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CKET NATURAL HISTORY No. 1

Price 15 cents

Botanical Series No. 1

Published January, 1922

TREES OF OHIO

IDENTIFIED BY THEIR LEAVES

HAROLD L. MADISON

Curator of Education

THE CLEVELAND MUSEUM OF NATURAL HISTORY

Paul Marshall Rea, Director

Cleveland, Ohio

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TREES OF OHIO

HAROLD L. MADISON

POCKET NATURAL HISTORY NO. 1

BOTANICAL SERIES NO. 1

THE CLEVELAND MUSEUM
OF NATURAL HISTORY
CLEVELAND, OHIO

POCKET NATURAL HISTORY

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It is our hope that the simplicity and comprehensiveness of these little publications may bring new interests and a wider and deeper appreciation of nature into many lives.

PAUL M. REA, *Director.*

Cleveland Museum
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THE CLEVELAND MUSEUM
OF NATURAL HISTORY

THE BRITTON PRINTING COMPANY
CLEVELAND, OHIO

TREES OF OHIO

LIBRARY
NEW YORK
BOTANICAL
GARDEN

We should know trees as we know people; have a speaking acquaintance with many and be intimate with a few. Intimacy can come only from long association, when you will come to know your tree friends by their bark, their buds, their flowers, their fruits, and their shapes, as well as by their leaves. You will also know their habits, the kind of places they frequent, and the trees they associate with.

This Pocket Natural History of Trees of Ohio is only an introduction. It gives the common and scientific name of each species, a word about the individual peculiarities of each and drawings of the leaves, (occasionally of the fruits) which are the best first-acquaintance tags.

Instead of using many different characteristics to individualize a species, an effort has been made to find and record some one peculiarity that will set a tree apart from other related species. In instances where this has not been found practicable, the least possible number of distinguishing marks has been noted.

It is a rule of nature that nothing is more constant than variation. This applies especially to the leaves of a tree, no two of which are exactly alike. Some vary more than others. If, therefore, one is in doubt about the identification of a tree, he should not depend upon one leaf, but should examine ten or fifteen leaves taken from different parts of the tree. He should lay them out in a row, discarding the one or two of exceptional form or size, and make his decision on the larger number which more closely resemble one another and which we speak of as typical or as representative of the species. The freak never represents the group, whether it is among people or among leaves of trees.

This introduction is based largely on the leaves because they are the easiest means of identification. They may be said to be near the tree all the year, since they are attached for six months or more to the tree, and are often found on the ground beneath during the winter. The bark, while distinctive to the skilled observer, is as difficult to describe as a person's face. Buds, flowers and fruits, together with the shape or habit of the whole tree, are equally characteristic, but the scope of this little manual forbids extended discussion here.

PINE FAMILY, *Pinaceae*

Trees with leaves in the form of needles or scales, cone-bearing, except cedars.

1. **White Pine**, *Pinus strobus*. Leaves 3-4 in. long in clusters of 5. (N.)*

2. **Pitch Pine**, *Pinus rigida*. Leaves 3-5 in. long, in clusters of 3. (S. C.)

3. **Jersey Pine, Scrub Pine**, *Pinus virginiana*. Leaves $1\frac{1}{2}$ -3 in. long, twisted, in clusters of 2. Cone scales with sharp prickle. (S. E.)

4. **Austrian Pine**, *Pinus laricio austriaca*. Leaves 4-6 in. long, in clusters of 2. Needles of Red Pine, *Pinus resinosa* are the same as those of Austrian Pine except they have 2 resin ducts while those of the Austrian Pine have 4 resin ducts. (see fig 4 a) (I).

5. **Scotch Pine**, *Pinus sylvestris*. Leaves 1-4 in. long, twisted, in clusters of 2. Cone scales without a prickle. (I).

6 **American Larch, Tamarack**, *Larix laricina*. Leaves not over 1 in. long. The only member of the family whose leaves fall in winter. It may be known by its clusters of more than 5 needles scattered along the branches. (N).

7. **Douglas Fir, Douglas Spruce**, *Pseudotsuga taxifolia*. Leaves $\frac{3}{4}$ - $1\frac{3}{4}$ in. long, not in clusters, scattered along branches. A fir is an evergreen tree with flat needles which do not have leaf stalks. Foliage soft to the touch; branches pointing upward. (I).

8. **Colorado Blue Spruce**, *Picea pungens*. Leaves $\frac{3}{4}$ - $1\frac{1}{4}$ in. long. A spruce is an evergreen tree with stiff, sharp-pointed, 4-sided needles. The Colorado Blue Spruce may be known by its silvery foliage at the ends of the branches, which are flat horizontally. (I).

9. **Norway Spruce**, *Picea abies*. Leaves $\frac{1}{2}$ -1 in. long, stiff, sharp-pointed, 4-sided. Foliage stiff to the touch, branches drooping. Large cones 4-6 in. long. (I).

10. **Hemlock**, *Tsuga canadensis*. Leaves about $\frac{1}{2}$ in. long, flat, blunt with distinct leaf stalks, whitish beneath. (E).

11. **Arbor Vitae**, *Thuja occidentalis*. Leaves reduced to flat scales hugging the twigs. Twigs are flat. (S. C.)

12. **Red Cedar** *Juniperus virginiana*. Leaves reduced to flat scales hugging the twigs. Twigs are cylindrical. (G).

*Distribution in Ohio is indicated by regular compass-point abbreviations, also G means throughout the state, C, central, I, introduced, not native to the state.

WHITE PINE

PITCH PINE

JERSEY PINE

AUSTRIAN PINE

SCOTCH PINE

AMERICAN LARCH

DOUGLAS FIR

COLORADO BLUE SPRUCE

NORWAY SPRUCE

HEMLOCK

ARBOR VITAE

RED CEDAR

WILLOW FAMILY, *Salicaceae*

Willows have long narrow leaves.

13. **Black Willow**, *Salix nigra*. Leaves $\frac{1}{4}$ - $\frac{3}{4}$ in. wide. Only willow of tree size with 2 crescent-shaped stipules at the base of each leaf. (G).

14. **Peach-leaved Willow**, *Salix amygdaloides*. Leaves. $\frac{3}{4}$ - $1\frac{1}{4}$ in. wide, with sharp teeth. Its leaf is broad, tapering to a long slender tip. (N. W.)

15. **Crack Willow**, *Salix fragilis*. Leaves $\frac{1}{2}$ - $1\frac{1}{2}$ in. wide, with 10-15 blunt teeth to the inch. The weeping willow is the only other having so few teeth to the inch. (G., I.)

16. **Weeping Willow**, *Salix babylonica*. Leaves $\frac{3}{8}$ - $\frac{5}{8}$ in. wide, very slender with 10-15 sharp teeth to the inch. (I.)

Poplars have trembling leaves because the leaf stalks are flattened sideways.

17. **White Poplar**, *Populus alba*. Leaves 4-7 in. long. Under surface of leaves cottony-white. (G).

18. **American Aspen**, *Populus tremuloides*. Leaves $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long. The leaves of this poplar are roundish-heart-shaped with more than 6 teeth to the inch. (N).

19. **Large Toothed Aspen**, *Populus grandidentata*. Leaves 3-5 in. long. As the name implies, the leaves have large teeth, 5 or less to the inch. (G).

20. **Downy Poplar**, *Populus heterophylla*. Leaves 4-7 in. long, veins downy beneath. This is the only poplar, whose leaf stalk is not at all flattened sideways. May be recognized by the blunt tips and heart-shaped bases of its leaves. (N. W., C.)

21. **Balsam Poplar**, *Populus balsamifera*. Leaves 3-6 in. long whitish beneath. May be distinguished from the Balm of Gilead by its narrower leaf which is rounded and widest at the base, tapering gradually to the tip. (N. E.)

22. **Balm of Gilead**, *Populus candicans*. Leaves 4-6 in. long. May be confused with the Balsam Poplar because both have brown, sticky, aromatic buds. Its leaf, however, is broader and is hairy beneath. (I).

23. **Carolina Poplar, Cottonwood**, *Populus deltoides*. Leaves 3-6 in. long. The leaf-blade of this poplar is triangular and longer than broad. (G).

24. **Lombardy Poplar**, *Populus nigra italica*. Leaves 2-4 in. long. This poplar also has triangular-shaped leaf-blades but they are broader than long. Tree a slender spire. (I).

WALNUT FAMILY, *Juglandaceae*

Trees with pinnately* compound leaves alternately arranged on the twigs. The twigs also are alternately branched. Walnut leaves may easily be mistaken for ash tree leaves except the leaves of the ash are opposite each other on the twigs and the twigs are oppositely branched.

25. **Butternut, White Walnut, *Juglans cinerea*.** Leaflets 11-17, 2-4 in. long. Pith of twigs chocolate brown. Its leaves and fruit are both sticky and hairy. (G.)

26. **Black Walnut, Walnut, *Juglans nigra*.** Leaflets 11-23, 2-4 in. long. Pith of twigs cream color. Its leaves and fruits are neither sticky nor hairy. (G.)

27. **Shag-Bark Hickory, *Carya ovata*.** Leaflets usually 5, upper ones 5-7 in. long. Known by the loose shaggy bark of the trunk and its large globular fruit. (G.)

28. **Big Shell-Bark, Hickory, *Carya laciniosa*.** Leaflets usually 7, upper ones 5-9 in. long. Has large egg-shaped fruit $1\frac{3}{4}$ - $2\frac{1}{2}$ in. long, and orange colored twigs. (G.)

29. **Mockernut, Hickory, *Carya alba*.** Leaflets 7-9, upper ones 5-8 in. long. This hickory has large globular fruit in which are large nuts with a very small kernel, hence the name Mockernut. (G.)

30. **Small-Fruited Hickory, *Carya microcarpa*.** Leaflets 5-7, upper ones 3-6 in. long. Twigs covered with hairs. Known by its small globular fruit which is less than 1 in. long and has a sweet kernel. (G.)

31. **Pignut, Hickory, *Carya glabra*.** Leaflets 5-7, upper ones 3-6 in. long. Twigs smooth. The fruit has a thin husk which is winged. (G.)

32. **Bitternut, Hickory, *Carya cordiformis*.** Leaflets 7-11, upper ones 4-6 in. long. Twigs and fruit hairy. The Bitternut may be distinguished by its bright yellow buds and the bitter kernel of its nut. (G.)

*The term pinnately comes from the word pinna, meaning feather, and is used to describe compound leaves, which have a central stalk like the shaft of a feather.

The term palmately has its origin in the word palm, and is applied, to compound leaves whose leaflets branch from the end of the leaf-stalk.

25

BUTTERNUT

26

BLACK WALNUT

27

SHAG-BARK HICKORY

28

BIG-SHELL BARK

29

MOCKERNUT

30

SMALL-FRUITED HICKORY

31

PIGNUT

32

BITTERNUT

BIRCH FAMILY, *Betulaceae*

Trees with thin finely-toothed leaves and slender twigs. Flowers in catkins.

33. Hop Hornbeam, Ironwood, *Ostrya virginiana*. Leaves 3-5 in. long. The only tree whose fruit resembles hops. (G.)

34. American Hornbeam, Blue Beech, *Carpinus caroliniana*. Leaves 2-4 in. long. Bark bluish gray. Fruit a loose cluster of nuts, each protected by a small arrow-head leaf. (G.)

35. Black Birch, *Betula lenta*. Leaves 3-4 in. long. Reddish bark and twigs with wintergreen taste. (S. C.)

36. Yellow Birch, *Betula lutea*. Leaves 3-5 in. long. The twigs have a wintergreen taste, but the bark of the trunk is dirty yellow covered with shaggy curls. (N. E.)

37. River Birch, Red Birch, *Betula nigra*. Leaves 1½-3 in. long. This tree resembles the Black Birch in the color of its bark, which is greenish brown, and the Yellow Birch in the ragged papery bark of the trunk, but its twigs are without the wintergreen taste. (S. C.)

38. Gray Birch, *Betula populifolia*. Leaves 2½-3 in. long, triangular, tapering tip. Bark white, but not papery. Not reported for Ohio, but is found in Pennsylvania and northern Indiana.

39. Cut-Leaved Birch, *Betula pendula dalecarlica*. Leaves 1-2½ in. long, deeply cut. Trunk white, branches drooping. (I.)

40. American Canoe Birch, *Betula alba papyrifera*. Leaves 2½-4½ in. long, larger than those of other birches. Bark of trunk creamy white, papery. Branches not drooping. Not reported for Ohio, but occurs in Pennsylvania and northern Indiana.

HEATH FAMILY *Ericaceae*

41. Sourwood, *Oxydendrum arboreum*. Leaves 4-7 in. long, sour. Flowers and seed pods about the size of and in clusters like those of Lily-of-the-Valley. (I.)

LINDEN FAMILY, *Tiliaceae*

Leaves unevenly heart-shaped. Fruit like cherry stones, attached by a stalk to a wing

42. Basswood, Linden, *Tilia americana*. Leaves 5-6 in. long. Leaves are smooth, but not silvery beneath. (G.)

43. White Basswood, *Tilia heterophylla*. Leaves 6-7 in. long. May be known by its silvery white leaf, woolly beneath. (S.)

EBONY FAMILY, *Ebenaceae*

44. Persimmon, *Diospyros virginiana*. Leaves 4-6 in. long. By the fruit you may know it; plum-like, puckery when green, yellow when ripe, sweet when frost-bitten. (S.)

BEECH FAMILY, *Fagaceae*

45. **Beech**, *Fagus grandifolia*. Leaves 3-5 in. long. Known by its smooth light-gray bark and its slender brown buds. (G.)

46. **Chestnut**, *Castanea dentata*. Leaves 6-8 in. long, coarsely-toothed. Fruit a prickly bur with 1-3 nuts. (E.)

OAKS. All oaks have acorns.

47. **White Oak**, *Quercus alba*. Leaves 5-9 in. long, with rounded lobes. Acorns sweet, in a shallow woody cup. (G.)

48. **Post Oak**, *Quercus stellata*. Leaves 5-8 in. long. The leaf has rounded lobes and its shape suggests that of a cross. (S.)

49. **Bur Oak**, *Quercus macrocarpa*. Leaves 6-12 in. long. Has corky wings on the young branches and a deep acorn-cup with fringed rim. (W., E.)

50. **Swamp White Oak**, *Quercus bicolor*. Leaves 5-7 in. long, soft downy beneath with few shallow rounded lobes. Acorn-cup woody with slightly fringed edge, and with long stem. (G.)

51. **Yellow Oak**, *Quercus muhlenbergii*. Leaves 4-7 in. long, with about 12 rather sharp teeth on each side. Small acorns half in the deep thin cup. (G.)

52. **Chestnut Oak**, *Quercus prinus*. Leaves 4-7 in. long, with coarse rounded teeth. Acorns almost $\frac{1}{2}$ enclosed in deep thin-edged cups. (E., S.)

53. **Red Oak**, *Quercus rubra*. Leaves 5-9 in. long, with bristle-pointed lobes. Very large acorns in flat shallow cups. (G.)

54. **Pin Oak**, *Quercus palustris*. Leaves 4-6 in. long. Acorns tiny. A cone-shaped tree like a Spruce, with drooping branches. (G.)

55. **Scarlet Oak**, *Quercus coccinea*. Leaves 3-6 in. long, red in fall. Kernel of acorn white. Buds blunt, hairy near tip. (G.)

56. **Black Oak**, *Quercus velutina*. Leaves 5-10 in. long, red in the spring. Kernel of acorn yellow. Buds pointed, hairy all over. (G.)

57. **Black Jack Oak**, *Quercus marilandica*. Leaves 5-7 in. long. A peculiarly shaped leaf (fig. 57) rusty-hairy beneath. (S.)

58. **Laurel Oak**, *Shingle Oak*, *Quercus imbricaria*. Leaves 4-6 in. long, resembling laurel leaves. The bunching of leaves at the ends of branches will help identify this oak. (G.)

59. **English Oak**, *Quercus robur*. Leaves $2\frac{1}{2}$ -5 in. long. The English Oak may be known by its leaves which are blue-green beneath, and have rounded lobes and an ear-shaped base. (I.)

NETTLE FAMILY, *Urticaceae*

60. Slippery Elm, Red Elm, *Ulmus fulva*. Leaves 4-7 in. long, rough on both surfaces. Called Slippery Elm because of its thick mucilaginous inner bark. (G).

61. American Elm, White Elm, *Ulmus americana*. Leaves 4-6 in. long, rough upper surfaces. Inner bark not mucilaginous. Tree vase-shaped. (G.)

62. Cork Elm, *Ulmus racemosa*. Leaves 3-6 in. long, both surfaces smooth. The corky ridges on the bark of the branches distinguish this Elm and give it its name. (G).

63. Hackberry, *Celtis occidentalis*. Leaves 2-4 in. long. The Hackberry is distinguished by its leaves, the margins of which are entire near the base, toothed above. (G).

64. Osage Orange, *Maclura pomifera*. Leaves 3-5 in. long, shiny, tapering. The Osage Orange has thorns on its branches, a growing spine in the angle of each leaf. (G., I).

65. Red Mulberry, *Morus rubra*. Leaves 3-5 in. long. The tree may be distinguished by its leaf, which is rough above and hairy beneath, often irregularly lobed. (G).

66. White Mulberry, *Morus alba*. Leaves 3-5 in. long. Unlike the Red Mulberry the leaves of the White Mulberry are smooth and shiny. (I).

MAGNOLIA FAMILY, *Magnoliaceae*

Trees with large tulip-shaped flowers and cone-like fruit.

67. Cucumber Tree, *Magnolia acuminata*. Leaves 6-10 in. long. Two things distinguish this tree: its large shiny leaves, and its cone-like fruit, green ripening to red. (E.)

68. Tulip Tree, *Liriodendron tulipifera*. Leaves 5-6 in. long. No other tree has a leaf with a flattened top indented to the midrib. (G.)

CUSTARD APPLE FAMILY, *Anonaceae*

69. Papaw, *Asimina triloba*. Leaves 10-12 in. long. In addition to the shape of the leaves the Papaw may be distinguished from the Cucumber Tree by its fleshy fruit. (G).

LAUREL FAMILY, *Lauraceae*

70. Sassafras, *Sassafras variifolium*. Leaves 4-6 in. long. The Sassafras has three distinguishing marks: mitten-shaped leaves, yellowish green twigs, a sassafras taste. (G).

WITCH HAZEL FAMILY, *Hamamelidaceae*

71. Sweet Gum, *Liquidambar styraciflua*. Leaves 3-5 in. long, glossy, five-pointed. The leaves of the tree suggest maple, but their resinous fragrance, and corky wings on twigs, will always identify the tree (S).

60

SLIPPERY ELM

61

AMERICAN ELM

62

CORK ELM

63

HACKBERRY

64

OSAGE ORANGE

65

RED MULBERRY

66

WHITE MULBERRY

67

CUCUMBER TREE

68

TULIP TREE

69

PAWPAW

70

SASSAFRAS

71

SWEET GUM

ROSE FAMILY, *Rosaceae*

Trees whose flowers have 5 petals and whose fruit is pulpy with one or many seeds

72. Apple, *Pyrus malus*. Leaves 1-3 in. long, thick, toothed, woolly beneath. Fruit 1½ in. or more in diameter. (I.)

73. American Crab, *Pyrus coronaria*. Leaves 3-4 in. long, irregularly toothed, often lobed. Fruit 1-1½ in. in diameter, yellowish green. Branches often prolonged into short thorns. (G.)

74. European Mountain Ash, *Pyrus aucuparia*. Leaves compound. 7-15 leaflets, ¾-2 in. long, blunt, hairy beneath, toothed, entire near the base. Fruit ½ in. in diameter in convex clusters. (I.)

75. Shad Bush, *Amelanchier canadensis*. Leaves 3-4 in. long. Tree noticeable in the spring because of whitish leaves. (G.)

76. Cock-Spur Hawthorn *Crataegus crus-galli*. Leaves 1-3 in. long. Fruit has one or two nutlets. (G.)

77. Dotted Hawthorn, *Crataegus punctata*. Leaves 2-3 in. long, gray-green, prominently veined. Fruit has 3-4 nutlets. (G.)

78. Scarlet Hawthorn, *Crataegus coccinea*. Leaves 1-5 in. long, rough and hairy. Fruit has 3-4 nutlets. (G.)

79. Downy Hawthorn, *Crataegus mollis*. Leaves 2-4 in. long, thick hairy beneath. Edible fruit with 5 nutlets. (G.)

80. Black Cherry *Prunus serotina*. Leaves 2-5 in. long, with incurved blunt teeth. Black fruit. (G.)

81. Choke Cherry, *Prunus virginiana*. Leaves 2-4 in. long, thin with sharp spreading teeth. Bitter red fruit. (G.)

82. Wild Red Cherry, *Prunus pennsylvanica*. Leaves 3-5 in. long, sharp-pointed incurved teeth. Twigs have brown pith. (N. E.)

83. Sweet Cherry, *Prunus avium*. Leaves 3-5 in. long, dull and soft in color and texture. Fruit large, yellow or red, sweet, not in grape-like clusters. (I.)

84. Sour Cherry, *Prunus cerasus*. Leaves 3-4 in. long, smooth on both sides, stiff like parchment. Fruit large, red, acid, not in grape-like clusters. (I.)

85. Wild Plum, *Prunus americana*. Leaves 2-4 in. long, sharply toothed. Smooth red one-seeded fruit about 1 in. in diameter. (G.)

86. Peach, *Prunus persica*. Leaves 3-5 in. long, finely toothed. Velvety fruit 1½-3 in. in diameter, stone deeply sculptured. (I.)

72

APPLE

73

AMERICAN CRAB

74

EUROPEAN MOUNTAIN ASH

75

SHADBUSH

76

COCKSPUR HAWTHORN

77

DOTTED HAWTHORN

78

SCARLET HAWTHORN

79

DOWNY HAWTHORN

80

BLACK CHERRY

81

CHOKE CHERRY

82

WILD RED CHERRY

83

SWEET CHERRY

84

SOUR CHERRY

85

WILD PLUM

86

PEACH

PULSE FAMILY, *Leguminosae*

Trees with pea-like flowers and pods.

87. **Kentucky Coffee Tree**, *Gymnocladus dioica*. Leaves twice-compound.* Leaflets 2-2½ in. long. No thorns on the branches or limbs. (G.)

88. **Honey Locust**, *Gleditsia triacanthos*. Leaves twice-compound.* Leaflets 1½-2 in. long. Large thorns on branches or limbs. (G.)

89. **Redbud**, *Cercis canadensis*. Leaves 2-5 in. long. Only tree of the family with a simple leaf. (G.)

90. **Common Locust**, *Robinia pseudo-acacia*. Leaves once compound.* Leaflets 1-2 in. long. Twigs and pods smooth. (G.)

91. **Clammy Locust**, *Robinia viscosa*. Leaves once compound.* Leaflets 1-2 in. long. Twigs sticky; pods hairy. (I.)

QUASSIA FAMILY, *Simarubaceae*

92. **Tree of Heaven**, *Ailanthus glandulosa*. Leaves compound.* Leaflets 3-5 in. long. Leaflets with teeth or notches at their bases. May be mistaken for sumach. (G. I.)

SOAPBERRY FAMILY *Sapindaceae*

The only family with palmately compound* leaves.

93. **Horse-Chestnut**, *Aesculus hippocastanum*. Leaflets 5-7 in. long. Fruit a prickly bur. If the leaf has 7 leaflets the tree is a Horse-chestnut. (I.)

94. **Ohio Buckeye**, **Buckeye**, *Aesculus glabra*. Leaflets 3-6 in. long. If the leaflets are 5 and the bur prickly it is Ohio Buckeye. (G.)

95. **Sweet Buckeye**, **Yellow Buckeye**, *Aesculus octandra*. Leaflets 4-7 in. long, 5 in number. If the bur is not prickly the tree is Sweet Buckeye. (S.)

PLANE-TREE FAMILY, *Platanaceae*

96. **Buttonwood**, **Plane-Tree**, **Sycamore** *Platanus occidentalis*. Leaves 5-10 in. long. Has patchy greenish-white and brown bark and button-ball fruit on a stringy stalk. (G.)

BIGNONIA FAMILY, *Bignoniaceae*

Large heart-shaped leaves. Fruit a long cylindrical pod.

97. **Hardy Catalpa**, *Catalpa speciosa*. Leaves 8-12 in. long. Thin leaves, thick bark, large pod hardly 1 in. thick. (I.)

98. **Common Catalpa**, *Catalpa bignonioides*. Leaves 5-8 in. long. Thick leaves, thin bark, small pod about ¼ in. thick. Leaf same shape as that of the Hardy Catalpa. (I.)

GINKGO FAMILY, *Ginkgoaceae*

99. **Ginkgo**, *Ginkgo biloba*. Leaves 3-6 in. long. No other tree has such a leaf, leathery, fan-shaped with a deep notch at the tip. (I.)

*See Note Page 8.

KENTUCKY COFFEE TREE

HONEY LOCUST

REDBUD

COMMON LOCUST

CLAMMY LOCUST

TREE OF HEAVEN

HORSE CHESTNUT

OHIO BUCKEYE

SWEET BUCKEYE

BUTTONWOOD

CATALPA (Hardy-Common)

GINKGO

MAPLE FAMILY, *Aceraceae*

All Maples have winged seeds in pairs.

100. **Mountain Maple**, *Acer spicatum*. Leaves $2\frac{1}{2}$ -4 in. long, 3-5 lobed, white-downy beneath. Its distinguishing mark is a coarsely-toothed leaf with a triangular-shaped middle lobe. (N. E.)

101. **Sugar Maple, Rock Maple**, *Acer saccharum*. Leaves 3-6 in. long, 3-5 lobed. The leaves of the Sugar Maple are lobed but not toothed, which distinguishes it from all but the Black Rock and Norway Maples. Its leaves differ from those of the Black Rock in being smooth and thin; from the Norway in the absence of milky sap in the leaf stalk. (G.)

102. **Black Rock Maple**, *Acer saccharum nigrum*. Leaves 5-6 in. long, 3 lobed, very thick, edges wavy but not toothed. The only maple whose leaves have green hairy under surfaces. (G.)

103. **White Maple, Soft Maple, Silver Maple**, *Acer saccharinum*. Leaves 4-8 in. long, deeply 5 lobed. The White Maple may be known by two leading characteristics; deeply cut leaves with silvery-white under surfaces. (G.)

104. **Red Maple**, *Acer rubrum*. Leaves 3-4 in. long; 3 sometimes 5 lobed. The distinguishing mark is a finely-toothed leaf with a middle lobe whose edges are parallel near the base of the lobe. (G.)

105. **Norway Maple**, *Acer platano'des*. Leaves 3-5 in. long, lobed but not toothed. The Norway Maple might easily be mistaken for the Sugar Maple were it not for the fact that it is the only member of the family which has milky juice in its leaf stalk. (I.)

106. **Sycamore Maple**, *Acer pseudoplatanus*. Leaves 3-5 in. long, 5 lobed. This tree may be readily recognized by its thick coarsely-toothed leaves which are dark green above and whitish beneath. (I.)

107. **Box Elder, Ash-leaved Maple**, *Acer negundo*. Leaves pinnately compound (see note page 8), Leaflets 2-4 in. long. The only maple whose leaves are compound, whose fruit remains attached during the winter, and whose leaf scars meet around the twig. (G.)

100

MOUNTAIN MAPLE

101

SUGAR MAPLE

102

BLACK ROCK MAPLE

103

WHITE MAPLE

104

RED MAPLE

105

NORWAY MAPLE

106

SYCAMORE MAPLE

107

BOX ELDER

OLIVE FAMILY, *Oleaceae*

Two characteristics distinguish the Olive Family, pinately compound* thin leaves and single-winged seeds.

108. **White Ash**, *Fraxinus americana*. Leaflets 3-5 in. long, Twigs and leaf stalks smooth. May be known by the whitish-green under surfaces of its leaves and small seeds about $\frac{1}{4}$ of the whole fruit. (G.)

109. **Biltmore Ash**, *Fraxinus biltmoreana*. Leaflets 3-6 in. long. Twigs and leaf stalk hairy. Known by the whitish and hairy under parts of its leaves, and its seeds which are about $\frac{1}{3}$ of the whole fruit and over $\frac{1}{8}$ in. thick. (S.,W.)

110. **Red Ash**, *Fraxinus pennsylvanica*. Leaflets 3-6 in. long. Twigs, buds and leaf stalk hairy. Called Red Ash because the inner side of bark of branches is reddish. In addition its leaves are green and hairy beneath and seed parts nearly $\frac{1}{2}$ the whole fruit, and less than $\frac{1}{8}$ in. thick. (G.)

111. **Green Ash**, *Fraxinus pennsylvanica lanceolata*. Leaflets 2-5 in. long. Twigs smooth. Distinguished by the bright green and smooth under parts of its leaves. (G.)

112. **Blue Ash**, *Fraxinus quadrangulata*. Leaflets 3-5 in. long. Seed part surrounded by the wing of the fruit. This is the only ash whose twigs are four-sided and four-winged. (G.)

113. **Black Ash**, *Fraxinus nigra*. Leaflets 3-6 in. long. Seed part surrounded by wing of fruit. The only ash whose side leaflets are without stalks. (N.)

DOGWOOD FAMILY, *Cornaceae*

The dogwoods have thin leaves without teeth and with veins curving from the middle toward the tip.

114. **Flowering Dogwood**, *Cornus florida*. Leaves 3-5 in. long. If the leaves are opposite on the stem it is a Flowering Dogwood. (G.)

115. **Alternate-leaved Dogwood**, *Cornus alternifolia*. Leaves 3-5 in. long. If the leaves are alternate on the stem it is an Alternate-leaved Dogwood. (G.)

116. **Tupelo, Pepperidge, Black Gum**, *Nyssa sylvatica*. Leaves 2-3 in. long, alternate. If the pith of the twigs has cross partitions it is Tupelo. Leaves bright scarlet in October. (G.)

*See Note on page 8.

WHITE ASH

BILTMORE ASH

RED ASH

GREEN ASH

BLUE ASH

BLACK ASH

FLOWERING DOGWOOD

ALT. - LEAVED DOGWOOD

TUPELO

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H. L. M.

Cleveland, Ohio.
December, 1921.

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