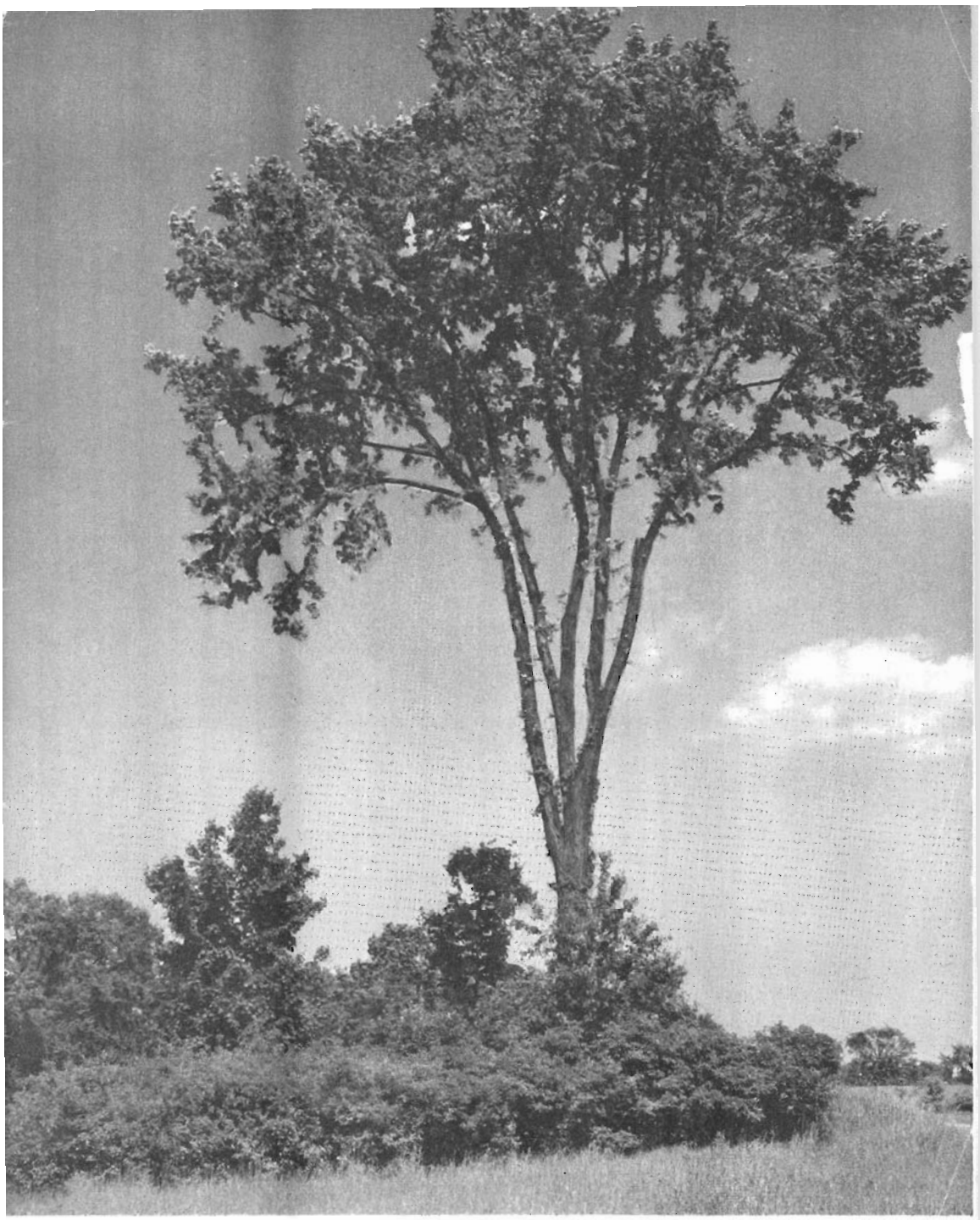

Know Your Trees

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New York State College of Agriculture

CORNELL 4-H CLUB BULLETIN **85**

Know Your Trees

FOREST APPRECIATION

J. A. COPE AND FRED E. WINCH, JR.

SINCE one-half of the entire land area of New York State is better adapted to growing trees than to any other use, forestry is a vital part of agriculture.

Work in forestry appeals to boys and girls because of its outdoor nature and the possibility of combining activities in nature study, conservation, camping, and woodcraft.

Because of the number of years required to grow a crop of wood, you, as future land owners, will reap the direct benefit of the principles learned and the work undertaken.

To have a real appreciation of the forest is to know the importance of the forest to agriculture and industry, to have a thorough knowledge of the trees in the forest, and to know the relative values of these trees in producing crops of timber. The first step, therefore, for you to appreciate the forest is to become familiar with the various kinds of trees, the individuals of the forest community. They must be met at home, in the forest where they can be found in conditions most natural to their growth. Each kind of tree has certain characteristics that distinguish it from other trees. No two trees have bark, leaves, and fruit exactly alike. The wood of each kind of tree varies as much as the external characteristics, and upon these variations depends the use to which that wood may be put. In growing timber for a definite use or in choosing trees to be cut for a certain purpose, you must know what woods can be put to that use or will answer that purpose.

This bulletin has been prepared to assist you in becoming better acquainted with the forest trees of your neighborhood. Probably a hundred distinct varieties of trees are native to the State, but some of them are so small that they are in this State scarcely more than shrubs and do not deserve to be classed as trees. In such a group are the **alder**, the **pussy willow**, and the **witch-hazel.** Still other varieties, while of real forest-tree size, are confined to very limited localities, such as the **willow oak** and the **sweet gum** on Long Island. No attempt has been made, therefore, to provide an all-inclusive list of trees in this publication, but rather to pick out and to describe the more common trees that are generally distributed throughout the State and that you are likely to find in the average woodlot.

With this bulletin as a guide, it should be possible for every boy and girl electing the forestry and conservation projects to become familiar with all the forest trees in their neighborhood. As future woodland owners, this basic knowledge of the trees of the forest will put you in a position to cut wisely and well in bringing about better forests.

AUTHORS' ACKNOWLEDGMENTS. The descriptive text (pages 13 to 64) covering the tree characters is largely a compilation rather than the result of original investigations. *Trees in Winter*, by Albert Francis Blakeslee and Chester Deacon Jarvis, was freely consulted in the matter of bark characters; *Trees of New York State*, by H. P. Brown, furnished valuable suggestions in the way of uses; and *Common Trees of New York*, by J. S. Illick, was followed closely in many particulars.

The cuts for the bulletin were furnished through the courtesy of W. R. Mattoon of the Forest Service.

In listing scientific names the *Check List of Forest Trees of the United States*, Miscellaneous Circular 92 of the United States Department of Agriculture, was followed.

HOW TO USE THE BULLETIN

The place, of course, to study the trees is in the woods; take along this bulletin and look for the characters—bark, twigs, buds, leaves, and fruit.

Pay considerable attention to the bark. It is always present, summer and winter, and even in the log you can tell the tree if you know the bark. The points mentioned in the text, such as color and texture, whether smooth or furrowed, scaly or firm, all should be remembered.

The twigs are interesting to study in the winter time. They, too, vary in color; some are brittle, while others are tough and pliable; some are slender, while others are coarse. A taste of the twig often helps to identify the tree, as for example, the cherries or the **black birch** (page 34).

The buds go along with the twigs as part of the winter study of the trees. Frequently it may be important to be able to recognize a forest seedling in the early spring before the leaves are out. Particularly if you want to transplant the seedling. This would also be true if it were a valuable forest tree, such as a **sugar maple,** and it was desired to cut around it to give it more light. In such instances the buds are a helpful means of identification. All deciduous-leaved trees are listed as having or lacking a terminal bud.

Study the winter twigs carefully. It is obvious that **hickories** have a terminal bud as do also the **maples** and the **ashes.** But you must watch out when the **basswood,** the **elms,** and the **birches** are found. They may look at first glance as if they had a terminal bud, but on closer examination it is evident that there is really a leaf scar on the end of the twig and the bud is a little below and to one side. The color of buds also is helpful; for example, by a glance at the color of the bud you can tell at once whether the tree is a **soft** or a **hard maple.** Under *leaves* is a statement as to whether they are arranged opposite or alternate. This applies also to the buds and helps you to tell some trees apart (page 6).

Leaves are, for those just starting in the study of our forest trees, the easiest approach. As you study the leaves and compare them, look for the following points: Are they simple (one leaf to a stem) or compound? Are they arranged opposite on the twig or alternate? How is the margin of the leaf shaped? This is most important. In some leaves the margin is entire (no breaks at all); in some, it is like the fine teeth of a carpenter's saw, and these are called *serrate* (saw-like); still others are doubly serrate; in others, the margin is more deeply notched, as in the **chestnut,** the **beech,** and the **big-toothed aspen,** and these we have called *toothed.* Then come the **oaks** and some others where the margin is very deeply cut and the leaves are described as *lobed,* and the hollows between are called *clefts* (page 5).

Trees have flowers as do most green plants, but usually the blooms are not noticeable high up in treetops where you cannot easily see them to aid in identification. Then, too, they are present only for a very brief season. In the interest of using available space for more important identifications, the description of flowers has been left out.

The fruit of the forest trees is an important item in the appreciation of the forest, not so much as a means of identifying the tree, but as recognizing the seeds from which the different forest trees spring. Fruit, it should be remembered, does not mean in this connection necessarily fleshy, edible products, such as apples or cherries, but includes any seed and the covering in which it develops, whether cone, pod, samara (winged-seed), burr, or husk. Note carefully the time of year the seed matures; this is given in each description in the text.

Some brief mention is also made of the uses of the tree and where it is to be found growing naturally. This should round out the knowledge and appreciation of the trees of your community.

Learning to know the names of your "tree neighbors" is like playing a detective game. With certain "clues," such as color of the bark, size and branching of the twig, shape of the bud, and form of the leaf, the names of the tree can be "tracked down."

After you learn the names of the trees in your neighborhood, you may want to know whether they are "good" trees or "poor" trees for forest crops. The table on page 65 classifies them as valuable, intermediate, or inferior crop trees.

SUMMER AND WINTER KEYS

As a further help to the identification of these fifty trees in both summer and winter condition, keys have been made.

A key is a scheme for easily and quickly identifying any unknown object under observation. It is based usually on the most striking similarities and differences shown by the various parts of the object. In trees, the leaves have been selected for the summer key and the twigs and buds for the winter key as presenting the most easily available parts of the tree for showing differences and similarities.

Two alternatives are presented, either a character is or is not present; these are the only choices possible. The two opposed characters are preceded in the key by the same number (*1* and *1* or *2* and *2*) and are set at the same distance from the left-hand margin of the page. Often times, *1* and *1* are subdivided further into other groups on the basis of other differences; in every case, however, the characters are opposed. If you find the desired character in the first group *(1)*, there is no need to look in the second group, and study need be confined to the subdivisions of the first group only. In this key it has been found advisable to make an exception to this general scheme if there are more than two species in the same genus. Here each species is separated from others in the genus under the same number or letter whether three or more species are included. Also, in the summer key, where the shape of the leaf presents a very easily distinguished characteristic, the variation in the shapes, such as linear, lanceolate, ovate, and so forth, has made necessary the inclusion of more than two key numbers in the same group. This is true also in the subdivisions where leaf margins are considered.

Here is an example of the way to use the summer key. A branch with leaves is taken from a tree. The leaves are broad so this falls under the second *1* on page 7 (note that each number is in pairs, two *1*'s, two *2*'s and so on, and that each one of a pair contains different characters or details). The twigs and leaves are in pairs (opposite) so this character falls under the first *8* (if the twigs were not opposite, the character would fall under the second *8*, or alternate arrangement). The leaves are compound (several leaflets on one stem) so the next clue is in the second *9* (page 7). The leaflets have no stems, but sit tight on the main stem or petiole of the leaf. The tree is **black ash.**

Another branch, taken in the late fall, has no leaves, and must be traced through the winter key on pages 9 through 12. The twigs have no pitchy taste or wart-like branches found under the second *1*, but are slim without a terminal bud. Under the second *3* are the characters for trees with alternate arrangement of buds and twigs. Since no terminal bud is present, it is necessary to turn to the second *5* which is on page 11. Close observation at the side or lateral bud reveals many bud scales. This leads to the second *18*. The buds are fair-sized, which comes under the second *20*. The twigs are zig-zag, and the buds are "hump-backed" and greenish-red. At last the trail has ended with the name of the tree, which is **basswood.**

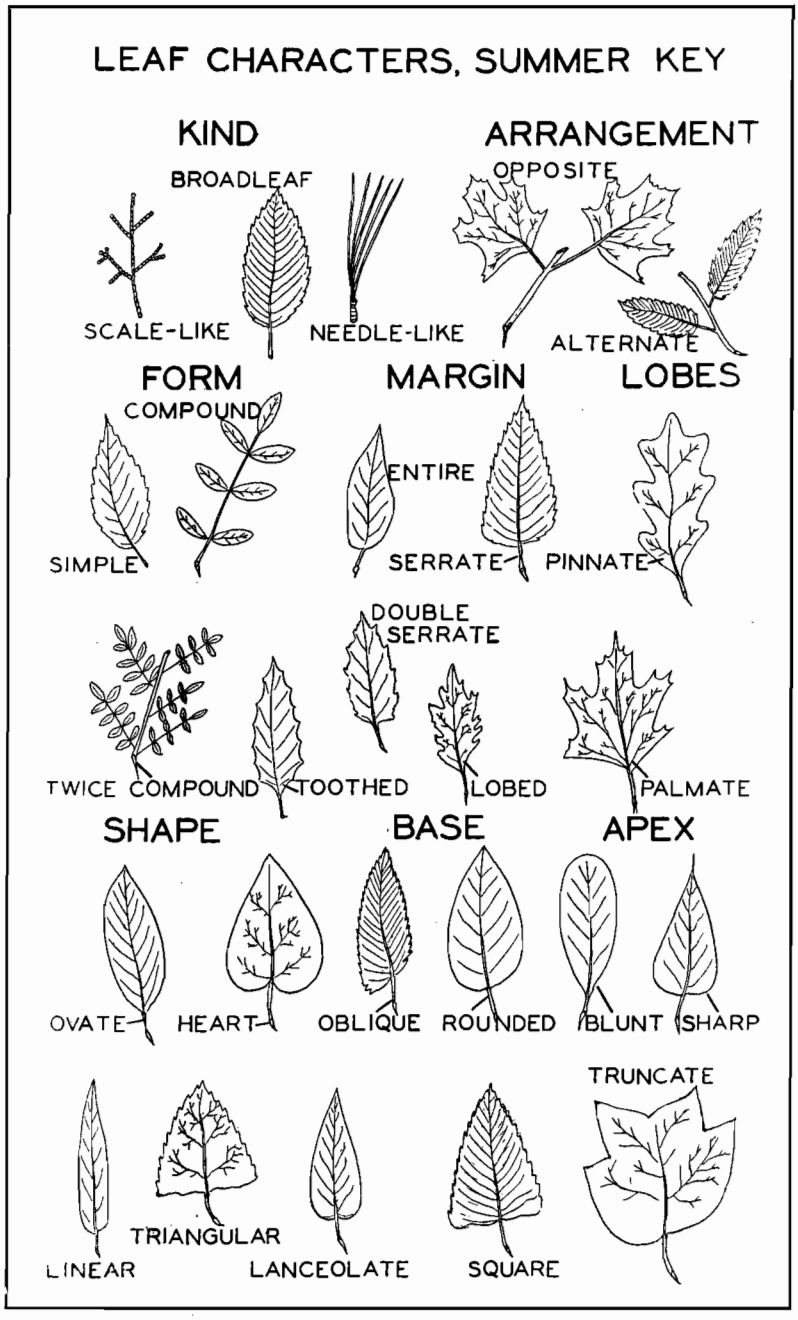
LEAF CHARACTERS, SUMMER KEY
KIND
BROADLEAF
SCALE-LIKE
NEEDLE-LIKE
ARRANGEMENT
OPPOSITE
ALTERNATE
FORM
COMPOUND
SIMPLE
MARGIN
ENTIRE
SERRATE
LOBES
PINNATE
DOUBLE SERRATE
TWICE COMPOUND
TOOTHED
LOBED
PALMATE
SHAPE
BASE
APEX
OVATE
HEART
OBLIQUE
ROUNDED
BLUNT
SHARP
TRUNCATE
TRIANGULAR
LINEAR
LANCEOLATE
SQUARE

CHART 1

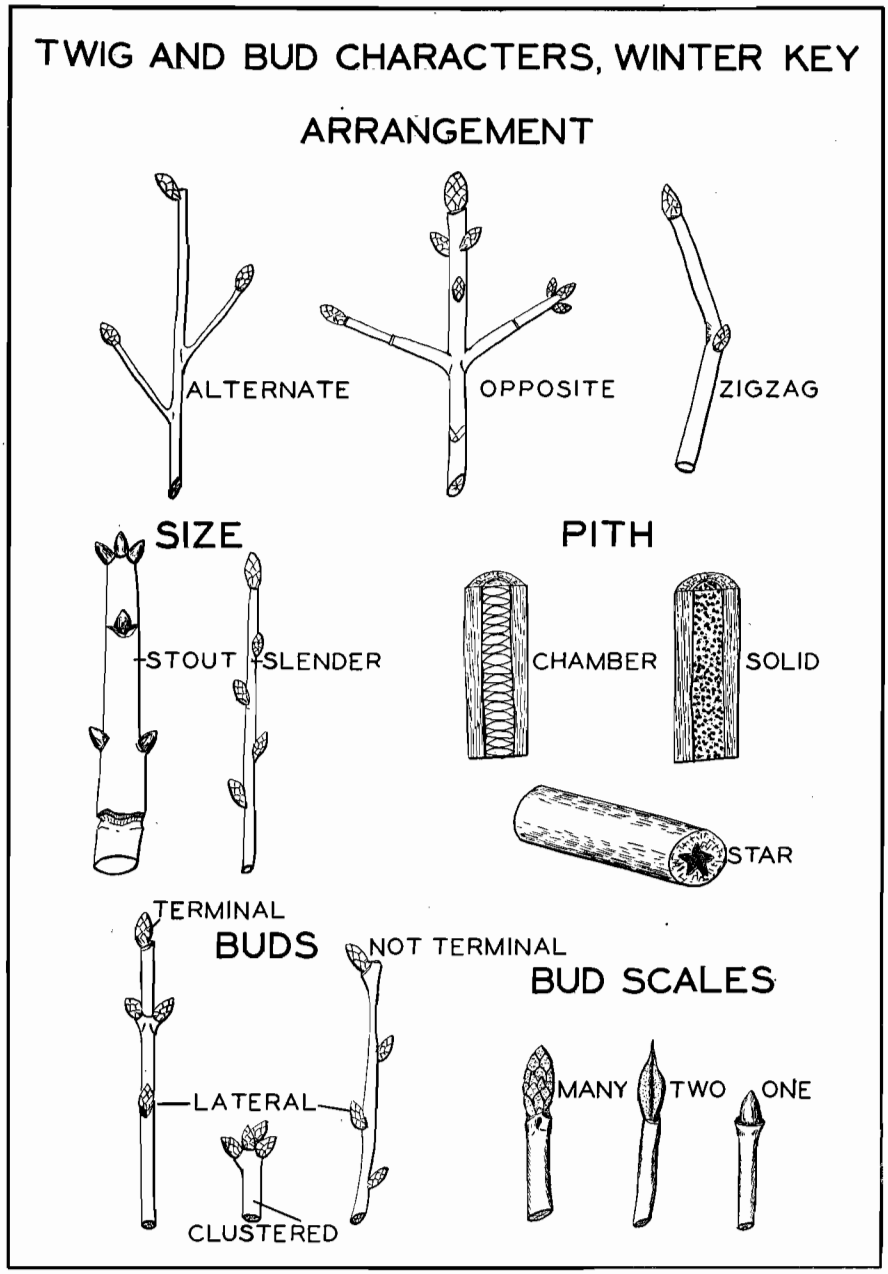
TWIG AND BUD CHARACTERS, WINTER KEY
ARRANGEMENT
ALTERNATE
OPPOSITE
ZIGZAG
SIZE
STOUT
SLENDER
PITH
CHAMBER
SOLID
STAR
TERMINAL
BUDS
NOT TERMINAL
LATERAL
CLUSTERED
BUD SCALES
MANY
TWO
ONE

CHART 2

The most important distinguishing characteristics of trees in the summertime are the form, arrangement, shape, and margin of the leaves. In the wintertime, the size, color, and arrangement of the twigs are important, and the position (terminal or not), size, shape, and color of the bud. Be sure you thoroughly understand these illustrations and learn the distinctions before you attempt to use the key or go into the field.

Once the name of the tree has been discovered in the key, you can make a check by turning to the number listed in parentheses before the name. For example, (48) **Basswood** is found on page 62. If the description of the tree given on this page does not check with the twig, trace the specimen again through the key. A small "clue" may lead the "trail" in a new direction, and finally to the right tree.

A nontechnical summer key to the fifty trees[1]

1. Leaves needle-like, awl-shaped or scale-like; usually evergreen (conifers).
   2. Leaves needle-like.
      3. Needles borne in clusters.
         4. Cluster containing 2–5 needles (Pines).
            a. Needles in clusters of 5. **(1) White Pine**
            b. Needles in clusters of 3. **(2) Pitch Pine**
            c. Needles in clusters of 2. **(3) Red Pine**
         4. Needles many (more than 5) in clusters on short spur-like lateral branches; not persistent through winter; on vigorous shoots needles borne singly. **(8) American Larch**
      3. Needles borne singly.
         5. Needles without stems.
            6. Needles 4-sided in cross section, sharp-pointed (Spruces).
               a. Needles dark, yellowish green. **(4) Red Spruce**
               b. Needles bluish green or silvery white. **(5) White Spruce**
            6. Needles flat, blunt-pointed. **(6) Balsam Fir**
         5. Needles with short stems, flat, and blunt-pointed. **(7) Hemlock**
   2. Leaves awl-shaped or scale-like.
      7. Foliage both scale-like and awl-shaped; awl-shaped foliage particularly on young growth. **(10) Red Cedar**
      7. Foliage scale-like, spray distinctly flattened and fan-like. **(9) Arbor vitae**

1. Leaves broad, not needle-like or scale-like; not persistent through winter.
   8. Arrangement of leaves opposite.
      9. Leaves simple (Maples).
         a. Pale green on undersurface, clefts rounded, lobes sparsely toothed. **(45) Sugar Maple**
         b. Whitish beneath, usually 3-lobed, clefts shallow and sharp-angled. **(46) Red Maple**
         c. Silvery white beneath, usually 5-lobed, clefts deep (particularly the middle two). **(47) Silver Maple**
      9. Leaves compound (Ashes).
         a. Leaflet with stems. **(49) White Ash**
         b. Leaflet without stems. **(50) Black Ash**
   8. Arrangement of leaves alternate.
      10. Leaves simple.
         11. Leaves entire, that is, not lobed or deeply cut.

[1]While an effort was made to base the summer key entirely on the leaves, it was necessary to resort to twig and bark characters of main stem in the case of the black, paper, and yellow birch, the blue beech, and the hop hornbeam. All five of these species have leaves similar in appearance.

12. Margin or leaves entire.
    13. Leaves ovate or egg-shaped (when not lobed), aromatic odor when crushed. **(37) Sassafras**
    13. Leaves ovate (egg-shaped), no aromatic odor.
12. Margin of leaves serrate. **(35) Cucumber Tree**
    14. Leaves heart-shaped, serrations coarse. **(48) Basswood**
    14. Leaves linear, serrations fine. **(11) Black Willow**
    14. Leaves lanceolate.
        a. Broadly lanceolate, tufts of reddish hairs along midrib on undersurface of leaf. **(41) Wild Black Cherry**
        b. Narrowly lanceolate, no hairs along midrib. **(42) Pin Cherry**
    14. Leaves triangular, serrations coarse.
        a. Base square. **(14) Cottonwood**
        b. Base rounded. **(12) Trembling Aspen**
    14. Leaves ovate (egg-shaped).
        a. Serrations fine. No thorns on twigs. **(39) Shad Bush**
        b. Serrations coarse. Long thorns on twigs. **(40) The Hawthorns**
12. Margin of leaves doubly serrate.
    15. Leaves triangular, long tip. **(20) Gray Birch**
    15. Leaves ovate (egg-shaped).
        16. Base of leaves oblique (Elms).
            a. Leaf surface very rough above and below. **(34) Slippery Elm**
            b. Leaf surface less rough, particularly above. **(33) American Elm**
        16. Base of leaves not oblique.
            17. Twigs with wintergreen flavor.
                a. strong wintergreen flavor; bark on trunk black, not peeling off in papery layers. **(22) Black Birch**
                b. Faint wintergreen flavor; bark on trunk yellowish, peeling off in papery layers. **(23) Yellow Birch**
            17. Twigs without wintergreen flavor.
                18. Bark smooth.
                    19. Light gray, firm. **(24) Blue Beech**
                    19. White, papery layers. **(21) Paper Birch**
                18. Bark scaly, scales easily rubbed off. **(25) Hop Hornbeam**
12. Margin of leaves toothed.
    20. Leaves triangular, blunt-pointed. **(13) Large-toothed Aspen**
    20. Leaves lanceolate, sharp-pointed. **(27) Chestnut**
    20. Leaves ovate (egg-shaped).
        21. Teeth rounded; not bristle-tipped. **(29) Chestnut Oak**
        21. Teeth sharp-pointed; bristle-tipped. **(26) Beech**
11. Leaves not entire (lobed).
    22. Leaves palmately lobed.
        23. Margins of lobes entire.
            24. 2–3 lobed when not entire; leaves have aromatic odor when crushed; apex of lobes or leaf rather sharp-pointed. **(37) Sassafras**
            24. 3–4 lobed; apex of leaf truncate. **(36) Tulip Tree**

23. Margins of lobes not entire; 3–5 shallow lobes with sparse teeth on lobes. **(38) Sycamore**

22. Leaves pinnately lobed; no thorns on twigs (Oaks).

25. Lobes with bristle tips.

a. Leaves shiny, smooth above and below; clefts extending halfway to midrib. **(30) Red Oak**

b. Leaves dull green above, hairy along midrib below; clefts halfway to midrib. **(31) Black Oak**

c. Leaves shiny, dark green above, paler below, clefts extending over halfway to midrib. **(32) Scarlet Oak**

25. Lobes rounded, not bristle-tipped.

a. Clefts halfway to midrib; leaves dark green above, paler below. **(28) White Oak**

b. Clefts very shallow; leaf almost toothed. **(29) Chestnut Oak**

25. Leaves with 5–9 small lobes; thorns on twigs. **(40) The Hawthorns**

10. Leaves compound.

26. Leaves only once compound.

27. Margins of leaflets entire; leaflets almost oval in shape. **(43) Black Locust**

27. Margins of leaflets not entire (serrate).

28. Leaflets 5–11 (Hickories).

a. Leaflets 5–7, with upper three largest. **(17) Shagbark Hickory**

b. Leaflets 5–7, of which all are same size or nearly so. **(18) Pignut Hickory**

c. Leaflets 7–11, long narrow, sharp-pointed. **(19) Bitternut Hickory**

28. Leaflets 11–23 (Walnuts).

a. A "mustache" of hairs at base of leaf stem where it joins the twig. **(16) Butternut**

b. No "mustache" of hairs at base of leaf stem where it joins the twig. **(15) Black Walnut**

26. Leaves doubly compound, leaflets usually even in number. **(44) Honey Locust**

A nontechnical winter key to the fifty trees[2]

1. Leaves persistent and green throughout the winter, needle-shaped, awl-shaped, or scaly (see summer key).

1. Leaves not remaining on trees throughout winter.

2. Twigs with lateral wart-like branches, slender, glossy brown, resinous taste. **(8) American Larch**

2. Twigs without lateral wart-like branches.

3. Arrangement of branches, leaf scars, and buds opposite.

4. Twigs slender, red to brown; buds red or brown (Maples).

a. Buds narrow, sharp-pointed, brown. **(45) Sugar Maple**

b. Buds broad, blunt-pointed, reddish color, often clustered. No odor to twigs when broken. **(46) Red Maple**

c. Buds broad, blunt-pointed similar to red maple; usually clusters of lateral buds. Fresh twigs have rank odor when broken. **(47) Silver Maple**

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[2]While an effort was made to use chiefly twigs and buds in making this key, difficulty was encountered in separating the hop hornbeam and the blue beech; the gray and paper birches, and the elms, on bud and twig characters alone. In these last six trees, therefore, the bark characters of the main stem were introduced. These characters are distinctive and should aid materially in identification.

4. Twig stout, gray to brown in color; buds brown or black (Ashes).
   a. Buds rusty brown; bark dark brown, corky in texture with diamond-shaped fissures. **(49) White Ash**
   b. Buds usually black; bark ashy gray without ridges, scaling off easily. **(50) Black Ash**

3. Arrangement of branches, leaf scars, and buds alternate.
   5. Terminal bud present either surrounded by a cluster of buds or borne singly.
      6. Terminal bud surrounded by a cluster of buds at end of twig; fruit an acorn (Oaks).
         a. Buds sharp-pointed.
            aa. Buds smooth, light yellowish brown; twigs light orange. **(29) Chestnut Oak**
            bb. Buds smooth, reddish brown; twigs reddish to greenish brown. **(30) Red Oak**
            cc. Buds covered with dense yellowish gray wool. **(31) Black Oak**
         b. Buds broadly oval, rather blunt at top, somewhat woolly, especially upper half; reddish brown; twigs light red. **(32) Scarlet Oak**
         c. Buds rounded, blunt-pointed, reddish brown. **(28) White Oak**
      6. Terminal bud borne singly. (In the birches only the short spur-like lateral twigs have terminal buds, not the long shoots.)
         7. Buds have 3–4 dark brown smooth outer scales standing away from bud. **(17) Shagbark Hickory**
         7. Buds not as above.
            8. Buds covered with close-fitting woolly scales.
               9. Twigs with chambered pith (Walnuts).
                  a. Pith of twigs cream colored; "mustache" of hair beneath bud absent. **(15) Black Walnut**
                  b. Pith chocolate colored; "mustache" of hair beneath bud present. **(16) Butternut**
               9. Twigs without chambered pith, solid.
                  10. Twigs brittle, brown, aromatic odor. **(35) Cucumber Tree**
                  10. Twigs tough, yellowish or reddish color, hairy toward end; bud scales sulfur colored. **(19) Bitternut Hickory**
            8. Bud scales not woolly in appearance, smooth.
               11. Bud scales 2 united into a cap; twigs brittle with aromatic odor. **(36) Tulip Tree**
               11. Bud scales more than two (many).
                  12. Twigs with wintergreen flavor; terminal bud on spur-like lateral branches only.
                     a. Strong wintergreen flavor; twigs reddish brown; bark smooth, no papery fringes. **(22) Black Birch**
                     b. Slight wintergreen flavor; twigs yellowish brown; papery fringes to yellowish bark. **(23) Yellow Birch**
                  12. Twigs without wintergreen flavor; terminal bud not on spur-like branches.
                     13. Lateral buds usually same size as terminal bud.
                        14. Buds long, sharp-pointed.
                           a. Buds tinged with purplish brown; lateral buds flattened against twig. **(39) Shad Bush**
                           b. Buds reddish brown, lateral buds bending away from twig. **(26) Beech**

14. Buds usually round, red to chestnut-brown; thorns on twigs. **(40) The Hawthorns**

13. Lateral buds smaller than terminal bud.

15. Bark and twigs spicy aromatic. **(37) Sassafras**

15. Bark and twigs not spicy aromatic.

16. Twigs and bark with bitter almond odor and taste, slender (Cherries).

a. Twigs reddish brown; bark on trunks early becoming scaly. **(41) Wild Black Cherry**

b. Twigs bright red; bark remaining smooth; buds very small. **(42) Pin Cherry**

16. Twigs without bitter almond odor or taste.

17. Twigs very tough; terminal bud small, bluntly ovate. **(18) Pignut Hickory**

17. Twigs decidedly brittle; buds conical, twigs with rather rank odor when broken (Poplars).

a. Buds large, shiny, often slightly resinous; twigs bright yellow; lateral buds bending away from twig. **(14) Cottonwood**

b. Buds medium, dull, dusty looking, generally bending away from twigs; twigs reddish brown. **(13) Large-toothed Aspen**

c. Buds small showing lateral buds flattened against twig; twigs slender, reddish brown. **(12) Trembling Aspen**

5. Terminal bud absent (first lateral bud may seem terminal but in fact is not).

18. Bud scales one (forms cap over bud).

19. Twigs stout, zigzag; brown. **(39) Sycamore**

19. Twigs slender, not zigzag. **(11) Black Willow**

18. Bud scales many.

20. Buds very small, inconspicuous.

21. Twigs usually bearing spines in pairs at nodes; twigs slender, reddish to greenish brown, brittle. **(43) Black Locust**

21. Twigs usually bearing branched thorns; twigs stout, zigzag, smooth, glossy. **(44) Honey Locust**

20. Buds medium to large, conspicuous.

22. Buds large with characteristic hump, green to red; twigs zigzag. **(48) Basswood**

22. Buds medium without characteristic hump; twigs not zigzag.

23. Twigs stout, pith star-shaped. **(27) Chestnut**

23. Twigs slender, pith other than star-shaped.

24. Bark of trunk scaly.

25. Scales easily coming off when rubbed. **(25) Hop Hornbeam**

25. Scales not easily coming off when rubbed (Elms).

a. Buds dark, chestnut brown, covered at tip with long rusty hairs; twigs light gray, hairy, mucilaginous when chewed. **(34) Slippery Elm**

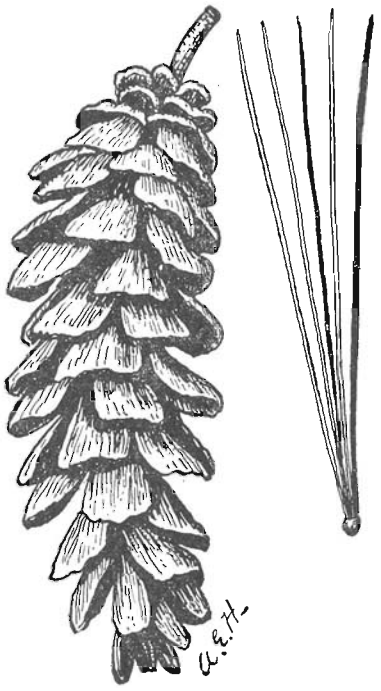
b. Buds light reddish brown, ovate (egg-shaped) pointed; twigs reddish brown, smooth.
(33) American Elm

24. Bark of trunk smooth.
    26. Bark chalky white.
        a. Bark peeling off in thin papery layers.
(21) Paper Birch
        b. Bark not peeling off in papery layers; distinct triangular patch below each branch where it joins stem. **(20) Gray Birch**
    26. Bark dark bluish gray. **(24) Blue Beech**

1. WHITE PINE

(*Pinus strobus* Linnaeus)

White pine is one of the most rapid-growing, widely distributed, beautiful, and useful forest trees native to the State. It grows naturally in a wide range of sites, from the steep mountain sides in the Adirondacks to the hillsides and valley swamps of central and western New York. The miles of stump fences still standing in the southwestern section of the State are evidence to the abundance of the tree at one time in this region. The wood is soft, even-textured, very light brown in color, and easily worked. The lumber has a wide range of uses for interior trim, sash and doors, boxes and buckets. In fact, no other wood in the United States has such a wide range of uses.



WHITE PINE
Cone, one-half natural size; needles, natural size

Bark—thin, smooth, and greenish in color on young trees, becoming deeply furrowed and grayish brown in color on older trees.

Twigs—rather slender, brittle, light brown in color.

Winter buds—sharp-pointed, yellowish brown in color.

Leaves—needle-like, in clusters of 5, from 3 to 5 inches long, bluish green in color, soft, flexible, staying on the twigs for two years.

Fruit—a cone, from 5 to 10 inches long, with short stalks, drooping, cylindrical, ½ inch in diameter, tending to curve from stem to apex, requiring two years to mature. Seeds—2 under each scale, winged, ripening in September.

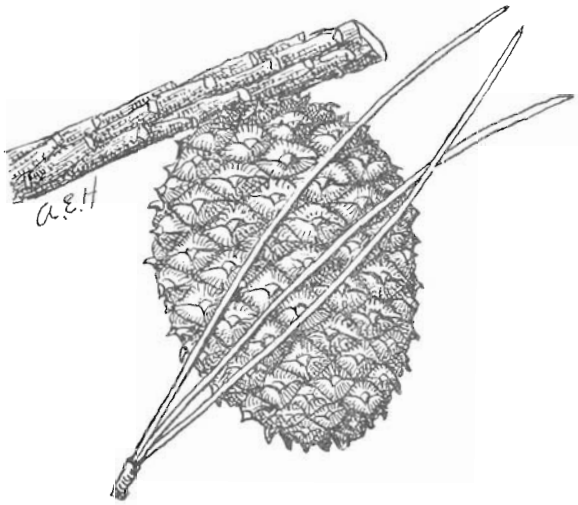
Outstanding features—needles in clusters of 5; long, limber cone.

2. PITCH PINE

Hard Pine, Yellow Pine

(*Pinus rigida* Miller)

Pitch pine is to be found on dry ridges and slopes, in the northeastern section of the State and on Long Island, and infrequently elsewhere. The wood is coarse-grained and brownish red in color. The tree never reaches a large size and the lumber is generally knotty. Its chief uses, are for rough framing lumber, ties, and mine props, and crates.



PITCH PINE
Cone and needles, natural size

Bark—early becomes very rough and is of a reddish brown to a very dark brown color, with age becoming deeply furrowed into broad, flat-topped ridges separating on the surface into loose, dark reddish brown scales. The unusual thickness of the bark makes it the most fire-resistant tree in the State. Clusters of needles are very commonly found on the main trunk.

Twigs— coarse, brittle, golden-brown in color.

Winter buds—conspicuous, pointed, reddish brown in color, resin coated.

Leaves—needle-like, in clusters of 3, from 3 to 5 inches long, yellowish green in color, very stiff, staying on twigs from two to three years.

Fruit—a cone, from 2 to 3 inches long, somewhat egg-shaped, without stem, requiring two years to mature; persists on tree for many years. Cone scales—each carried a stiff recurved prickle. Seeds—2 under each scale, dark brown in color, ripening in September.

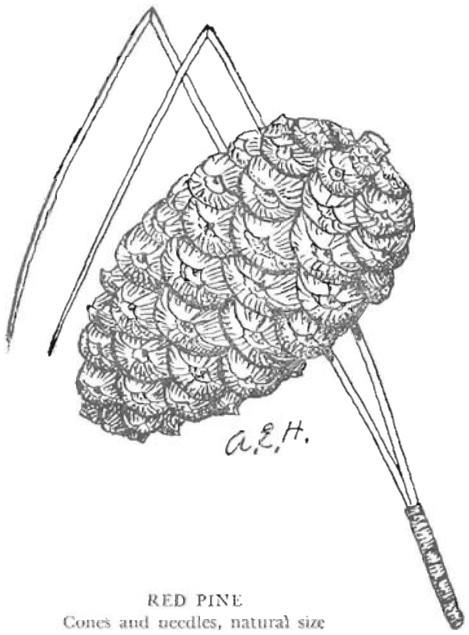
Outstanding features—needles in threes; sharp prickles on tip of cone scale.

3. RED PINE

Norway Pine

(*Pinus resinosa* Solander)

Red pine is a valuable, fast-growing timber tree less generally distributed than the white pine. It is found commonly on the sandy soils adjacent to the Adirondacks and frequently on dry benches in west-central New York. The wood is light, medium in texture, close-grained, pale red in color, and is often sold as white-pine lumber. Because of its rapid growth and relative freedom from insect and fungous diseases, it is one of the best trees for forest planting on many of the thousands of acres of idle land in the State.



RED PINE
Cones and needles, natural size

Bark—reddish brown in color, with shallow, flat ridges separating into thin, flaky scales.

Twigs—coarse, reddish brown in color, roughened at base of year's growth.

Winter buds—rather inconspicuous, with pointed reddish brown scales.

Leaves—needle-like, in clusters of 2, from 3 to 6 inches long, dark green in color, slender, flexible, remaining on twigs from three to four years.

Fruit—a cone, 2 inches long, without stem, requiring two years to mature, light brown in color when ripe, staying on the tree into the next season. Cone scales—without spines or prickles. Seeds—2 under each scale, winged, light chestnut brown in color, 1/8 inch long, ripening in September.

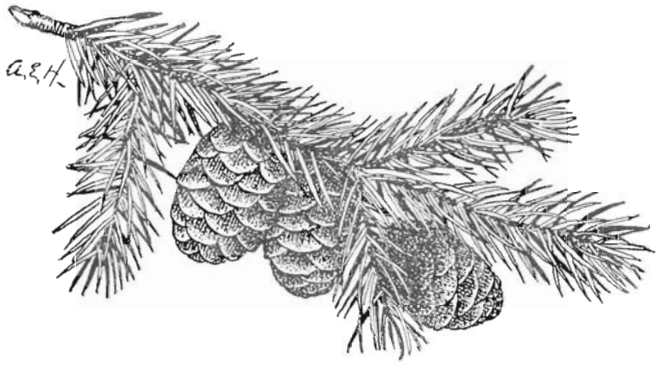
Outstanding features—limber needles in two's; nearly round cone without prickles.

3a. *Scotch pine* from Europe has been planted extensively throughout the State. Its blue-green, twisted flat needles in clusters of two's, tapering cone from 2 to 3 inches long with greenish scales and the orange-brown bark on upper stem and branches, are its main characters. It is used for pulpwood, framing lumber, ties, and Christmas trees.

4. RED SPRUCE

(*Picea rubra* Link)

Red spruce is a common and valuable forest tree of the Adirondacks and Catskills, and occasionally is found at high elevation (2000 feet) in eastern New York (Schoharie, Delaware, and Otsego Counties). The wood is light, close-grained, soft, and is in great demand for chemical wood pulp. It has a peculiar resonant quality that makes it exceedingly valuable for the sounding boards of musical instruments. It is used also for framing.



RED SPRUCE
Branchlet and cone, one-half natural size

Bark—very thin, peeling off in small reddish brown scales.

Twigs—slender, reddish brown in color, coated usually with fine pale hairs.

Winter buds—small, pointed, reddish brown in color.

Leaves—needle-like, borne singly rather than in clusters as with the pines, but coming out all around the stem, ½ inch long, without stalk, yellowish green in color, blunt-pointed, 4-sided in cross section, remaining on twigs from five to six years.

Fruit—a cone, from 1½ to 2 inches long, dark brown when ripe, borne on a short stalk, pendant, maturing in one year, mostly falling off before the next season. Cone scales—thin, entire-margined. Seeds—dark brown in color, winged, ⅛ inch long, ripening in September.

Distinguishing features—lack of rank odor from crushed needles; cone dark brown and falling early from tree.

4a. *Black spruce* closely resembles the red spruce and covers the same general range, but is confined to swamps. It is used for pulpwood. The cones, unlike red spruce, remain on the tree for two or three years.

5. WHITE SPRUCE

Cat Spruce

(*Picea glauca* (Moench) Voss)

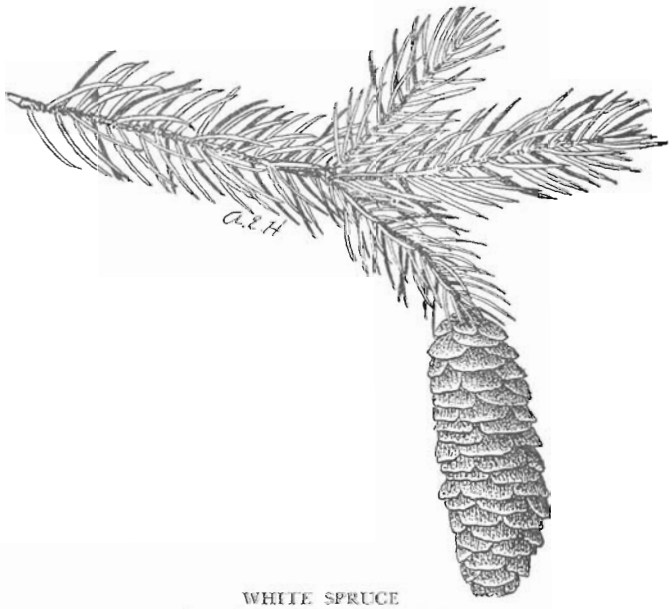
White spruce is confined in its natural distribution to the Adirondacks, reaching its best development in the so-called "spruce flats," but extending also far up the mountain slopes. The wood is in great demand for chemical pulp. Its attractive foliage makes it prized as an ornamental tree, for which purpose it is planted far south of its natural range. It is also planted for Christmas trees.

Bark—grayish to pale reddish brown, separating in thin scales.

Twigs—smooth, slender, yellowish brown in color.

Winterbuds—small, blunt-pointed, light brown in color.

Leaves—needle-like, borne singly and densely crowded on twigs, light shiny green in color when young, becoming blue-green, ½ inch long, 4-sided in cross section, without stalk, remaining on the twig from eight to ten years. Odor—strong and rank when crushed.



WHITE SPRUCE
Branchlet and cone, natural size

Fruit—a cone with very small stalk, pendant, from 1½ to 2½ inches long, pale brown in color when ripe, maturing in one year. Cone scales—thin, rounded, papery, entire margined. Seeds—2 under each scale, brown in color, winged, ⅛ inch long, ripening in September.

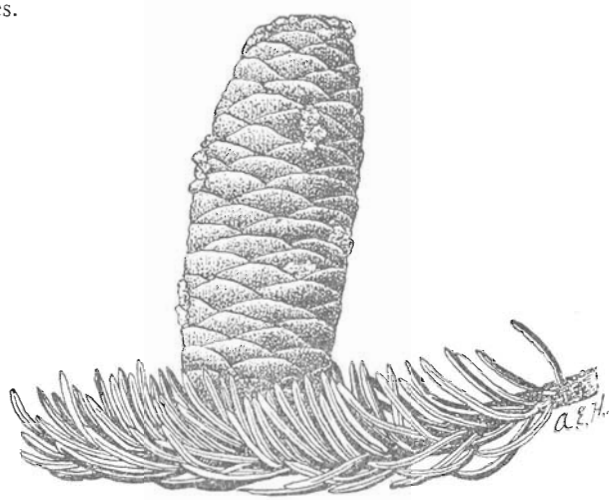
Outstanding features—papery cone scales; rank odor from crushed needles.

5a. The *Norway spruce* from Europe, the common ornamental spruce of our lawns and cemeteries throughout the State, also is used extensively in forest plantations. The cones more than 6 inches in length easily distinguish it from our native spruce.

6. BALSAM FIR

(*Abies balsamea* (Linnaeus) Miller)

Balsam fir is a medium-sized forest tree generally distributed in deep, cold swamps throughout the State. The wood is light, soft, coarse-grained, not durable, pale brown in color, and is of little value as a source of lumber. It is cut along with spruce for pulp wood, and is desirable as Christmas trees and for lawns. Balsam pillows are frequently made from the needles.



BALSAM FIR
Branchlet and cone, natural size

Bark—smooth, grayish brown in color, dotted with balsam blisters containing fragrant oily resin; in old trees becoming somewhat roughened with small scales.

Twigs—smooth with age, grayish in color.

Winter buds—small, almost spherical, glossy, clustered at end of twigs.

Leaves—borne singly and twisting so as to appear 2-ranked as in the hemlock, flattened rather than 4-sided as in the spruces, dark green in color above, pale below with 2 broad white lines, ¾ inch long, blunt, not stalked, aromatic when crushed, persistent from two to three years.

Fruit—an erect cone, from 2½ to 4 inches long, rounded at the top, ripening the autumn of the first year, purplish green in color. Cone scales—longer than broad, somewhat fan-shaped, falling the winter following maturity of cone and leaving only the erect central stalk to which they were attached. Seeds—in pairs, winged, dark brown in color, ¼ inch long, ripening in September.

Outstanding features—needles without stalks; blisters in bark; cone erect and falling apart when ripe.

7. HEMLOCK

Hemlock Spruce

(*Tsuga canadensis* (Linnaeus) Carriere)

Hemlock is a valuable forest tree very widely distributed throughout the State, particularly common on northern exposures, shaded gorges, steep mountain slopes, and borders of deep swamps. The wood is light, not strong, coarse-grained, brittle, not durable, splinters easily, and is light

HEMLOCK
Branchlet and cone, natural size

brown in color. It is largely manufactured into construction lumber and is also in demand for mechanical pulp.

Bark—reddish to grayish brown in color, with shallow, broad connecting ridges; inner bark bright cinnamon red in color. The high-tannin content of the bark is of commercial value in tanning leather.

Twigs—slender, yellowish to grayish brown in color, rough when needles are shed.

Winter buds—very small, reddish brown in color, not resinous-coated.

Leaves—borne singly, twisting to appear 2-ranked with a third row pointing forward on top of the twig; with distinct short stalk, flat, ½ inch long, rounded or notched at the apex, dark green in color above, paler below with 2 white lines, persistent from two to three years.

Fruit—a cone, stalked, pendant, ¾ inch long, ripening in one year, grayish brown in color when mature, falling during the winter following maturity. Cone scales—with rounded entire margins. Seeds—in pairs, winged, light brown in color, 1/16 inch long, ripening in September.

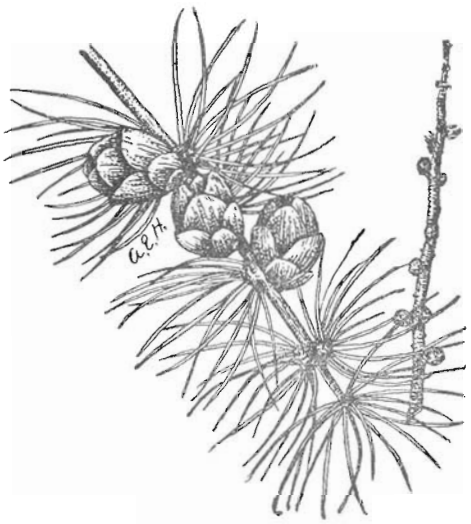
Outstanding features—needles with tiny stalks; small cones.

8. AMERICAN LARCH

Tamarack, Hackmatack

(*Larix laricina* (Du Roi) Koch)

American larch is a forest tree of the swamps. In the mountainous sections of the State, it is frequently found well up the slopes, but is confined to cold swamps in eastern, central, and western New York. The wood is very heavy, hard, and strong, light brown in color, and durable in contact with the soil. It is used for fence posts, telegraph poles, and railroad ties.



AMERICAN LARCH
Branchlet and cone, natural size

Bark—smooth, light gray in color on young trunks; with age becoming roughened with thin reddish brown scales.

Twigs—slender, smooth, glossy brown in color, with short lateral wart-like branches.

Winter buds—scattered along last season's twigs and at the ends of short lateral branches, small, rounded, reddish brown in color, shining.

Leaves—borne singly on twigs of last season's growth; on spurs of older twigs in clusters of 10 or more, flat, slender, pale green in color, about 1 inch long, falling off in the autumn of the first year.

Fruit—a cone, ½ inch long, borne on short curving stalks, maturing in autumn of the first year, chestnut brown in color, standing upright from the twigs, staying on the tree for several years. Cone scales—concave in shape. Seeds—in pairs, winged, light brown in color, ⅛ inch long, ripening in early autumn.

Outstanding features—many needles in cluster, dropping in autumn; small stiff cone on incurved stalk.

8a. *European larch* of several varieties that are difficult to distinguish apart have been planted for many years on lawns and more recently in forest plantations. Its cones are from 1 to 1½ inches long, standing out from the twig. It grows on well-drained soils much more rapidly than the American larch.

9. ARBORVITAE

Northern White Cedar

(*Thuja occidentalis* Linnaeus)

Arborvitae (meaning "tree of life") is a medium-sized, slow-growing forest tree rather common in the northeastern part of the State, less frequent in the central and western parts. Dense arborvitae swamps are common in Madison County and northward and eastward. In the Adirondack region it also occurs frequently outside the swamps. The wood is light, soft, brittle, coarse-grained, light yellowish brown in color, and durable in contact with the soil. It is used extensively for fence posts and small poles.

ARBORVITAE
Natural size

Bark—ashy gray to light reddish brown, separating in long, narrow, flat, shreddy strips, often more or less spirally twisted.

Twigs—decidedly flattened, arranged in fan-shaped clusters, and not to be confused with the leaves which cover the last season's growth; with the death of the leaves in the second season, the twigs become reddish brown in color and shiny.

Winter buds—extremely minute, almost covered by the scale-like leaves.

Leaves—scale-like, yellowish green in color, aromatic when crushed, borne in pairs closely overlapping; on leaves of leading shoots, glandular dot conspicuous in center of leaf.

Fruit—An oblong, erect cone, ½ inch long, reddish brown in color, persists through the winter. Cone scales—from 6 to 12, open to the base at maturity in autumn of the first season. Seeds—¼ inch long, in pairs, nearly surrounded by broad wings.

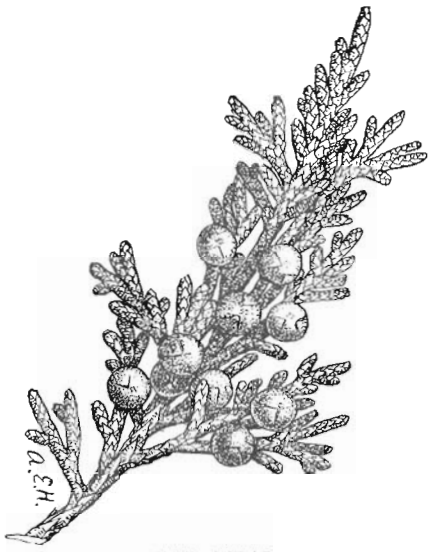
Outstanding features—cones with few scales; dot in center of flat, scale-like leaf.

9a. The name *white cedar* properly belongs to a Coastal Plain tree, *Chamaecyparis thyoides,* closely resembling the arborvitae.

10. RED CEDAR

(*Juniperus virginiana* Linnaeus)

Red cedar, a small-sized, slow-growing forest tree, is common to the poor, dry soils of the lower Hudson and Mohawk Valleys, is not common in the higher Adirondack region, and is infrequent in central and western New York, except on barren soils adjoining the Finger Lakes. It is found growing only in open woods and pastures where plenty of sunlight is obtained. The wood is soft, light, fragrant, brittle, dull red in color with contrasting white sap wood, extremely durable in contact with the soil, and is easily worked. It is largely used in the manufacture of pencils, cedar chests, cabinet work, and interior finish. As a post wood, it has few superiors.



RED CEDAR
Natural size

Bark—light reddish brown in color, separating in long, narrow shreddy strips fringed along the edges.

Twigs—generally 4-sided on mature trees, green in color from the covering of minute leaves, not flattened or arranged in fan-shaped clusters, becoming reddish brown in color after the fall of the leaves.

Winter buds—minute, covered by the overlapping scale-like leaves.

Leaves—various shades of green to reddish brown in color, persistent from three to four years, 2 kinds: (1) scale-like, closely over-lapping, opposite in pairs, giving the twig a 4-sided appearance; (2) awl-shaped, from ½ to ¾ inch long, usually on young trees or more vigorous shoots and yellowish green to light bluish green in color, sharp-pointed.

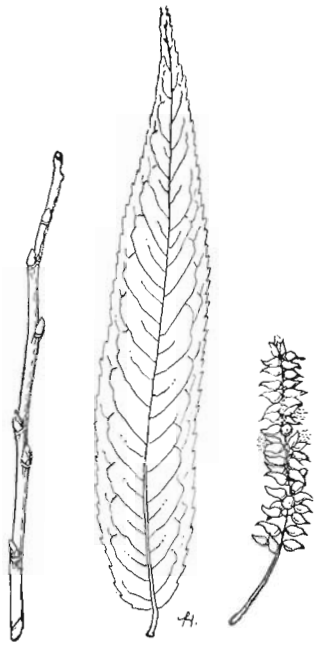
Fruit—a berry-like cone, ¼ inch in diameter, light blue in color, with bloom at maturity in the autumn of the first year. Fruit remains on the tree during the winter, highly prized by birds. Seeds—from 1 to 2, wingless, brown in color, covered with a thin, sweet flesh with resinous flavor.

Outstanding features—berry-like fruit; two kinds of leaves, sharp and awl-like and flat and scale-like.

11. BLACK WILLOW

(*Salix nigra* Marshall)

Black willow is the largest and most widely distributed of the native willows, although it is rare above an altitude of 2000 feet in the Adirondacks and in the pine barrens of Long Island. It prefers moist or wet soils along streams or lakes but will sometimes be found on fresh, gravelly or sandy soils where it can get plenty of light. It is of little importance as a timber tree as it often divides into several crooked, medium-sized trunks close to the ground and the wood is soft and weak. It is used chiefly for boxes, excelsior, pulp, and also for artificial limbs because of its lightness.



BLACK WILLOW
Twig, leaf, and fruit, two-thirds natural size

Bark—thick, rough with wide ridges covered by thick scales, varies in color from light to dark brown.

Twigs—slender, smooth, somewhat drooping, very brittle at the base, reddish brown in color; falling to the ground they may take root and grow.

Winter buds—terminal bud absent, lateral buds small, sharp-pointed, reddish brown in color; only one bud scale.

Leaves—alternate, simple, linear, sharp-pointed, finely serrate margin, dark green in color above, pale green below.

Fruit—a smooth capsule, about 1/8 inch long, occurring in large numbers on drooping tassels, ripening in the spring, reddish brown in color. Seeds—within capsule, covered with a dense, tuft of long, silky hairs.

Outstanding features—narrow leaves; small buds with one bud scale.

11a. The *shining willow* is an attractive small tree of moist soils, used extensively for holding soil in place where erosion is to be feared and also for ornamental plantings. Its shiny, broad leaves and yellowish brown twigs will help to distinguish it from the black willow.

12. TREMBLING ASPEN

Popple, Small-toothed Aspen

(*Populus tremuloides* Michaux)

Trembling aspen is the most widely distributed tree in North America. It is common in most sections of New York State but is infrequent on the pine barrens of Long Island. It is to be classed as a short-lived "weed" tree, but has some value as a cover tree in slashes, burns, and in

TREMBLING ASPEN
Twig, natural size; leaf, one-half natural size; pistillate flower, natural size

old fields where it quickly establishes itself. The wood is soft, weak, not durable, light brown to white in color, and is used primarily in the manufacture of mechanical pulp, excelsior, crates, and boxes.

Bark—on young trunks and branches yellowish green to whitish in color, on old trunks roughened with broad, flat, blackish ridges.

Twigs—smooth, shiny, reddish, brown in color.

Winter buds—terminal bud 1/4 inch long, narrow, conical, often incurved, sharp-pointed, shiny, reddish brown in color; lateral buds smaller.

Leaves—alternate, simple from 1½ to 3 inches in width, somewhat triangular in shape with rounded base, serrate margin, with flattened stem which allows the slightest breeze to flutter the leaves, from which the name, "trembling aspen," is derived.

Fruit—a scattered cluster of small, curved capsules, maturing in early spring. Seeds—within capsule, each with a tuft of hairs, carried long distances by the wind when capsule breaks open. This explains why the aspens spring up so quickly after fires on burned-over areas and in abandoned fields.

Outstanding features—tiny teeth on margin of leaves; shiny twigs.

13. LARGE-TOOTHED ASPEN

(*Populus grandidentata* Michaux)

Large-toothed aspen is a medium-sized, rapid-growing, short-lived "weed" tree that develops best on deep moist soils, but is common also on dry, upland, sandy or stony sites, where it rapidly covers slashes and burns. Here it acts as a temporary shelter for seedlings of more valuable species. The wood is similar to that of the trembling aspen and is used for excelsior, pulp, woodenware, crates, and boxes.

Bark—resembles that of trembling aspen, though small branches are of a more pronounced yellow color. The lower trunk is generally less deeply furrowed than is that of the trembling aspen.

Twigs—stout, round, reddish or yellowish brown in color in early winter, often pale and downy as contrasted with those of the trembling aspen which are shiny.

Winter buds—usually larger than those of the trembling aspen, terminal bud present; lateral buds generally bending away from twig, dull, dusty-looking, light chestnut brown in color.

LARGE-TOOTHED ASPEN
Leaf, one-half natural size; twig, one-half natural size; fruit, one-half natural size

Leaves—alternate, simple, from 3 to 6 inches long, roughly triangular with square base, blunt apex, coarsely toothed margin in direct contrast to the finely serrate margin of the trembling aspen.

Fruit—very similar to that of trembling aspen (page 24). Seeds—spread by wind.

Outstanding features—coarse teeth on leaf with square base; twigs downy.

14. EASTERN COTTONWOOD

(*Populus deltoides* Marshall)

Eastern Cottonwood is an exceedingly rapid-growing, moisture-loving species that is found locally in moist places and along streams and lakes throughout the State except at the higher elevations. The wood is light, soft, and weak, and is dark brown in color with thick nearly white sapwood, warping badly in drying. It is used for pulp and for boxes. The cottonwood has been extensively planted as an ornamental tree along the streets, but as such it has few merits as it is short-lived and the roots often penetrate and clog drains and sewers. It is not easy to destroy, for, once cut down, the stump continues to sprout vigorously.

COTTONWOOD

Leaf and fruit, one-half natural size; twig, one-third natural size

Bark—smooth on young trunks and branches; light yellowish green in color, becoming thick, ashy gray in color, and deeply furrowed with age.

Twigs—stout, round or ridged below the bud, bright yellow or greenish yellow in color; rank odor when broken.

Winter buds—terminal bud present, large, resinous, glossy, smooth, chestnut brown in color; lateral buds smaller, in many instances bending away from the twig.

Leaves—alternate, simple, broadly triangular, from 3 to 5 inches long, coarsely serrate margin, square base, long and laterally flattened leaf stalk.

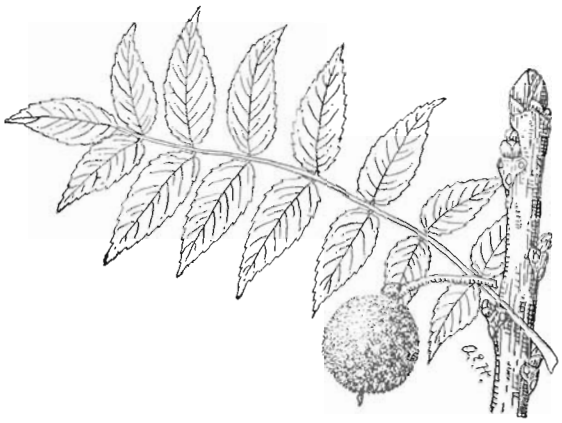
Fruit—a scattered cluster of capsules as in the aspens, though somewhat larger (3 to 6 inches long), arranged in long, drooping tassels. Seeds—within capsule, numerous, small surrounded by a mat of fine hairs, ripening in the spring, conveyed long distances by the wind. The cotton-like mat of fine hairs is the reason for the name "cottonwood".

Outstanding features—rank odor when twig is broken; incurved teeth on leaf margin of triangular leaf.

15. BLACK WALNUT

(*Juglans nigra* Linnaeus)

Black walnut is one of the most valuable timber trees native to this State. It reaches a large size and produces highly prized wood and large edible nuts. It is common at low elevations in rich, well-drained bottom-



BLACK WALNUT
Leaf, one-fifth natural size; twig, three-fourths natural size; fruit, one-third natural size

lands northward to Saratoga and Jefferson Counties and west to Lake Erie. The wood is heavy, hard, strong, durable, rich dark brown in color, easily worked, and takes a fine polish. It is largely used in cabinet-making, interior trim, and for gunstocks. It deserves protection and planting in suitable locations.

Bark—thick, dark, deeply furrowed with rounded ridges between; grayish brown in color; inner bark dark chocolate brown in color.

Twigs at first hairy, later smooth, stout, brittle, orange brown in color, cream-colored chambered pith.

Winter buds—terminal bud pale, downy, scarcely longer than broad, blunt-pointed, less than 1/3 inch long; lateral buds less than 1/6 inch long.

Leaves—alternate, compound, with from 13 to 23 leaflets; leaflets from 3 to 4 inches long, sharp-pointed, serrate along margin, usually stalkless; leaves up to 2 feet in length.

Fruit—a round nut, 1½ inches in diameter, black, the surface roughened by rather coarse ridges, enclosed in a yellowish green, fleshy, husk, usually solitary or in clusters of 2, ripening in October. Kernel—sweet, edible, and when properly cured somewhat easier to extract than the butternut. It is necessary to remove the outer husk if nuts are to be stored.

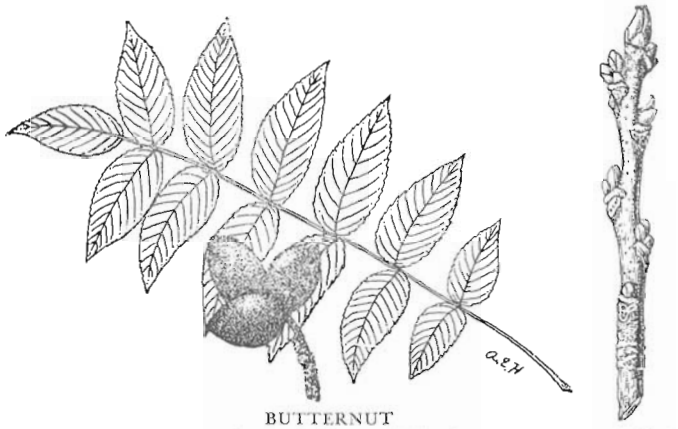
Outstanding features—large round nut; cream-colored, chambered pith.

16. BUTTERNUT

White Walnut

(*Juglans cinerea* Linnaeus)

Butternut is a close kin to the black walnut though not so valuable a timber tree. It produces attractive wood and edible nuts, but branches freely and seldom reaches a large size. It is common in moist soils, especial-



BUTTERNUT
Leaf, one-fifth natural size; twig, one-half natural size; fruit, one-third natural size

ly along fences and roads throughout the State, but is infrequent in the higher Adirondacks. The wood is light, soft not strong, coarse-grained, light brown in color, fairly durable, and easily worked and polished. It is used for interior trim, furniture, and fence posts.

Bark—smooth on young trunks and branches, light gray in color; on older trunks deeply divided into long, broad, flat-topped, whitish ridges.

Twigs—stout, brittle, greenish-gray in color, often hairy, easily identified by a dark-brown furry growth, or "mustache," found just above most leafscars; chambered pith dark brown as contrasted with the light brown chambered pith of the **black walnut.**

Winter buds—terminal bud pale, downy, blunt-pointed from ½ to ¾ inch long, flattened, longer than wide; lateral buds smaller and shorter.

Leaves—alternate, compound, with from 11 to 17 practically stemless long-pointed leaflets, margins serrate as in black walnut; leaves up to 2½ feet in length; leaf stalk, hairy where it joins stem.

Fruit—a rather large nut, 1½ inches long, tapering at the end, black with fine cut ridges, enclosed in a sticky, green husk usually in clusters of from 3 to 5, ripening in October of the first season. Kernel—sweet, oily, but somewhat difficult to extract. The **butternut** has the advantage of curing without removing the outer husk.

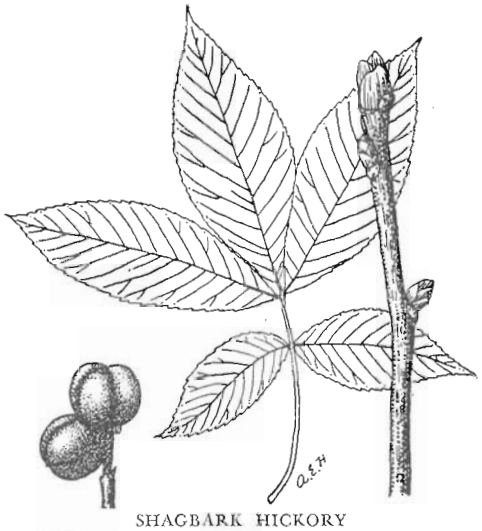
Outstanding features—"mustache" above "monkey-faced" leaf-scars; dark brown, chambered pith.

17. SHAGBARK HICKORY

Shellbark Hickory, Scalybark Hickory

(*Carya ovata* (Miller) K. Koch)

Shagbark hickory is the best known and most valuable of the hickories in this State. It is common in deep, moist soils throughout New York, though rare in the higher Catskills and Adirondacks, and is not reported



SHAGBARK HICKORY
Leaf, one-third natural size; twig, one-half natural size; fruit, one-third natural size

from the pine barrens of Long Island. In the forest it is a tall straight-branched tree but in open fields and along hedgerows where it often grows it usually forks near the ground into stout ascending limbs. The wood is very heavy, tough, elastic, close-grained, and is used chiefly for handles, vehicles, agricultural implements, and fuel.

Bark—light gray in color, smooth and seamy, becoming shaggy with age and peeling off into long strips which are loose at both ends and attached in the middle, thus giving rise to the name "shagbark hickory."

Twigs—covered with numerous light dots, extremely tough and pliable, reddish brown to gray in color.

Winter buds—large, ovate, blunt-pointed, with papery, dark brown, loose bud scales, the outer scales much darker, persistent through the winter; terminal bud usually more than ½ inch long.

Leaves—alternate compound, from 8 to 14 inches long, with from 5 to 7 leaflets, the three upper ones being by far the largest.

Fruit—a smooth, white, 4-angled nut, enclosed in a thick, round husk that splits into 4 sections as the nut falls after heavy autumn frosts. Kernel—large, sweet.

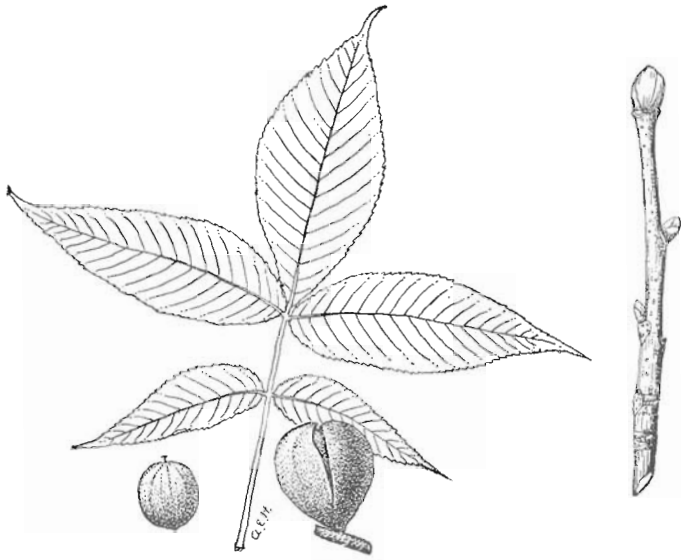
Outstanding features—large terminal bud; from 5 to 7 leaflets, outer 3 much larger; bark peeling in long plates.

18. PIGNUT HICKORY

Pignut, Brown Hickory

(*Carya glabra* (Miller) Sweet)

Pignut hickory is a fair-sized, upland species preferring dry ridges and hillsides throughout the State, except in the Adirondack region where it is found only at the lower elevations. The wood is strong and very tough. Its uses are similar to those of **shagbark hickory**.



PIGNUT HICKORY
Leaf and fruit, one-third natural size; twig, one-half natural size

Bark—typically close-fitting, dark gray in color, marked with shallow furrows and narrow ridges which are seldom shaggy, though sometimes becoming detached at end. The variation in bark characteristics of the **pignut hickory** is very pronounced.

Twigs—comparatively slender, smooth, tough, and pliable, reddish brown to gray in color.

Winter buds—small, oval, blunt-pointed, covered with reddish brown scales, the outer pair of which often drop off in winter; terminal bud less than ½ inch long, much smaller than the terminal bud of the **shagbark hickory**.

Leaves—alternate, compound, from 8 to 12 inches long, with from 5 to 7 leaflets all of which are alike or nearly alike as to size.

Fruit—a pear-shaped to nearly round, thin-husked, buff-colored nut without ridges, 1 inch long, thick shelled. Kernel—at first sweet, later somewhat bitter. Husk—contrasted with **shagbark hickory**, all or part usually clings to the nut after it has fallen to the ground.

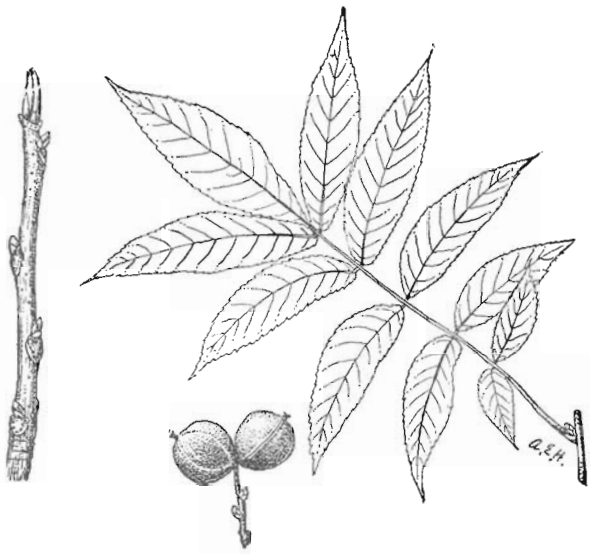
Outstanding features—from 3 to 5 leaflets, all nearly same size; lacey design in bark; small terminal bud like that of rose.

19. BITTERNUT HICKORY

Swamp Hickory, Water Hickory, Tightbark Hickory

(*Carya cordiformis* (Wangenheim) K. Koch)

Bitternut hickory is occasional in most sections of the State except in the higher Adirondacks or Catskills. It is by preference a bottomland tree growing on wet sites in pastures, fields, and along streams, though it is occasionally found on hillsides. It grows well on moist, rich soil such as is found in many farm woodlots. The wood is heavy, very hard, strong, tough, and dark brown in color with paler sap-wood. It is inferior to that of the other hickories but is used for practically the same purposes.



BITTERNUT HICKORY

Twig, one-half natural size; leaf, one-third natural size; fruit, one-half natural size

Bark—thin, close, with shallow furrows and narrow regular ridges, usually does not scale or shag off, light gray in color.

Twigs—slender, often yellowish in color, hairy toward the end; grayish or orange-brown in color during the first winter; pith brown and unlike any other hickory in this respect.

Winter buds—long, flattened, blunt-pointed, covered by 4 sulfur-colored scales; terminal bud from 1/3 to 3/4 inch long.

Leaves—alternate, compound, from 6 to 10 inches long, with from 7 to 11 long, narrow, sharp-pointed leaflets which are smaller and more slender than are those of other hickories.

Fruit—a nearly round nut, thin-husked, brown in color, from 3/4 to 1 inch long, without ridges. Kernel bitter, not edible. Husk—clings to the nut after falling. Shell is so thin that it can easily be crushed between the fingers.

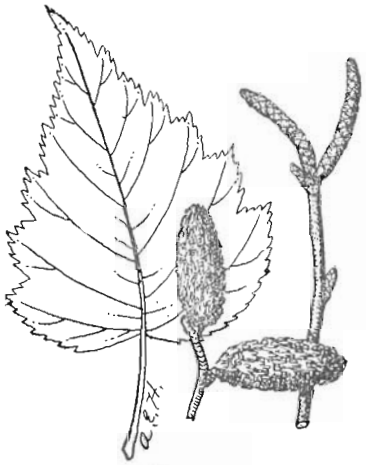
Outstanding features—smooth bark and usually straight stem; sulfur-colored bud; from 7 to 11 small leaflets.

20. GRAY BIRCH

Old-field Birch, White Birch, Poplar Birch

(*Betula populifolia* Marshall)

Gray birch must be classed with the aspens as one of New York's "weed" trees, being particularly abundant in the lower Hudson Valley where it grows chiefly on dry, gravelly soils of burned-over areas and abandoned farms. Though often confused with the true paper birch, it is far inferior to that species in size and value of the wood. Its white bark renders it more attractive than the aspens, and the characteristic clump effect of its growth is striking, particularly along streams. The tree is short-lived and is rarely as much as 8 inches in diameter. The wood is light and soft, decaying quickly. In New York it is used for fuelwood and pulpwood only.



GRAY BIRCH

Leaf and twig, two-thirds natural size; fruit natural size; male flower buds at upper right

Bark—on small stems, reddish brown in color, becoming with age dull, chalky white, not peeling off in papery layers as in paper birch; with distinct black triangular patch below each branch where it joins the stem.

Twigs—slender, reddish brown in color, becoming dull chalky white with age.

Winter buds—small, smooth, pointed, brownish in color, in many instances bending away from the twigs; end bud on the season's growth not terminal.

Leaves—alternate, simple, from 3 to 4 inches long, triangular in shape, very long-pointed, shiny on upper surface, margin doubly serrate.

Fruit—a slender, erect, cone-like structure, ¾ inch long, ⅓ inch thick, on a short stalk; consisting of winged nutlets and 3-lobed scales in alternate layers; both become detached from the central stem in late autumn and winter. Seeds—minute, broad wings, spread by the wind.

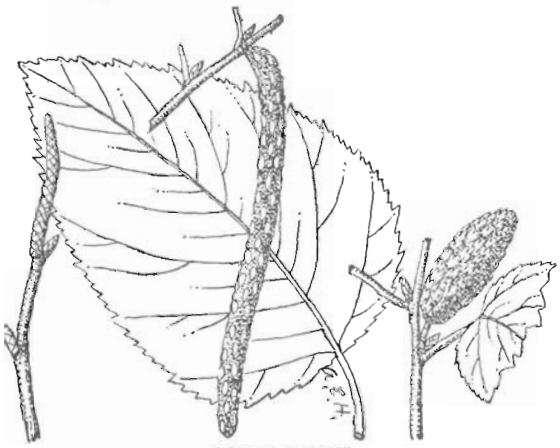
Outstanding features—long-pointed, triangular leaf; dull, chalky-white bark, not peeling in thin layers.

21. PAPER BIRCH

Canoe Birch, White Birch

(*Betula papyrifera* Marshall)

Paper birch is well known throughout the Adirondacks and the Catskills and along the highlands of the Susquehanna and Delaware drainage on account of its white, papery bark. This tree grows on a wide range of soils; it thrives along lakes, streams, and swamps, and maintains itself



PAPER BIRCH

Twig, one-half natural size; leaf and fruit, natural size; male flower buds in winter at left; male flower in center

on the higher slopes of our mountains. Spools, woodenware, shoe lasts, wood pulp, and fuel wood are made from its light, strong, tough, hard, light brown wood.

Bark—on young stems, golden to reddish brown in color, early becoming chalky white and peeling off in thin, papery layers, which once separated from the tree are never renewed. Because it is tough, resinous, durable, and impervious to water, it was the choice of all northern Indians for their canoes. Now it is the choice of the souvenir hunter.

Twigs—stouter than those in gray birch, dull reddish brown in color.

Winter buds—terminal bud absent as in gray birch; lateral buds small, sharp-pointed, bending away from twig.

Leaves—simple, alternate, ovate, blunt-pointed rather than slender at apex, from 2 to 3 inches long, coarsely serrate on margin; at maturity dull dark green in color above, paler below.

Fruit—a cone-like structure as in the gray birch, 1 inch long, 1/3 inch thick, usually pendant rather than erect; nutlets and bracts falling in late autumn and winter as with other birches.

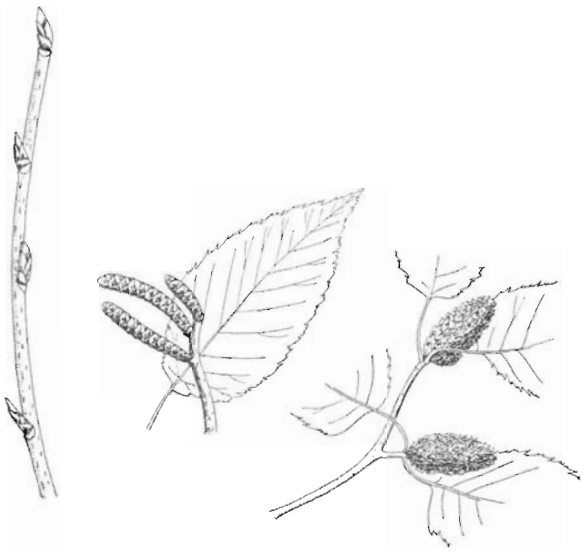
Outstanding features—white bark peeling in papery layers in older trees, in saplings reddish-brown; ovate leaves.

22. BLACK BIRCH

Cherry Birch, Sweet Birch

(*Betula lenta* Linnaeus)

Black birch yields a variety of useful products. From the Hudson River Valley to Lake Erie, except along the higher mountains, in moist or dry, gravelly soils, this tree is well known to boys and girls for the wintergreen flavor of its twigs. The wood is heavy, strong, hard, close-grained, and dark brown in color with yellowish sapwood, and is used for fuel and in furniture, especially as a substitute for **cherry** or **mahogany.** Oil of wintergreen, used medicinally and for flavoring, is distilled from the twigs. Birch tea is made from scrapings of inner bark of twigs steeped in hot water.



BLACK BIRCH
Leaf and twig, one-third natural size; male flower buds one-half natural size

Bark—on branches smooth, close, not peeling, dark reddish brown in color with conspicuous, light colored, elongated breathing pores; on older trunks breaking into long, thick irregular plates almost black in color.

Twigs—slender, light reddish brown in color, with numerous, short, spur-like lateral **twigs**; strong wintergreen flavor when chewed.

Winter buds—**terminal** bud present on spur-like lateral branches only, about ¼ inch **long, conical**, sharp-pointed, reddish brown in color, buds on season's growth usually bending away from twigs.

Leaves—alternate, simple, ovate, from 2 to 5 inches long, sharp-pointed, with fine doubly serrate margin, found usually in pairs, not opposite on lateral spurs.

Fruit—an erect, cylindrical, cone-like structure as in other birches, from 1½ to 2 inches long, without stalk; the winged nutlets falling in autumn and winter.

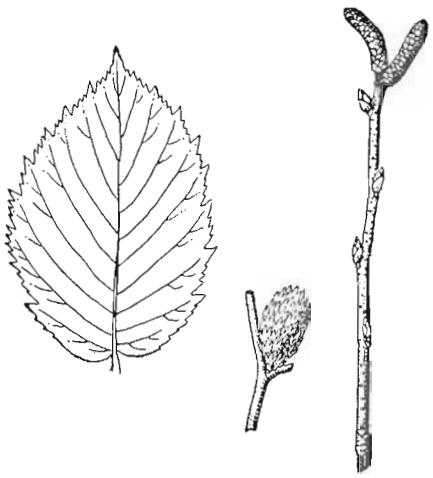
Outstanding features—strong wintergreen flavor in twigs and bark; leaves usually in pairs on spurs.

23. YELLOW BIRCH

Silver Birch, Gray Birch

(*Betula lutea* Michaux)

Yellow birch is one of the most important and largest timber trees of New York State. It is common throughout the State, except on Long Island, on rich, moist uplands in company with beech and sugar maple, but is found also with red spruce in the swamps and along waterways. The heavy, very strong, hard, close-grained, light brown wood is largely used for furniture, woodenware, flooring, interior finish, airplanes, and for agricultural implements. Its value for fuel wood entitles it to a place in farmers' woodlots. It often grows out of old stumps.



YELLOW BIRCH
Leaf and twig, one-half natural size; fruit, one-fourth natural size; male flower buds at upper right

Bark—on young branches close, bright, silvery, yellowish gray in color; with age peeling into thin papery layers which roll back and extend up the trunk in long lines of ragged fringe, making excellent tinder for starting a fire in the rain; on very old trunks becoming rough and furrowed, reddish brown in color.

Twigs—similar to those of **black birch** though more yellowish brown in color, slightly wintergreen-flavored; abundant, spur-like laterals as in **black birch.**

Winter buds—similar to those of **black birch.**

Leaves—similar to those of **black birch;** undersurface somewhat hairy, particularly along veins.

Fruit—similar to that of **black birch** though usually wider in proportion to its length, falling in late autumn and throughout the winter. Bracts—3-lobed, distinctly hairy, while in the **black birch** they are smooth.

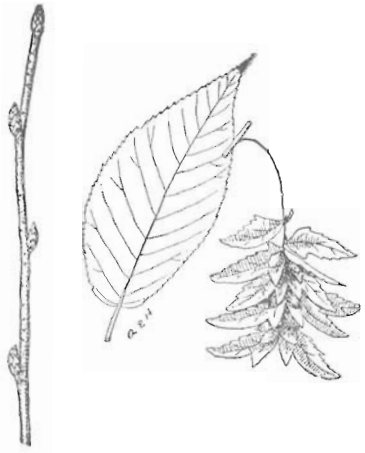
Outstanding features—silvery gray to yellowish bark, peeling in thin sheets; slight wintergreen flavor in bark and twigs; undersurface of leaves hairy along veins.

24. BLUE BEECH

Ironwood, Water Beech

(*Carpinus caroliniana* Walter)

Blue beech is a small-sized, bushy tree frequent along water courses and along the edges of swamps generally throughout the State. It is rarely more than 6 inches in diameter and may be classed as a "weed" tree. The wood is very heavy, hard, strong, close-grained, and is occasionally used for mallets on account of its hardness.



BLUE BEECH
Twig, leaf, and fruit, one-half natural size

Bark—smooth, thin, dark bluish gray in color, close-fitting, with smooth, rounded lengthwise ridges that resemble tensed muscles.

Twigs—very slender, dark red in color, and shining.

Winter buds—terminal bud absent; lateral buds small, narrowly ovate, pointed, covered with many reddish brown scales.

Leaves—simple, alternate, ovate, from 2 to 4 inches long, finely and doubly serrate on margin.

Fruit—a small prominently ribbed nutlet, 1/3 inch long, enclosed in a 3-lobed leaf-like bract. Bracts with their enclosed nutlets are in long, drooping clusters which ripen and fall before winter.

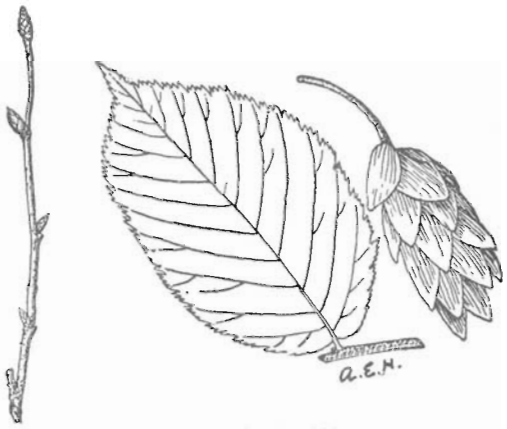
Outstanding features—"muscles" in bark; fruit a nutlet enclosed in 3-part "dress."

25. HOP HORNBEAM

Ironwood

(*Ostrya virginiana* (Miller) Koch)

Hop hornbeam is another "weed" tree closely related to the blue beech and is rather generally distributed throughout New York State on dry, gravelly, and stony soils of slopes and ridges, sometimes taking possession of woodlots in central New York to the exclusion of other species.



HOP HORNBEAM
Twig, leaf, and fruit, one-half natural size

The tree is slow-growing and is rarely found larger than 10 inches in diameter. The wood is very heavy, hard, and strong, hence the name "ironwood." It is used for tool and implement handles and for levers, and makes excellent fuel wood when seasoned.

Bark—thin, very markedly flaky; light grayish brown in color, broken into narrow, flattish pieces, loose at the ends.

Twigs—fine, reddish brown in color, smooth, and shiny; a very easy winter character for identification of the tree, particularly of young saplings.

Winter buds—terminal bud absent as in birches and elms; lateral buds small, light reddish brown in color, bending away from the twig.

Leaves—alternate, simple ovate, from 3 to 5 inches long, doubly and finely serrate on margin.

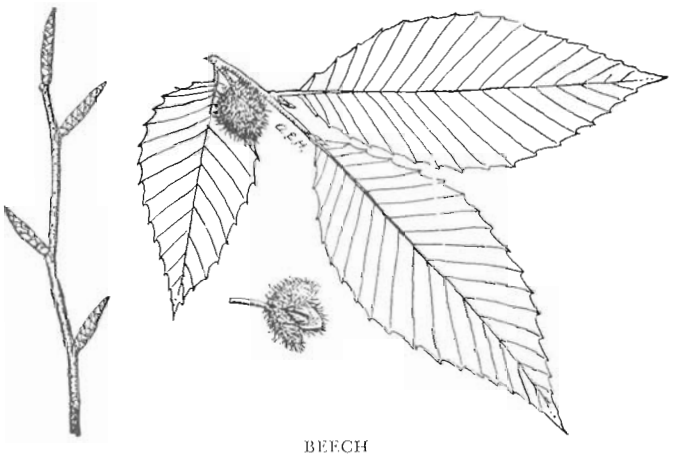
Fruit—a small, seed-like nutlet, enclosed in an inflated, sac-like bract. Bracts—in clusters from 1 to 2 inches long, resembling hops, hence the name "hop hornbeam." Fruit usually falls before winter.

Outstanding features—shreddy bark; shiny, reddish-brown twigs; papery fruit like a hop.

26. BEECH

(*Fagus grandifolia* Ehrhart)

Beech has perhaps the widest distribution of any forest tree in the State and for that reason, no doubt, is one of the best known. In the Adirondacks and Catskills it forms an important part of the hardwood forest, but is almost equally common throughout the rest of the State. Though the tree is of large and stately size, the wood is less valuable than that of many of its associates in the woodlot section of the State, with the result that it has been left standing. Because of its heavy shade, it has also excluded more valuable trees. In such conditions, it is, in effect, a "weed" tree. The wood is heavy, hard, strong, tough, and close-grained, and is excellent as fuel wood. It also is used largely in the acid-wood industry, for baskets and crates, and to some extent for furniture.



BEECH
Twig, leaf, and fruit, one-half natural size

Bark—smooth, close, steel gray in color, easily recognized by this character.

Twigs—slender, zigzag, smooth, shining reddish brown in color becoming gray on older twigs.

Winter buds—terminal bud present, slender, ¾ inch long, sharp-pointed, covered with light brown scales; lateral buds not much smaller than terminal bud.

Leaves—simple, alternate, from 3 to 4 inches long, ovate, coarsely toothed on margin, bristle tipped; at maturity very thin, dull green in color above, pale green beneath.

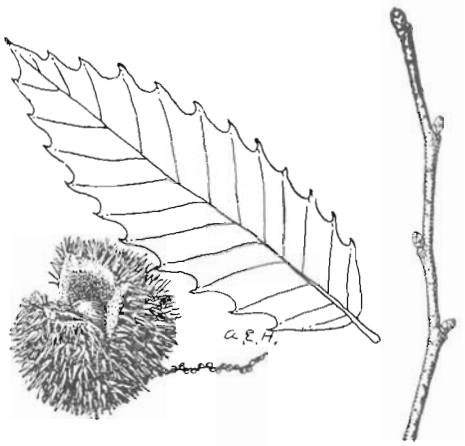
Fruit—a stalked burr, covered with soft, curving prickles, containing a nut. Burrs—usually in pairs, open up to let the nuts fall in the early autumn, remaining on the tree into the winter. Nut—triangular, pale brown in color, shining, with sweet edible kernel.

Outstanding features—smooth gray bark; coarse, sharp teeth on leaf margin; "cigar-shaped" buds.

27. CHESTNUT

(Castanea dentata (Marshall) Borkhausen)

Chestnut, once common across the State south of the Adirondacks, has in the past twenty years succumbed to the deadly chestnut blight, so that there are practically no live trees of commercial size in the State. Perhaps almost any other species could have been better spared in the farmer's



CHESTNUT
Twig, one-half natural size; leaf and fruit, one-third natural size

woodlot because of its rapid growth, the many uses of its wood, and the fine crop of nuts it furnished. The wood is light, soft, coarse-grained, reddish brown in color, and durable in contact with the soil. It is now used largely for posts.

Bark—on young trunks smooth, reddish brown in color, with age broken by shallow fissures into long, broad flat, more or less slanting ridges.

Twigs—stout, greenish yellow or reddish brown in color, somewhat swollen at base of buds; pith star-shaped in cross section.

Winter buds—small ovate, light chestnut brown in color, set at an angle to the leaf scar; terminal bud absent.

Leaves—simple, lanceolate, alternate, from 6 to 8 inches long, sharp-pointed, widely toothed.

Fruit—a light brown burr, sharp, spiny without and hairy within; opening at the first frost and letting fall generally 3 nuts. Nuts—shiny, woolly at the top; shell very thin; kernel solid, white, sweet, and makes excellent eating.

Outstanding features—stout twigs, with star-shaped pith; long leaves with widely-spaced, sharp teeth.

THE OAKS[3]

Of the 300 oaks known in the world, fifty-five are native to North America, and most of these are in eastern United States. The oaks make up the largest group of forest trees native to New York. In all there are sixteen 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 oaks of New York do not thrive in the high forests of the mountains; therefore, representatives of the family found in the Adirondack section are in the sheltered valleys of the foothills. South and westward in the drainages of the Susquehanna, Genesee, and Alleghany Rivers, they become very plentiful in variety and number.

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 the white-oak 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 most important members of the group in New York are **white oak, swamp white oak, bur oak, post oak,** and **chestnut oak.**

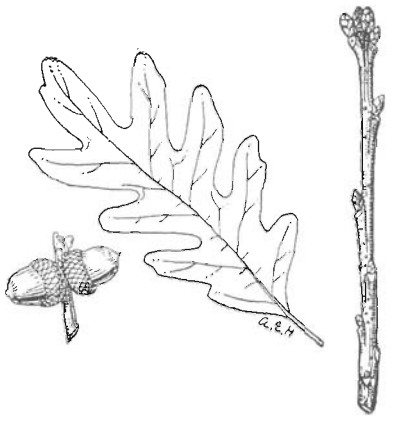
The black oaks—The leaves of the members of the black-oak group have bristle-tipped (not round-lobed) leaves, and the kernels of their acorns are usually bitter. All the oaks of this group require two seasons to mature their acorns; for this reason the representatives of this group are sometimes called "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 most important members of this group in New York State are **black oak, red oak, scarlet oak,** and **pin oak.**

[3]Largely adapted from *Common Trees of New York*, by J. S. Illick. 1927.

28. WHITE OAK

(*Quercus alba* Linnaeus)

White oak is one of the most important forest trees in the southern two-thirds of the State, growing to large size and producing lumber of high grade and value. It is found in moist as well as in dry locations, and was once particularly abundant on what are now the best farm lands of the Genesee Valley. The wood is hard, heavy, strong, and durable. It is highly prized for furniture, flooring, implements, ties, and in general construction where strength is required, especially in piling and ships.



WHITE OAK
Leaf and fruit, one-third natural size; twig, one-half natural size

Bark—ashy gray in color, broken by shallow furrows into long, irregular, thin scales which readily flake off; on old trunks furrows frequently become deep.

Twigs—medium in thickness, greenish red to gray in color, smooth, sometimes covered with a bloom.

Winter buds—clustered at end of twigs, blunt, reddish brown in color, 1/8 inch long.

Leaves—alternate, simple, from 5 to 9 inches long, with from 5 to 9 rounded lobes, generally deeply cleft toward midrib, dark green in color above, paler below, frequently staying on tree over winter.

Fruit—an acorn, either with short stalk or stalkless, maturing in one year. Nut—light brown in color, 3/4 inch long, 1/4 enclosed in the cup, falling in September, frequently starts sprouting in late autumn. Meat—white, slightly bitter.

Outstanding features—ashy gray, flaky bark; deeply cleft lobes in leaves; acorn 1/4 enclosed in cup.

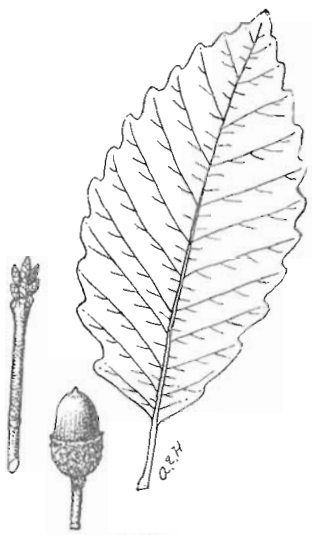
28a. *Swamp white oak* is a tree of the moist bottom lands with leaves wider at outer ends and rounded teeth. The bark on young branches and twigs separates into curling scales. The acorn cups are long-stalked and deeply saucer-shaped. The wood has the same uses as that of white oak.

29. CHESTNUT OAK

Rock Oak

(*Quercus montana* Willdenow)

Chestnut oak gets its name from its chestnut-like leaves. It is found principally on dry, rocky ridges and hillsides, and is very common on such soils in the lower Hudson Valley. The wood is similar though somewhat inferior to white oak and is used generally for ties, posts, and rough construction. The lumber is too hard for interior finish.



CHESTNUT OAK
Leaf, twig, and fruit, one-third natural size

Bark—on young branches smooth, thin, yellowish brown in color; with age becoming dark brown to black in color, deeply furrowed into long, more or less continuous thick, rough ridges which are sharp and angular. At the bottom of the furrow, the bark may be reddish brown in color. The thick bark of mature trees is an important source of tannin.

Twigs—stout, light orange or reddish brown in color.

Winter buds—clustered at ends of twigs, sharp-pointed, light yellowish brown in color, ¼ inch long.

Leaves—simple, alternate, thick, yellowish green in color above, somewhat paler beneath, from 5 to 9 inches long, coarsely toothed as in chestnut, but teeth rounded and without bristle tips.

Fruit—an acorn, borne singly or in pairs on short stalks, maturing in September of the first season, starts sprouting soon after falling; one of the larger of our native acorns. Nut—shiny, light chestnut brown in color, from 1 to 1½ inches long, ⅓ enclosed in the cup. Meat—white, somewhat bitter.

Outstanding features—orange streak between ridges of bark; round teeth or scallops on leaf margin; long slim acorn.

30. RED OAK

(*Quercus borealis* Michaux)

Red oak is the fastest growing and largest of all the oaks native to New York State. It shows adaptability to a wide variety of soil conditions and ranges farther north than any other oak common to the State. The wood is heavy, hard, strong, light reddish brown in color, and is used for furniture, interior finish, ties, piling, ships, and general construction, though less durable than white oak.

RED OAK
Leaf, one third natural size; twig and fruit, one-half natural size

Bark—on young trees smooth, gray green in color; with age tardily breaking into rather regular, firm, elongated, flat-topped ridges with shallow furrows between. The smooth ridge tops are markedly lighter in color than are the furrows. On very large trees, this characteristic is lost at the base but is evident higher up the trunk. Inner bark is red in color.

Twigs—stout or slender, reddish to greenish brown in color.

Winter buds—clustered at end of twigs, oval, sharp-pointed, ¼ inch long, generally smooth (particularly on the lower half).

Leaves—alternate; simple, from 5 to 9 inches long, from 4 to 6 inches wide, from 7 to 9 lobes; lobes sparsely toothed, bristle-tipped; wide rounding clefts extending halfway to midrib. At maturity thin, dark, shiny green in color above, paler and smooth below.

Fruit—an acorn, borne solitary or in pairs, either with or without stalk, maturing in the autumn of the second year; one of our largest acorns. Nut—chestnut brown in color, ¾ inch long, only ⅓ enclosed in a wide, shallow cup. Meat—pale yellow in color, bitter.

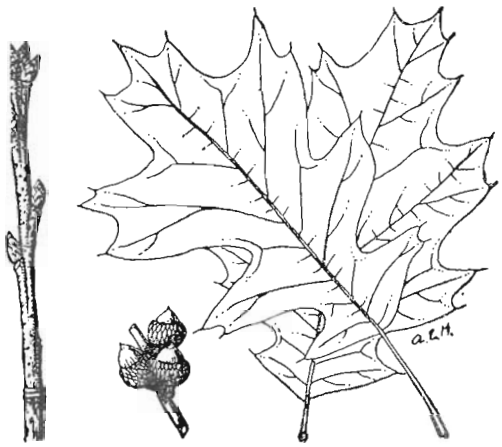
Outstanding features—reddish inner bark; leaf balanced (no heavier at outer than inner end); large fat acorn with flat cup. In thick woods, lower branches usually are self-pruned to more than half the height of tree.

31. BLACK OAK

Yellow Oak

(*Quercus velutina* La Marck)

Black oak is another dominant forest tree of the southern part of the State though not so valuable or so fast growing as the red oak. It is usually found in gravelly soils, and on drier sites than red oak. The wood is hard, heavy, strong, but is not considered so valuable as red oak. It finds its chief use for ties, construction, and fuel wood.



BLACK OAK
Leaf, one-third natural size; twig and fruit, one-half natural size

Bark—on young stems smooth, dark brown in color, soon becoming dark gray to black, very rough, broken by deep furrows into thick ridges which are further divided by cross furrows; roughened especially at the base of trunk even in quite young trees; inner bark orange yellow in color, rich in tannin, yields a yellow dye.

Twigs—stout, reddish brown in color mottled with gray.

Winter buds—cone-shaped sharp-pointed, from 1/4 to 1/2 inch long, covered with yellowish gray wool, clustered at end of twig.

Leaves—simple, alternate, from 4 to 10 inches long, from 3 to 6 inches wide, from 5 to 7 lobes, toothed, bristle tipped, separated by wide rounded clefts, extending over halfway to midrib; at maturity leaves thick, dark green in color and shining above, paler and woolly beneath (particularly along midrib).

Fruit—an acorn, borne singly or in pairs, with or without stalks, maturing in autumn of second year. Nut—reddish brown in color, from 1/2 to 3/4 inch long, enclosed about 1/2 its length in light brown cup. Meat—yellow, very bitter.

Outstanding features—orange-yellow inner bark; leaf unbalanced, heavier on outer end, woolly along midrib beneath; acorn small, half-enclosed in cup. Lower branches usually remain below half the height of tree.

32. SCARLET OAK

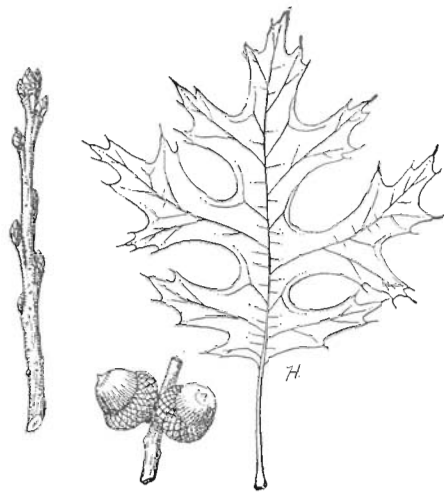
(*Quercus coccinea* Muenchhausen)

Scarlet oak, so called from the brilliant coloring of its autumnal foliage, thrives on poor soils. The wood is hard, heavy, strong, and coarse in texture. It is of inferior commercial value except for props, ties, and fuel. Because of the characteristic habit and brilliant coloring of the leaves in autumn is often used for ornamental purposes.

Bark—on young trunks, smooth, light brown in color; with age dividing into irregular ridges with shallow furrows between; in general, ridges not so regularly flat-topped as in **red oak** or so roughly broken up as in **black oak;** inner bark reddish in color.

Twigs—medium stout to slender, light red in color.

Winter buds—broadly oval, blunt at the top, clustered at end of twig, dark reddish brown in color, somewhat woolly.



SCARLET OAK
Leaf, one-third natural size; twig and fruit, one-half natural size

Leaves—simple, alternate, from 3 to 6 inches long, from 3 to 5 inches wide, from 5 to 9 lobes; lobes toothed, separated by wide, rounding clefts, extending well over halfway to the midrib; at maturity leaves thin, firm, shiny, dark green in color above, paler below.

Fruit—an acorn, borne singly or in pairs with or without stalks, maturing in autumn of second year. Nut—oval, reddish brown in color, from ½ to 1 inch long, from ½ to ⅓ enclosed in reddish brown cup. Meat—pale yellow, bitter.

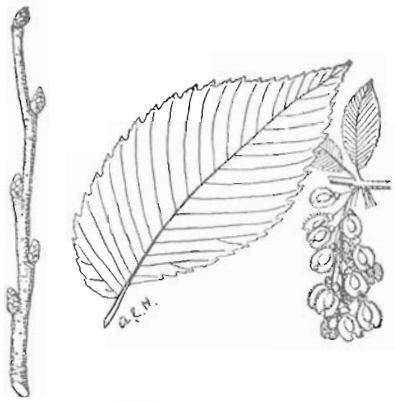
Outstanding features—clefts between lobes of leaves extending nearly to midribs; lower branches persistent for many years, down curving.

33. AMERICAN ELM

White Elm

(*Ulmus americana* Linnaeus)

American elm is one of the most beautiful, graceful, and best known forest trees in New York. It occupies a wide range of sites though typically a tree of the bottomlands, and grows to be one of the largest trees in the State. (The Gowanda elm has a basal circumference of 39 feet.) The wood is heavy, hard, strong, tough, coarse-grained, difficult to split, and light brown in color; largely used for veneer, barrel staves and hoops, crates and wheel hubs. The graceful symmetry of the crown makes the elm highly prized for ornamental planting.



AMERICAN ELM
Twig, leaf, and fruit, one-half natural size

Bark—dark gray in color, divided by irregular up-and-down furrows into broad flat-topped ridges, rather firm or occasionally in old trees flaking off; inner bark in alternate layers of brown and white.

Twigs—slender, smooth, reddish brown in color, not mucilaginous (like glue) when chewed.

Winter buds—winter twig obviously ends in leaf scar, hence larger bud near end of twig not truly terminal; lateral buds somewhat smaller, ovate, pointed, light reddish brown in color, smooth, 1/8 inch long.

Leaves—simple, alternate, from 4 to 6 inches long, oblique at the base, margin doubly serrate, at maturity dark green in color above, lighter beneath, midrib and parallel veins prominent; upper surface of leaf somewhat rough to the touch, although not so pronounced as in slippery elm.

Fruit—flat, winged, deeply notched at the end, 1/2 inch long, containing one small seed; in clusters, ripens in early May as the leaf buds unfold, falling soon thereafter.

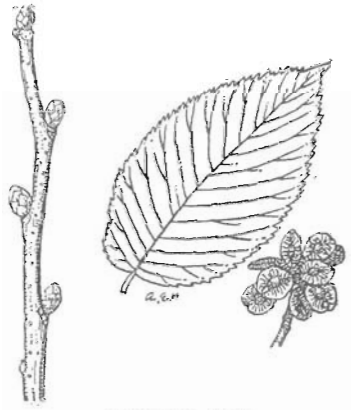
Outstanding features—zigzag twigs; inner bark not mucilaginous, having alternate layers of brown and white; leaf slightly rough on upper side only; with oblique base.

34. SLIPPERY ELM

34. Red Elm

(*Ulmus fulva* Michaux)

Slippery elm is a medium-sized forest tree of stream banks and low fertile slopes and is common south of the Adirondacks. The wood is hard, heavy, strong, coarse-grained, and fairly durable in contact with the soil. This tree is not an important commercial species but is used for fence posts, ties, barrel staves and hoops.



SLIPPERY ELM
Leaf, one-third natural size; twig and fruit, one-half natural size

Bark—grayish brown in color, more or less deeply furrowed, the ridges tending to lift more along one edge than in the **American elm**; layers of outer bark reddish brown in color, shows no alternate layers of brown and white as in the **American elm**; inner bark, next to the wood, whitish, strongly mucilaginous (like glue), giving the name "slippery elm."

Twigs—light gray in color, hairy, somewhat rough, characteristically mucilaginous when chewed.

Winter buds—terminal bud absent as in American elm; lateral buds ¼ inch long, dark chestnut brown in color, covered at tip with long, rusty hairs.

Leaves—alternate, simple, oval, from 5 to 7 inches long, oblique at the base, margin doubly serrate; at maturity thick, dark green in color above, decidedly rough to the touch, paler and white-hairy below; midrib and parallel veins prominent.

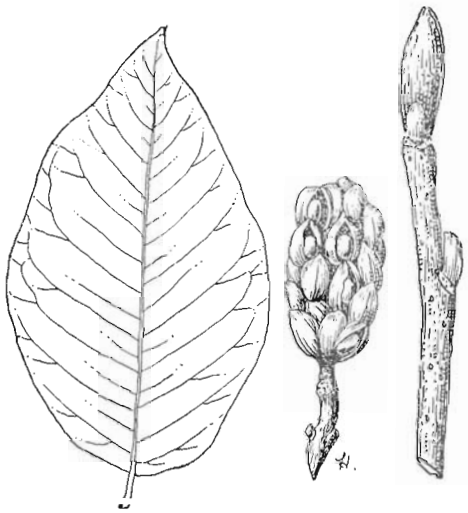
Fruit—flat-winged, but not notched at the end, from ½ to ¾ inch long, containing one seed; in clusters, maturing in late May or early June when the leaves are about half grown, falling soon thereafter.

Outstanding features—inner bark chewy, without alternate layers of brown and white; leaf base oblique, rough above and below; twigs chewy; buds tipped with rusty hairs.

35. CUCUMBER TREE

(*Magnolia acuminata* Linnaeus)

Cucumber tree, so called because of its cucumber-like fruit, is the only magnolia that is at all common to this State outside of Long Island. In rich woods, on moist slopes, and along stream courses, from the central part of the State westward and southward, it is to be found locally. The wood is light, soft, close-grained, brittle, and light yellowish brown in color. It resembles that of yellow poplar and besides wood-carving, has much the same uses. Because of its yellowish green flowers, its large leaves, its rapid growth, and its red seeds, it is often found in lawns and parks.



CUCUMBER TREE
Fruit and leaf, one-third natural size; twig and bud, two-thirds natural size

Bark—grayish brown in color, with long narrow furrows separating into rather loose, scaly, flat-topped ridges.

Twigs—brittle, brown in color, smooth or shiny, aromatic odor.

Winter buds—terminal bud oblong, somewhat curved, thickly covered with pale, silky hairs, pointed, about ½ inch long; lateral buds smaller, blunt, also hairy.

Leaves—alternate, simple, ovate, pointed at the tip, from 4 to 10 inches long, entire margin. One of the few forest trees of the State that has an entire-margined leaf.

Fruit—a cone-like or cucumber-like, cylindrical mass, often curved, about 2½ inches long, containing a large number of scarlet, pea-like seeds which dangle from the ends of short, white threads when ripe in the early autumn.

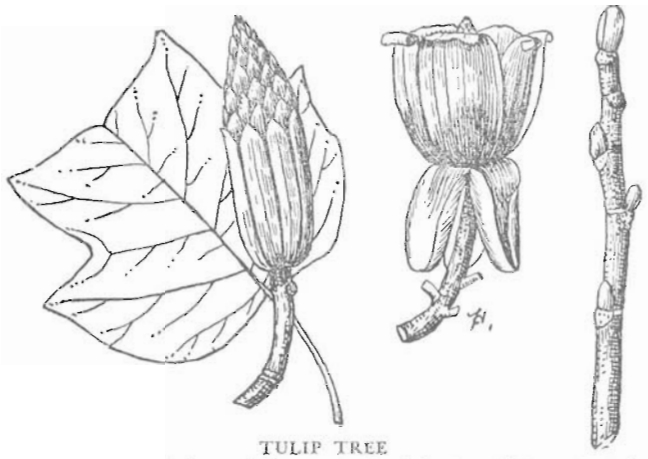
Outstanding features—smooth margin of large leaf; aromatic odor of twigs; oblong terminal bud; branching like that of pear tree, fruit like cucumber.

36. TULIP TREE

Yellow Poplar, Tulip Poplar, Whitewood

(Liriodendron tulipifera Linnaeus)

Tulip tree is one of our most distinctive and attractive trees. It is native from Saratoga and Rensselaer Counties westward along Lake Ontario to Lake Erie, and becomes more abundant southward in deep, rich, moist soils. Its large tulip-like, greenish yellow flowers have given



TULIP TREE
Flower, fruit, and leaf, one-half natural size; twig, two-thirds natural size

rise to the name "tulip tree." The wood is light, soft, brittle, not strong, straight-grained, light yellow or brown in color, and is largely made into lumber and interior finish and used where a soft, easily worked wood is required. Veneer of yellow poplar is highly prized in airplane construction.

Bark—on young trees, smooth, ashy gray or brown in color; on older trunks, light gray to brown, thick, distinctly and regularly furrowed and ridged.

Twigs—smooth, shiny, rather stout, reddish brown in color, often branching the first year, aromatic odor, very bitter taste.

Winter buds—terminal bud smooth, flattened, about ¼ inch long, simple, blunt, covered by two reddish brown bud scales giving the appearance of a mitten; lateral buds similar but much smaller.

Leaves—alternate, simple, from 4 to 6 inches long, almost square in outline, usually 3- or 4-lobed with truncate tip; the most distinctive and unusual leaf of any of our native forest trees.

Fruit—a cone, light brown in color, upright, pointed, from 2 to 3 inches long. Seeds—long winged, ripening in September, and for the most part falling soon after; outer ring of winged seeds may stay on the tree into the next season.

Outstanding features—unusual leaf, with "cut-off" tip; bitter taste, aromatic odor of twigs; mitten-like terminal bud.

37. SASSAFRAS

(*Sassafras variifolium* (Salisbury) Kuntze)

Sassafras is a small to medium-sized tree, best known, perhaps, for its bark and root which have long been used for making sassafras tea. It is rare or absent in the higher Adirondacks and Catskills but is locally common on the sandy soil between these mountain ranges, and is abun-

SASSAFRAS
Twig, one-half natural size; leaf, and fruit one-third natural size

dant on the hills along the lower Hudson River Valley and on Long Island. Its wood is soft, weak, brittle, coarse-grained, aromatic, and very durable in contact with the soil. It is used locally for fence posts.

Bark—reddish brown in color, deeply furrowed even in young trees, with flat-topped ridges crossed by horizontal cracks; inner layers bright cinnamon red in color.

Twigs—slender, brittle, spicy to smell, at first light yellowish green in color, later becoming reddish brown.

Winter buds—terminal bud present, from 1/3 to 3/5 inch long, pointed, greenish in color; lateral buds much smaller.

Leaves—alternate, simple, from 4 to 6 inches long, entire margined. The leaves present a great variation in shape on the same tree, some are ovate, others mitten-shaped (both left and right handed), still others are 3-lobed, more rarely 5-lobed.

Fruit—berry-like, small, dark blue in color, containing a stony seed 1/4 inch long, on a stout red stem, usually in clusters; ripens early in autumn.

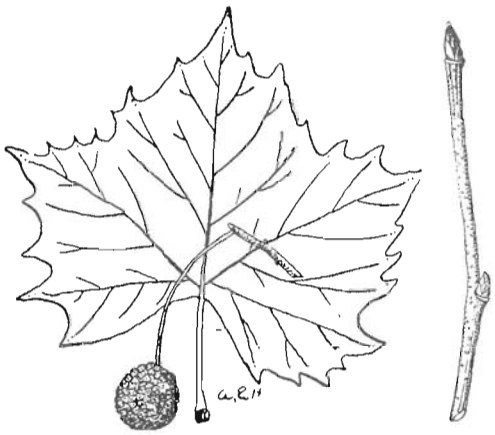
Outstanding features—leaves with 3 different shapes; inner bark cinnamon red; spicy smell of twigs.

38. SYCAMORE

Buttonwood, Buttonball, Plane Tree

(Platanus occidentalis Linnaeus)

Sycamore is a large-sized forest tree common throughout the State except in the Adirondacks and the higher Catskills and on Long Island. Wherever the soil is moist and fertile, along streams, in river bottoms, in low, damp woods, and occasionally in dryer places it is likely to be found. Its wood is heavy, tough, hard, not strong, coarse-grained, reddish brown in color, and is difficult to split or work. It is used for crates, tobacco boxes, butchers' blocks, novelties, and occasionally for furniture and for interior woodwork.



SYCAMORE
Leaf, one-third natural size; twig and fruit, one-half natural size

Bark—dark brown in color at base of older trunks, shallowly furrowed into broad ridges which are broken up into small plate-like scales; higher up on trunk and branches, peeling off in large, thin plates exposing areas of whitish, yellowish, or greenish inner bark which are very striking in winter.

Twigs—rather stout, somewhat shiny, zigzag, at first green in color and fuzzy, later grayish or brownish and smooth.

Winter buds—terminal bud absent; lateral buds conical, dull-pointed, smooth, reddish brown in color, 1/4 inch long, only one scale visible forming a cap over the bud.

Leaves—alternate, simple, broad, from 4 to 10 inches across, from 3 to 5 shallow lobes, thin, firm, smooth, bright green in color above, pale green and white woolly below.

Fruit—a ball, brown in color, about 1 inch in diameter, borne on a long stem, made up of tiny seeds. Seeds—each furnished with a long tuft of hairs; seed balls seldom break up before spring.

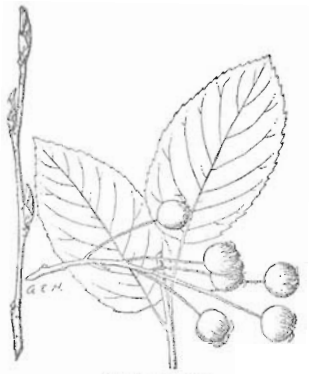
Outstanding features—whitish to greenish under-bark on upper trunk and limbs; bud with one scale forming cap; broad leaves, woolly below; fruit a brown, pebbly-grained ball.

39. SHAD BUSH

June Berry, Service Berry

(*Amelanchier canadensis* (Linnaeus) Medicus)

Shad bush is an attractive tree though not commercially valuable because of its small size. In the spring when the shad are ascending the rivers, its small white flowers are commonly noticed along the drier banks of the



SHAD BUSH
Twig, leaf, and fruit, one-half natural size

streams, along fence rows, and on hillsides in open woods. It is common throughout most parts of the State, particularly in the central and southern highlands. Its wood is heavy, harder than white oak, strong, close-grained, and dark brown in color often tinged with red. It is occasionally used for tool handles, and is highest of all native woods in heat value.

Bark—very smooth, grayish brown in color, with age often marked with dark lengthwise streaks.

Twigs—slender, somewhat zigzag, olive green to purplish brown in color, smooth, but usually covered by a thin grayish outer layer.

Winter buds—terminal bud from ¼ to ½ inch long, slender, sharp-pointed, greenish or purplish brown in color; lateral buds somewhat smaller than terminal bud or undeveloped.

Leaves—alternate, simple, ovate, from 2 to 4 inches long, sharp-pointed, finely serrate on margin.

Fruit—a berry, sweet, reddish purple in color, about ⅓ inch in diameter, contains many seeds; borne in clusters; ripening in June or July; a favorite food for birds.

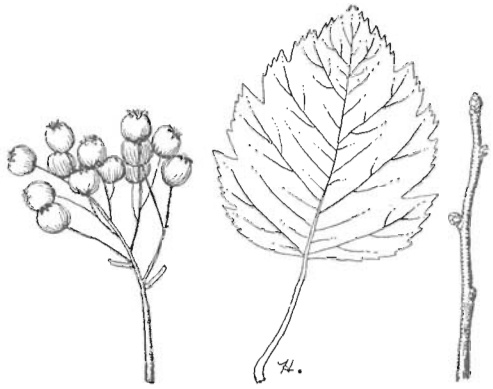
Outstanding features—gray bark marked with streaks; finely serrate leaves; clusters of red berries.

40. THE HAWTHORNS

Thornapple

(*Crataegus* Linnaeus)

Hawthorns comprise a large group of small-sized trees. More than a score of varieties are common in New York State. The differences are chiefly in flower and fruit and it seems advisable in this publication to



SCARLET HAWTHORN
Twig, leaf, and fruit, two-thirds natural size

call attention to the general characteristics of the group without going into the minute differences that separate the many species. The very small size of the trees, generally less than 20 feet, makes them of no commercial value. In fact, some members of the group may be regarded as a serious pest, because of the rapidity with which they seed up old pastures, shading out available pasturage or making costly the preparation of the land for forest planting.

Bark—generally dark brown to gray in color, scaly.

Twigs—stiff, zigzag, armed with large, generally unbranched thorns from 1½ to 2 inches long.

Winter buds—round, chestnut brown in color; terminal bud usually present but no larger than lateral buds.

Leaves—simple, alternate, from 3 to 4 inches long, from 2 to 3 inches wide, serrate on the margin; in some species leaves more or less ovate, others from 5- to 9-lobed.

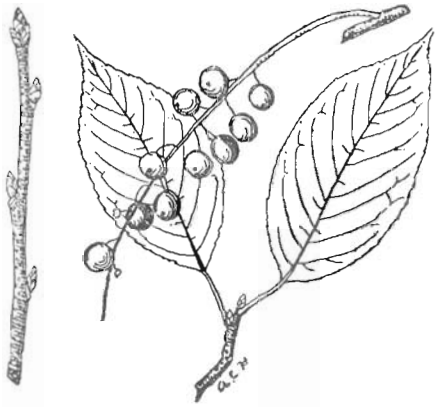
Fruit—berry-like, in a cluster, each fruit the size of a small cherry; when mature in early autumn, usually red, with from 1 to 5 nutlets in center of fleshy covering; highly prized by birds in winter.

Outstanding features—stiff thorns, from 1½ to 2 inches long; berry-like fruit, usually red.

41. WILD BLACK CHERRY

(*Prunus serotina* Ehrhart)

Wild black cherry is the largest of the cherry trees in New York State. It prefers rich, bottomlands, and moist hillsides, but is found also in drier situations. It is common in most sections of the State, though seldom found above an altitude of 3000 feet in the Adirondacks. Its wood is light, strong, hard, close-grained with pale reddish brown heartwood and is much in demand for cabinet-making, interior finishing, tools, ties and fence posts. It is a most valuable fast-growing timber tree and should be encouraged in every woodlot.



WILD BLACK CHERRY
Twig, two-thirds natural size; leaf, one-third natural size; fruit, one-half natural size

Bark—at first smooth, reddish brown in color, marked with easily seen, long, white breathing pores; with age becoming much roughened by irregular, close, dark scaly circular plates with upturned edges.

Twigs—slender, smooth, reddish brown in color, having bitter almond taste which is characteristic of all cherries.

Winter buds—smooth, ovate, from $^1/_8$ to $^1/_6$ inch long, sharp-pointed, chestnut brown in color; terminal bud present.

Leaves—alternate, simple, from 2 to 5 inches long, lanceolate, broader than are those of pin cherry, fairly long-pointed, margin finely serrate, tufts of hair along midrib on undersurface of leaf.

Fruit—a single-seeded juicy fruit, about $^1/_2$ inch in diameter, grouped on very short stems, in long scattered, drooping clusters, purplish black when ripe in late summer. Birds and animals eat the fruit, though its flavor is decidedly bitter.

Outstanding features—long white pores on young bark; dark scaly, circular, saucer-like plates in older bark; hairy midrib below on leaf; fruit in short-stemmed clusters.

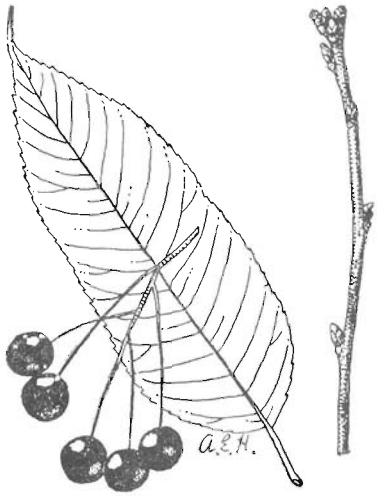
41a. *Bird cherry* is the escaped cultivated cherry found in abandoned fields and hedgerows. Its shiny red bark and thick twigs are its outstanding features.

42. PIN CHERRY

Wild Red Cherry, Fire Cherry

(*Prunus pennsylvanica* Linnaeus fils)

Pin cherry is a "weed" tree coming in on burned, cut-over, and abandoned land throughout the State, except in the higher Adirondacks. It is not a timber-producing species and its main value lies in its ability to cover waste land and to protect the soil until larger and more important trees can establish themselves and crowd it out. The wood is light, soft, close-grained, with light brown heartwood, and is seldom used.



PIN CHERRY
Leaf and fruit, natural size; twig, one-half natural size

Bark—bright, reddish brown in color, for the most part smooth, often slightly peeling around the trunk, marked with numerous long, pale breathing spores; in old trees somewhat roughened near the base.

Twigs—slender, smooth, shiny, bright red in color, a characteristic bitter almond taste, peculiar odor.

Winter buds—very small, reddish brown in color, characteristically clustered at the twig tip and sometimes along the sides; terminal bud present, usually smaller than the lateral buds around it.

Leaves—alternate, simple, from 3 to 5 inches long, narrowly lanceolate as contrasted with the broader leaves of wild black cherry, sharp-pointed, with finely serrate margin.

Fruit—a round, juicy, one-seeded fruit, light red in color, about ¼ inch in diameter, arrayed on long stems, from 3 to 5 in a cluster, ripening in July. Birds often pick the ripe fruit.

Outstanding features—smooth, reddish brown bark, with long horizontal pores; branches at almost right angles to trunk; fruit in long-stemmed clusters.

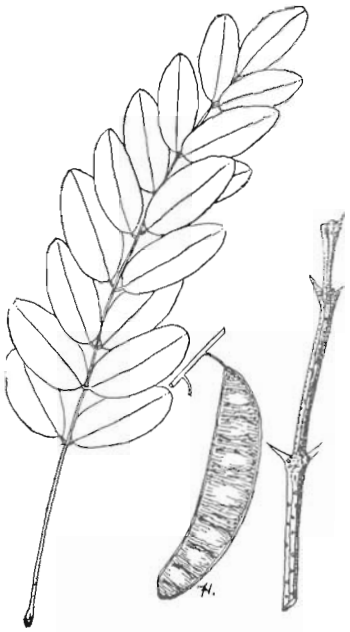
42a. *Choke cherry* usually is a bushy shrub, sometimes a small tree, furnishing food for game in hedgerows. Its dark-brown bark shows lighter streaks of gray.

43. BLACK LOCUST

Yellow Locust, White Locust

(*Robinia pseudoacacia* Linnaeus)

Black locust was not originally a native of the State, but was a great favorite with early settlers as a dooryard tree from where it has escaped to form dense thickets along the roadside in many sections of the State. In favorable locations, its spread by means of root suckers is very rapid. It grows with exceptional rapidity on well-drained fertile soils, and in such locations seems better able to survive attacks of the locust borer which in some sections has rendered the tree worthless. The wood is very strong, heavy, hard, and extremely durable in contact with the soil. As a post wood it has no equals and is also used for insulator pins on pole lines and for ties and fuel wood.



BLACK LOCUST
Leaf and fruit, one-third natural size; twig, two-thirds natural size

Bark—rough even on young trunks, yellowish brown in color, becoming deeply furrowed into distinct, thick, rounded ridges, which are not scaly.

Twigs—slender, brittle, reddish to greenish brown in color; generally bearing short stiff spines from ¼ to ½ inch long, in pairs at base (node) of leaves.

Winter buds—terminal bud absent; lateral buds very small, in a cavity below leaf scars, rusty brown in color, covered with down.

Leaves—alternate, compound, from 8 to 14 inches long, with from 7 to 19 entire leaflets arranged along a central stem; leaflets usually odd in number, short-stalked, oval in shape, from 1½ to 2 inches long.

Fruit—a pod, flat, smooth, brown in color, from 2 to 4 inches long, containing from 4 to 8 small brown or black seeds, ripening in September. Pods—hang on into the winter; finally torn off by the wind in halves with seeds attached, the dried pod acting as a sail to carry the seed considerable distances.

Outstanding features—compound leaves with oval leaflets; small, downy buds depressed in bark; short stiff spines; papery pods.

44. HONEY LOCUST

(*Gleditsia triacanthos* Linnaeus)

Honey locust, while native in western New York only, has been widely introduced as a hedge and ornamental tree, and is hardy and frequent throughout the State except in the mountains. The wood is hard, strong, coarse-grained, but not so durable in contact with the soil as is the black locust. It is not commercially important because of its scattered distribution and the knotty character of the wood due to its being open-grown as contrasted with forest-grown.

HONEY LOCUST

Leaf and fruit, one-fourth natural size; twig, three-fourths natural size

Bark—on young branches smooth, grayish brown in color, with age becoming roughened into firm, broad, blackish ridges with edges that curve outwards.

Twigs—rather stout, smooth, glossy, zigzag; usually bearing stiff, sharp-branched thorns from 3 to 4 inches long, above leaf base (node).

Winter buds—terminal bud absent; lateral buds very small, not easily seen.

Leaves—alternate, simply or, more usually, doubly compound, from 6 to 8 inches long; is singly compound, with from 18 to 28 leaflets; leaflets usually even in number, elliptical, 1½ to 2 inches long; if double compound, with from 4 to 7 pairs of secondary leaf stems.

Fruit—a pod, flat, usually twisted, reddish brown in color, from 10 to 18 inches long, 1½ inches wide, from 2 to 3 in a cluster, ripening in late autumn but staying on the tree well into winter; each pod containing from 10 to 20 brown oval seeds, ⅓ inch long. The fleshy part of the pod is sweet, hence the name "honey locust."

Outstanding features—branched, stout thorns; usually doubly-compound leaves, with elliptical leaflets; large, reddish brown pod.

THE MAPLES

Maples are an important group of forest trees in New York State. Of the nine maples east of the Rocky Mountains, six are found in the State. In the order of their abundance, they are **sugar maple, red maple, silver maple, mountain maple, striped maple, boxelder maple.** The first three only are important timber trees.

Maples as a group are readily distinguishable from other trees by the opposite arrangement of buds, leaves, and twigs, together with the characteristically shaped simple maple leaf (the **box elder maple** as an exception has a compound leaf). The fruit of the maple group is also very distinctive. They are without exception winged-seeds borne in pairs, and popularly known as *maple keys.*

The **mountain maple** and the **striped maple** are very small trees or often shrub-like, growing as an understory at higher elevations throughout the State. The **boxelder maple** is a medium-sized forest tree found in moist locations at lower elevations but very common and of little commercial importance. It is the only maple that has a compound leaf.

The *mountain maple* is distinguished by its downy buds, on stalks; the acute clefts between leaf lobes which have tapering points; and by its reddish keys or fruits. It has no commercial use.

The *striped maple* (also called *goose-foot,* or *Pennsylvania maple,* or *moosewood)* is distinguished by the distinct white lines in the bark of limbs, by the large leaves shaped like a goose's foot, and by its keys with wide spreading wings. It has no commercial use.

The *boxelder maple (ash-leaved)* has compound leaves, with distinct veins on the pointed leaflets; thick, greenish brown twigs; and keys with large, incurved wings. The wood is used for boxes and crates.

The three important maples of the State, **sugar, red,** and **silver,** are divided by lumbermen into two groups, the hard and soft maples. The **sugar maple** is classed as a hard maple because of that characteristic of the wood, while both the **red** and **silver maples** are classed as soft maple to denote that characteristic of their wood.

The foliage of both sugar and red maple is particularly brilliant in the fall, and for that reason those species are often planted as shade trees.

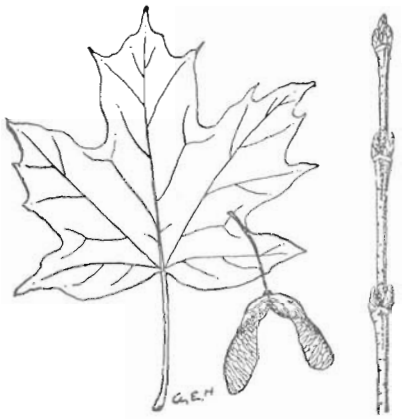
Two important maples from Europe worthy of mention because of the frequency with which they are planted in the State for shade and ornament, are the **Norway maple** and the **sycamore maple.**

45. SUGAR MAPLE

Hard Maple, Rock Maple

(*Acer saccharum* Marshall)

Sugar maple is a magnificent forest tree abundant everywhere in the State outside of Long Island. It is the official State tree of New York, a very fitting selection. Besides providing beautiful borders to many miles



SUGAR MAPLE
Leaf, one-third natural size; fruit and twig, one-half natural size

of highway, and thousands of gallons of maple sirup from the many hundreds of sugar bushes in all parts of the State, it yields a wood of high grade. It is hard, strong, close-grained, and tough, with a fine, satiny surface, and is in great demand for flooring, veneer, interior finish, furniture, shoe lasts, rollers, and as a fuel wood of the best quality.

Bark—on young trees dark gray in color, close, smooth, and firm, becoming furrowed into long irregular plates lifting along one edge.

Twigs—slender, shining, the color of maple sugar.

Winter buds—very narrow, sharp-pointed, brown in color, the terminal buds much larger than the laterals.

Leaves—simple, opposite, from 3 to 5 inches long and fully as wide, from 3 to 5 shallow lobes with wide-spaced coarse teeth, dark green in color above, paler below; the clefts are rounded at the base.

Fruit—maple keys, in short clusters, ripening in September. *Seeds*—join each other in a straight line. *Wings*—turn down almost at right angles.

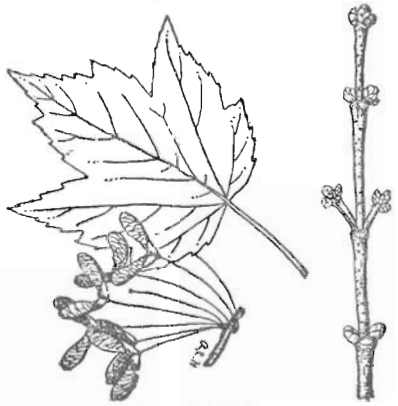
Outstanding features—rounded cleft between lobes of leaves; sharp-pointed, brown buds; brown twig.

46. RED MAPLE

Swamp Maple, Soft Maple

(*Acer rubrum* Linnaeus)

Red maple derives its name from its brilliant autumnal foliage. While common in swamps all over the State, it is also abundant on moist slopes. It is an extremely rapid-growing tree, furnishing a fairly strong, close-



RED MAPLE
Twig, one-half natural size; leaf and fruit, one-third natural size

grained wood, extensively used for cheap furniture, in the manufacture of baskets and crates, for mine props, railroad ties, and fuel wood.

Bark—on young trunks smooth, light gray in color, often resembling beech; with age becoming darker and roughened into long ridges, often shaggy or scaly on surface; bark character extremely variable on different trees in the same stand.

Twigs—rather slender, bright or dark red in color, without odor when cut or broken.

Winter buds—broad, blunt-pointed, clustered, short stalk, red in color; terminal bud slightly larger than lateral buds; numerous large, plump flower buds along the twig.

Leaves—simple, opposite, from 3 to 4 inches long, fully as wide, usually 3-lobed; the clefts between lobes shallow and sharp angled as contrasted with deep clefts of silver maple; margins of leaf lobes coarsely serrate; at maturity leaves light green in color above, pale greenish white below.

Fruit—maple keys, in clusters on long stalks, ripening in May or early June. Seeds—joined more or less end on end. Wings—diverge at wide angles.

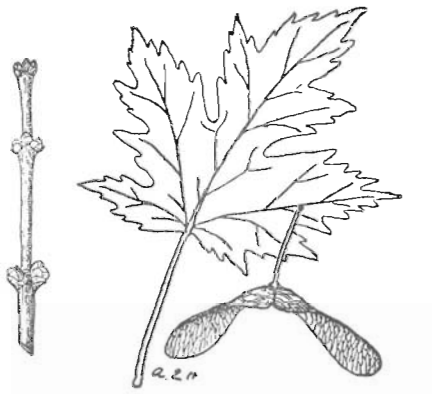
Outstanding features– red buds and twigs; sharp angle between leaf lobes.

47. SILVER MAPLE

White Maple

(*Acer saccharinum* Linnaeus)

Silver maple is generally distributed throughout the State, but is not nearly so common as is **red maple.** It prefers the same general moist soil conditions, and the wood is used for the same purposes as the **red maple**



SILVER MAPLE
Twig, one-*half* natural size; leaf and fruit, one-third natural size

with which it is included under the term "soft maple" by lumbermen. Frequently it is planted as a shade tree on account of its rapid growth.

Bark—on young trunks smooth, gray in color with reddish tinge; with age becoming reddish brown in color, more or less furrowed, the surface separating in long thin flakes which become free at the ends and flake off.

Twigs—similar to **red maple** but having a distinctly rank odor when broken or crushed.

Winter buds—similar to **red maple** but larger, usually very dense clusters of lateral buds.

Leaves—simple, opposite, from 3 to 5 inches long, fully as wide, 5-lobed; margins of lobes coarsely serrate; clefts between lobes, particularly the middle two, very deep; at maturity leaves pale green in color above and silvery white below, hence the name "silver maple."

Fruit—maple keys, much larger than in the **red maple** though maturing at about the same time in the spring. Wings—more widely divergent than those of the **red maple.** Sometimes only one side of the key develops.

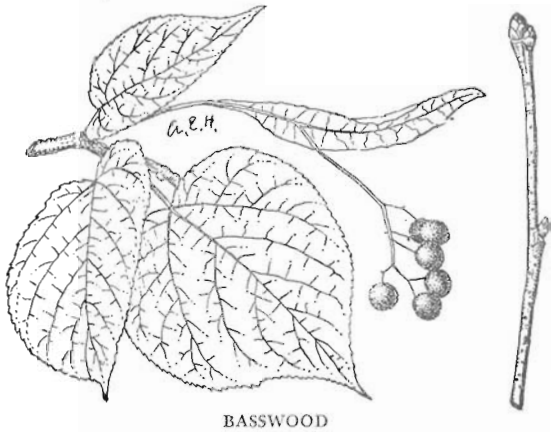
Outstanding features—silvery bark on upper limbs; deeply cut clefts between coarse-toothed lobes; rank odor from crushed twig; large-winged keys.

48. BASSWOOD

Linden, Whitewood

(*Tilia glabra* (Ventenat) Linnaeus)

Basswood takes front rank as a valuable forest tree in New York State because of its rapidity of growth and the wide range of use for its lumber. It does best in the deep, moist soils of the woodlot sections but is generally



BASSWOOD
Leaf and fruit, one-third natural size; twig, one-half natural size

distributed except in the high Adirondacks and Catskills. The wood is soft, even-grained, light, and fairly strong, and is in demand for boxes, crates, veneer, cheap furniture, woodenware, and paper pulp; often used as a substitute for white pine.

Bark—on young stems smooth, dark gray in color; on older trunks firm but easily cut, becoming furrowed into rather narrow flat-topped ridges; on still older trunks furrows deeper, ridges more rounding and broader, surface scaly.

Twigs—rather slender, smooth, bright red or greenish in color or covered by a gray skin, zigzag, slightly mucilaginous when chewed; fibers of bark on twigs very tough, may be used as rope.

Winter buds—terminal bud absent; lateral buds large, smooth, sometimes lopsided or humped, bending away from the twigs, dark red or sometimes green in color.

Leaves—simple, alternate, heart-shaped, from 5 to 10 inches long, sharp-pointed, coarsely serrate along margin.

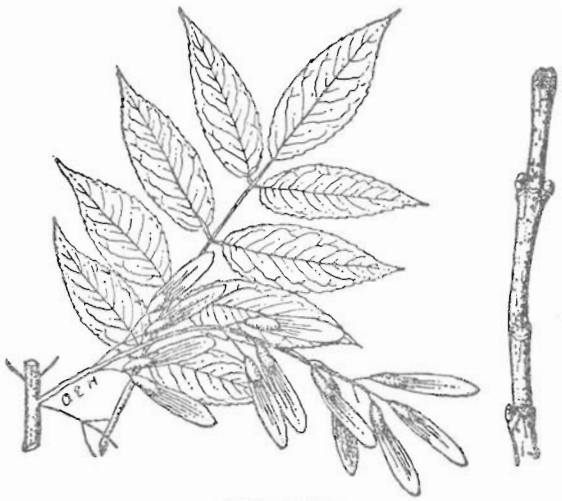
Fruit—a nut, round, woody, about the size of a pea, borne singly or in clusters, with a common stalk, attached midway to a leafy bract, ripening in late fall but sometimes remaining on the tree into the winter. Bract—acts as a sail to scatter the seed.

Outstanding features—often found in clumps; usually large, heart-shaped leaf; hump-backed bud on zig-zag twig; fruit a pea-like nut attached to a slender "parachute."

49. WHITE ASH

(*Fraxinus americana* Linnaeus)

White ash shares with the basswood the distinction of being one of the most valuable and rapid growing trees in the woodlots of New York State. It is common throughout New York, and is found up to an altitude of 2000 feet in the Adirondacks. It prefers to grow in rich moist woods near water. The wood is heavy, hard, strong, close-grained, and tough. Large quantities of it are used for agricultural implements, tool handles, oars, furniture, and in sporting goods.



WHITE ASH
Leaf and fruit, one-third natural size; twig, one-half natural size

Bark—dark grayish brown in color, deeply furrowed with narrow flat-topped firm ridges which on older trunks are somewhat scaly; ridges in some instances tending to run together enclosing diamond-shaped fissures.

Twigs—very stout, smooth, shining, grayish brown in color, brittle, flattened at leaf bases (nodes).

Winter buds—plump, blunt-pointed, dark brown or nearly black in color; terminal bud 1/5 inch long, larger than lateral buds; last pair of lateral buds almost on level with terminal bud.

Leaves—opposite, compound, from 8 to 15 inches long, with from 5 to 9 leaflets; leaflets sharp-pointed, from 3 to 5 inches long, with slightly and sparsely serrate margins; borne on short stems, by this characteristic may be told from black-ash leaflets which are stemless.

Fruit—a winged seed, from 1 to 2 inches long, broadly paddle-shaped with the wing occupying the position of the blade; borne in long, open, drooping clusters, ripening in September, often not dropping off until early winter.

Outstanding features—thick twigs; compound leaves with stemmed leaflets; brown buds; ashy-gray, older bark.

49a. *Green ash* is frequently confused with white ash. The former has narrower leaflets with more noticeable serrations which extend farther toward the base; the leaflets are greener beneath; the terminal bud is more pointed; and the leaf-scar is notched. It has the same uses as white ash.

50. BLACK ASH

(*Fraxinus nigra* Marshall)

Black ash is a tree of cold, deep swamps. It is common in moist places over most of New York State. Its wood is heavy, rather soft, tough, coarse-grained, and is used for hoops, chair bottoms, and baskets.

BLACK ASH
Twig, natural size; leaf and fruit, one-third natural size

Bark—ashy gray in color, somewhat furrowed, forming thin, smoothish scales which are easily rubbed off.

Twigs—very stout, similar to those of white ash but not shiny and usually a lighter gray in color.

Winter buds—buds resembling those of white ash though usually decidedly black; terminal bud as long or longer than broad, sharp-pointed; lateral buds much smaller, blunt-pointed; last pair of lateral buds at some distance from the terminal bud instead of nearly on a level with it as in the white ash.

Leaves—opposite, compound, from 10 to 14 inches long, with from 7 to 11 leaflets; leaflets similar to those of white ash but much longer in proportion to their width, without stems.

Fruit—a winged seed, with the wing broader and distinctly notched at the tip; in clusters, ripening in the early autumn.

Outstanding features—found in moist locations; leaflets without stems; black buds; notched tip in seed.

50a. *Red ash* grows in wet spots but has the same uses as white ash. Red ash may be identified by slightly serrate leaflets, silky below, on a woolly leaf-stem, and by the woolly twigs marked by semi-circular leaf-scars.

COMMON AND SCIENTIFIC NAMES OF OTHER TREES MENTIONED

Common name	*Scientific name*
3a. Scotch pine	*Pinus sylvestris* Linnaeus (page 15)
4a. Black spruce	*Picea mariana* (Miller) BSP. (page 16)
5a. Norway spruce	*Picea Abies* (Linnaeus) Karsten (page 17)
8a. European larch	*Larix decidua* Miller (page 20)
11a. Shining willow	*Salix lucida* Muhlenberg (page 23)
28a. Swamp white oak	*Quercus bicolor* Willdenow (page 41)
41a. Bird cherry	*Prunus avium* Linnaeus (page 54)
42a. Choke cherry	*Prunus virginiana* Linnaeus (page 55)
Mountain maple	*Acer spicatum* Lambert (page 58)
Striped maple	*Acer pennsylvanicum* Linnaeus (page 58)
Boxelder maple	*Acer Negundo* Linnaeus (page 58)
49a. Green ash	*Fraxinus pennsylvanica* var. *lanceolata* (Burkhausen) Sargent (page 63)
50a. Red ash	*Fraxinus pennsylvanica* Marshall (page 64)

CLASSIFICATION OF SPECIES IN UPLAND WOODLOTS

Valuable species	Intermediate species	Inferior species
White pine	Black oak	Grey birch
Red pine	Scarlet oak	Shad bush
Hemlock	Beech	Blue beech
Chestnut oak	White birch	Ironwood
White oak	Yellow birch	Dogwood
Red oak	Black birch	Bird cherry
Basswood	Shag-bark hickory	Fire cherry
White ash	Pignut hickory	Choke cherry
Tulip tree	Bitternut hickory	Sassafras
Sugar maple	Butternut	
Black cherry	American elm	
Cucumber	Slippery elm	
	Red maple	
	Trembling aspen	
	Big-toothed aspen	

MAKING A TREE COLLECTION

The main requirement of the forest-appreciation project is to make a collection of (1) the leaves and (2) the winter twig with the buds of *each* of at least 15 *forest* trees. This collection is the check on whether or not a club member has learned to identify his or her tree neighbors. Such collections may be used also for exhibit material at school and county fairs, and in nature-study programs. Fruits are not required to complete this project, but add to the interest in the collection.

Collecting the specimens for mounting

When to collect

Leaves. Since this project starts in the autumn, there will be many trees which have dropped their leaves. Green leaves are the best to use in the collection, so leaves of all but the conifers should be collected after the end of May.

Fruits. Most fruits should be collected in the autumn when seeds are matured. If one waits until spring, many of the fruits will not be found. The collection *can* be completed in spring and summer with seeds from trees that fruit in these seasons.

Twigs. Small branches may be collected any time in the autumn or winter, after the leaves have dropped. Of course, conifers that keep their leaves (all but the larches) will have full-sized buds by October. A twig from one of these trees will also bear the leaves and occasionally the fruit as well.

Where and what to collect

Leaves. Specimens of average size should be selected, not taking those that are extra large and found on sprouts or vigorously growing seedlings. In specimens with compound leaves (locusts, walnuts, hickories, ashes), the **whole** leaf, not just the leaflet, should be obtained. Leaves of **black walnut, butternut, the hickories, or honey locust**, may be too large to mount easily, so smaller but typical specimens should be gathered.

Twigs. The twig should be cut about 5 inches long, from a live side branch (not from the top shoot which would spoil the tree). Sprout growth should be avoided. Lower branches that are heavily shaded may not show typical features. The specimen should include the terminal bud (if present in the species) and several side (lateral) buds. Dead branches, of course, are not acceptable.

The twigs should be cut on a slant to expose the pith. This is particularly important for **black walnut, butternut**, and **chestnut**. If a number of twigs are collected in any one day, each should be tagged to prevent mistakes.

Fruits. Many fruits, such as nuts from hickories and walnuts, keys of maples, seeds of **white ash**, balls of **sycamore**, and pods of **locusts** are easy to find and collect. However, a close watch must be kept for many others. The fruits of **cucumber** and **tulip trees** are usually high up near the tops of the trees. The worm-like fruits of **poplars** and **willows** quickly drop and must be gathered within a few days after ripening. (Care should be taken not to gather the flowers instead of the fruits. Catkins of the birches are often mistaken for the cone-like fruits. It is best to collect several fruits, as well as twigs and leaves, from which to select one or more good-looking specimens for mounting, and to have others in case of accident.

Preparing the specimens for mounting

Leaves. When gathering leaves, carry a good-sized notebook, which will hold the specimens without crushing. A good substitute is a large catalog. For each tree, two or more leaves should be selected, taking foliage without holes, galls, or unnatural shapes. For **sassafras**, a sample of each of the three shapes should be collected.

Keep the leaves of each tree together with a piece of paper bearing the name.

Carefully dry and press the leaves as soon as they are brought from the woods. This may be done in a press similar to that used in school for flowers and leaves. A simple press can be made at home by placing the leaves, well spread out and not overlapping, between sheets of newspaper on a flat surface and placing a weighted board on the pile of papers. Specimens can be kept in the press until you are ready to mount them. Dip hemlock and spruce in shellac to hold the needles on.

Twigs. These small branches, except for those of the conifers, should be kept, properly tagged, in a cool, dry place where they will dry gradually. The twigs of conifers should be mounted at once or the leaves will drop off.

Fruits. Many of the fruits are fragile, such as cones of the birches and of **balsam fir** (which should be collected green) and **sycamore** balls, and should not be pressed. Such fruits, if dipped in paraffin, rubber cement, or white shellac, will remain in good condition. Delicate fruits of willows and poplars keep well if placed in small cellophane or oiled paper bags, which can be mounted complete.

Mounting the specimens on paper

Equipment

A set of standard covers, paper or cardboard sheets for mounting, corrugated cardboard, gummed-cloth mending tape or adhesive tape, a small tube of rubber cement, a small jar of white shellac, some cellophane or oiled paper bags, and a piece of window glass about 8 by 10 inches (or a piece of slate, marble, or painted board of about the same size) are used in mounting specimens. Perhaps not all of the items on this list may be required, depending upon the specimens collected and the method of mounting.

The book covers are provided through your club agent, by the Department of Conservation at the New York State College of Agriculture. The mounting

sheets usually are supplied by the club agent free, or for a small fee. If you obtain your own sheets, use heavy buff or white paper or cardboard, punched to fit the covers. Plain writing paper will wrinkle and warp too greatly for good appearance.

The covers and mounting paper usually are not sent to the collector until the specimens have been collected, pressed, and are ready to mount.

Cut the corrugated cardboard into strips 1 inch wide and 10½ inches long to make "fillers" to be punched and placed between the mounting sheets to make the book level. For large fruits, such as pine cones and nuts, two or three fillers may be needed to bring the sheets even.

Names and uses of trees

Each sheet is to bear the specimens from one tree only. Print the name carefully about 1 inch from the bottom of the page. Under the name list the uses for the tree. Some trees such as **thornapple** and **pin cherry** have no commercial uses but may serve to furnish cover and food for game, for erosion control, and as a "nurse crop" to prepare a good seedbed for the more valuable trees.

It may help to print the names and uses first, before mounting the specimens, so that the leaves, twig, and fruit, will not cover the title.

Method of mounting

Mount the leaves with tape, or cement, or with both. If you use tape only then cut and set aside a supply of narrow strips from 1½ to 2 inches long. Center the leaf on the paper, and fasten the points and stem in place with tape (page 68). Be sure to leave space for the twig and the fruit and the name and uses of the tree.

If you use rubber cement, spread it in a thin layer over the glass (or other material). Lay the leaf (or twig with needles if it is a conifer) upon the cement, and press down by rubbing with the hand on a piece of scrap paper placed over the leaf or needles. This pressure assures contact of the leaf or needle with the cement. Remove the piece of paper and throw it away. Carefully peel the leaf off the glass, so it will keep whole. If a specimen breaks, then use one of the extra samples collected.

Center the leaf, top surface up on the paper, press down with the hand rubbing over another bit of scrap paper, and finally fasten the leaf at tips and stem with tape. Mount the other leaf (if simple) in the same way but with the undersurface showing.

For compound leaves, it is unnecessary to mount two whole leaves, since a leaflet may be turned over to show the undersurface. This should be done when the leaf is put into the press. With long leaves, like those of the walnuts, the leaf stem may be bent in the middle so that all of the leaf can be mounted on the sheet.

Twigs are best mounted with tape (page 68). Some persons sew or bind the twig through the paper with thread or twine.

Cut in half lengthwise large fruits, such as pine cones, nuts, and the fruit of cucumber, that are round and difficult to mount. These can be fastened with cement, shellac, or tape. Nuts can be halved, or cross-sections cut with a fine saw. Other and fragile fruits should be placed in small transparent sacks that can be cemented to the paper. Of course the whole fruit, and not the seed alone, should be mounted. For instance, the cones of pines, pods of locusts, and husks and burs of nut trees should be included. It is well to separate an individual seed and mount it by itself with cement.

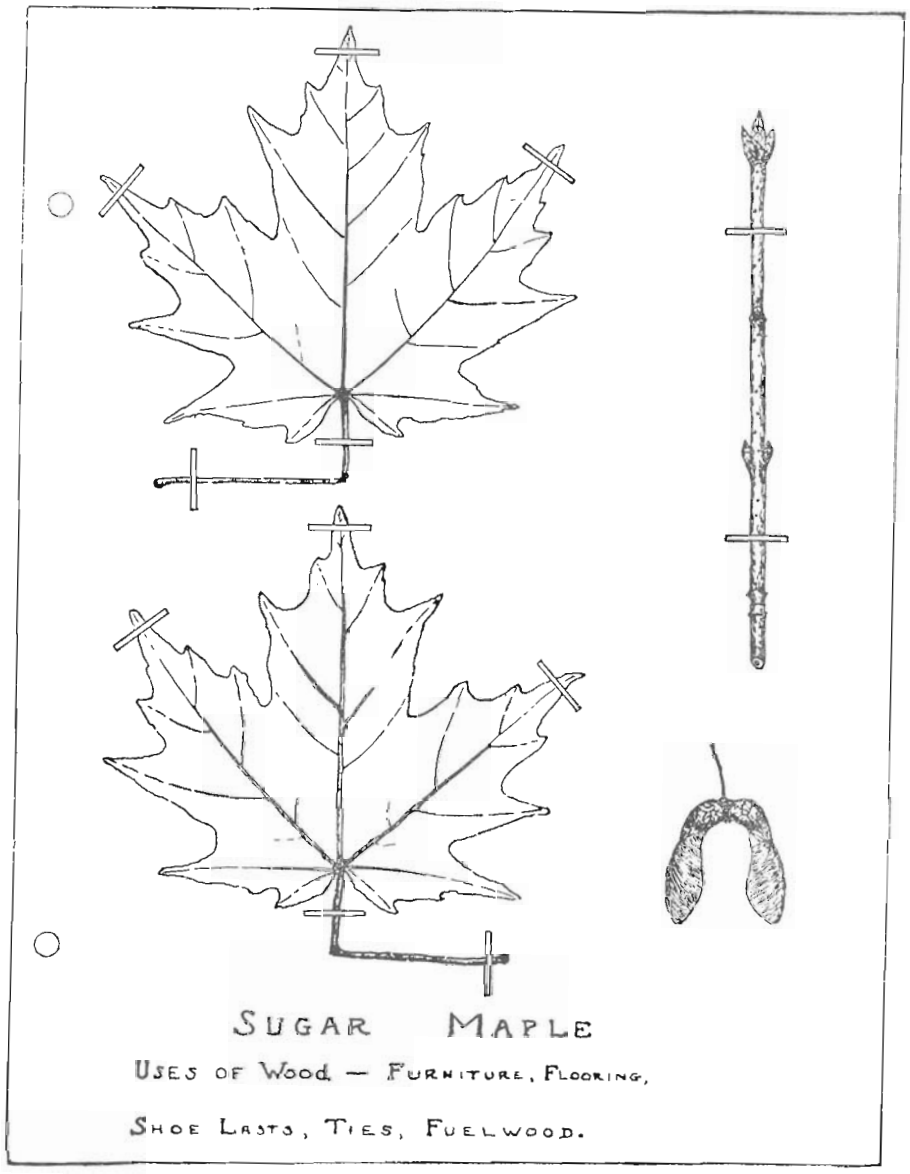


CHART 3

The top leaf shows the upper surface; the bottom leaf the lower surface

Finishing the collection book

Finally place the mounted sheets between the covers provided. Write your name, address, and county on the top cover. Fasten the collection together attractively with string, cloth tape, small ribbon, rawhide, or, make it more "woodsy," with small rootlets from **hemlock** or with bark from **basswood** branches.

THE STORY

The fourth requirement of this project calls for a brief story of at least 250 words, telling how the local woodlots are of value to the club member's community. This story gives you an opportunity to record, from your observation, some valuable information about the contributions and uses of the small forests on your own and near-by lands.

The story might cover these, and many other points:

Location of woodlots: good land, poor land, hills; in valleys, near roads.

Effect of woodlots: on springs and water supply, muddy water in brooks where timber has been cut off.

Source of: timber and fuel for home use; timber for local or distant sale.

Local wood-using industries: kinds of timber used; prices paid for logs or lumber; products made.

Assistance to game and fish: protection, food, and homes; soil conservation.

EXHIBITING THE COLLECTION

The collection book should be completed as early as possible in the summer. It then should be sent to the county agent who will, if it is in his hands by July 1, forward the collection to Ithaca where it will be graded and judged in the state-wide contest.

Interest should be centered on the common trees of the community, rather than on rare or ornamental trees. In checking the collection book, no credit is allowed for such ornamentals as **white** and **Lombardy poplars, horse chestnut, Colorado blue spruce,** nor for any of the fruit trees such as apples, peaches, pears. The club member may wish to collect specimens of these trees, but should place them in a separate section, plainly labeled "Ornamental and Fruit Trees."

This state contest is based upon a point system as follows: For each of the first 15 trees with complete and correct specimens, 3 points are scored. A good story can earn 5 points. For each additional tree collection above the 15, an extra 1½ points may be awarded. Hence the collector with the greatest number of trees, and probably the best knowledge of his tree neighbors, stands the best chance of winning this competition. However, the contest is fun, as well as for prizes, while the main objective of making the collection book is to have some means of checking the knowledge gained of the trees. The minimum of 15 trees and the story will satisfy the project requirements and earn for the club member his achievement pin, provided other and local requirements are met.

Specimens of fruits are no longer required in this project, but may be included and will be scored for points in the contest.

FORESTRY PROJECTS

While this bulletin is concerned mainly with the forest-appreciation project, its object also includes maintaining interest in other forestry work for 4-H Club members. Additional projects are:

Tree Planting. Plant and keep records on 1000 free trees. Cornell 4-H Club Bulletin 90.

Transplanting Hardwood Plantations. Lift and plant 500 trees of 5 or more species of broad-leaved trees. Mimeographed circular.

Woodlot Improvement

Find how through common-sense cutting of firewood in the home woodlot you can increase its rate of growth and obtain a higher income. Cornell 4-H Club Bulletin 43.

Log Scaling and Timber Estimating

Learn how to measure logs, how to market woodlot products to the best advantage, and how to estimate the contents of standing trees. Cornell 4-H Club Bulletin 39.

Hardwood Nursery and Planting

Gather seeds and grow hardwood seedlings in the garden for planting on your own farm or for sale. Mimeographed circular.

INDEX TO TREE DESCRIPTIONS

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