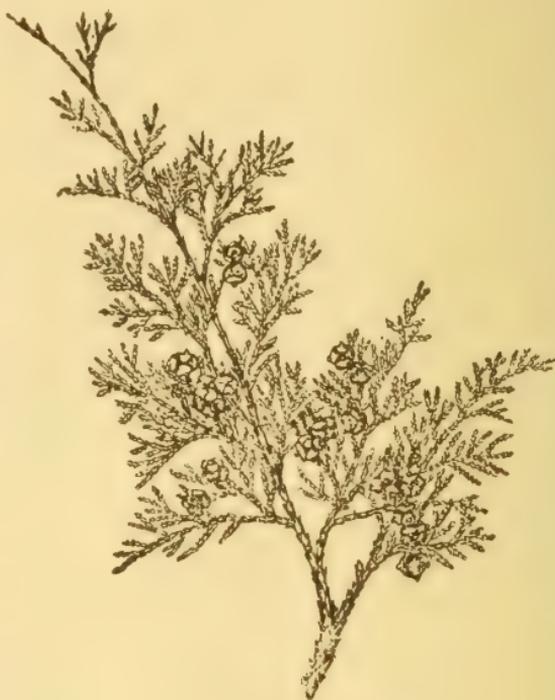
The bark is thin, ranges in color from an ash-gray to light brown. It separates freely into loose shreddy scales.

The wood is light, soft, slightly fragrant

and rather durable. These qualities recommend it for boat and canoe building, shingles, fence posts, poles, stakes, and rustic furniture. It is being substituted for chestnut telephone poles, since the supply of the latter is becoming scarce.

The White Cedar ranges from Maine southward along the coast of Florida and Mississippi. In New York this tree is found chiefly in swamps along the coast. It has been reported inland to Putnam and Orange counties. Some of the commoner ornamental varieties are the Golden White Cedar and the Blue White Cedar.

Closely related to the Eastern White Cedar are two western cedars also belonging to the genus *Chamaecyparis*. They are the Nootka Cedar—*Chamaecyparis nootkatensis*, Sudworth—and the Port Orford Cedar—*Chamaecyparis lawsoniana*, Parl.



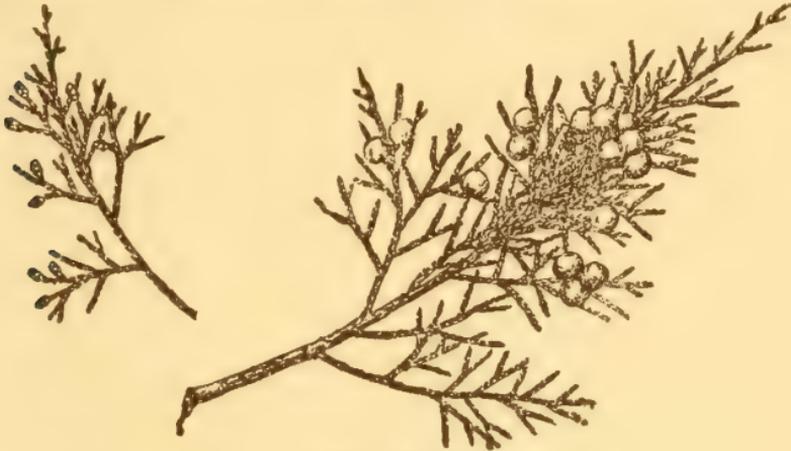
WHITE CEDAR
One-third natural size.

RED CEDAR

Juniperus virginiana, Linnaeus

RED CEDAR is a common household word. In recent years the "red cedar chest" has won its way to a special place in the modern home.

The leaves are of two kinds, namely, scale-shaped and awl-shaped. The scale-shaped are commonest, one-sixteenth



RED CEDAR
One-half natural size.

of an inch long, closely appressed to twigs, four-ranked. The awl-shaped are narrow, sharp-pointed, spreading, do not overlap, occur in 2's and 3's.

The fruit is a dark blue berry about $\frac{1}{4}$ of an inch in diameter. Berries are freely eaten by birds.

The bark is very thin, reddish-brown, shallowly furrowed, peels off in long shred-like strips.

The wood is soft, very durable, of even texture, works easily. The heartwood is red, the sapwood white. This color combination and its pronounced fragrance, supposed to ward off moth and other insects, account for its wide use for clothes chests, closets and for interior woodwork. It is also used for fence posts and pencils.

The Red Cedar, also called Cedar, and Juniper, is found from Nova Scotia to South Dakota south to Florida and Texas. In New York this tree is common on poor dry soil in the Hudson and Mohawk valleys. It becomes less abundant northward and is rare in the southwestern counties, not known in the Adirondacks, but local westward in Jefferson and St. Lawrence counties. In abandoned fields, waste places and along fence rows one often finds it. Birds distribute the seeds widely. This tree grows slowly, needs plenty of sunlight, and rarely exceeds 50 feet in height and 18 inches in diameter. It has a distinctive narrow conical crown when growing in the open.

COMMON JUNIPER

Juniperus communis, Linnaeus

THE COMMON JUNIPER is a variable tree with several geographical varieties and garden forms. It sometimes becomes 20 feet high.

The leaves are linear, about $\frac{1}{3}$ to $\frac{1}{2}$ of an inch long, tapering to a sharp point, usually concave, and marked with a broad white band on upper surface. They spread nearly at right angles to the twigs and persist for many years.

The fruit is a dark blue to glaucous round berry, about $\frac{1}{4}$ of an inch in diameter and matures at the end of the second or third year.

The fruit is occasionally employed in medicine,

and in Europe it is used to impart a peculiar flavor to gin.

The bark is dark reddish-brown and peels off in thin scales. The twigs are smooth, glossy, and reddish-brown. The wood is hard, close-grained and very durable.

The Common Juniper reaches almost around the World. It occurs from Greenland and Newfoundland south through New England to Pennsylvania and along the mountains to North Carolina and westward to Alaska and New Mexico. It is also common in northern and western Asia to Korea and Japan. It is probably the most widely distributed tree native to North America. In New York this tree is found across the northern and central parts of the State. It is rare in western New York and unknown on Long Island and Staten Island.

The variety "depressa" is common on exposed summits of the Adirondacks and Catskills.



COMMON JUNIPER
One-third natural size.

BLACK WILLOW

Salix nigra, Marshall

THE BLACK WILLOW reaches the largest size and has the widest distribution of any native American Willow. It is the only native willow of timber size, sometimes reaching a height of 80 feet and a diameter of 4 feet.

It can always be distinguished by its simple, alternate, long, narrow, sharp-pointed leaves, 3 to 5 inches long. At the base of the short leaf-stalk round leaf-like appendages of the n clasp the twigs.

The flowers are of two different kinds. Both are arranged in short stubby spikes. The pollen-bearing and seed-producing always occur on different tree. The seeds are minute, bear dense tufts of long silky down, occur in large numbers in small capsules on drooping tassels.

The bark varies from light brown to dark brown and black. On old trunks it becomes furrowed and peels off in scales. The branches are slender, brittle, somewhat drooping. The buds are sharp-pointed, $\frac{1}{2}$ of an inch long, covered by a single reddish-brown scale.

The wood is pale reddish-brown, used chiefly in boxes, excelsior, charcoal, pulp, artificial limbs.

The Black Willow occurs from New Brunswick to Florida, west to the Dakotas and southern Mexico. It is generally distributed throughout New York, but is rare above 2,000 feet in the Adirondacks and in the pine barrens of Long Island. One usually finds it in wet places, but it will grow on dry situations.



BLACK WILLOW

One-fourth natural size, except 2, 4, 6 and 8 which are enlarged.

PUSSY WILLOW

Salix discolor, Muhl

THE PUSSY WILLOW, probably more than any other tree, tells the people of both city and country when spring is here. During a brief period of spring it gives the chief touch of beauty to the landscape through its fine display of yellow blossoms that are visited by thousands of bees.

The leaves are simple, alternate, elliptic, 3 to 5 inches long, bright green above and silvery white below. A distinctive feature of the leaves is the wavy margins with coarse teeth.

The flowers are of two kinds. Both are arranged in short, stubby spikes. The pollen-bearing and the seed-producing always occur on different trees. They appear before the leaves and tell us when spring

is coming. The seeds are produced in large numbers in hairy long-beaked light-brown capsules.

The bark is thin, smooth, greenish, rarely scaly. The stout branchlets are marked with orange-colored breathing pores. The buds are alternate, $\frac{1}{4}$ of an inch long, duck-bill like, flattened on inside, dark reddish-purple. The wood is similar to that of Black Willow.

The Pussy Willow is found in moist meadows, and along banks of streams and in other wet places from Nova Scotia south to Delaware and west to Manitoba and Missouri. In New York this tree is generally distributed in the State below 3,000 feet, but it is rare on Long Island and Staten Island. It rarely exceeds 25 feet in height and is of considerable value in landscape work, especially along water courses.



PUSSY WILLOW
One-fourth natural size.

SHINING WILLOW

Salix lucida, Muhl

THE SHINING WILLOW, also called Glossy Willow, is an attractive small tree sometimes reaching a height of 25 feet. It takes its common name from its shiny leaves and twigs.

The leaves are alternate, simple, lanceolate to ovate, long-pointed, finely toothed along margin, shiny on upper surface, 3 to 5 inches long, 1 to 1½ inches wide.

The flowers (both staminate and pistillate) occur in drooping tassels before the leaves come out.

The fruit is a smooth pale-brown capsule arranged in drooping tassels. They contain many minute seeds.

The bark is smooth, bitter, and reddish-brown. The twigs are shiny, stout, yellowish-brown. The buds are alternate, ¼ of an inch long, covered by a single yellowish-brown scale. The

wood is soft, light, even-grained, white to light brown. It is of little commercial importance.

The Shining Willow has a wide distribution. It is found from Newfoundland to Manitoba, south to Pennsylvania and Kentucky and west to Nebraska and eastern Montana. In New York this tree is found in most sections of the State. It is common in the Adirondacks, less common southward, and rare on Long Island and Staten Island.

The Shining Willow will grow on almost any kind of soil with considerable moisture. Its dark green, laurel-like, lustrous leaves make it attractive for ornamental planting in cemeteries, parks, and estate. This tree acts as a soil binder on areas subject to erosion.



SHINING WILLOW
One-half natural size.



WIDELY INTRODUCED WILLOWS

THREE WILLOWS have been widely introduced into New York. They are the Weeping Willow, the White Willow, and the Crack Willow.

The Weeping Willow (*Salix babylonica*, Linnaeus), a native of Asia, was introduced into the United States in 1702 by a famous botanist named Tournefort. Sometimes this tree is called Napoleon Willow because of its association with the great French general during his exile. It has been planted widely in New York. This tree can always be distinguished by its weeping habit. Its long drooping branches are distinctive, and when young they are tough and pliable, but later become brittle. Its leaves are simple, alternate, 4 to 7 inches long; in shape they resemble the Black Willow and in color those of the White Willow.

The White Willow (*Salix alba*, Linnaeus), a native of Europe, was brought to America by the early settlers. It is now found from the Atlantic to the Pacific and is given planting preference where erosion and landslides are to be stopped. It is found throughout New York as an ornamental tree. In some places it has escaped cultivation. This tree sometimes reaches a height of 70 feet and a diameter of 4 feet. The leaves are simple, alternate, 2 to 4 inches long, one-third to two-fifths of an inch wide, finely toothed along edge. When young the leaves are pale green and hairy on both sides, but when mature they are distinctly white only on the lower surface, whence the name White Willow.

The Crack Willow (*Salix fragilis*, Linnaeus), a native of Europe and northern Asia, has been planted widely in America, especially in the prairie states. It is well established in eastern New York, particularly about the earlier settlements. It occurs locally westward. It is readily distinguished from the White Willow by its yellowish-green twigs and larger leaves, which are 3 to 6 inches long, $\frac{1}{2}$ to 1 inch wide, coarsely toothed along margin. The branches are so brittle that they crack off easily in a slight breeze, whence the appropriate name Crack Willow. After a storm the ground beneath this tree is often completely covered with twigs and branches.

QUAKING ASPEN

Populus tremuloides, Michaux

THE QUAKING ASPEN is also called Trembling Aspen and Small-toothed Aspen. The air must be remarkably still if the foliage is not quaking or trembling.

The leaves are simple, alternate, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, nearly round, finely toothed on margin, with leaf-stalks flattened laterally.

The flowers appear early in the spring. Pollen-bearing and seed-producing occur on different trees. Both are arranged in slender drooping tassels.

The fruit is a 2-valved capsule containing small seeds with tufts of fine hairs.

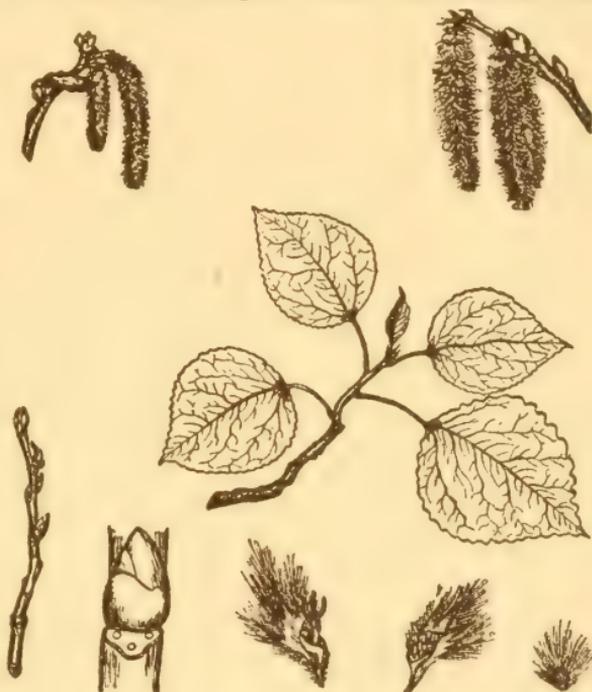
The bark is white or grayish to yellowish-green; on old trunks becomes rough and black. The twigs are smooth, shiny, reddish-brown.

The buds are narrow, conical, sharp-pointed, smooth, shiny, appear varnished, covered with 6 to 7 reddish-brown scales.

The wood is soft, weak, not durable, fine in texture, white to light brown. It is used for paper pulp, boxes, crates, and wooden dishes.

The Quaking Aspen is the most widely distributed tree in North America. It is a transcontinental tree extending from Newfoundland to Alaska and south to New Jersey, Kentucky, Mexico, and California. This tree is common in most sections of New York, but is rare on calcareous soils and infrequent in the pine barrens of Long Island.

Closely related to the Quaking Aspen and widely distributed in New York is the Large-toothed Aspen (*Populus grandidentata*). The leaves of the latter are larger and more coarsely toothed, and its buds are stout, broad-pointed and covered with a flour-like coating.



QUAKING ASPEN

One-fourth natural size, except enlarged flowers and twigs.

COTTONWOOD

Populus deltoides, Marshall

THE COTTONWOOD, also called Carolina Poplar, has been extensively planted along streets, in parks and on home grounds in New York.

The leaves are simple, alternate, broadly triangular, square at base, 3 to 5 inches long, with long and laterally flattened leaf-stalks.

The flowers appear before the leaves. Pollen-bearing and seed-producing occur on different trees. Both are arranged in drooping tassels.

The fruit is a 3 to 4-valved capsule arranged in drooping tassels and containing numerous small seeds with tufts of fine hairs.

The bark on young trunks is smooth and greenish-yellow; on old trunks becomes ashy-gray to dark brown and deep furrowed. The lateral branches take an upright position. The twigs are stout, yellowish, marked with grayish dots, have prominent ridges below leaf-scars. The buds are large, resinous, glossy, chestnut-brown. Terminal bud is often 5-angled.

The wood is soft, not durable, white to brown, works easily. Used for paper pulp, boxes, and crates.

The Cottonwood is found from Quebec south to Florida and west to the Rocky Mountains. This tree occurs locally in moist soils, and along streams and lakes throughout New York outside of the Adirondacks and Catskills.

Closely related to the Cottonwood is the introduced Lombardy Poplar, a native of southern Europe. It can be recognized by its narrow and high crown with almost vertical lateral branches. Its leaves are triangular, short-tipped, finely toothed along the margin.



COTTONWOOD

One-fourth natural size, except enlarged flowers and twig.

BALSAM POPLAR

Populus balsamifera, Linnaeus

THE BALSAM POPLAR, also called Balm of Gilead, is a well-known tree of the Northwoods, where it reaches a height of 75 feet and a diameter of 3 feet.

The leaves are alternate, simple, ovate, 3 to 6 inches long, 1 to 3 inches wide, lustrous dark green above, and finely toothed along margin. The leaf-stalks are round and 1 to 2 inches long. The flowers appear in April before the leaves. The staminate are arranged in tassels 3 to 4 inches long and the pistillate in loose-flowered tassels 4 to 5 inches long.

The fruit is a 2-valved capsule arranged in drooping tassels 4 to 5 inches long. It matures from May to June.

The bark on old trunks is thick, grayish, and roughened by shallow furrows and dark warty formations. The twigs are stout reddish-brown to greenish-gray. The buds are large, long-pointed, sticky, resin-coated and fragrant if crushed. The terminal bud is up to one inch long. The wood is light, soft, close-grained, light reddish-brown.

The Balsam Poplar is a tree of the Northwoods. It is found from Newfoundland south to New York and west through Michigan to Colorado and Alaska. In New York it is common in the Adirondack region and across the northern part of the State, but less common southward to Dutchess county, the higher Catskills and westward to Wyoming and Niagara counties.

Moist sites, river bottoms and borders of lakes are its favorite home. This tree grows rapidly and is easily propagated from cuttings. It is used locally for shelter belts.

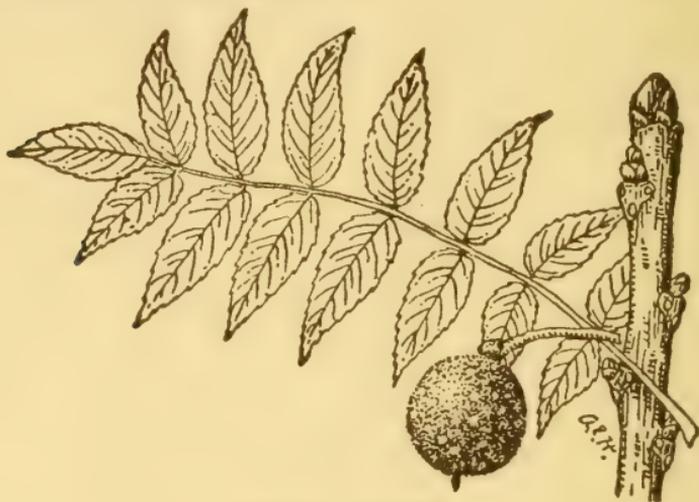


BALSAM POPLAR
One-third natural size.

BLACK WALNUT

Juglans nigra, Linnaeus

THE BLACK WALNUT is more fortunate than many trees in that it has only a few common names. Throughout its entire range of 650,000 square miles it is called Walnut, Black Walnut or Walnut-tree.



BLACK WALNUT

Leaf and fruit, one-fifth natural size. Twig, three-fourth natural size.

The leaves are alternate, compound, with 13 to 23 leaflets. Leaflets are 3 to 4 inches long, sharp-pointed, toothed along margin, stalkless.

The flowers are of two kinds. Both occur on same tree. The pollen-bearing occur in unbranched drooping tassels. The nut-producing occur in few-flowered clusters on the new growth.

The fruit is a round furrowed nut, 1 to 2 inches in diameter with a green non-splitting fleshy husk which turns black when mature.

The bark is thick, rough, furrowed, dark brown to grayish-black. The twigs are stout, grayish-brown, bitter to taste, contain gray to light brown chambered pith. The buds are covered with downy scales. Terminal bud is as long as wide. Lateral buds are smaller.

The wood is rich dark brown, hard, strong, splits easily, very durable. Used in furniture, interior finishings, sewing machines, gun stocks.

The Black Walnut is found from southern New England to Minnesota and south to Florida. In New York it is common north to Saratoga and Jefferson counties and westward to Lake Erie. It is rare in the Chemung and Tioga sections, and generally less common than formerly. It does not go so far north nor to such high altitudes as the Butternut. The Black Walnut is an important timber tree, producing excellent lumber and fine nuts.

BUTTERNUT

Juglans cinerea, Linnaeus

THE BUTTERNUT, also called White Walnut, is close-kin of the Black Walnut.

The leaves are alternate, compound, with 13 to 23 leaflets.

The flowers are of two kinds. The pollen-bearing occur in unbranched drooping clusters. The nut-producing occur in few-flowered clusters on new growth.

The fruit is an elongated nut with a hairy, sticky, non-splitting husk. The nut is 4-ribbed, pointed at one end, sharply furrowed over entire surface, and contains a sweet, oily edible kernel.

The bark is gray to ashy-white, separates into wide flat ridges. The twigs are stout, greenish gray, often downy, contain dark-brown chambered pith. The buds are covered with dense pale down. Terminal bud is $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long, flattened, blunt-pointed, longer than wide. Lateral flower buds are pineapple-like, often placed one above another.

The wood is soft, not strong, light-brown. Used in furniture, interior finishing, and chests.

The Butternut is found from New Brunswick to Minnesota, south to Delaware and Arkansas and along mountains to Georgia. This tree is common locally across New York, but remains below 1,500 feet in the Adirondacks. It prefers rich, moist, calcareous soil, is most frequently met along streams, fences, and roads, and rarely exceeds 50 feet in height and 2 feet in diameter.



BUTTERNUT

One-fourth natural size, except 3 and 4 which are enlarged and 7, 8, 10, 11 and 12 natural size.

Lateral flower buds are pineapple-like, often placed one above another.

SHELLBARK HICKORY

Carya ovata, (Miller) K. Koch

THE SHELLBARK HICKORY, also called Shagbark Hickory, is the best known of all the hickories. It produces the best nuts and has the most distinctive features of all the native hickories.

The leaves are alternate, 8 to 14 inches long, compound, with 5 to 7 leaflets.

The three upper leaflets are the largest, the pair nearest the base is usually only about one-half the size of the terminal ones.

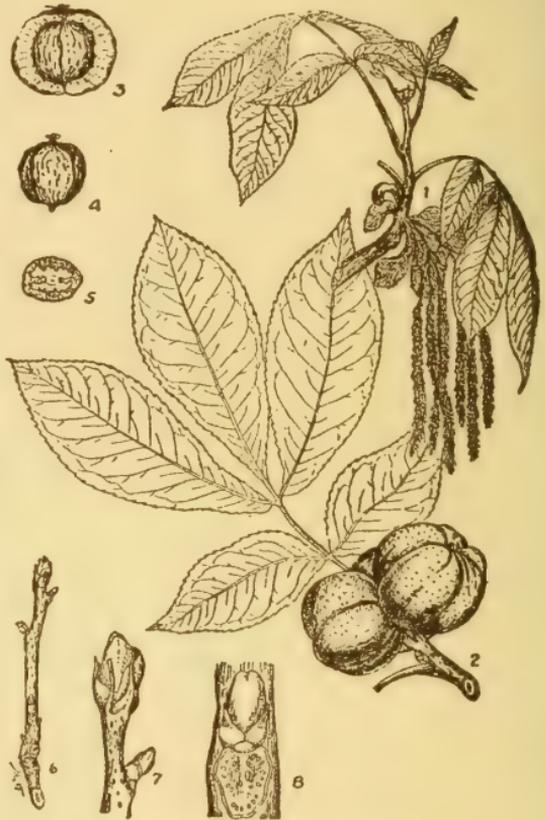
The flowers are similar to those of the other hickories.

The fruit is round, 1 to 2 inches long, with husk that splits into 4 sections from apex to base. The nuts are smooth, white, 4-angled, pointed at the ends. The kernel is large and sweet.

The bark is smooth and light gray on young stems. On old trunks it becomes distinctly shaggy. The twigs are reddish-brown to gray, covered with numerous light dots, usually smooth, sometimes hairy. The buds are egg-shaped, blunt-pointed, about three-fifths of an inch long, covered with about 10 bud-scales.

The wood is very heavy, hard, strong, tough, elastic, close-grained. Used chiefly for handles and vehicles.

The Shellbark Hickory is found from Quebec to Minnesota, south to Florida and Texas. In New York this tree is common in most sections of the State outside of the Adirondacks and the higher Catskills. Not reported from the pine barrens of Long Island. This tree, usually reaching a height of 50 to 75 feet and a diameter of 2 feet, should be carefully protected. It is the largest of the true hickories.



SHELLBARK HICKORY

One-fourth natural size, except 7 which is natural size and 8 slightly enlarged.

BITTERNUT HICKORY

Carya cordiformis, (Wangenheim) K. Koch

THE BITTERNUT HICKORY, also called Swamp Hickory and Water Hickory, is usually found in moist to wet locations. One usually finds it as a single specimen or in small groups in low and fertile situations in the rich agricultural valleys. It is the most handsome of the native hickories.

The leaves are alternate, compound, 6 to 10 inches long with 7 to 11 leaflets. Leaflets are long, narrow, sharp-pointed, without stalks except the terminal one. They are smaller and slenderer than those of other hickories.

The flowers are of two kinds. They occur on same tree. The pollen-bearing occur in drooping tassels, 3 to 4 inches long. The nut-producing occur in few-flowered clusters on new growth.



BITTERNUT HICKORY
One-fourth natural size.

The fruit is a thin-shelled nut with bitter kernel covered with a thin shelled husk, which splits to middle into 4 valves. Winged projections mark meeting line of husk sections from apex to middle.

The bark is light gray, rather thin, roughened by shallow furrows, does not scale nor shag off. The twigs are slender, smooth, grayish to orange brown or reddish. The buds are long, flattened, blunt-pointed, covered by 4 yellowish scales.

The wood is heavy, hard, strong, somewhat brittle. It is inferior to that of other hickories, but used for practically the same purposes.

The Bitternut Hickory is found from Quebec to Minnesota, south to Florida and Texas. This tree is found in most sections of New York, except the Adirondacks above 1,500 feet and the higher Catskills. Not reported from pine barrens of Long Island. It is often found along streams and in swamps. It grows best on rich, moist soil such as is found in the farm woodlot. This tree may attain a height of 100 feet and 3 feet in diameter.

PIGNUT HICKORY

Carya glabra, (Miller) Spach

THE PIGNUT HICKORY is an important forest tree. It occurs on real forest soil on the foothills and mountain slopes, and produces valuable wood.

The leaves are alternate, compound, 8 to 12 inches long with 5 to 7 leaflets. Leaflets are long, narrow, sharp-pointed, smooth, glossy. They are slightly larger than those of the Bitternut Hickory.

The flowers are similar to those of the other hickories.

The fruit is pear-shaped to spherical, with neck-like projection at base. The husk is thin, often does not split or may split to middle. The kernel is usually small and bitter, and not edible.

The bark is close-fitting, dark gray, marked with shallow furrows, does not shag off. The twigs are smooth, tough, reddish-brown, marked with pale dots. The buds are oval, blunt-pointed, reddish-brown.

The wood is similar to that of other hickories, but somewhat superior to Bitternut Hickory.

The Pignut Hickory is found from Maine to Minnesota, south to Florida and Texas. It occurs in most sections of New York except in the Adirondack region, where it is found only at lower elevations. It is most common on dry ridges and hillsides. It is a medium-sized tree, frequently reaching a height of 60 feet and diameter of 2 feet.

Closely related to the Pignut is the Mockernut Hickory—*Carya alba*, (Linnaeus) K. Koch. It is also called Big Bud and White-heart Hickory, and can be distinguished by its close-fitting, evidently furrowed bark that does not shag off, its stout hairy twigs, its hairy leaves with 7 to 9 large leaflets, its large round thick-shelled nut with thick husk and small kernel. The buds are larger than those of any other hickory. While the fruit is larger, its kernel is small and not edible. It is common in the rich agricultural valleys of New York.



PIGNUT HICKORY
One-fourth natural size.

GRAY BIRCH

Betula populifolia, Marshall

THE GRAY BIRCH, also called White Birch and Poplar Birch, is among the most beautiful and the most adaptive of North American trees. It thrives in wet places and grows on dry and rocky mountain tops. It is conspicuous because of its white bark marked with triangular black spots at the origin of lateral branches.

The leaves are simple, alternate 2 to 3 inches long, triangular to egg-shaped, long-pointed, slender-stalked, highly varnished on upper surface.

The flowers are similar to those of other birches.

The fruit is a slender cylindrical spike containing numerous small winged seeds and 3-lobed scales.

The bark is close-fitting, dull-white, marked with triangular black spots. It peels off sparingly in layers. Near the base of old trunks it becomes dark and rough. On small stems it is golden yellow and marked with as many as 75 pale elongated breathing pores per square inch.

The twigs are slender, grayish-brown, rough to touch. The wood is light, soft, not strong, not durable. It is used for fuel and locally manufactured into spools, novelties, and paper pulp.

The Gray Birch is found from Nova Scotia to Lake Ontario and south to Delaware and southern Pennsylvania. This tree is common across New York south of the Adirondacks, especially in the Hudson valley and Ontario lowlands. It is rare or absent in the Chenango, Chemung, Susquehanna and Allegheny valleys. It sprouts freely, producing as many as 100 sprouts from a single stump. The Gray Birch rarely exceeds 8 inches in diameter.



GRAY BIRCH
One-third natural size.

PAPER BIRCH

Betula papyrifera, Marsh

THE PAPER BIRCH is also called Canoe Birch and White Birch. Every boy and girl has learned that the bark of this tree was used by the Indians and early settlers in the making of canoes. No person who has seen it will forget its chalky white bark. It reaches a height of 50 to 75 feet and a diameter of 3 feet.

The leaves are simple, alternate, oval, 2 or 3 inches long, finely toothed on margin.

The flowers appear about April and are of two kinds. The pollen-bearing occur in drooping tassels about 4 inches long. The seed-producing occur in erect spikes about 1 inch long.

The fruit is short-stalked, usually drooping, cylindrical spike about 1½ inches long. The tiny seeds are winged and produced with 3-lobed scales.

The bark on older branches and small to medium stems is chalky to creamy white and peels off in thin papery scales marked with elongated yellowish - brown breathing pores.

On old trunks it becomes rough and fissured. On very young stems it is golden to reddish-brown. When once removed the bark is never renewed.

The wood is strong, hard, light-brown with light sapwood. It is used for spools, shoe lasts, fuel, paper pulp, and many common household articles.

The Paper Birch is found in the Northwoods from the Atlantic to the Pacific. It extends east to Labrador, south to New Jersey and Pennsylvania and Michigan, west to the Rocky Mountains and from there to Alaska. In New York it is common on barren, stony, and sandy soils throughout the Adirondacks and Catskills, where it ascends to higher elevations than any other deciduous-leaved tree. It extends southward locally to Delaware and Broome counties and westward to Lake Erie.



PAPER BIRCH

Twig sections, winged seed and fruit scale,
One-fourth natural size.
enlarged.

BLACK BIRCH

Betula lenta, Linnaeus

THE BLACK BIRCH, also called Sweet Birch and Cherry Birch, is one of the handsomest of our native birches. The winter-green flavor of the twigs is an unfailing distinguishing characteristic.

The leaves are simple, alternate, egg-shaped, 2 to 5 inches long. On the last season's growth they occur singly; on older twigs in pairs but never opposite each other.

The flowers appear before the leaves and are of two kinds. The pollen-bearing are arranged in drooping tassels from 3 to 4 inches long.

The fruit is an erect cylindrical spike $1\frac{1}{2}$ to 2 inches long. The seeds are small winged nutlets with 3-lobed scales. The bark on young stems and branches is smooth, shiny, close-fitting, blackish, and dotted with pale elongated breathing pores. On old trunks is thick, black, breaks into irregular rough plates.

The wood is heavy, hard, strong, brownish with yellow sapwood. It is used for furniture, interior finish, pulp, chemicals, and fuel.

The Black Birch is found from Newfoundland to Ontario, south to Indiana and North Carolina. It is common in rich soils of moist woods across New York from Lake Champlain and the Hudson valley to St. Lawrence county and Lake Erie outside of the higher Adirondacks and Catskills. It extends southward to Long Island.



BLACK BIRCH

Leaves, fruit, and flower tassels one-fourth natural size.

RIVER BIRCH

Betula nigra, Linnaeus

THE RIVER BIRCH is also called Red Birch and Water Birch. It usually occurs on river banks or other watery places.

The leaves are simple, alternate, egg-shaped, 2 to 3 inches long and wedge-shaped at base.

The flowers appear about April, are of two kinds. The pollen-bearing are arranged in drooping tassels, 2 to 3 inches long. The seed-producing occur in small spikes about one-third of an inch long.

The fruit is an erect cylindrical spike, 1 to 1½ inches long. The seeds ripen in early summer with 3-lobed scales.

The bark is reddish-brown to cinnamon-red, peels off in large thick layers. On old trees the bark becomes thick and deeply furrowed.

The twigs are reddish-brown and more or less hairy.

The wood is strong, heavy, close-grained, reddish-brown with white sapwood. It is used in the manufacture of wood-ware, turnery, pulp, and chemicals.

The River Birch extends farther south than any other of our native birches. Its range is from Massachusetts to Minnesota and south to Florida and Texas. In New York this tree is found locally in wet places in the lower Hudson valley and other places in the southern and central parts of the State. Exceptional trees reach a height of 80 feet and a diameter of 4 feet. The River Birch may be called a soldier tree, for it battles fiercely with the overflow waters of swollen streams. It is of inestimable value as a protector of river and stream banks.



RIVER BIRCH

One-third natural size.

YELLOW BIRCH

Betula lutea, Michaux

THE YELLOW BIRCH, also called Silver Birch and Swamp Birch, is one of the most important timber trees of eastern North America, sometimes reaching a height of 100 feet and a diameter of 4 feet. It can be readily recognized by its ragged yellow bark which peels off in thin papery scales. On old trunks the bark becomes reddish-brown and roughened with fissures.

Its twigs, leaves, flowers and fruit are similar to those of the Black Birch, but the twigs lack the sweet wintergreen flavor, and the fruit scales are smooth and equally lobed while those of the Yellow Birch are hairy and unequally lobed.

The Yellow Birch is found from Newfoundland to Minnesota, south to New Jersey and Pennsylvania and along the mountains to North Carolina and Tennessee. It is common in the Catskills and Hudson highlands, and abundant northward across the State, especially in the Adirondacks and west to the Great Lakes. It is one of the commonest timber trees of the Adirondacks. Rich uplands, borders of streams and swamps are its favorite home. It deserves to be classed as an important forest tree, for it reaches a large size, produces valuable wood, is propagated easily and has few enemies.

WHITE BIRCH

Betula alba, Linnaeus

THE WHITE BIRCH, also called European Birch, is native from northern Europe to Japan. Its bark is white, close-fitting, and peels off sparingly. The leaves are not so long-pointed and its twigs are smoother than those of the Gray Birch. It is common in cemeteries, along streets, upon lawns, and in parks. The varieties of the White Birch commonly found in New York are (1) Cut-leaved White Birch; (2) Weeping White Birch; (3) Cut-leaved Weeping White Birch; and (4) Purple-leaved White Birch. This tree has won a prominent place in American landscape work. The first memorial tree to mother was a White Birch planted on Mother's Day at Reading, Pennsylvania, in 1923. President Coolidge planted a White Birch tree at the White House on Mother's Day, 1924.

AMERICAN HORNBEAM

Carpinus caroliniana, Walter

THE AMERICAN HORNBEAM, also called Ironwood, Blue Beech, and Water Beech, is a small bushy tree usually found along streams and other low places. In appearance it will pass for a little brother of the Beech.

The leaves are simple, alternate, 2 to 4 inches long, ovate, long-pointed, finely toothed along margin.

The flowers are of two kinds, both appearing on same tree. The pollen-bearing occur in tassels about 1½ inches long; the seed-producing in few-flowered clusters about ¾ of an inch.

The fruit is a small, prominently ribbed nut about one-third of an inch long, enclosed in a leaf-like 3-lobed bract, which is usually toothed on one margin of middle lobe. The seed is attached to a leaflike bract.

The bark is thin, smooth, bluish-green, and marked with distinctive furrows running up and down along the trunk. The twigs are slender, reddish to orange, and covered with scattered pale breathing pores. Small buds are about ⅛ of an inch long, covered with 8 to 12 reddish-brown bud-scales.

The wood is heavy, hard, and strong. It is sometimes used for levers, tool handles, wedges, and mallets.

The American Hornbeam is found from Nova Scotia to Florida and west to Minnesota and Texas. It is common across New York, including the Adirondacks up to 2,000 feet. It is rare or absent in the coastal plain part of the State. Locally it is common in wet places where it often occurs in dense thickets almost to the exclusion of other trees.



AMERICAN HORNBEAM

One-fourth natural size.

Twig section and seed with winged bract, enlarged.

HOP HORNBEAM

Ostrya virginiana, Miller (K. Koch)

THE HOP HORNBEAM, also called Ironwood, has appropriate common names, for its fruit is hop-like and the wood is "hard as iron." It is the only tree native to eastern North America that produces hop-like fruit. An examination of the fruit shows that it is made up of a number of loose papery bags in each of which is found a little brown nutlet. The seed bags are arranged in clusters usually from 1 to 2 inches long and attached to the twig by a hairy stem.

The leaves are simple, alternate, 3 to 5 inches long, ovate, long-pointed, finely toothed along the margin.

The flowers are of two kinds. Pollen-bearing and seed-producing occur on the same tree. The former occur in drooping tassels about 2 inches long, and the latter are produced in erect clusters.

During winter the partly developed pollen-bearing flower catkins occur in clusters of 3 or 4 at the ends of the twigs.

The twigs are delicate and interlacing. The thin grayish-brown bark peeling off in narrow, flat scales, and the small reddish-brown buds with four-ranked bud scales are distinctive.

The Hop Hornbeam is widely distributed over the eastern United States. It is found from Cape Breton Island to Florida and west to Minnesota and Texas. It is found locally throughout New York except in the higher Adirondacks, but is rare southward on Long Island and Staten Island. One finds this tree usually by itself. It is rarely over 30 feet high and 12 inches in diameter.



HOP HORNBEAM
Twig section and seed with enclosing
One-fourth natural size.
membrane enlarged.

SMOOTH ALDER

Alnus rugosa, (DuRoi) Sprengel

THE SMOOTH ALDER, also called Black Alder, is common along streams and other wet places. It usually remains a shrub, but occasionally it becomes 20 feet high.

The leaves are simple, alternate, obovate, rounded at apex, wedge-shaped at base, finely toothed along margin.

The flowers appear before the leaves and are of two kinds. The pollen-bearing occur in drooping tassels 2 to 5 inches long. The seed-producing are greenish to purplish with scarlet styles. They are about $\frac{1}{4}$ of an inch long and occur in 2's or 3's at the end of the branches.

The fruit is a cone-like woody structure about $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long.



SMOOTH ALDER

One-fourth natural size.

Twig section with bud and leaf-scar, enlarged.

The bark is thin, smooth, often grooved, grayish-green, dotted with numerous brown lenticels and marked with white blotches. The twigs are greenish to grayish-brown, dotted with brownish lenticels and marked with leaf-scars with 3 bundle-scars. The buds are alternate, $\frac{1}{2}$ of an inch long, evidently stalked, blunt-pointed, covered with 2 scales. The wood is yellowish-brown and marked with broad rays.

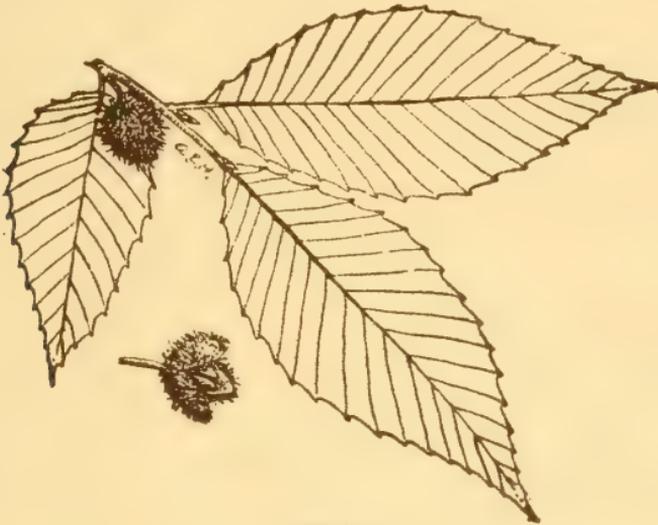
The Smooth Alder is found from Maine to Florida and Texas and west to Minnesota. It is common in New York south of the Adirondacks. The Speckled Alder (*Alnus incana*) is commoner northward across the State. At higher elevations in the northern part of the State the Mountain Alder (*Alnus viridis*) is found. *Alnus incana*, a large shrub, is generally distributed in wet soil throughout the State.

BEECH

Fagus grandifolia, Ehrhart

NO hardwood tree is more beautiful or more easily recognized than the American Beech.

The leaves are simple, alternate, 3 to 4 inches long, pointed at tip, wedge-shaped at base, coarsely-toothed along margin. When mature they are stiff, leathery, with straight, sunken veins.



BEECH
One-half natural size.

The flowers are of two kinds, appear about April. The pollen-bearing occur in stalked round heads; the nut-producing in a few-flowered clusters.

The fruit is a stalked, prickly, four-valved bur, usually produced in pairs, containing triangular, pale brown, shining nutlets with sweet kernel.

The bark is smooth, light gray, often marked with initial carvings. The twigs are slender, dark gray, marked with circle of bud-scale scars. The buds are alternate, slender, conical, sharp-pointed, $\frac{3}{4}$ of an inch long, 5 times as long as wide, covered with 10 to 20 reddish-brown scales.

The wood is very hard, strong, tough, not durable in contact with soil. It is an excellent fuelwood, and is used extensively in the manufacture of charcoal, chemicals, novelties.

The Beech is found from Nova Scotia to Wisconsin and south to Florida and Texas. This tree is common throughout New York except in the pine barrens of Long Island. The beech trees one usually sees about our cities are the European Beech (*Fagus sylvatica*, Linnaeus), which is the parent of the Purple or Copper Beech, the Weeping Beech, and the Cut-leaved Beech.

CHESTNUT

Castanea dentata, (Marshall) Bork.

NO TREE has brought more real joy to boys and girls, and grown folks than the Chestnut. To go a-nutting for Chestnuts is among the best of outdoor sports.

The leaves are simple, alternate, 6 to 8 inches long, sharp-pointed and coarsely-toothed.

The flowers appear in June or July. They are arranged in slender, yellowish-white, pencil-like plumes. The seed-producing occur in small numbers near the base of the plumes.

The fruit is a prickly bur with 1 to 5 nuts maturing in September or October.

The bark on branches and small trunks is smooth, brownish and close-fitting; on old trunks becomes grayish-brown and deeply furrowed. The twigs are smooth, greenish to brown, dotted with numerous small white breathing pores. The buds are alternate, $\frac{1}{4}$ of an inch long, blunt-pointed, covered with 2 to 3 chestnut-brown scales.



CHESTNUT

One-fourth natural size.

Twig sections and single flowers, enlarged

The wood is light, soft, not strong, coarse-grained, durable. It is used for posts, poles, ties, general construction and interior finish.

The Chestnut is found from Maine to Michigan, and south to the Carolinas and Georgia and Arkansas. This tree is common locally across New York south of the Adirondacks, but rare or absent in pine barrens of Long Island, and infrequent on soils rich in lime. The deadly Chestnut Blight has killed practically all trees of commercial size.

THE OAKS

OF THE 300 Oaks known in the world, 55 are native to North America, and most of these occur in the eastern United States. The oaks make up the largest group of forest trees native to New York. In all there are 16 different kinds of oaks native to this State. They grow under a wide range of conditions and show wide variations in form and other distinguishing characteristics. The best way to get acquainted with New York oaks is to divide them into two major groups, the one group to comprise the White Oaks and the other the Black Oaks. It is easy to place the oaks of New York in these two groups by remembering the following characteristics of each:

THE WHITE OAKS: The leaves of the members of this group have rounded lobes (not bristle-tipped), and the kernels of the acorns are usually sweet. All the oaks of this group mature their acorns in a single season; for this reason they are sometimes called Annual Oaks. The seven New York members of this group are White Oak, Swamp White Oak, Bur Oak, Post Oak, Chestnut Oak, Yellow Oak, and Scrub Chestnut Oak.

THE BLACK OAKS: The leaves of the members of this group have bristle-tipped (not round-lobed) leaves, and the kernel of their acorns is usually bitter. All the oaks of this group require two seasons to mature their acorns; for this reason the representatives of this group are sometimes called Biennial Oaks, which means two-year oaks in contrast with the one-year White Oaks. The immature acorns are very helpful in recognizing the members of the Black Oak group, especially during the winter months when the trees are without leaves. The nine New York members of this group are Black Oak, Red Oak, Scarlet Oak, Pin Oak, Spanish Oak, Black Jack Oak, Elliott's Oak, Willow Oak, and Scrub Oak.

The sign of all oaks is the acorn. It is an unfailling distinguishing characteristic. Man has good reasons for his high regard for the oaks. Their most important gift is wood. They also supply us with cork, dyeing materials, tanning products, food for wild and domestic animals, and many other valuable products.

WHITE OAK

Quercus alba, Linnaeus

THE WHITE OAK is the most important hardwood forest tree native to North America. It has held this front rank place since the earliest days of colonization. This tree was common in the original forests of the rich agricultural areas of New York.

The leaves are simple, alternate, 5 to 9 inches long, 2 to 4 inches wide. They are divided into 3 to 9, usually 7, blunt-pointed, finger-like lobes. Mature leaves are deep green above and light green beneath.

The flowers appear about May and are of two kinds. The pollen-bearing occur on the old growth in drooping tassels 2 or 3 inches long. The acorn-producing occur in small clusters on the new growth.

The fruit is a sessile or short-stalked acorn maturing in one season. The light brown nuts are about $\frac{3}{4}$ of an inch long, seated in a warty cup, enclosing about $\frac{1}{4}$ of nut. The nuts are relished by wild animals. The bark is grayish-white and peels off in numerous loose scales. The early settlers made it into a tea used in the treatment of tonsillitis. The twigs are smooth, light-gray, dotted with light lenticels.

The buds are alternate, egg-shaped, blunt-pointed, reddish-brown, clustered at end of twigs. The wood is heavy, hard, strong, close-grained, light-brown, durable. Its uses are interior finish, flooring, furniture, general construction, implements and fuel.

The White Oak is found from Maine to Minnesota and south to Florida and Texas. It is common throughout New York south of the Adirondacks and locally northward. This tree reaches its best development on rich moist soil, where it attains a height of 75 to 100 feet and 2 to 4 feet in diameter.



WHITE OAK

One-fourth natural size.

Single flowers and twig sections, enlarged

SWAMP WHITE OAK

Quercus bicolor, Willdenow

THE SWAMP WHITE OAK is usually found in swamps, about ponds, and along the banks of streams. In youth it is rather attractive, but with advancing years it becomes ragged and unkempt in appearance.

The leaves are simple, alternate, 5 to 6 inches long, 2 to 4 inches broad, wavy-toothed on margin, dark green above, light green and hairy on lower surface. They are broadest between the middle and the apex.

The flowers and wood are similar to those of the White Oak.

The fruit is a long-stalked acorn that matures in one season. The acorns are about an inch long and usually occur in pairs.

The bark on old trunks is thick, grayish-brown and breaks in long deep furrows. On the small branches it sheds off in flakes like that of the Sycamore.

The twigs are stout, yellowish to reddish-brown. The buds are about $\frac{1}{8}$ of an inch long, blunt-pointed, smooth, reddish-brown.

The Swamp White Oak is found from Maine to Michigan and south to Georgia and Arkansas. It is common in moist to wet places across New York south of the Adirondacks and northward to Saratoga and St. Lawrence counties. Not reported from pine barrens of Long Island. Trees 3 to 4 feet in diameter and 80 feet high are not unusual. The largest specimen of Swamp White Oak ever recorded was the Wadsworth Oak which was 27 feet in circumference. It was near this tree that Robert Morris and the Seneca Indians made an important treaty in 1797.



SWAMP WHITE OAK

One-third natural size.

BUR OAK

Quercus macrocarpa, Michaux

THE BUR OAK, also called Mossy Cup Oak and Over Cup Oak, is one of the largest of American oaks. It reaches a height of 100 feet and 5 feet in diameter.

The leaves are simple, alternate, 6 to 12 inches long, 3 to 6 inches wide, shiny and deep green above, pale and finely hairy beneath. Near the middle are deep clefts that almost divide the leaves into two parts.

The flowers and wood are similar to those of White Oak.

The fruit is a large acorn maturing in one season. The nuts are $\frac{3}{4}$ of an inch long with a white and sweet kernel. The cup covers about half of nut and is bordered by distinct fringe along margin.

The twigs are stout, yellowish-brown and usually marked with corky winged projections. The buds are alternate, $\frac{1}{8}$ of an inch long, blunt-pointed, reddish-brown, clustered at end of twigs. The bark becomes deeply furrowed and has a tendency to peel off in flaky scales.

The Bur Oak is found from New Brunswick and Nova Scotia west to Manitoba, and south to Pennsylvania, Kansas and Texas. In New York it is found across the State on rich soils south of the Adirondacks and northward to Lake Champlain and Jefferson county. Not reported south of Greene county in Hudson valley.

The Bur Oak is a valuable timber tree and used extensively for ornamental planting. It is easy to transplant, grows rapidly, has few insect enemies.



BUR OAK
One-third natural size.

POST OAK

Quercus stellata, Wangenheim

THE POST OAK was given its name in pioneer days when it was used extensively for posts, a use for which it is well adapted on account of durability.

The Post Oak is not an evergreen tree, but some of its brown leaves usually hang on until the new crop appears.

The leaves are simple, alternate, coarse, stiff, leathery in texture, 4 to 6 inches long. They are dark green and shiny on the upper surface, have a heavy coating of rusty brown hairs on lower surface. Under a magnifying glass the hairs are star-shaped whence the specific name "stellata." The two basal lobes are small and the three terminal lobes are large and generally squarish in outline. Near the middle of the leaf is a deep cut that almost separates the leaf into two parts.



POST OAK
One-third natural size.

The flowers are like those of the other oaks. See White Oak.

The fruit is a small acorn maturing in one season. The nut is about $\frac{1}{2}$ of an inch long, dark brown, often striped. The cup is shallow, covered with pale wooly scales, enclosing about $\frac{1}{3}$ of nut.

The bark is darker, rougher and less scaly than White Oak. The twigs are stout, hairy and rusty. The buds are alternate, $\frac{1}{8}$ of an inch long, blunt-pointed, reddish-brown, clustered at end of twigs.

The wood is similar to White Oak and used for the same purposes.

The Post Oak, also called Iron Oak, is found from Massachusetts to Kansas and south to Florida and Texas. It is found on Long Island and Staten Island northward to Westchester county. It is a medium-sized tree, rarely exceeding 60 feet in height and 3 feet in diameter.

CHESTNUT OAK

Quercus Prinus, Engelmann

THE CHESTNUT OAK, also called Rock Oak, and Tanbark Oak, is an important forest tree. Its importance will grow, for it produces valuable wood, and yields bark rich in tannin.

The leaves are simple, alternate, stiff, 5 to 9 inches long, 2 to 4 inches wide, coarsely toothed along margin.

The flowers are similar and the wood ranks close to White Oak.

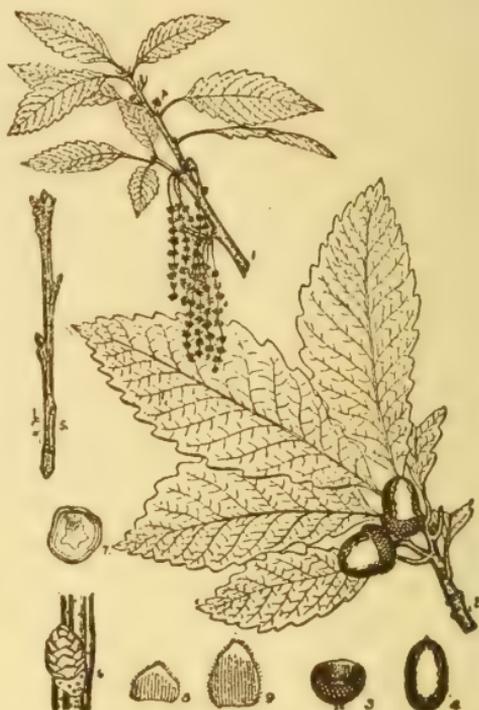
The fruit is a large acorn maturing in one season. The nut is 1 to 1½ inches long, oval, smooth, glossy, chestnut-brown. The cup is thin, deep, hairy inside, covers one-third of nut.

The bark on young stems and branches is smooth, thin, yellowish-brown. On old trunks it is thick, brown to black, deeply furrowed. The bark ridges are high, sharp and angular. At the bottom of the furrows the bark is cinnamon-red. It is rich in tannin.

The twigs are slender, angular, orange-brown. The buds are light-brown, ¼ to ½ of an inch long, sharp-pointed, and clustered at tip of twigs.

The Chestnut Oak is found from Maine to Ontario, south to Alabama and Tennessee. It reaches its best development in the Alleghenies of Pennsylvania and southward. In New York this tree is abundant on dry soil in the Hudson valley northward to Lake Champlain and westward across the State to Lake Erie.

A closely related tree occurring chiefly on limestone soils of central New York and the Hudson valley is the Yellow Oak—*Quercus Muhlenbergii*, Engelmann. This tree is limited largely to the main valleys and the bordering lower slopes.



CHESTNUT OAK

One-third natural size.

Twig section and bud scales enlarged.

RED OAK

Quercus rubra, Linnaeus

THE RED OAK is one of the biggest, stateliest, and handsomest trees of eastern North America. As early as 1740 it was introduced into Europe.

The leaves are simple, alternate, 5 to 9 inches long, 4 to 6 inches wide, 7 to 9-lobed. Lobes are bristle-tipped and separated by clefts that reach halfway to midrib.

The flowers appear with the leaves. The pollen-bearing are arranged in drooping tassels; the acorn-producing occur in few-flowered clusters on new growth.

The fruit is an acorn maturing in two seasons. The cup is wide, shallow, covered with overlapping reddish-brown scales, enclosing only base of nut. The nuts average one inch long, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch wide, are flat a base and short-tipped at apex.

The bark on young stems is smooth, grayish or brown. On older trunks it becomes rough with furrows separating wide, smooth grayish to brownish ridges. The lateral branches are straight and ascend at about an angle of 45 degrees. The twigs are smooth and rich brown. The buds are $\frac{1}{4}$ of an inch long, sharp-pointed, smooth, glossy, reddish-brown, without hairs.

The wood is heavy, hard, strong, light reddish-brown, with light sapwood. It is used for furniture, interior finishing, ties, and general construction.

The Red Oak has a wide distribution. It is found from Nova Scotia to Minnesota and Kansas south to Florida and Texas. This tree is found in rich woods and uplands across New York outside of the Adirondacks, where it occurs up to 1,500 feet, and in the Catskills up to 2,500 feet. Moist, porous, sandy to gravelly clay soils are its favorite homes. It is one of the most important timber trees of North America, reaching a height of 150 feet and an age of 300 or more years.



RED OAK

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

BLACK OAK

Quercus velutina, Lambert

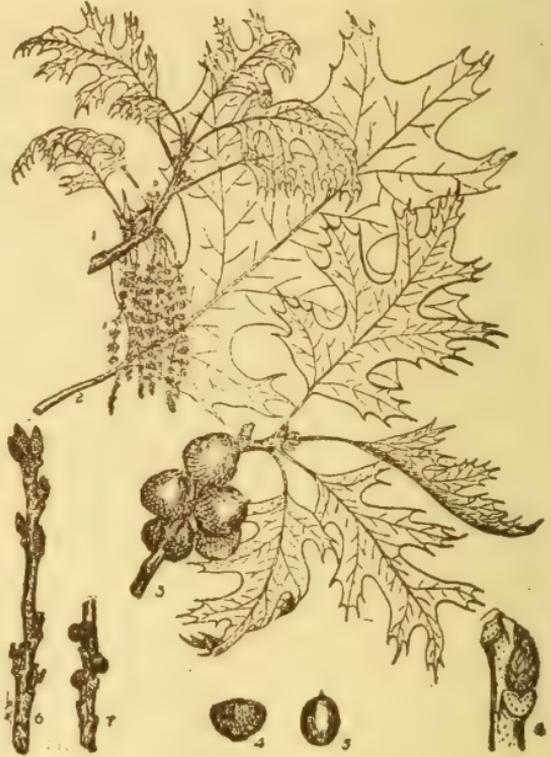
THE BLACK OAK is one of the biggest oaks native to the eastern states reaching a height of 100 feet and 4 feet in diameter. By its bark one can always recognize this tree. Its outer bark is black and its inner bark is distinctly yellow.

The leaves are simple, alternate, 4 to 10 inches long, 3 to 6 inches wide, usually 7-lobed with bristly tips. The lower leaf surfaces are pale green to rusty brown.

The flowers are similar to those of other oaks.

The fruit is an acorn maturing in two seasons. Cups are cup-shaped, light-brown, often slightly fringed along margin, enclose $\frac{1}{2}$ of nut. Nuts are $\frac{1}{2}$ to 1 inch long, light reddish-brown.

The bark on older trunks is black, thick, very rough. Twigs are stout, angular, reddish-brown, often hairy. Buds are large, sometimes $\frac{1}{2}$ of an inch long, angular, covered with a coating of yellowish or dirty-white hairs.



BLACK OAK
One-fourth natural size.
Twig section, enlarged.

The wood is similar to that of Red Oak.

The Black Oak is found from Maine to Ontario, south to Florida and Texas. It occurs throughout New York, especially on dry uplands and gravelly plains northward to Lake Champlain and westward to Lake Erie.

The Black Jack Oak (*Quercus Marylandica*, Muench) occurs locally on Long Island and Staten Island in New York. It can be distinguished by its large leaves which usually spread abruptly near the tips, are widest between the tip and the middle, and hairy on the lower surface.

SCARLET OAK

Quercus coccinea, Muench

THE SCARLET OAK, also called Spanish Oak, is the showiest of the American oaks. Its autumn garb of brilliant scarlet red and crimson makes it stand out among all its associates.

The leaves are simple, alternate, 3 to 6 inches long, 3 to 5 inches wide, 5 to 9-lobed. Lobes are bristle-tipped and separated by deep clefts.

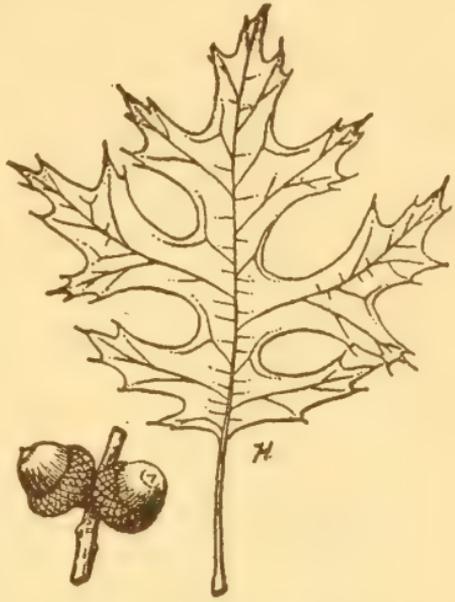
The flowers resemble those of other oaks.

The fruit is an acorn maturing in two seasons. The cup is thin, narrowed at base, often glossy on surface, covers $\frac{1}{2}$ of nut. The nut is three-fifths of an inch long, reddish-brown.

The bark on small stems and branches is smooth, thin, light to grayish-brown, becomes rough and irregular on older trunks, sometimes almost black near base. Flat-topped ridges occur between shallow furrows. Inner bark is of pale coloring. Dead limbs often persist along lower trunk. The twigs are smooth, rather slender, reddish to grayish-brown. The buds are about $\frac{1}{4}$ of an inch long, covered with a pale wool from apex to middle.

The wood is rather strong, heavy, hard, coarse in texture. It does not have a wide commercial use, but is valuable for fuel, ties and general construction.

The Scarlet Oak is found from Maine to Minnesota south to North Carolina and west to Nebraska. It is common in southern New York, but rare northward to Saratoga and Schnectady counties, and local in western part of State. It is common on Long Island and Staten Island. Toward its southern limits it becomes 80 feet high and 3 feet in diameter. No other oak can equal the Scarlet Oak in brilliant foliage. It is used extensively for ornamental purposes.



SCARLET OAK

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

PIN OAK

Quercus palustris, Muench

THE PIN OAK, also called Spanish Oak and Swamp Oak, is one of the most attractive oaks native to North America. Its trunk usually remains unbranched and the lateral branches take a horizontal position along the middle of the trunk. At the bottom they are drooping and those at the tip are ascending.

The leaves are simple, alternate, 4 to 6 inches long, 2 to 4 inches wide, 5 to 9-lobed. Lobes are bristle-tipped and separated by deep clefts. They resemble those of the Scarlet Oak, but are coarser and less lustrous.

The flowers are similar to those of other oaks.

The fruit is a tiny acorn, maturing in two seasons. The cup is thin, shallow, saucer-shaped, about $\frac{1}{2}$ of an inch across. The nut is light brown, often striped, about $\frac{1}{2}$ of an inch long.

The bark is rather smooth, grayish or dark-brown. The twigs are smooth, shiny, grayish-brown. The branches are thickly set with stiff pin-like twigs, whence its name Pin Oak. The buds are small, smooth, light-brown.

The wood is rather heavy, hard, and strong. It warps and checks freely. It is used for fuel, ties and general construction work.

The Pin Oak is found from Massachusetts to Michigan south to Tennessee and Oklahoma. It is common in the lower Hudson valley of New York, northward to Dutchess and Greene counties. Rich bottom-lands are its favorite home. It is a medium-sized tree reaching a height of 75 feet and a diameter of 3 feet. It grows rapidly, produces good wood, is well adapted for shade, park, and street planting.



PIN OAK

Twig, one-half natural size.

Leaf and acorns, one-third natural size.

WILLOW OAK

Quercus phellos, Linnaeus

THE WILLOW OAK takes its name from its narrow, willow-like leaves. Other common names for this tree are Peach Oak, Water Oak, Swamp Oak, and Pin Oak.

The leaves are simple, alternate, 2 to 5 inches long, $\frac{1}{2}$ to 1 inch wide, and entire along the margin. The mature leaves resemble those of our common willows.

The flowers are similar to those of other oaks.

The fruit is an acorn. The nut is egg-shaped, about $\frac{1}{2}$ to 1 inch long, sometimes striped. The cup is saucer-shaped and covers only a small portion of the base of the nut.

The bark is reddish-brown and becomes shallow-fissured and scaly. On young trunks it is smooth and shiny. The twigs are rather stout and become smooth and shiny and reddish-brown in color. The buds are $\frac{1}{8}$ to an inch long, strongly angled and sharp-pointed.



WILLOW OAK
One-fourth natural size.

The wood is rather heavy, strong, coarse-grained, and light-brown. It is used for fuel and for general construction work.

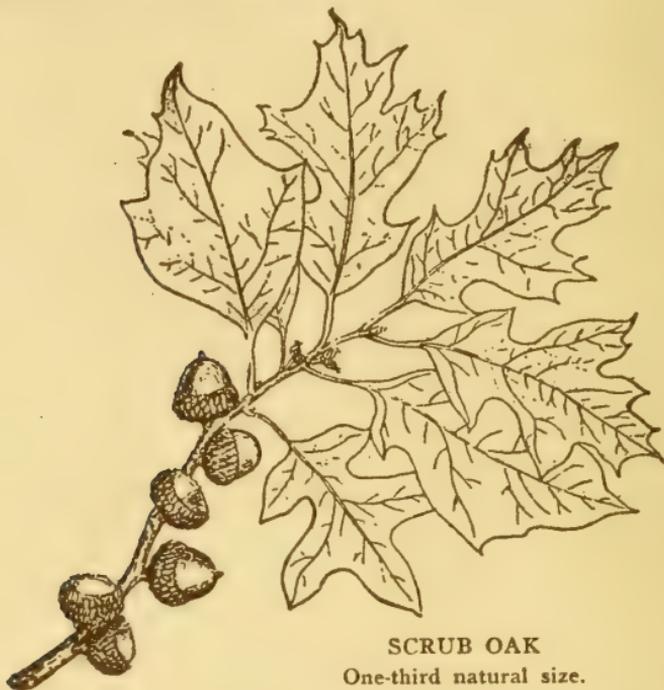
The Willow Oak is found along the coast from New York to Florida and west to Kentucky, Missouri, and Texas. In New York this tree is found locally on Staten Island and rare on Long Island south of the moraine.

Wet and sandy soil, swampy places, and stream borders are the favorite home of this tree. It usually reaches a height of 50 to 60 feet with a diameter of $1\frac{1}{2}$ to 2 feet. Occasionally specimens reach a diameter of four feet. It hybridizes freely with other oaks, particularly the Red Oak. On Staten Island are many interesting hybrid specimens of this tree. It is an attractive ornamental tree. One of the most remarkable Willow Oak trees known is the large specimen in Bartram's Garden in Philadelphia.

SCRUB OAK

Quercus ilicifolia, Wangenheim

THE SCRUB OAK, also called Bear Oak, Ground Oak, and Barren Oak, is the smallest member of the Black Oaks native to eastern North America. It rarely extends 15 feet in height and 5 inches in diameter.



SCRUB OAK
One-third natural size.

The leaves are simple, alternate, 2 to 5 inches long, $1\frac{1}{2}$ to 3 inches wide, 3 to 7-lobed, with bristle tips, dark green and glossy above, whitish beneath, leathery in texture.

The flowers appear with the leaves and are of two kinds. The pollen-bearing are arranged in drooping tassels; the acorn-producing occur in few-flowered clusters on new growth.

The fruit is an acorn maturing in two seasons. The nut is light-brown, about $\frac{1}{2}$ of an inch broad and long, half enclosed in cup. The cup is reddish-brown, scaly, stalkless, hairy within. The acorns are produced in large numbers and occur in dense clusters.

The bark is smooth, grayish to dark-brown. The twigs are grayish to dark-brown. The buds are small, blunt-pointed, chestnut-brown. The wood is of no commercial importance, but is used locally for fuel.

The Scrub Oak is found from Maine to Ohio and south to North Carolina and Kentucky. It is found on dry sterile soil and burned-over areas on Long Island, Staten Island, the highlands of the Hudson, the sandy plains of central New York and locally westward.

AMERICAN ELM

Ulmus americana, Linnaeus

OF ALL TREES native to North America, the American Elm, also called White Elm and Water Elm, is probably the best known and most admired. For beauty, grace, and stateliness this tree has no superior.

The leaves are simple, alternate, 4 to 6 inches long, unequally based. The veins run straight from the midrib to the doubly-toothed margins.

The flowers appear early in spring before the leaves. They are greenish and occur in small drooping clusters.

The fruit is a small seed, surrounded completely by a thin, flat, membrane-like wing. It matures after the flowers, and is about $\frac{1}{2}$ of an inch across. inch across.



AMERICAN ELM
One-fourth natural size.

The bark is grayish-brown, rather thick, roughened by shallow furrows, sometimes flaky or corky. The twigs are smooth, reddish-brown, marked with obscure pale breathing pores. The leaf-scars are marked with three distinct bundle-scars. The buds are egg-shaped, usually smooth, covered with 6 to 10 overlapping reddish-brown scales with darker margins.

The wood is heavy, hard, tough, rather durable, dark-brown to red with lighter sapwood. It is used for barrels, agricultural implements, posts, ties, and novelties.

The American Elm has a total range of more than 2,500,000 square miles. It extends from Newfoundland west to the Rocky Mountains, a distance of 3,000 miles, and south to Florida and Texas, a distance of 1,200 miles. It is common in moist soils, especially along streams and swampy lowlands, throughout New York, except in the Adirondacks above 2,500 feet. It often reaches a height of 80 to 100 feet and a diameter of 2 to 4 feet.

As a forest tree, the American Elm stands in the front rank. Its wide range, good wood, rapid growth, and adaptation to a wide range of soils, suggest good care and protection.

SLIPPERY ELM

Ulmus fulva, Michaux

THE SLIPPERY ELM, also called Red Elm and Moose Elm, has been a well-known tree ever since the pioneer hunters and early travellers learned that its bark has excellent properties for quenching thirst and staying hunger. The bark is still held in esteem for the treatment of throat trouble, fevers and inflammation.

The leaves are simple, alternate, 5 to 7 inches long, rough, unequally based, doubly toothed on margin.

The greenish flowers appear early in spring before the leaves. They occur in few-flowered clusters along twigs.

The fruit is a small seed surrounded completely by a thin, flat, membrane-like wing. It is about $\frac{1}{2}$ of an inch across and matures shortly after the flowers.

The bark is dark-brown tinged with red, becomes rough and furrowed. Inner bark is slippery, fragrant, mucilaginous. The twigs are grayish and rather rough when mature. The buds are dark chestnut-brown, covered with about 12 hairy rusty-brown scales.

The wood is heavy, hard, tough, dark-brown to red, with light sapwood. It is used for barrels, agricultural implements, posts, ties, and novelties.

The Slippery Elm is found from the Valley of the St. Lawrence, south to Florida and west to North Dakota and Texas. It is frequent across New York south of the Adirondacks. The rich soil of the lowlands is its favorite home. It is often found near streams and prefers limestone soil.

In addition to the native elms, the English Elm (*Ulmus campestris*, Linnaeus) has been planted extensively in New York.



SLIPPERY ELM

One-fourth natural size.

Twig section, leaf-scar and flowers, enlarged.

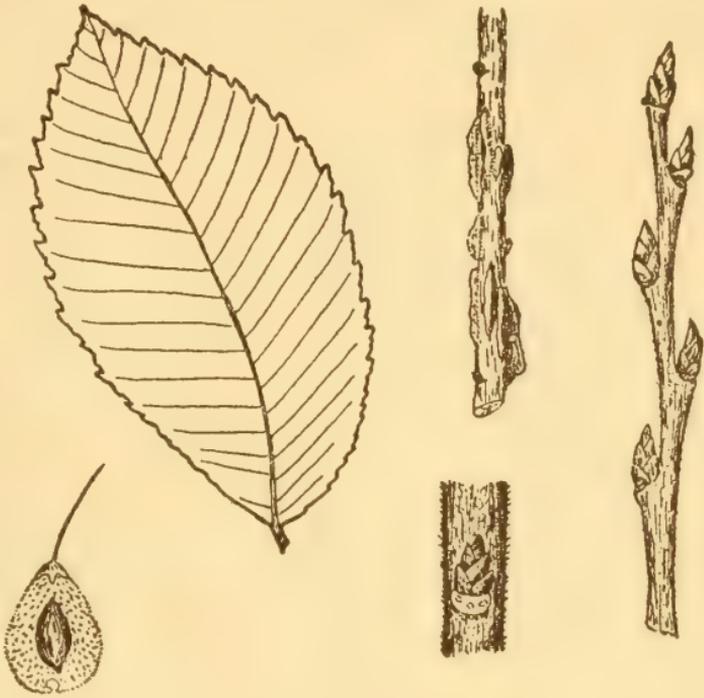
ROCK ELM

Ulmus racemosa, Thomas

THE ROCK ELM, also called Cork Elm, reaches a height of 100 feet and a trunk diameter of 5 feet.

The leaves are alternate, simple, 3 to 6 inches long and about one-half as wide. They are coarsely toothed along the margin, unequally based, thick and firm in texture.

The flowers appear in March and April before the leaves. They occur in slender stalked drooping, raceme-like clusters.



ROCK ELM

The fruit matures in May. It is a small one-seeded samara, surrounded with a thin membranous wing about one-half of an inch long and hairy all over.

The bark on the main trunk is thick, ridged with wide furrows separating flat scaly ridges. The twigs are at first light-brown and hairy, become shiny reddish-brown, finally grayish-brown with corky winged projections. The buds are alternate, egg-shaped, brownish, about one-fourth of an inch long, with minutely hairy bud-scales.

The wood is heavy, very strong, tough, light reddish-brown with light sapwood. It is used for purposes requiring toughness, solidity and flexibility.

The Rock Elm is found from Quebec, westward to Ontario, Michigan and Wisconsin and northeast Nebraska, and southward to New York and central Indiana. In New York this tree is found chiefly in the western and central parts of the State. It occurs from St. Lawrence county south to Herkimer and Broome counties. It is a valuable timber tree and occasionally planted for shade and ornamental purposes.

HACKBERRY

Celtis occidentalis, Linnaeus

THE HACKBERRY, also called Sugarberry, Nettle-tree, and Hack-tree, is not a common tree in New York.

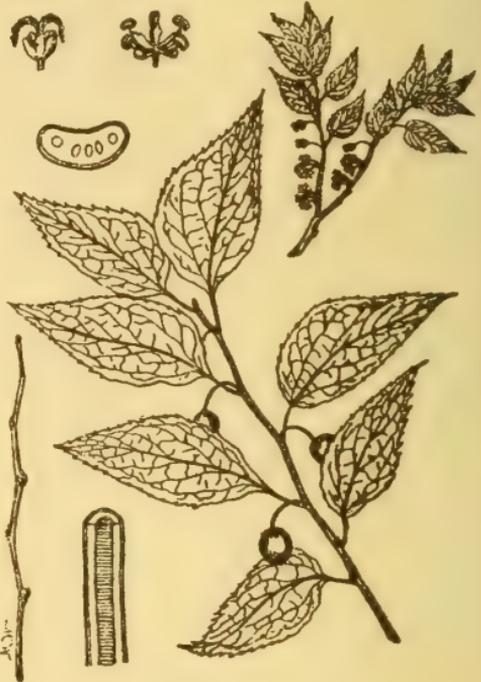
The leaves are simple, alternate, ovate, 2 to 4 inches long, finely toothed along margin, sharp-pointed, rounded and often lopsided at base, rough on upper surface, with prominent primary veins.

The flowers are small, greenish and borne on slender stalks. The fruit is a round, dark purple berry about $\frac{1}{4}$ of an inch in diameter. It matures about September, hangs far into winter, and is eaten freely by birds and other animals.

The grayish-brown bark ranges from smooth, like that of the beech, to very rough. Hard wart-like bark projections are common on medium-sized trees. The twigs are slender, tend to zigzag, and are often grouped in dense clusters known as "witches-brooms." They contain a pith that is made up of thin white plates separated by wide air spaces. This is known as "chambered pith."

The wood is yellowish, rather heavy, and coarse-grained. It is used chiefly for crates, boxes, handles and agricultural implements.

The Hackberry covers a range of 2,000,000 square miles from New England to the Pacific Coast and south to Florida and Texas. It is found locally across southern New York, but infrequent northward through the Hudson valley and westward to Oneida Lake, Ontario lowlands and Lake Erie. It is rare on Long Island. It prefers rich moist soil and is often found near streams. It is rarely over 50 feet high.



HACKBERRY

Twig section, flowers and leaf-scar, enlarged.
One-fourth natural size.

RED MULBERRY

Morus rubra, Linnaeus

THE RED MULBERRY, also known as Black Mulberry and more frequently called "Mulberry," came in the limelight in the early days of American history. The early pioneers were inspired with the false hope that it was a new source of food for the silkworm. The outcome was altogether disappointing.

The leaves are simple, alternate, 3 to 5 inches long, roundish, short-tipped, deep green and with deeply sunken veins on upper surface. Some leaves are lobed and resemble an ordinary mitten. The leaf-stalks give a milky secretion upon being squeezed.

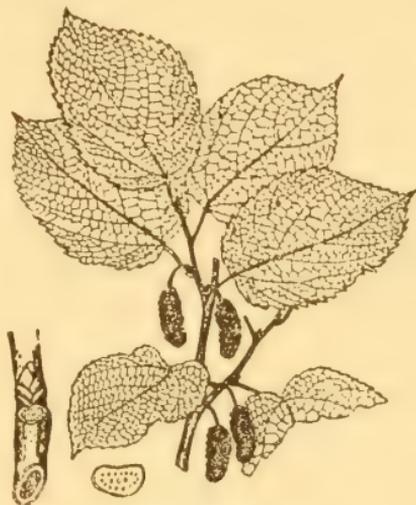
The flowers are of two kinds. Pollen-bearing and seed-producing occur in short drooping tassels.

The fruit is a soft, fleshy, dark red to black aggregation of many-seeded berries. They are sweet, juicy, and greatly relished by man, birds, and various other animals.

The bark is rather thin, dark, grayish-brown, begins to roughen about the third year, peels off in thin scales. The twigs are smooth, clean, light greenish-brown, and bear oval, hollowed-out leaf-scars dotted with numerous bundle-scars. The bowl-shaped leaf-scars are helpful in recognizing this tree in winter.

The wood is soft, light, not strong, orange yellow to brown. It is durable in contact with soil, and used chiefly for fence posts.

The Red Mulberry rarely exceeds 50 feet in height and 2 feet in diameter. It grows from Massachusetts west to Kansas and south to Texas and Florida. It is rather common across the southern part of New York, becoming rare northward to Albany, Oneida and Niagara counties. Rich moist soil of valleys and foothills is its favorite home. The tree should be protected to insure a food supply for birds.



RED MULBERRY

One-fourth natural size.

Twig section, natural size. Leaf-scar enlarged.

LAUREL MAGNOLIA

Magnolia virginiana, Linnaeus

THE LAUREL MAGNOLIA, also called Sweet Bay and Swamp Magnolia, is one of the most beautiful small trees of the eastern states.

The leaves are simple, alternate, 3 to 6 inches long, and glossy above, and whitish beneath. In many parts of its range the leaves persist throughout the winter.

The flowers appear the latter part of June and early July. They are white, globular, about 2 inches wide, very fragrant, and occur solitary.

The fruit is cone-like, oval, about 2 inches long, contains a considerable number of bright red, shiny seeds suspended by a film-like cord.

The bark on young stems is light-gray and smooth, becoming darker gray and scaly on old trunks. The twigs are green, rather slender, bitter, covered with a downy coating. The buds are bright green, about two-fifths of an inch long, and decidedly hairy. The wood is soft, brittle, light yellowish-brown.

The Laurel Magnolia is a characteristic tree of the Coastal Plain. It is found from Massachusetts to Florida, and along the coast to Texas and southern Arkansas. In New York this tree is found south of the moraine on Long Island and also reported from Staten Island. This tree is of little commercial importance, but is well adapted for ornamental planting.



LAUREL MAGNOLIA
One-fourth natural size.

CUCUMBER TREE

Magnolia acuminata, Linnaeus

THE hardest *Magnolia* native to eastern North America is the Cucumber Tree. In appearance it suggests a tropical tree, for its leaves and flowers are large.

The leaves are simple, alternate, thin, egg-shaped, 4 to 12 inches long, pointed at apex, smooth along margin. They fall in response to first frost.

The flowers are large, upright, solitary, bell-shaped, about 3 inches long, greenish tinged with yellow, scarcely perceptible among mass of foliage.

The fruit is a red cucumber-like mass, 2 to 3 inches long, containing scarlet, pea-size seeds suspended by long slender white threads at maturity.

The bark is grayish to brown, breaks up into long furrows. The twigs are smooth, shiny, bitter, rather stout, brown, marked with crescent-shaped leaf-scars. The buds are conical, sharp-pointed, about $\frac{1}{2}$ of an inch long, and pale silky.

The wood is soft, not strong, brittle, light yellowish to reddish-brown. It is used for same purposes as Yellow Poplar.

The Cucumber Tree is found from western New York south to Illinois, Georgia and Arkansas. In New York this tree occurs locally in rich woods in the central and western parts of the State, especially in the Alleghany watershed. It becomes more abundant southward in the State. Rich, moist woods with abundant sunlight is its favorite home. It reaches a height of 80 to 90 feet and a diameter of 3 to 4 feet. Good wood, rapid growth, few foes are among its principal merits. It is a beautiful tree for lawns and parks.



CUCUMBER TREE

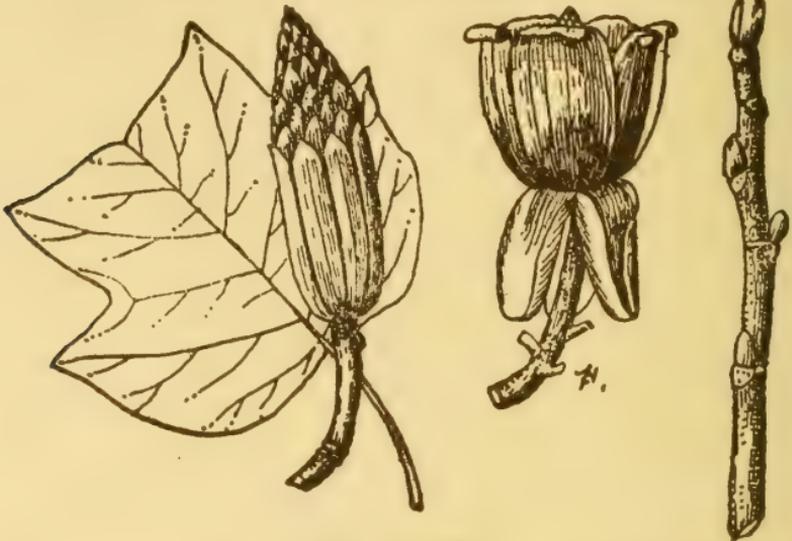
Seeds and twig section, enlarged.
One-fourth natural size.

TULIP TREE

Liriodendron tulipifera, Linnaeus

THE TULIP TREE, also called Yellow Poplar and White-wood, is one of the most distinctive of American trees.

The leaves are simple, alternate, usually 4-lobed, 4 to 6 inches across, appear to have tips cut off at right angle to



TULIP TREE

Leaf and flower, one-third natural size. Twig, two-thirds natural size.

stem, are long-stalked. At the base of each leafstalk are two leaf-appendages.

The flowers are tulip-like, $1\frac{1}{2}$ to 2 inches deep, greenish-yellow with 3 reflexed sepals and 6 petals.

The fruit is made up of long winged nutlets arranged in light-brown, cone-like clusters $2\frac{1}{2}$ to 3 inches long.

The bark when young is smooth, bitter, ash-gray to brown, mottled with light blotches. On old trunks it becomes thick, brown, deeply furrowed. The twigs are smooth, shiny, stout, reddish-brown, marked with pale obscure breathing pores. Complete rings of stipule-scars surround twigs. The buds are smooth, flattened, $\frac{1}{4}$ to $\frac{1}{2}$ of an inch long, blunt-pointed, reddish-brown, covered with one pair of bud-scales. Within buds are small miniature leaves.

The wood is soft, not strong, light, white-yellowish to brownish, works easily. It is used for furniture, interior finishings, woodenware, novelties, and veneer.

The Tulip Tree is found from Rhode Island to Michigan, south to Florida and Arkansas. In New York it is found from Rensselaer and Saratoga counties to the Ontario lowlands and Lake Erie, and southward it becomes more abundant. Deep rich moist soil is its favorite home. It frequently reaches a height of 80 feet and a diameter of 5 feet.

PAPAW

Asimina triloba, Dunal

THE PAPAW is a dainty tree rarely exceeding 30 feet in height. A mere glance at the tree in summer suggests that it has escaped from the tropics, for its leaves are truly tropical and its fruit resembles a stubby banana.

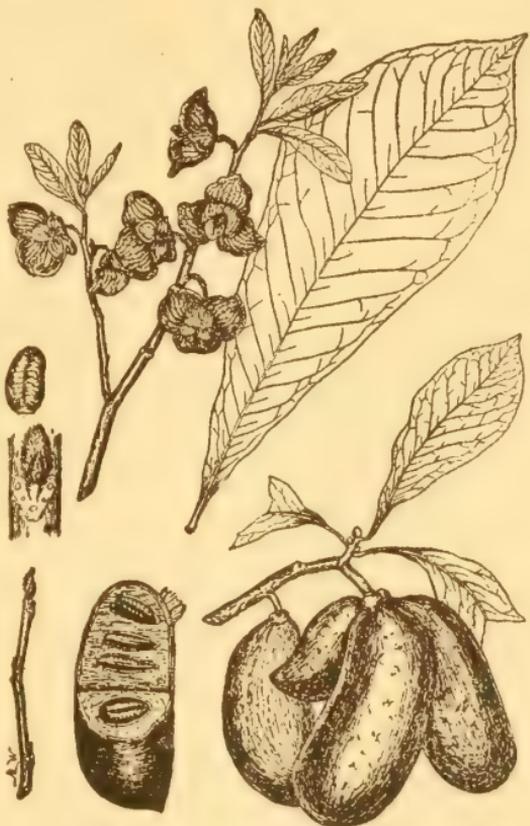
The leaves are simple, alternate, 4 to 12 inches long, thin in texture, short-pointed, long-tapering at base, smooth on margin.

The flowers are large, 1 to 1½ inches wide, solitary, at first green, later reddish.

The fruit suggests a stubby banana, 3 to 5 inches long, at first green, yellowish to dark brown when ripe, contains many dark-brown shiny flat seeds scattered throughout flesh. The fruit is edible.

The bark is thin, smooth, dark-brown, often dotted with light blotches. The twigs are rather slender, smooth, olive-brown, enlarged at nodes. The buds are brown, naked, hairy. Terminal bud is large and flattened. Flower buds are round, one-sixth of an inch in diameter, very hairy, dark-brown. The wood is soft, weak, yellowish to brown. Not used commercially.

The Papaw is found from western New York and New Jersey south to Florida and west to Michigan and Texas. In New York this tree is found from Monroe county southward and westward in low grounds and along streams. This tree is of no commercial value on account of the wood it produces, but it deserves to be planted ornamentally because of its tropical leaves, unique flowers, and peculiar fruit.



PAPAW

One-fourth natural size.
Twig section and bud, enlarged.

SASSAFRAS

Sassafras variifolium, (Salisbury) Kuntze

THE SASSAFRAS, also called Sassafras and Saxifrax, is a distinctive tree. It is recorded that Sassafras bark and roots were among the first cargo shipped from the American colonies. The bark and roots are still used locally in the manufacture of Sassafras Tea.

The leaves are simple, alternate, egg-shaped, 4 to 6 inches long, usually smooth along margin. Sometimes 2 to 5-lobed leaves are found on same twig with the normal leaves.

The flowers appear with the leaves and are of two kinds. They are greenish-yellow, and arranged in loose, short-stalked clusters.

The fruit is a dark-blue, shiny berry borne on a stout red stem. It is excellent bird food.

The bark becomes rough early. On old trunks is reddish-brown, deeply furrowed, separates in thin scales. The twigs are rather brittle, yellowish-green, aromatic, sometimes hairy. The inner bark is very mucilaginous. The buds are about three-fifths of an inch long, slightly hairy, greenish, covered with a few bud-scales.

The wood is soft, brittle, durable, aromatic, dull orange-brown, with light sapwood. It is used for posts, rails, furniture, interior finishing, crates, coffins.

The Sassafras is found from Massachusetts to Florida and west to Michigan and Texas. In New York this tree is common locally across the State except in the Adirondacks and higher Catskills. It is abundant on sandy plains between Albany and Schenectady, and on Long Island and Staten Island. It rarely exceeds 70 feet in height and 3 feet in diameter.



SASSAFRAS

One-fourth natural size.

Single flowers and bud, enlarged.

WITCH-HAZEL

Hamamelis virginiana, Linnaeus

THE WITCH-HAZEL is a very interesting small tree. It has the unusual habit of blossoming late in autumn and a full year elapses between the appearance of its flowers and the maturing of its unusual fruit.

The leaves are simple, alternate, oval, 4 to 6 inches long, usually rounded at apex, oblique at base, coarsely toothed along margin, with prominent veins.

The flowers appear in October or November. They are bright yellow, and occur in few-flowered clusters.

The fruit ripens in October or November with the flowers. It is a yellowish-brown woody pod with two cells in which black shiny seeds are produced. The seeds are often propelled five or more feet when seed pods burst open.

The bark is light-brown, somewhat mottled with light blotches. The twigs are light-brown, smooth, zigzag. The buds are flattish, curved, brown, hairy. The terminal bud is sickle-shaped, about one-third of an inch long. Flower buds are small, round, occur on slender stalks.



WITCH-HAZEL

Single flower and fruit pod, enlarged.
One-fourth natural size.

The wood is hard, light-brown, close-grained. Not used commercially.

The Witch-hazel is found from Nova Scotia to Minnesota, south to Florida and Texas. It is found in most sections of New York, except in the higher elevations of the Adirondacks. Moist and rocky situations are its favorite home. It is very tolerant of shade, which accounts for its being found commonly in the understory of the forest.

SWEET GUM

Liquidambar styraciflua, Linnaeus

THE SWEET GUM, also called Red Gum and Liquidambar, is a handsome and symmetrical tree.

The leaves are simple, alternate, 3 to 5 inches long, broader than long, star-shaped, six-pointed. In autumn they turn to a pale orange to deep red, and when crushed give off fragrant odor.

The flowers are green and of two kinds. Pollen-bearing are arranged in tassels 2 to 3 inches long. Seed-producing occur in long-stalked heads.

The fruit is a long-stalked round head made up of many capsules, each containing many small seeds.

The bark on older trunks is deeply furrowed, grayish-brown and scaly. On younger trunks it is smoother and dark gray. The twigs are stout, angular, smooth, with corky winged projections.

The buds are sharp-pointed, lustrous brown, fragrant when crushed.

The wood is rather hard, strong, reddish-brown, with white sapwood. It is used for boxes, crates, furniture and interior finishing. Large quantities are used in imitation of Circassian Walnut.

The Sweet Gum grows naturally from Connecticut to Florida and as far south as Guatemala. In the swamps of the Coastal Plains it reaches a height of 120 feet and a diameter of 4 feet. This tree is common on Long Island and Staten Island and northward to the southern edge of the Hudson highlands. It is handsome, has a symmetrical form, grows rapidly, produces unique leaves, and has few enemies.



SWEET GUM
One-fourth natural size.

BUTTONWOOD

Platanus occidentalis, Linnaeus

THE BUTTONWOOD, also called Buttonball, Sycamore, and Plane Tree, is one of the largest trees of New York.

The leaves are simple, alternate, broadly ovate, 3 to 5-lobed, 4 to 10 inches across, bright green above, pale green and white wooly below. The leaf-stalks are about 2 inches long, enlarged and hollowed at base.

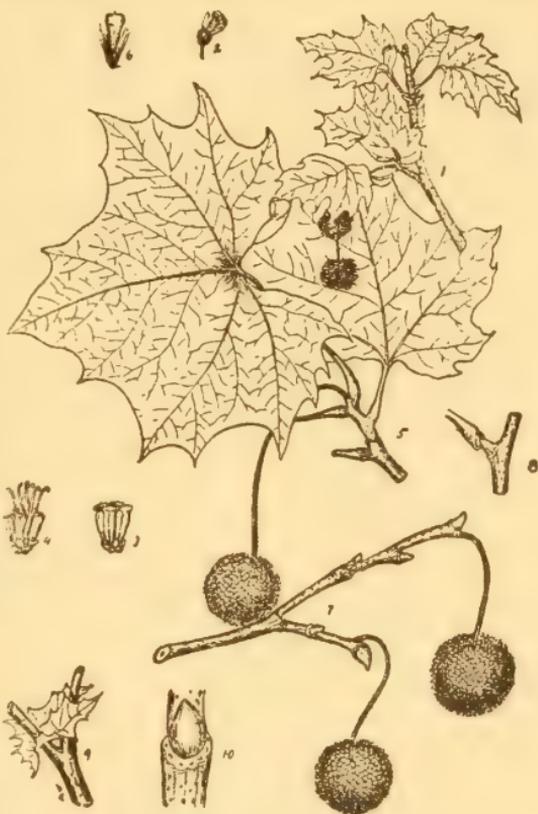
The flowers are of two kinds, occur in dense ball-like heads, attached to twigs by long slender stalks.

The fruit consists of tiny seeds, arranged in ball-like heads about 1 inch in diameter, attached to twigs by long slender stalks.

The bark on old trunks is rather thick, dark-brown, peels off in broad scales. On young stems and the upper part of larger trunks it peels off in thin scales, exposing white, greenish and yellowish inner bark. The twigs are rather stout, at first green and fuzzy, later grayish to brown and smooth. The buds are about $\frac{1}{4}$ of an inch long, conical, dull-pointed, smooth, reddish-brown. Terminal bud is absent.

The wood is hard, strong, reddish-brown. It is used for boxes, furniture, novelties, charcoal, chemicals.

The Buttonwood is native from Maine to Minnesota and south to Florida and Texas. Moist to wet fertile soil are its favorite home. In New York this tree is found from Lake Champlain and Lake George westward to the St. Lawrence, becoming more abundant southward and westward. It is rare on Long Island and Staten Island and absent in the Adirondacks above 1,000 feet. The Oriental Plane Tree, a close relative of our Buttonwood, has been planted locally in New York for ornamental purposes.



BUTTONWOOD

One-fourth natural size.

Flowers and twig sections, enlarged.

SHAD BUSH

Amelanchier canadensis, (Linnaeus) Medicus

THE SHAD BUSH, also called Service Berry, June Berry, and Sarvice, is one of the most conspicuous small trees when in full bloom early in spring. The early settlers observed that it was in full bloom when the shad ascended the rivers to spawn.

The leaves are simple, alternate, egg-shaped, 3 to 4 inches long, sharp-pointed, finely toothed along margin, when young hairy, later smooth.

The flowers appear just when the leaves start to come out. They are white, stalked, arranged in drooping clusters 3 to 5 inches long.

The fruit is a reddish-purple sweet berry, about one-third of an inch in diameter, coated with whitish bloom when fully ripe, matures in June or July.



SHAD BUSH

Flower, fruit, and twig section, enlarged.
One-fourth natural size.

The bark is usually smooth, grayish, often marked with black streaks. The twigs are slender, bright green to purplish-brown, smooth. The buds are slender, conical, $\frac{1}{4}$ of an inch long, 3 to 4 times as long as wide, sharp-pointed, greenish-brown.

The wood is heavy, hard, light to dark brown, checks and warps easily.

The Shad Bush is found from Newfoundland west to Kansas and south to Florida and Louisiana. It is common throughout most sections of the State, especially the highlands of central New York and southward on the Alleghany plateau. It is usually found solitary or in small clumps. Along the border of forests, along fences, roads and water-courses one usually finds this small tree that rarely exceeds 25 feet in height and 12 inches in diameter. Its fine floral beauty recommends the protection of this beautiful tree, which also yields delicious berries for man, birds and other animals.

MOUNTAIN ASH

Pyrus americana, (Marshall) De Candolle

THE MOUNTAIN ASH is one of our small forest trees, rarely exceeding 30 feet in height and 14 inches in diameter. It is essentially a tree of the Northwoods, being found commonly at high altitudes or in and about cool swamps.

The leaves are alternate, 6 to 10 inches long, compound, with 13 to 17 stalkless leaflets. The leaflets occur in pairs, except the terminal ones, are 2 to 3 inches long, sharp-pointed, finely-toothed along margin, and turn to a bright yellow in autumn.

The flowers are white, small, about $\frac{1}{8}$ of an inch wide, arranged in flat clusters 3 to 4 inches wide.

The fruit is a bright-red, round berry, about the size of a pea, arranged in flat-topped clusters 3 to 4 inches wide. The bark is thin, smooth, grayish, somewhat scaly. The twigs are rather stout, smooth, grayish to reddish-brown, marked with pale dots, contain brownish pith.

The buds are purplish-red, smooth or slightly hairy on outside, densely hairy on inside. The terminal buds are about $\frac{1}{4}$ of an inch long, conical, sharp-pointed, covered with 2 or 3 visible scales.

The Mountain Ash is found from Newfoundland to Manitoba, southward to Iowa and Pennsylvania and along the mountains to North Carolina. In New York this tree is common in the cooler and higher parts of the State. In the Adirondacks and Catskills it is abundant. Southward to the Susquehannah valley and westward to Erie county it is found locally. Sometimes it occurs on rocky hillsides and dry ledges. Moist and rocky hillsides and cool swamps are its favorite homes. This tree is too small to produce wood of commercial importance. Its chief merits are its attractive white flowers and beautiful red fruit.

Closely related to the American Mountain Ash is the European Mountain Ash (*Pyrus acuparia*, Linnaeus). It is planted extensively for ornamental purposes.



MOUNTAIN ASH
One-fourth natural size.

THE HAWTHORNS—*Crataegus*

THE HAWTHORNS comprise a big group of small trees. There are more than 30 common species. If one observes their flowers and fruit it is easy to see that they are closely related to the apples, plums, and peaches. The most distinctive feature of their make-up is their stiff thorns on the zigzag branches.



COCKSPUR THORN
One-fourth natural size.

Two common Hawthorns are the Cockspur Thorn and the Scarlet Thorn. The Cockspur Thorn (*Crataegus crus-galli*, Linnaeus) may be recognized by its long, usually unbranched, chestnut brown thorns, its inversely ovate leaves, and its small nearly spherical buds. The white flowers are grouped in round-topped clusters, and the bright apple-like scarlet fruit persists far into winter. This small tree is common locally in New York especially in sandy soil in the central counties.

The Scarlet Hawthorn (*Crataegus coccinea*, Linnaeus) can be recognized by its ovate leaves, and its round, reddish-brown fruit. Both the leaves and the fruit show a tendency to be hairy. The leaves are 5 to 9-lobed, often deep-cleft and finely-toothed along the margin. The nearly round chestnut-brown buds and the slender, straight thorns are also helpful in recognizing this small tree, which is found in meadow pastures, abandoned fields, and waste places across New York south of the Adirondacks. Its abundant bloom, rich scarlet fruit, and attractive autumnal foliage recommend it highly for ornamental planting.

WILD BLACK CHERRY

Prunus serotina, Ehrhart

THE WILD BLACK CHERRY, also called Wild Cherry, Black Cherry, and Cabinet Cherry, is the only native cherry that reaches large tree size. It often attains a height of 75 feet and a diameter of 3 feet.

The leaves are simple, alternate, 2 to 5 inches long, long-pointed, finely-toothed along margin, rather thick, shiny on upper surface and paler below.

The flowers are white, about $\frac{1}{4}$ of an inch across, arranged in spikes 3 to 4 inches long.

The fruit is a purplish-black juicy berry, about one-third of an inch in diameter, grouped in drooping clusters.

The bark on young trunks is smooth, glossy, reddish-brown marked with conspicuous white, horizontally elongated breathing pores, peels off in thin film-like layers exposing green inner bark.

On old trunks it becomes black, rough, breaks up into thick plates. The twigs are smooth, reddish-brown, marked with numerous small whitish breathing pores. Twigs and inner bark have bitter taste and unpleasant odor. The buds are about $\frac{1}{8}$ of an inch long, smooth, glossy, reddish-brown, covered with about 4 visible scales.

The wood is moderately heavy, hard, and strong, fine-grained, with reddish-brown heartwood. It is durable and used for furniture, interior finishings, tools, ties, implements, and high class panels.

The Wild Black Cherry is found from Nova Scotia south to Florida and west to Kansas and Texas. This tree is common to abundant in most sections of New York, up to 3,500 feet in the Adirondacks. Rich bottom-lands and moist hill-sides are its favorite home. We need its fine wood, the birds eat its fruit, and the bees frequent its flowers.



WILD BLACK CHERRY
One-fourth natural size.

FIRE CHERRY

Prunus pennsylvanica, Linnaeus

THE FIRE CHERRY, also called Wild Red Cherry, Bird Cherry, and Pin Cherry, is a small tree seldom more than 30 feet high and 12 inches in diameter.

The leaves are alternate, sometimes paired but never opposite each other. They are simple, 3 to 5 inches long and $\frac{3}{4}$ to $1\frac{1}{4}$ inches wide, finely toothed along margin, bright green and shiny on upper surface and paler below. The flowers appear about May, when leaves are partly developed. They are white, about $\frac{1}{2}$ inch across and arranged in 4 to 5-flowered clusters. The fruit is a round juicy, light-red berry, about $\frac{1}{4}$ of an inch in diameter. The skin is thick and the flesh sour. It ripens in July-August. The bark on young trunks is reddish-brown, rather smooth, marked by large horizontally elongated light-colored breathing pores (lenticels). The outer bark peels off in thin layers and exposes the green bitter inner bark. The twigs are slender, smooth, and bright-red. They are marked with numerous pale



FIRE CHERRY

to yellowish breathing pores, have a bitter taste and peculiar odor. The wood is light, soft, with light brown heartwood.

The Fire Cherry is found from Newfoundland, British Columbia southward to Georgia, Tennessee and Colorado. York it is common north of the coastal region, but is generally absent above 3,500 feet in the Adirondacks. The tree is common along fences, in abandoned fields and rocky woods, particularly on cut-over and burned-over areas. It is a short-lived tree of little commercial importance. It furnishes food for birds and other wild animals.

COMMON LOCUST

Robinia Pseudo-Acacia, Linnaeus

THE COMMON LOCUST, also called Black Locust, Yellow Locust, and Acacia, is a valuable, and when in full bloom a beautiful forest tree. It is unquestionably the best-known American pod-bearing tree.

The leaves are alternate, compound, with 7 to 21 leaflets, 8 to 14 inches long. Leaflets are usually odd in number, short-stalked, 1 to 2 inches long.

The flowers appear in May or June, are cream-white, fragrant, resemble a pea blossom, are arranged in drooping clusters 4 to 5 inches long. The fruit is a small, dark-brown, thin pod, 2 to 4 inches long, $\frac{1}{2}$ of an inch wide, contains 4 to 8 small brown seeds. The bark on both young and old trunks is reddish-brown, becomes thick, deeply furrowed. The twigs are stout, brittle, greenish to reddish-brown, bear two short spines at each node. The buds are small, imbedded in bark, and 3 to 4 occur above each other. The wood is yellowish-brown, very heavy, hard and durable. It is used for posts, insulator pins, ties, fuel and ship-building.



COMMON LOCUST
One-fourth natural size.
Twig section, enlarged.

The Common Locust is found from the mountains of Pennsylvania south to Georgia, west to Iowa and Kansas. It is doubtful if this tree is native in any part of New York, but it has been planted extensively and locally it has escaped cultivation. It is now well established northward to Washington and Saratoga counties and westward to Ontario lowlands and Lake Erie. The most vigorous growth is made on moist fertile soil. Its valuable wood and rapid growth recommend it for planting, especially where the Locust Borer need not be feared. This destructive insect has done heavy damage to many plantations in recent years.

HONEY LOCUST

Gleditsia triacanthos, Linnaeus

THE HONEY LOCUST, also called Sweet Locust, Thorn Tree and Three-thorned Acacia, is the most beautiful pod-bearing tree found in New York.

The leaves are alternate, singly or doubly compound, 7 to 8 inches long. When singly compound they have 18 to 28 leaflets, and when doubly compound have 8 to 14 pinnae each with 18 to 20 leaflets.

The flowers are greenish, appear about May or June, and are of two kinds. The pollen-bearing are arranged in short tassels; the pod-bearing occur in few-flowered clusters.

The fruit is a thin, flat, more or less twisted, reddish-brown pod, 10 to 18 inches long, containing many small flat seeds and often persist far into winter.

The bark on young stems is smooth, brownish, dotted with many oblong breathing pores. On old trunks it becomes grayish-brown to black and roughened with shallow furrows and firm ridges. The branches and trunk usually bear very distinctive, large, three-pronged sharp-pointed thorns. The twigs are smooth, glossy, greenish-brown. The buds are very small, usually 3 at a node, and placed above one another.

The wood is hard, heavy, strong, reddish-brown with pale sapwood. It is durable in contact with soil and used for posts, rails, and general construction work.

The Honey Locust has a rather extensive range from Ontario to Kansas and south to Pennsylvania, Florida and Texas. This tree is apparently native only to the Lake region of New York and westward and southward, but now well established in most sections of the State except the Adirondacks and Catskills. Under favorable conditions it will grow to a height of 80 feet and a diameter of 4 feet. It is a handsome park tree.



HONEY LOCUST

Twig, natural size. Leaves, pod, and thorn.
One-fourth natural size.

REDBUD

Cercis canadensis, Linnaeus

THE REDBUD, also called Judas Tree, is one of the most attractive of our small trees. No tree has more striking distinguishing characteristics.

The leaves are simple, alternate, heart-shaped, 3 to 5 inches long, pointed at apex, entire on margin.

The flowers appear before the leaves, resemble sweet peas, are brilliant red, occur in numerous clusters of 4 to 8 along twigs.

The fruit is a small rose-colored to light-brown, short-stalked, thin, flat pod, $2\frac{1}{2}$ to 3 inches long, about $\frac{1}{2}$ of an inch wide, contains 4 to 8 light-brown flat seeds.

The bark is thin, reddish-brown, peels off into thin scales. The twigs are slender, smooth, light-brown; buds are small, spherical, $\frac{1}{8}$ of an inch across, dark purplish-red, usually occur one above another and often are grouped in small clusters at base of lateral branches.

The wood is heavy, hard, dark reddish-brown with light sapwood. It is of no commercial importance.

The Redbud is found from Ontario to Minnesota, south to Florida and Arkansas. It is being widely planted for ornamental purposes in southern New York, and was probably native in a few places south of the Hudson highlands. Rich fertile lowlands and moist hillsides are its favorite home.

It is difficult to tell at which season of the year the Redbud is most beautiful. Its spring robe of brilliant red blossoms is glorious, its summer dress is resplendent, its autumn garb of yellow trimmed with purplish pods is truly beautiful, and its winter appearance is most charming.



REDBUD

One-fourth natural size.

Twig sections, enlarged.

KENTUCKY COFFEE TREE

Gymnocladus dioica, (Linnaeus) Koch

THE KENTUCKY COFFEE TREE, also called Coffee Nut, Nigger Tree, and Mahogany, attracts attention because of its unusual features. A close relative is native to China.

The leaves are alternate, twice and sometimes thrice compound, 1 to 3 feet long, 1½ to 2 feet wide. Leaflets are egg-shaped, about 2 inches long, sharp-pointed at apex, smooth to wavy along margin.

The flowers appear about June and are of two kinds. The pollen-bearing are greenish-white and grouped in clusters 3 to 4 inches long. The pod-producing are greenish-white and grouped in clusters 6 to 8 inches long.

The fruit is a broad, flat, thick, stubby, reddish-brown pod, 4 to 10 inches long, 2 to 4 inches broad. Pods contain 6 to 9 marble-like brown seeds and often persist far into winter.

The bark is dark gray to blackish-brown, roughened by long shallow furrows. The twigs are very stout, greenish-brown, often covered with a crusty coating, marked with large, broadly heart-shaped leaf-scars and contain wide pinkish to brown pith. The buds are small, downy, almost imbedded in twigs, surrounded by hairy ring of bark, often placed above one another.

The wood is rather heavy, coarse-grained, light-brown to reddish-brown. It is used for posts, rails, and locally for general construction work.

The Kentucky Coffee Tree is found from central New York to Tennessee, west to Minnesota and Oklahoma. In New York this tree occurs from Onondaga county southward and westward. It has been planted throughout the State for ornamental purposes. Rich bottom-lands are its favorite home. It reaches a height of 100 feet and a diameter of 3 feet.



KENTUCKY COFFEE TREE

One-fourth natural size.
Twig section, natural size.

AILANTHUS

Ailanthus glandulosa, Desfontaines

THE AILANTHUS, also called Tree of Heaven, Chinese Sumac, and Paradise Tree, came to this country from China about 150 years ago, and was planted first near Philadelphia. Shortly thereafter it was introduced at Flushing, New York.

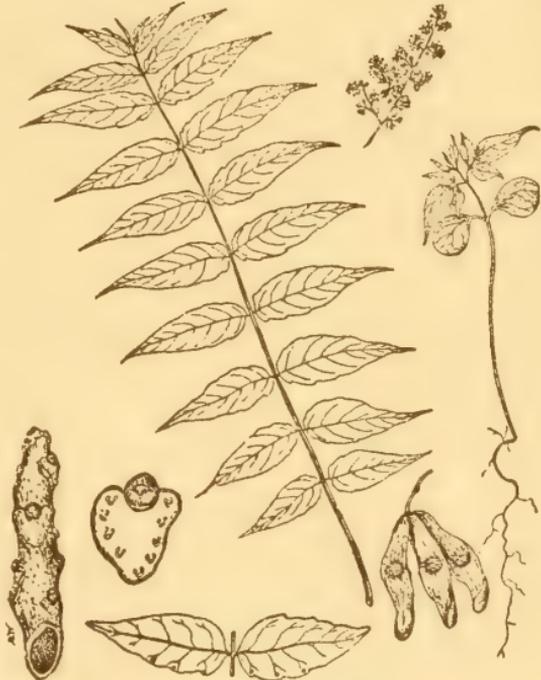
The leaves are alternate, compound, with 11 to 31 leaflets, occasionally 3 feet long. Leaflets are 3 to 5 inches long, egg-shaped, long-pointed at apex, smooth along margin except for a few teeth near base. They produce unpleasant smell when crushed. Glands are usually present near base of leaflets.

The flowers are small, greenish, of two kinds and arranged in loose clusters. Pollen-bearing and seed-producing occur on different

trees. The fruit is a thin winged seed produced in large clusters. The bark on young trees is smooth, thin, light-gray. On older trunks it becomes dark-gray to black. The twigs are very stout, yellowish-green to brown, covered with a velvety down, marked with ochre-colored breathing pores and large heart-shaped leaf-scars with 8 to 14 groups of bundle-scars. The buds are small, round, reddish-brown.

The wood is light, soft, weak, white to pale yellow. It is well adapted to the manufacture of paper pulp.

The Ailanthus has been planted in southern and eastern New York and locally westward across the State. It is well-established about Greater New York. In many places it has escaped cultivation and now forms dense thickets. It is common along fences, in waste places and abandoned fields.



AILANTHUS

One-fourth natural size.
Twig, one-half natural size.
Leaf-scar, slightly enlarged

AMERICAN HOLLY

Ilex opaca, Ait

ALMOST EVERYBODY KNOWS the Christmas Holly, with its spiny-pointed, leathery, evergreen leaves and its bright-red berry clusters.

The leaves are simple, alternate, evergreen, leathery, glossy, with wavy margins and spiny teeth.

The flowers are of two kinds. They occur on different trees, are white and occur in few-flowered clusters.

The fruit is a bright-red berry about the size of a pea.



AMERICAN HOLLY
One-half natural size.

The bark is smooth, grayish to yellowish-brown.

The wood is medium in weight and hardness, not tough, chalky-white. It is used in turnery, cabinet-making, for cheese containers, piano and organ keys.

The American Holly is primarily a tree of the coastal plains region of the South. Near the coast it is found as far north as Massachusetts, and south to Florida, Texas and Missouri. It reaches its greatest abundance in the coastal plains of the South, its largest size in Texas, and its greatest beauty in the foothills of the Carolinas. This tree was probably native in a few places in southern New York, including Long Island and Staten Island. It has been planted locally and is doing well where protected. This important tree should be carefully protected.

For many years an outpost of this tree near Cold Springs, in Dauphin county, Pennsylvania, was believed to be the most northern inland occurrence, but on December 12, 1921, the writer found a new station near McElhattan, in Clinton county, Pennsylvania, at an elevation of 600 feet above sea level—fully 100 miles farther north than any inland occurrence of this tree before recorded. This is now the most northern inland station of Christmas Holly known in America.

HORSE CHESTNUT

Aesculus hippocastaneum, Linnaeus

THE HORSE CHESTNUT has been carried by man from its original home in the mountains of Greece over a considerable part of the civilized world.

The leaves are opposite, compound, with 5 to 7 leaflets. The leaflets are 5 to 7 inches long, about 2 inches wide, inversely egg-shaped, arranged in fan-like form.

The flowers appear in May or June, are large, white, with throats dotted with yellow and purple, arranged in upright clusters 8 to 12 inches high. The fruit is a leathery round capsule, about 2 inches across, roughened with spines, and contain 1 to 3 shiny brown nuts.

The bark is dark-brown, breaks up into thin plates which peel off slowly. The twigs are

stout, reddish-brown, smooth, obscurely dotted with breathing pores, marked with large horseshoe-like leaf-scars each with 5 to 7 groups of bundle-scars. The buds are large, sticky, varnished, reddish-brown. The wood is soft, light weak, whitish.

The Horse Chestnut is a sturdy, rapid-growing tree, now found in every state of the Union, and widely distributed in eastern and southern New York. It does not survive the severe winters of the Adirondack region.



HORSE-CHESTNUT

Twig, one-half natural size.

Leaf, flowers and fruit, one-third natural size.

STAGHORN SUMAC

Rhus typhina, Linnaeus

THE STAGHORN SUMAC, also called Velvet Sumac, is the largest of the native Sumacs. Under favorable conditions it reaches a height of 35 feet and a diameter of 8 inches.

The leaves are alternate, 16 to 24 inches long, compound, with 11 to 31 leaflets. Leaf-stalks are hairy. Leaf-scars are U-shaped and contain 3 groups of small greenish bundle-scars.

The flowers are small greenish-yellow, appear about May, occur in pyramid-like panicles 5 to 12 inches long and 4 to 6 inches broad.

The fruit is a small red drupe arranged in conspicuous red heads 5 to 8 inches long and 4 to 6 inches broad.

The bark on old trunks is rough, dark-brown; on younger trunks it is smooth, thin, covered with numerous yellowish-brown dots. The twigs are stout, clumsy, covered with a dense coating of velvety hairs, contain a wide yellowish-brown pith, when cut or bruised they yield a milky sap. The buds are small, round and hairy.



STAGHORN SUMAC

One-fourth natural size.

Leaf-scars, seed, and single flowers, enlarged

The wood is soft, brittle, rather satiny to touch, orange-colored streaked with green.

The Staghorn Sumac is found from New Brunswick to Minnesota, south to Georgia and Alabama. This tree is common throughout New York, but rare on Long Island. It goes up to 1,600 feet in the Adirondacks. Fertile, dry uplands are its favorite home. It is common on abandoned fields and fence rows. It is highly prized on account of its autumnal foliage and the coloration of its fruit.

POISON SUMAC

Rhus Vernix, Linnaeus

THE POISON SUMAC, also called Poison Elder, and Swamp Sumac, differs from the other sumac in that it produces ivory-white fruit.

The leaves are alternate, 7 to 14 inches long, compound with 7 to 13 leaflets. The leaflets are 3 to 4 inches long,



POISON SUMAC
One-half natural size.

narrowly egg-shaped, smooth along margin, dark-green and shiny above, pale on lower surface.

The flowers appear in June or July. The pollen-bearing and seed-producing occur on different trees. They are small, yellowish-green, arranged in drooping panicles. The fruit is small, round, glossy ivory-white drupe, arranged in loose drooping clusters. The bark is smooth, somewhat streaked, light to dark gray, marked with elongated dots. The twigs are stout, orange-brown, smooth, glossy. The buds are purplish, about two-fifths of an inch long, sharp-pointed.

The wood is soft, brittle, coarse-grained, light-yellow.

The Poison Sumac is found from Ontario to Minnesota south to Florida and Louisiana. In New York this tree is found from Lake Champlain to Jefferson county southward and westward through the State outside of the higher Adirondack region. Swamps, low grounds and moist slopes are its favorite home. This tree is one of our most poisonous plants. Some people are immune from its attack while others are highly susceptible.

The Dwarf Sumac—*Rhus copallina*, Linnaeus—is a non-poisonous Sumac native in New York. It rarely exceeds 25 feet in height and may be distinguished by its leaves with winged stalks and leaflets with smooth margins.

THE MAPLES

NO TREES are better known or more widely useful than the maples, of which there are 70 different kinds in the World. They are abundant in China and Japan, common in Europe, widely distributed throughout North America. Of the 13 maples found in North America, 9 occur east of the Rocky Mountains. In New York there are 6 native maples. They are the Sugar Maple, Silver Maple, Red Maple, Mountain Maple, Striped Maple, and Ash-leaved Maple. Two European maples, the Norway Maple and Sycamore Maple, have been planted widely for ornamental purposes in this State.

No New York tree group shows such a wide variation in their leaves, twigs, flowers, fruit and other organs as do the maples. Most of them have simple leaves, but one in this State has compound leaves. The leaves range from large to small, and from smooth to hairy. The twigs have colors from green to brown and red. The flowers of the maples may occur in small lateral clusters, in long terminal racemes, or in drooping clusters. Some appear before the leaves (Red Maple, Silver Maple), others with the leaves (Sugar Maple, Ash-leaved Maple), and still others after the leaves (Striped Maple, Mountain Maple). The fruit also varies widely in size, divergence of the wings, and the arrangements in clusters. Some maples mature their fruit in early summer (Red Maple and Silver Maple). Their seeds will germinate the same year they are produced. Other maples mature their fruit in late summer and early autumn. The seeds of these lay over until the next year before germinating. The maples also show wide preferences for places to grow. The Red Maple prefers wet situations, others choose moist sites, while the Mountain Maple is usually found in rock situations.

The sign of the maples is the typical winged seed which occurs in pairs, and forms the well-known maple key, which is an unfailling distinguishing characteristic. In summer the leaves, which always occur opposite each other, are a helpful means of identification.

The maples are among the most widely distributed and most useful trees in New York. They occur in all parts of the State, and yield many valuable products that we use in our everyday life.

SUGAR MAPLE

Acer saccharum, Marsh

THE SUGAR MAPLE, also called Hard Maple and Rock Maple, is probably the best known American hardwood tree.

The leaves are simple, opposite, 3 to 5 inches long, coarsely-toothed, dark-green above and pale below.

The flowers are yellowish-green, appear in April and May with the leaves. Both pollen-bearing and seed-producing occur in drooping, slender-stalked clusters on the new growth.

The fruit is a two-winged maple key. The wings are about an inch long and are almost parallel to each other or slightly divergent.

The bark is grayish to brownish-black, roughened with shallow furrows. The twigs are slender, smooth, reddish to orange-brown, marked with pale dots. The buds are brown, conical, sharp-pointed, covered with 8 to 10 exposed scales.

The wood is heavy, hard, close-grained, light-brown to reddish.

It is an all-purpose wood, being manufactured into not less than 500 articles of commerce. The Sugar Maple is found from Newfoundland to Manitoba, south to Florida and Texas. It occurs in every state east of the Mississippi, but is rare in the South. This tree is common throughout New York, except on southern Long Island. Under favorable conditions it reaches a height of 100 feet and a diameter of 4 feet. As a timber tree the Sugar Maple has no superiors, as a memorial tree it is among the best, and as an ornamental and street tree it is in the front rank.



SUGAR MAPLE

One-fourth natural size.

Twig one-half natural size. Single flowers, enlarged.

SILVER MAPLE

Acer saccharinum, Linnaeus

THE SILVER MAPLE, also called White Maple, Soft Maple and River Maple, is one of the best known American trees on account of its wide natural range and its general use for shade and ornamental planting.

The leaves are simple, opposite, 5-lobed, silvery white on lower surface, divided by deep clefts with rounded bases. The base of the clefts of the Red Maple are sharp-angled.

The flowers are reddish to crimson, occur in compact clusters along twigs early in spring before the leaves appear.

The fruit is a typical two-winged maple key. The wings are 2 to 3 inches long and wide-spreading.

The bark on branches and young stems is smooth and gray; on old trunks it becomes grayish-brown and separates in thin flakes. The twigs are slender, glossy, reddish-brown, have disagreeable odor if broken, are marked with many light dots. The buds are round, red, covered with 6 to 8 visible scales, clustered in groups along twigs.

The wood is moderately hard, rather brittle, close-grained, light-brown with wide white sapwood. It is used in the manufacture of paper, berry baskets, boxboards and many small household articles.

The Silver Maple is found from New Brunswick to Florida and west to the Dakotas and Oklahoma. In New York this tree is generally distributed throughout the State except the higher Adirondacks. Moist to wet soils, stream banks, and borders of ponds and lakes are its favorite home. This tree grows rapidly and may reach a height of 80 feet and diameter of 3 feet. Formerly it was planted extensively for ornamental purposes, but now it is rarely planted, for it is short-lived, has many enemies, and suffers much from the wind, snow, and ice.



SILVER MAPLE
One-fourth natural size.

RED MAPLE

Acer rubrum, Linnaeus

AT ALL SEASONS of the year the Red Maple, also called Scarlet Maple, Soft Maple, Swamp Maple and Water Maple, is a beautiful red. In autumn it is at its best. Then it stands out among its associates as a flaming torch of scarlet and crimson.

The leaves are simple, opposite, about 3 inches long, 3 to 5-lobed, pale-green to whitish on lower surface. The clefts between lobes are shallow and sharp-angled.

The flowers are red, appear early in spring before the leaves, are arranged in numerous small clusters.

The fruit is a typical two-winged maple key. The wings are less than an inch long, and not wide-spreading from each other.



RED MAPLE
One-fourth natural size.

The bark on branches and young trunks is smooth and gray; on older trunks is grayish-brown and shags off in small thin plates. The twigs are smooth, red, marked with light dots. The buds are round, red, covered with 6 to 8 exposed scales, clustered in groups along twigs. They are similar to those of the Silver Maple.

The wood is moderately hard, rather brittle, close-grained, light-brown with wide and white sapwood. It is used in the manufacture of paper, berry baskets, box-boards and many small household articles.

The Red Maple is one of the most widely distributed trees of North America. This tree is common in nearly all sections of New York. Wet to swamp situations, fertile lowlands, and moist hillsides are its favorite home.

The Red Maple has rare beauty, produces good wood and grows to a height of 100 feet and a diameter of 4 feet. For ornamental planting it is superior to the Silver Maple.

STRIPED MAPLE

Acer pennsylvanicum, Linnaeus

THE STRIPED MAPLE, also called Moosewood and Whistlewood, is one of the most attractive and distinctive trees in the forests of New York.

The leaves are simple, opposite, goose foot-like, 3-lobed, with rusty brown to reddish hairs on lower surface.

The flowers are small, bell-shaped, greenish to yellow, arranged in drooping clusters 3 to 4 inches long.

The fruit is a two-winged maple key. The wings are about $\frac{3}{4}$ of an inch long, and rather divergent.

The twigs are stout, smooth, reddish, marked with a few dots, contain brown pith. The buds are two-fifths of an inch long, obviously stalked, covered with two visible red scales.

The wood is light, soft and of no commercial importance.

The Striped Maple is found from Nova Scotia to Minnesota, and south to Pennsylvania and Georgia. It is common in northern New York and rarer towards the western and southern parts of the State. Moist, cool and shaded mountain slopes and ravines are its favorite home. This tree rarely exceeds 30 feet in height, possesses rare beauty and deserves wide ornamental planting.



STRIPED MAPLE

One-third natural size.

Twig, one-half natural size.

MOUNTAIN MAPLE

Acer spicatum, Lambert

THE MOUNTAIN MAPLE has a good name, for it is truly a tree of the mountains. One usually finds it on rocky hillsides and along the border of ravines. It seldom exceeds 25 feet in height.



MOUNTAIN MAPLE
One-fourth natural size.

The leaves are simple, opposite, usually 3-lobed, 3 to 5 inches long, coarsely-toothed, light and hairy on lower surface.

The flowers do not appear until early summer. They are white and arranged in erect spikes about 3 inches long.

The fruit is a typical maple key ripening in autumn and often hanging into winter. The fruit keys are the smallest of the native maples.

A close examination of the reddish-brown twigs shows them covered with a whitish coating of fine hairs. The buds are one-fourth of an inch long, blunt-pointed, short-stalked, covered with a few visible greenish to grayish scales.

The Mountain Maple is found from Newfoundland to Manitoba, south to Michigan and Pennsylvania and along the mountains to Georgia. This tree is common in northern New York, less common southward and becomes very rare south of the Hudson highlands. It is not found on Long Island and Staten Island. This tree is of no commercial importance, but it is valuable as a soil protector and is very desirable for ornamental planting.

ASH-LEAVED MAPLE

Acer Negundo, Linnaeus

THE ASH-LEAVED MAPLE, also called Box Elder and Water Ash, is the only New York maple with compound leaves. All other maples have simple leaves.

The leaves are opposite, compound, with 3 to 5 leaflets. Leaflets are 2 to 4 inches long, coarsely-toothed. The leaf-scars completely encircle the twigs.

The flowers are yellowish-green suspended on slender stalks in small open clusters. The pollen-bearing and seed-producing occur on different trees.

The fruit is a typical two-winged maple key, which matures about September, occurs in drooping clusters, often persists far into winter. The wings are 1½ to 2 inches long, and usually incurved.

The bark on branches and young trunks is smooth and grayish-brown; on older trunks becomes dark and breaks up into shallow furrows. The twigs are stout, greenish to purplish-green, smooth, often covered with a whitish crusty coating. The buds are rather large, egg-shaped, short-stalked, white-wooly, grouped at nodes in clusters of 2 to 3. The outer pair of bud-scales completely covers the inner pair.

The wood is light, soft, close-grained, creamy white, not durable. It is used in the manufacture of pulp, wooden-ware, barrels and cheap furniture.

The natural range of Ash-leaved Maple is equalled by few American trees. It covers almost three million square miles from New England to Alberta, south to Florida, Texas and Mexico. In New York it is common in the eastern, central, western, and southern sections of the State, except at higher elevations. Locally it has escaped cultivation. Wet to moist sites along streams and borders of lakes and ponds are its favorite home.



ASH-LEAVED MAPLE
Leaf, one-third natural size. Twig and fruit,
two-thirds natural size.

NORWAY MAPLE

Acer platanoides, Linnaeus

THE NORWAY MAPLE is one of the most popular street trees in the United States. There are very few towns and cities in which this tree is not found. It comes to us from Europe, where it is found from Norway to Switzerland.

The leaves resemble those of the Sugar Maple, but are deeper green in color and firmer in texture. One characteristic by which it can always be distinguished is the presence of milky sap in the leaf-stalks. If pressed or twisted the leaf-stalks always yield a few drops of milky sap. In early spring the yellowish-green flowers arranged in clusters along the twigs are distinctive. In winter the large, red, blunt-pointed glossy buds are a sure means of identification. In late summer the large fruit keys and wide-spreading wings ripen and may hang on the tree for months.



NORWAY MAPLE
One-half natural size.

The Norway Maple has many merits as a street tree. It is hardy, rather free from disease and insect attacks, retains its leaves longer than the native maples, and endures well the smoke, dust and drought of the city. It has been widely planted throughout New York.

Another European maple occurs locally in New York. It is the Sycamore Maple (*Acer Pseudo-platanus*, Linnaeus), It can be distinguished easily by its firm, 3 to 5-lobed leaves with sharply-toothed margins, and its large, blunt-pointed green buds. The fruit keys are smaller than those of the Norway Maple. It does not thrive on all kinds of soil and has not been planted extensively in New York.

BASSWOOD

Tilia americana, Linnaeus

THE BASSWOOD is a tree of many names. Among them are Linden, Lynn, Lime-tree, White-wood, Beetree, and Whistle-wood.

The leaves are simple, alternate, egg-shaped to round, 4 to 7 inches long, firm in texture, toothed along margin, unequally heart-shaped at base, tufts of rusty hair often occur in axils of veins.

The flowers appear in June or July. They are small, yellowish - white, sweet, fragrant, 5 to 20 in a cluster, attached to a wing-like bract by a slender stalk.

The fruit is a woody, nut-like berry about the size of a pea. It usually occurs in small clusters attached to a wing-like bract by slender stalks, often persists far into winter.

The bark on young stems is smooth and dark-gray, on older trunks it becomes thick and clearly furrowed.

The twigs are smooth, shiny, rather stout, bright-red. The buds are egg-shaped, 2 - ranked, stout, blunt-pointed, usually deep-red, with 3 visible bud-scales.

The wood is light, soft, light-brown to nearly white. It is used in the manufacture of paper pulp, crates, furniture, kegs, pails, berry baskets.

The Basswood is found from New Brunswick to Manitoba, southward to Georgia and Texas. It is common in most sections of New York. In the Adirondacks it is found up to 3,200 feet. Rich, moist bottom-lands and hillsides are its favorite home. It reaches a height of 70 to 80 feet and sprouts freely.

Two species of European Basswood have been planted extensively in New York. They are the Small-leaved Linden and the Large-leaved Linden.



BASSWOOD

One-fourth natural size.

Twig, one-half natural size. Flower, leaf-scar and twig section, enlarged.

FLOWERING DOGWOOD

Cornus florida, Linnaeus

THE FLOWERING DOGWOOD is among the best-known trees of eastern North America.

The leaves are simple, opposite, 3 to 5 inches long, 2 to 3 inches wide, smooth or wavy along margin, often clustered at end of twigs. In autumn they become a beautiful red.

The flowers appear about April in greenish clusters surrounded by large white bracts.

The fruit is a scarlet berry about three-fifths of an inch long, arranged in clusters of 2 to 5.

The bark on young stems is smooth, light-brown to reddish-gray; on old stems becomes reddish-brown and divides into squarish blocks.

The twigs are usually smooth, red-tinged with green, often glossy. The flower buds are goblet-like, about two-fifths of an inch in diameter. The wood is hard, heavy, strong, reddish-brown to pinkish, with light sapwood. It is used for tool handles, shuttles, golf-stick heads.

The Flowering Dogwood is found from Massachusetts to Michigan, Florida and Texas. It is common across central New York, northward to Rensselaer and Saratoga counties and westward to Erie county. Southward it is abundant locally.



FLOWERING DOGWOOD
One-third natural size.

BLACK GUM

Nyssa sylvatica, Marshall

THE BLACK GUM, also called Sour Gum, Tupelo, and Pepperidge, is at its best in autumn when the entire crown is often clothed with a complete garment of flaming red. In winter when the foliage is off it has a strikingly picturesque form. The stem often continues from the base to the tip without dividing. In young and middle-aged trees the top branches take an upright position, the lower ones droop, while those along the middle stand out horizontally.

The leaves are simple, alternate, 2 to 5 inches long, oval, blunt-pointed, wedge-shaped at the base, smooth along margin.

The twigs are smooth, grayish-brown, and dotted with crescent-shaped leaf-scars each marked with three distinct bundle-scars. The buds are reddish-brown and scattered alternately along twigs.

On young trunks the bark is smooth to scaly. It breaks into squarish reddish-brown to black blocks on older stems.

The fruit is a dark blue fleshy berry about one-third of an inch long. Each berry contains a single hard-shelled seed. Several berries usually occur in a slender-stalked cluster. Some birds eat the berries freely.

The wood is very tough and cross-grained. It is hard to work, warps easily, and is not durable in contact with the soil. Farmers have disliked the wood ever since they attempted to split it for rails. In the hard coal mines it is used for rollers carrying ropes and cables.

The Black Gum is found from Maine to Florida, west to Michigan and Texas. It is common across the southern and central part of New York, and local to rare northward to Lake George. The best growth is made in wet places. This tree rarely exceeds 60 feet in height and 2 feet in diameter.



BLACK GUM

Twig, natural size. Bud and leaf-scar, enlarged. Leaves and fruit, one-third natural size.

PERSIMMON

Diospyros virginiana, Linnaeus

THE PERSIMMON is best known by its fruit, which is the largest berry produced by any American forest tree. There is no better way to get acquainted with this tree than to try to eat its fruit before it is ripe. Its harsh puckery taste draws the lips and chokes the throat.



PERSIMMON
One-half natural size.

The yellowish to white flowers appear in May.

The fruit is a reddish-yellow pulpy berry, one to one and one-half inches in diameter. The bitterness disappears with full maturity. The leaves are simple, alternate, oval, shiny, 4 to 6 inches long, sharp-pointed, smooth along margin. The twigs are reddish-brown, with rather large pith. They bear broadly egg-shaped buds, are marked with half-moon-shaped leaf-scars with only one bundle-scar. The bark is deeply furrowed, breaks into dark-gray to black squarish blocks separated by furrows that are cinnamon-red along the bottom.

The wood is hard, heavy and strong. The heartwood is brown to black; the sapwood is wide and white to yellowish. It is used for golfstick heads and shuttles.

The Persimmon is found from Rhode Island to Florida, west to Kansas and Texas. It thrives best on the light sandy soil of the warm South. In New York it occurs on Long Island, Staten Island and in Westchester county. It rarely exceeds 50 feet in height and 18 inches in diameter.

WHITE ASH

Fraxinus americana, Linnaeus

THE WHITE ASH is the most beautiful and useful of our native Ashes.

The leaves are opposite, about 10 inches long, compound, with 5 to 9 leaflets. Leaflets are 3 to 5 inches long, evidently stalked, smooth or obscurely toothed on margin, smooth and dark - green above, silvery-white below.

The flowers are of two kinds. The pollen-bearing occur in dense reddish-purple clusters, the seed-producing in rather open panicles.

The fruit is a winged seed, 1 to 2 inches long. The wing is long, narrow, attached to the end of seed. The seeds are grouped in loose drooping clusters.

The grayish-brown, and rather thick bark soon becomes rough, dividing into diamond-shaped fissures. The twigs are smooth, grayish-brown, flattened at nodes, marked with scattered pale dots. The buds are opposite, egg-shaped, dark-brown, blunt-pointed. Terminal buds are larger than the laterals.

The wood is very heavy, hard, tough, elastic, with light sapwood and brownish heartwood. It is used widely, particularly for athletic equipment, agricultural implements, tools, furniture, interior finishings.

The White Ash is found from Nova Scotia to Minnesota to Florida and Texas. It is common throughout New York, going up to about 2,000 feet in the Adirondacks. It is found on the north shore of Long Island and on Staten island. Fertile, moist soils, moist woods, meadow-lands, borders of lakes and streams are its favorite home. It often becomes 70 to 80 feet high and 3 feet in diameter, grows rapidly, is easily propagated.

The Red Ash—*Fraxinus pennsylvanica*—is a medium-sized tree. It can be distinguished from the White Ash by its hairy twigs and leaf-stalks. Its leaflets are narrower. It is common throughout New York outside and chiefly south of the Adirondacks.



WHITE ASH
One-fourth natural size.

BLACK ASH

Fraxinus nigra, Marshall

THE BLACK ASH is a tree of the swamps or other moist places. The early settlers called it Hoop Ash and the Indians called it Basket Ash.

The leaves are opposite, 10 to 14 inches long, compound, with 7 to 11 leaflets. The leaflets are 3 to 5 inches long, finely-toothed along margin, all are stalkless except the terminal one.

The flowers are similar to those of White Ash.

The fruit is a winged seed similar to that of White Ash, but is broader winged, notched at apex, and the wing completely surrounds flattened seed.

The bark is thin, grayish, very shallowly furrowed, peels off in powdery to corky fine scales. The twigs are smooth, stout, light-gray. The buds are opposite, black, sharp-pointed.

The wood is soft, rather coarse-grained, with white sapwood and dark-brown heartwood. It is used for baskets, hoops, furniture, interior finishings.

The Black Ash is found from Newfoundland to Manitoba, south to Virginia and Arkansas. It is common in low or wet soil across New York and westward to Lake Erie. It is rare south of the Hudson highlands. This tree, which usually has a slender stem, may reach a height of 60 to 80 feet.

The only other ash tree found in New York with black buds is the European Ash—*Fraxinus excelsior*, Linnaeus. Its buds are large, jet black and decidedly round-pointed. The leaves are not so large as those of the Black Ash and the leaflets are usually stalked.



BLACK ASH
One-fourth natural size.

CATALPA

Catalpa bignonioides, Walter

THE CATALPA, also called Indian Bean and Cigar Tree, is not native to New York, but has been planted widely for ornamental purposes, and locally for reforestation.

The leaves are simple, opposite or 3 may occur in a whorl, 6 to 10 inches long, 4 to 5 inches wide. heart-shaped at base, sharp-pointed at apex, smooth or wavy on margin. The leaf-scars are large, elliptical, with bundle-scars arranged in an ellipse.

The flowers appear in June or July, are white, sometimes marked with yellow to red dots, arranged in large erect clusters, 8 to 10 inches high.

The fruit is a long bean-like capsule which often persists far into winter, contains many flattened winged seeds.

The bark is light-brown and scaly. The twigs are stout, smooth, yellowish-brown marked with numerous dots and large leaf-scars. The buds are very small, often imbedded in bark, less than $\frac{1}{8}$ of an inch long.

The wood is soft, coarse-grained, durable, light-brown with satiny surface and kerosene-like odor.

Two species of Catalpa have been planted in New York—Eastern Catalpa and Western Catalpa. The original range of the Eastern Catalpa was from Georgia and Florida to Mississippi, but its range has been extended to most of the eastern States. It is found in central and southern New York. The Western Catalpa is native to the bottom-lands from lower Indiana to Missouri and Texas.



CATALPA
One-third natural size.

TREE TESTS

THE best way to find out if you really know trees is to organize a tree test among your friends. I know of no more delightful out-of-doors pastime for a group of boys or girls than to go out among the trees and actually find out who can come out on top in a tree-naming contest. The first thing to do is to select a leader, if you do not already have one. He will select the trees for the test. After you have examined the first test tree carefully, you will write your answer in the blank space following the number one in the blank tree tests that follow. Then, the leader will select a second tree and you will write your answer in the second blank space following the number two, and so on until your first test of ten trees is completed. As soon as a test is completed the test sheet of all who took part in the contest is corrected, and then you will know just how well you know the trees. For thirteen years the author of this booklet conducted tree tests in the open, and he remembers them as the most pleasant feature of all his teaching experiences.

TREE TEST—I. NAME OF TREE

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Name _____

TREE TEST—II. NAME OF TREE

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Name _____

A TREE RECORD

EVERY boy and girl that studies trees will find it interesting to keep a record of every different kind that can be found. In years to come this tree record will be a precious possession, and serve as a pleasant reminder of days among the trees. In any locality one should find 25 different trees and in many places 50 or even more can be found.

List the trees you have met on your hikes, about the camp, or along the roadside on this sheet and opposite each tree name enter the page of this booklet upon which it is described. The boy or the girl who can fill up all the following blank spaces will know more than twice the number of trees required to pass the tree test in scouting. To know 25 trees means that you are acquainted with about one-third of all the common trees of New York. This is an accomplishment of which you will have a right to feel proud. Today is the best time to begin your tree record.

	NAME OF TREE	DESCRIBED ON PAGE
1.	-----	-----
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25.	-----	-----
Date	-----	-----
	Name	-----

INSPIRATION IN TREES

By CHARLES LATHROP PACK,

President, American Tree Association

TO the trees the poet and the orator have turned all through the ages for some of their finest word settings. One that has great appeal is that of the Rev. Francis E. Clark, founder of the Christian Endeavor Societies of the world, who refers to "the Creator as the Great Tree Maker."



THEN, TOO, there is the sentiment the Father of Arbor Day, J. Sterling Morton, left in the wonderful memorial grove he planted in Nebraska when he arranged for a tablet, among the trees he loved, which says: "If ye seek my monument look around you."



TREES, man's best friend, the friend without whom existence is impossible, picture life in all its variety. Look at the wind-swept coast and there you will find struggling for existence among the rocks the trees. Thus does man, buffeted by the winds of fortune, struggle. You will find the trees clinging to river banks in their endeavor to hold those barriers in place against the flood time. Again you will find the trees mothering the springs and protecting them from the ravages of the sun that they may feed first the rivulet, then the stream that at last becomes the mighty river of commerce.



WE can look back through the ages and find that when the trees have gone, civilizations have disappeared. Nature is the great teacher, and when man violates her laws he must pay a terrible penalty. Nature works slowly, but her decisions and ends are sure as the coming and going of the sun. To Nature's laws man must give heed if he continues to inhabit the earth, for all life is bound up in her mandates.



WE see this enthralling mystery of life everywhere; in the seed that becomes the apple blossom; the flower that gives its nectar to the honey maker; in the roots of the tree that, buried, nevertheless gives back ever renewing life as a reward to those who plant. Kilmer pen-pictured this in that immortal verse about the "tree that looks at God all day and lifts its leafy arms to pray."

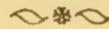
TURNING to the tree and the part it plays in man's existence we find it the corner stone of his existence because of the part the forest products play in commerce.



THEODORE ROOSEVELT expressed it well when he said: "A people without children would face a hopeless future; a country without trees is almost as helpless; forests which are so used that they cannot renew themselves will soon vanish, and with them all their benefits. When you help to preserve our forests or plant new ones you are acting the part of good citizens."



WE live by example. So in planting trees we set a fine example to others, for they see what you have done and thus the message of the trees is spread.



THAT this is of the utmost importance is set forth by Mrs. John Dickinson Sherman, President of the General Federation of Women's Clubs, when she says: "There can be no more important educational work than turning the attention of the new generations to the importance of trees. On every hand we will see this importance if we will but look. The thing is to get us to look."



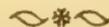
A CAMPAIGN of education must be carried on all the time on behalf of trees because the trees cannot speak for themselves.



WE must get more people to consider the beauty of trees; the value of trees; the economic situation bound up in trees; all the trees mean to us.



CAN you imagine this country without trees?



IF the planting of a tree carries you into the world beyond its beauty, into the world of service all trees perform, then the tree has, indeed, opened up a world of thought into which all must enter, for the vast economic problem is a national one. If the tree then succeeds in doing this it has, after all, spoken more loudly than any of us can speak for them. So may all of us, as Theodore Roosevelt pointed out, become "good citizens," and may there be new millions in the tree planting army.

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Red	41	Scrub	76
White	40	White	66
Cherry:		White, Swamp	67
Fire	94	Willow	75
Wild Black	93	Papaw	85
Chestnut	64	Persimmon	115
Cottonwood	48	Pine:	
Cucumber Tree	83	Jack	31
Dogwood, Flowering	113	Pitch	29
Elm:		Red	30
American	77	White	28
Rock	79	Poplar, Balsam	49
Slippery	78	Quaking Aspen	47
Fir, Balsam	37	Redbud	97
Gum:		Sassafras	86
Black	114	Shad Bush	90
Sweet	88	Spruce:	
Hackberry	80	Norway	35
Hawthorn (Cockspur Thorn, Scarlet Thorn)	92	Red	33
Hemlock	38	White	34
Hickory:		Sumac:	
Bitternut	53	Poison	103
Pignut	54	Staghorn	102
Shellbark	52	Sweet Gum	88
Holly, American	100	Tulip Tree	84
Hornbeam: American	60	Walnut, Black	50
Hop	61	Willow:	
Horse Chestnut	101	Black	43
		Pussy	44
		Shining	45
		Witch-Hazel	87

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