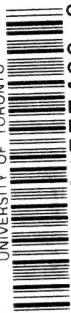


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Muldrew, William Hawthorne

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SYLVAN ONTARIO

A GUIDE TO OUR NATIVE TREES AND SHRUBS

*William
Multhorne*

BY

W. H. MULDREW, B.A., D.PAED.

Deceased 1904.

Principal of the Gravenhurst High School.

ILLUSTRATED WITH 137 LEAF-DRAWINGS

TORONTO

WILLIAM BRIGGS

1901



Father, thy hand
Hath reared these venerable columns, thou
Didst weave this verdant roof. Thou didst look down
Upon the naked earth, and, forthwith, rose
All these fair ranks of trees. They, in thy sun,
Budded, and shook their green leaves in thy breeze
And shot toward heaven.

Ah, why
Should we, in the world's riper years, neglect
God's ancient sanctuaries, and adore
Only among the crowd, and under roofs
That our frail hands have raised ?

—*Bryant : Forest Hymn.*

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the Parliament of Canada, in
the year one thousand nine
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HAWTHORNE MULDREW, at the
Department of Agriculture.

PREFACE.

A VERY high authority on the natural resources of our Dominion once explained to Lord Lansdowne, in answer to an inquiry, that the chief industry of Canadians was the destruction of forests. There is reason to believe, however, that this stage in our national development has been outgrown, and already there are on all sides evidences of a proper appreciation of the permanent value of grove and forest. Both the Dominion and the Provincial governments have applied themselves to the husbanding of our forest wealth and to the reforestation of our denuded areas, while various associations have been formed to further similar ends.

With this change of attitude towards the trees has come the very laudable desire to know more of them, to learn their names, their habits, and their uses. Such knowledge has been heretofore confined largely to two sources, the practical experience of the farmer or lumberman and the learned research of the systematic botanist, both of these being equally impracticable to the average observer. The purpose of this little book is to introduce the subject in a popular way to the intelligent reader, to show that there is more in the woods than is found by the scaler with his rule, and that such may be appreciated without the endless terminology of floral botany. On the other hand, the botanist's exactness in method and description is applied with the fewest possible technical terms, and the guide-marks of the woodman are rendered as definite as language will permit.

The experience of the author must be his justification in approaching this subject by a method which aims to combine, in a popular manual, the most useful features of both these aspects. Having had the good fortune to spend his childhood and youth on a Canadian farm, which is, under favorable conditions, our best kindergarten yet introduced, he gained in early years a practical knowledge of the botany of the woods. A little later, under the influence of an enthusiastic teacher, he absorbed some of the zeal of the naturalist, and as a result has now for some years made a hobby of the life of the woods and waters as an offset to the routine of a teacher's duties. The trees, especially, so common and so interesting, though so little known, he has tried to introduce to his classes as neighbors worthy of attentive study—not as mere units in a system, but as living things solving the problems of life in their own way. In pursuance of this idea there has been established in the grounds of the Gravenhurst High School an arboretum, where practically all the trees and shrubs of

the district may be seen and studied. The collection and care of such specimens has made necessary an accurate knowledge of their features, and the method employed in introducing them to successive classes has helped to make possible the preparation of this hand-book.

A few words may be added by way of introduction to our learned friends and the expert botanists. Although this work is intended mainly for beginners, it is hoped that it may prove suggestive to more mature students and help to stimulate a more lively interest in our Forest Flora, which is often little understood even among ardent collectors. It is believed that the method employed may fairly claim to be original. Certain American authors, notably Apgar and Newhall, have approached the subject in a somewhat similar way, but the analysis of the latter guides us scarcely farther than to the natural order, while that of the former depends very largely on flower and fruit and stops at the genus, which is often only the beginning of difficulty.

For the facts of distribution, especially in the south-western part of the Province, Macoun's Catalogue has been chiefly relied upon, and the nomenclature employed is in most cases that with which our students are familiar. The drawings have been made by the author, and, in nearly all cases, from typical natural leaves. The accompanying fractions indicate the size as compared with the actual leaves, and the numbers correspond with those of the Leaf Index and the succeeding pages. In the notes on the various species special references are in some cases made to the *Silva* of Muskoka, with which the author is naturally most familiar. This has seemed fitting from the fact that this interesting district has apparently not received from botanists the attention which it deserves. Much care has been taken to ensure correctness in description and habitat, and observers everywhere are requested to make known the errors and omissions brought to light by their investigations. From the similarity of the floras in neighboring Provinces and States it is hoped that the usefulness of this manual will not be confined to the territory for which it has been prepared, especially since blank pages have been added for the use of students in noting further species or other items of interest.

Finally, let it be kept always in mind that this is but an Index to one page in the infinite Book of Nature. Taken by itself it may prove as interesting as is usual with an index or a dictionary. When in connection with the living things which it introduces there is reason to hope that it may happily combine instruction with recreation in a way not without interest to the thoughtful reader.

INTRODUCTION.

IN the very numerous forms of life with which we meet we cannot help noticing that there are all degrees of likeness and difference. We believe that all these forms are in some sense related to each other, and the closer the similarity the closer we consider this relation to be. When such likeness is as exact as we are accustomed to find in Nature, we say that the forms compared are of the same kind or *Species*, and we mark them by the same name, noticing that the individuals reproduced from these continue equally similar to each other and to the parent forms. A number of species plainly related to each other, yet not the same, form a *Genus*, the plural of this Latin word being *Genera*. Thus all our Maples belong to one Genus, though there are five or six species; and we have at least a dozen distinct kinds of Willows, all belonging to the same group or Genus in the same way. Similar Genera again are grouped into Families, or Orders, and these again into higher and higher classes, upon which at present we need not dwell.

Such a classification would, of course, be impossible without some accurate system of naming, and the method introduced by the great botanist, Linnæus, about one hundred and fifty years ago, is now commonly used everywhere among students of Nature. In this system every Genus has a distinctive name, and this name, with a modifying word added, may become the full name of any species in that Genus. Thus, *Acer* is the name of the Maple Genus, while *Acer rubrum*, *Acer saccharinum* and *Acer dasycarpum* are three distinct kinds of trees within this Genus. To some it seems a pity that these names should be in Latin, but they have the corresponding advantages of being the same in all languages, and of having an exactness that would not be possible with every-day words. Thus, *Acer rubrum* will be known by this title wherever it is mentioned by botanists; while "Red Maple" or "Soft Maple" might easily be applied to several trees, even within the same

province or county. Since different names have at different times been given in some cases to the same species, it is customary to add, for still greater certainty, the name of the author who first gave this designation to the species. Thus, *Acer rubrum* (L.) is the Red Maple, as so named by Linnaeus. It will be seen that this Linnaean system is practically only a Latinized form of our common methods of naming persons as well as things.

Patient observers have thus named, and classified more or less correctly, all the forms of life that they have found throughout the world, and their work is still going on. The following pages are intended to assist the reader in the much humbler, though scarcely less interesting, task of *identifying* a few common and conspicuous forms of vegetable life, and learning the every-day and the botanical names of these, with a few interesting facts concerning their structure or habits. For this purpose, I have selected the Trees and Shrubs and Woody Vines that grow wild within our Province, and have fixed on their leaves as the most suitable feature upon which to base our observations. In classification *all* resemblances and differences must be taken into account; but for identification it is, fortunately, necessary to consider only the more obvious similarities and distinctions. It will be found possible, after a little practice in observing the peculiarities of leaves and the terms used in describing them, to identify any species included here, by means of the Index given on pages 15 to 37.

In order to use this Index, the beginner should first become acquainted with the terms and definitions given under the heading, "Description of a Leaf." This is best done by comparison with natural leaves, and with the drawings to which references are made. Begin by mastering the three headings, "Kind," "Arrangement," "Margin," so that you can at a glance apply the proper terms to any given leaf; *e.g.*, "Simple—Opposite Lobed" or "Compound—Alternate—Pinnate." When able to take this step you are certainly well begun, and often more than half done. The corresponding heading in the Index will give the group, and in most cases the page, which contains the species you are considering. Then follow the brief rule: "If description *agrees*, step to *right*; if *not*, step *down*." Compare the description carefully at every stage with the leaves before you, and a few steps will bring you to the botanical name of the tree or shrub you are examining. The common name, with a few added remarks, will be found by number in the succeeding pages.

The Cone-bearing Species, such as the Pine, Hemlock and Balsam, are very different in foliage from the broad-leaved forms, and are treated separately on the last page of the Index. They are, however, not difficult to identify, and, from their small number, can be mastered in a very short time, besides being nearly all available throughout the year.

Care should be taken to select leaves which are fully grown, and not very different from the average size and form of those seen on the same species at the same time. In beginning, it is well to follow out a number of forms which are already known, until the method has become familiar, and some confidence has been gained. For this purpose I would suggest the Virginia Creeper, the Hard or Sugar Maple, the Red or Black Oak, the Beech, the Poplars, and the White Pine.

Students should aim to become familiar with the proper botanical names. For the assistance of beginners, the pronunciation of these has been indicated in the present work. The accented vowel is marked by the grave accent when given the long or broad sound as in *Ròsa*; and by the acute accent when given the short or narrow sound as in *blánda*.

THE DESCRIPTION OF A LEAF.

I. THE KIND.

Simple: When the blade is in one piece. (See pp. 18 to 36.)

Compound: When the blade is divided into smaller parts, called *leaflets*. A compound leaf may resemble a twig with simple leaves, but the former *never* has buds growing from it, *never* leaflets regularly alternate, and *always* a leaflet at the end, in our species. Notice also that leaflets grow only from opposite sides of the central stalk, and so lie in one plane, while simple leaves often grow on all sides of the central twig. (See pp. 14 and 16.)

Pinnate: When the leaflets are placed along a central stalk. (See p. 16.)

Palmate: When the leaflets are placed around a centre. (See p. 14—20a, 26d, 26f.)

Figures placed before these words, as 5-9-pinnate or 5-palmate, refer to the number of leaflets.

II. THE ARRANGEMENT.

Alternate: Growing one by one and each higher on the stem than the last. (See pp. 16, 22, 24, 34.)

Opposite: Growing in pairs on opposite sides of branch and at equal height upon it. (See pp. 18, 14—1a, 22a, 36a.)

Alternate pairs: Leaves that are really alternate sometimes are so near together as to appear opposite on very short side twigs, while the true arrangement is seen on the newer wood of the young shoots. This peculiarity is very noticeable in the Birches. (See p. 30—68b, 68d.)

Whorled: In circles of three or more around a branch or stem. (See p. 36—84a.)

Two-rowed: Growing in two rows on opposite sides of twigs, as in the Elms. (See p. 36—80a, 81a.)

Solitary: One by one, not grouped. (See p. 36—79a, 81a.)

Shingled: With small flat leaves overlapping closely like shingles. (See p. 36—83a, 84c.)

III. THE MARGIN OF THE BLADE.

- Entire : With the edge even, or very nearly so, all around. (See pp. 18, 22, 24.)
- Serrate : With teeth pointing towards apex. (See p. 34.)
- Two-Serrate : With smaller teeth on the margins of the larger ones. (See p. 30—60a, 60b, 70b, 71a, 68b, 68d, 69b.)
- Toothed : With teeth pointing outward rather than forward. (See p. 20—37e.)
- Crenate : With rounded teeth. (See p. 28—73d, 32a.)
- Teeth incurved : Bent forward and inward so that points may appear rounded. (See p. 34—24c, 24e, 28c.)
- Notches : The hollows between teeth.
- Lobed : Deeply cut or hollowed so as to form lobes. (See p. 20—37b, 21a, 21b, 21c, 21d, 21e ; p. 26, except 73c.)
- Pinnate : With lobes arranged along a central stalk. (See p. 26—67b, 73a, 73g, 73h.)
- Palmate : With lobes arranged around a centre. (See pp. 20, 26—19b, 26a, 3a, 55a.)
- Sinuses are the hollows between the lobes.
- Revolute : With the edge turned under or rolled in on lower side.
- Ciliate : With a fringe of fine hairs like an eyelash along the edge. (See p. 18—39a.)

IV. THE VENATION OR VEINING.

- Veins : The framework of the blade.
- Midrib : A central vein running from end to end.
- Palmate : When main veins run outward from base of leaf. (See p. 20—21a, 21b, 21c, 21d, 21e, 37b.)
- Veins from the base often curve to or towards the apex without much branching, and are then called *nerves*. (See p. 22—86b ; p. 32—18a.)
- Pinnate : When branches run from midrib towards opposite margins. (See p. 34.)
- In leaves like those of Beech and Birch the pinnate veins are often nearly straight and parallel, running directly to the points of the main teeth. (See p. 30—60a, 60b, 70b, 71a, etc.)

V. THE STEM OR FOOTSTALK OF THE LEAF.

This is called the *petiole*, but in a leaflet it is the *stalk*.

The petiole may be perfectly round, or flattened as in the Poplars, or with a groove above as in the Cherries, or bordered by a narrow wing on each side as in the Sweet Viburnum, or marked by conspicuous glands (See VII. below) as in the High-bush Cranberry, the Cherries, or the Shining Willow. The petiole is sometimes not in line with the midrib, and may then be called *oblique*, as in the very small leaves of the Hemlock or the very large ones of the Basswood. The length of the petiole often serves to distinguish a species. A blade without petiole or stalk is *sessile*.

VI. STIPULES are small structures growing in pairs at the base of or along a petiole. In many species these disappear as soon as the leaves are unfolded, but in cases where they remain throughout the summer they are often distinctive marks. (See p. 16—27a, 27c, 27d, 26b; p. 20—37b; p. 26—67b.)

VII. SURFACE OF LEAF OR TWIG.

Smooth: Without hairs of any kind; no reference to *evenness* of surface.

Glaucous: Covered with a *bloom* like a cabbage-leaf or a grape. This covering is usually pale or white on the lower surface of leaves. It gives the color to "blueberries" and is noticeable in some cases on the upper surface of leaves, as in the Juneberries. In all cases it may be rubbed off, leaving a more or less shining surface.

Downy or Pubescent: With fine, soft, short hairs.

Woolly: With dense matted hairs.

Hoary: With fine, short, white or greyish down.

Rough: Applied to the "feel" of a leaf as in the Slippery Elm or Red Mulberry.

Scurfy: Covered with loose scales, usually colored or shiny.

Resinous-dotted: With shining dots, caused by a resin-like substance. Such leaves are often sticky when pressed between moistened finger and thumb.

Glands: Waxy-looking bodies or raised dots found on petioles, or on the midrib above as in Chokeberry, or on the points of teeth as in some Willows and Cherries. (See p. 34—24c, 24d, 24e; p. 20—37b.)

VIII. OUTLINE OR SHAPE OF BLADE.

Oval : Egg-shaped, length about twice width, ends nearly equal. (See p. 30—71a, 69b.)

Ovate : Similar to last, but narrower toward apex. (See p. 18—34e, 41a.)

Obovate : Similar, but narrower toward base ; like the last turned around. (See p. 34—24d, 28c, 13a.)

Lanceolate : Long and narrow, broader toward base. (See p. 32—76a, 76b.)

Oblanceolate : Long, narrow, broader toward apex, like the last turned around. (See p. 32—76g, 67a.)

Cordate : Heart-shaped. (See p. 30—10a ; p. 20—37a.)

Oblong : Length about three times width, and edges nearly straight (See p. 24—14a.)

Elliptical : Similar to last, but sides more rounded, and narrower towards each end. (See p. 24—49a.)

Awl-shaped : Small and sessile, and pointed. (See p. 36—84a, 84c.)

Linear : Long and narrow, with nearly straight edges, like a blade of grass. (See p. 36—81a ; p. 32—76d.)

Needle-shaped : Long and slender, like those of Pine and Spruce. (See p. 36—78a, 78b, 78c, 78d.)

Such leaves are often called *needles* ; they may be somewhat square, or three-sided, or four-sided, or half-round, or completely round.

The combination of two terms means that the form is between them ; *e.g.*, round-ovate, linear-lanceolate.

IX. THE ENDS OF THE BLADE. (Base and Apex).

Acute : Forming a rather sharp angle, pointed. (See p. 22—48a, 76g, 76i.)

Obtuse : Forming a rather wide angle, somewhat blunt. (See p. 22—45a, 46a, 43j.)

Tapering or taper-pointed : Curving *out* to a point. (See p. 34—24c, 24d, 24e.)

Abrupt : Suddenly forming a point. (See p. 34—28c, 13a.)

Mucronate : With very fine and short abrupt point. (See p. 24—14a, 42a.)

ENDS OF BLADE—*Continued.*

Cordate (base): Heart-shaped. (See p. 22—86b, 46a, 5a.)

Sub-cordate (base): Slightly cordate. (See p. 20—21a; p. 26—31a.)

Wedge-shaped: Acute, with straight edges. (See p. 32—67a; p. 34—24b.)

Oblique (base): One side larger than the other. (See p. 30—60b, 10a, p. 28—32a.)

Entire: The base may be entire for some distance, though the rest of the margin is toothed or serrate. (See p. 32—67a; p. 34—24b, 28a, 30a, 30e, 63a.)

X. THE SIZE OF BLADE OR LENGTH OF PETIOLES, ETC.

> means "greater than."

< means "less than." The point is always toward the smaller of the things compared.

3-5 in. means between 3 in. and 5 in., not $\frac{3}{5}$ of an inch.

XI. ODOR.

Many leaves when crushed have a fragrance by which they may be known. Such are those of Sweet Gale, Sweet Fern, Balsam, some of the Hickories, and Butternut. In some cases the odor is unpleasant, as in the Fetid Currant, the Staghorn Sumac and the Elders.

XII. TASTE.

Leaves differ as much in this particular as in any other. The Willows are particularly bitter, owing to the presence of a substance which has been used as a substitute for quinine. The Cherries and Juneberries have all the well-marked flavor of the very poisonous prussic acid; the Wintergreen shares its aroma with two of our Birches; and our two species of American or Mountain Holly (so-called) have a bitterness that cannot be mistaken for anything else. If the true Poison Ivy and the southern Sumacs are avoided, there is no danger of injury from the habit of "browsing and nibbling," so well described by Maurice Thompson, in "By-Ways and Bird-Notes."

THE DESCRIPTION OF A STEM.

Unarmed : Without thorns or prickles of any kind.

Many plants protect themselves by sharp-pointed hard growths, which are usually either stunted branches as in the Hawthorn and the Wild Plum, or developed from leaves as in the Barberry, or merely outgrowths from the bark as in the Roses. Such growths are commonly called, in the order of their size and strength, *thorns*, *spines*, *prickles* and *bristles*, the last being similar to very coarse hairs.

Climbing : Rising by the support of other stems, walls, etc. Many climbers take hold of their supports by means of *tendrils*.

Twining : Climbing by winding around another stem.

Trailing : Running along the ground.

Prostrate : Lying flat on the ground.

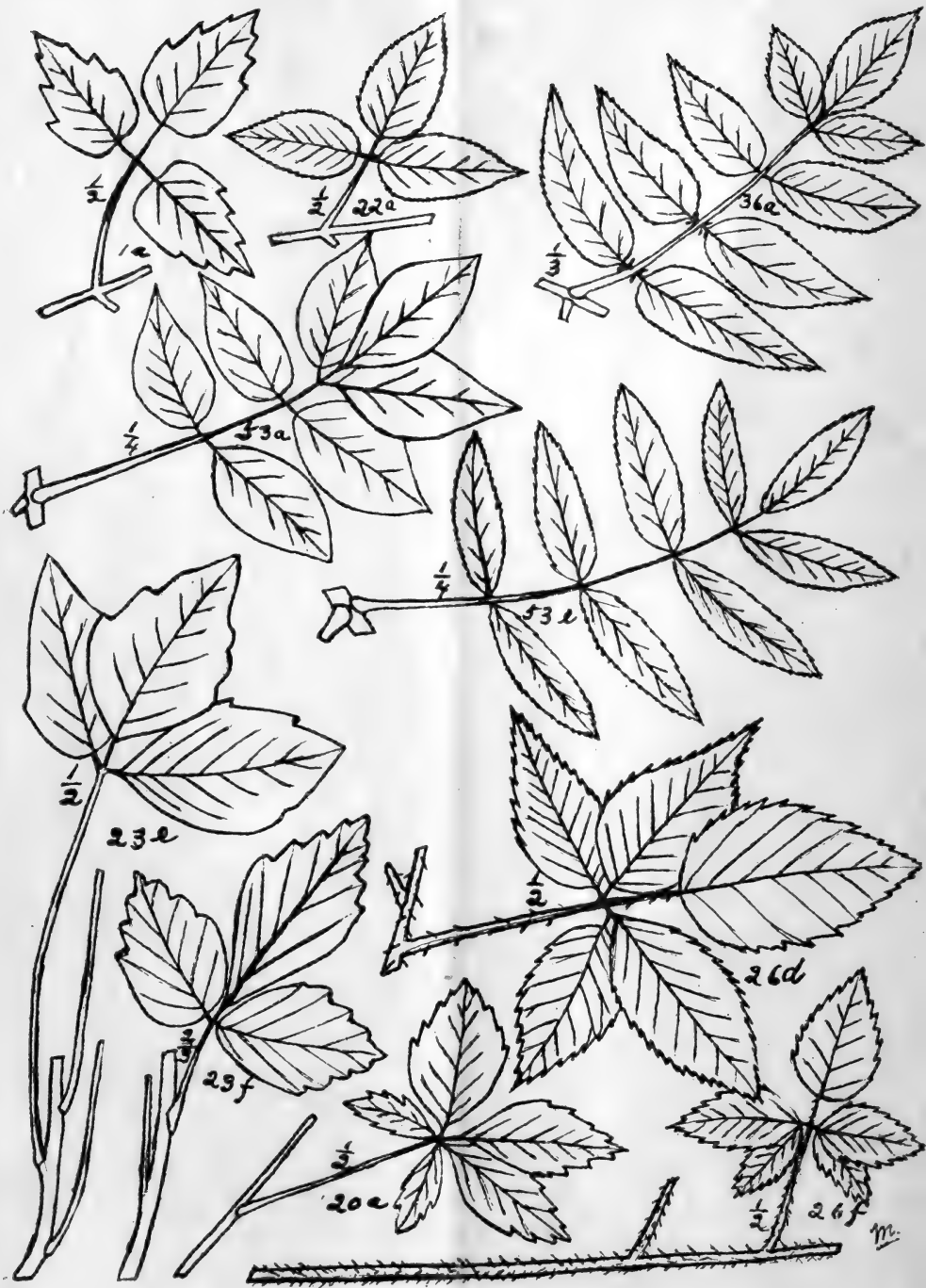
Reclining : Between prostrate and erect.

Ascending : Rising slantingly from the ground.

Straggling : Applied to weak stems, especially when spreading widely from the root, and ascending or reclining.

Stems grow from *buds*, which usually appear just above the petiole of a leaf, *i.e.*, in the *axil* of the leaf, or at the end of a stem or branch. The buds are often distinctive marks, and differ very much in different species. They are commonly covered by *scales*, but are sometimes *naked*, as in the Viburnums. The flowers are sometimes produced from the same buds as the leaves, and sometimes from distinct ones. The buds show the arrangement of leaves when the latter are not present.

The Bark of the Stem : An experienced eye can distinguish most of the forest trees by the appearance of the bark and the form of trunk and limbs, but it is very difficult to put into words the features which make this possible. It must also be kept in mind that the bark varies greatly with the age of the tree, and often with the conditions of soil and light under which it grows. Only general hints can be given here as to color, roughness and texture, but the student is urged to note carefully all such marks and to practise identification by their aid, especially in the winter season. Whatever may be the means by which we first make their acquaintance our aim should be to know the Trees at sight, as we know other familiar friends.



AN INDEX BASED ON THE LEAVES.

“If description agrees, step to right; if not, step down.”

COMPOUND-OPPOSITE.

Leaflets 3, shrubs or vines.

Climbing shrub, clinging by petioles, moist soil, common. *Clematis Virginiana* 1a

See also (a shrub, usually trailing, in rocky places, rare). *Clematis verticillaris* 1b

Erect shrub, side leaflets nearly sessile, serrate, bark striped. *Staphylea trifoliata* 22a

Leaflets, 5 or more, pinnate.

Sharply serrate, stalks short, mostly downy beneath, shrubs. (Elders)

Leaflets 5-11, long-tapering, stem soft, heart of stem white. *Sambucus Canadensis* 36a

Leaflets 5-7, bark warty, stem woody, heart of stem brown. *Sambucus racemosa* 36b

Leaflets 7-11, nearly sessile, finely serrate, nearly smooth, tall tree, swamps. *Fraxinus sambucifolia* 53e

Leaflets 5-9, stalked, not sharply and evenly serrate, trees. (Ashes)

Petioles and twigs pubescent, finely toothed, shores of lakes and rivers. *Fraxinus pubescens* 53b

Petioles and twigs smooth, margins nearly entire.

Leaflets pale beneath, or slightly downy, rich woods. *Fraxinus Americana* 53a

Leaflets green beneath, smooth, moist soil, not common. *Fraxinus viridis* 53c

See also (a southern tree with 4-sided twigs and finely toothed leaflets). *Fraxinus quadrangulata* 53d

COMPOUND-ALTERNATE-PALMATE or of only 3 leaflets.

Stems unarmed, low shrubs or climbing vines.

Leaflets 3, notched, or toothed, or crenate, or nearly entire.

Petiole long, mostly 2-in. or more, teeth few, very poisonous. *Rhus toxicodendron* 23e

Petiole about 1-in. or less, leaflets nearly sessile, toothed above middle, fragrant. *Rhus Canadensis* 23f

Leaflets five, coarsely serrate, climbing or trailing, harmless. *Ampelopsis quinquefolia* 20a

Stem unarmed, a small tree, leaflets 3, sessile and nearly entire, southern. *Ptelea trifoliata* 12a

Stems prickly or bristly, erect or trailing or climbing.

Stem climbing, stipules joined along petiole, leaflets 3 or 5-pinnate. *Rosa setigera* 27a

Leaflets 3 or 5-pinnate, pale-glaucous and downy beneath. (Raspberries)

Twigs and petioles, densely bristly, bristles weak and nearly straight. *Rubus strigosus* 26b

Twigs and petioles with stout hooked prickles, stems very glaucous. *Rubus occidentalis* 26c

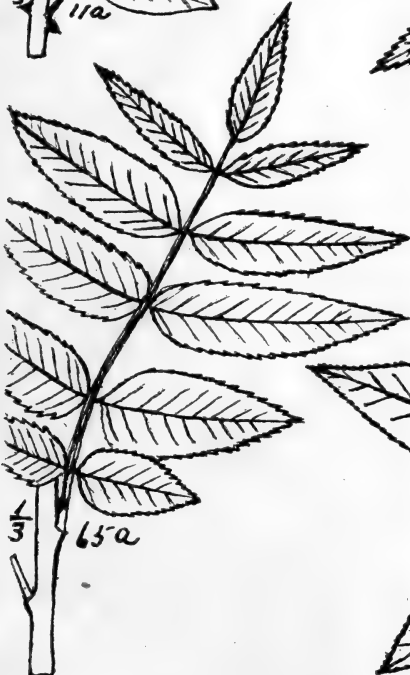
Leaflets 3 or 5-palmate, not glaucous.

Erect, downy beneath, stalked, with end stalk long and prickly. *Rubus villosus* 26d

Stems trailing, leaflets green and smooth beneath.

Bristles numerous, weak and slightly curved, stem slender. *Rubus hispidus* 26f

Prickles scattered, stout and curved, stem shrubby. *Rubus Canadensis* 26e



71.

COMPOUND-ALTERNATE-PINNATE ; leaflets 5 or more.

Stipules long and narrow, joined along petiole, leaflets 5-9. (Wild Roses)

Stems with spines in pairs at base of stipules.

Spines short, hooked, leaflets mostly 7, finely serrate, wet shores. *Rosa Carolina* 27d

Spines slender, straight, leaflets mostly 5, coarsely toothed, dry soil. *Rosa humilis* 27e

Stems mostly without spines in pairs at base of stipules.

Stems unarmed or nearly so, not resinous, common. *Rosa blanda* 27c

Stems very prickly, leaves often resinous or pubescent. *Rosa acicularis* 27b

Stems climbing, leaflets often only 3, southwestern. *Rosa setigera* 27a

Stems or branches prickly or bristly, shrubs.

Leaflets 5 or 3, downy-glaucous beneath, mostly with narrow stipules.

Twigs and petioles densely bristly, bristles weak and straight. *Rubus strigosus* 26b

Twigs and petioles with stout hooked prickles, stem very glaucous. *Rubus occidentalis* 26c

Leaflets more than 5, without stipules.

Margins nearly entire, prickles stout, bark aromatic. *Xanthoxylum Americanum* 11a

Margins sharply serrate, stem erect but short and bristly. *Aralia hispida* 33a

Leaflets 7-21, entire, or nearly so, southern shrubs.

Petiole winged between leaflets, bases oblique, sometimes toothed at apex. *Rhus copallina* 23c

Leaflets 7-13, quite entire, petiole not winged, very poisonous, swamps. *Rhus venenata* 23d

Leaflets many, often > 17, serrate, shrubs or small trees, twigs coarse. (Sumacs)

Twigs and petioles thickly soft-hairy, pale beneath, common. *Rhus typhina* 23a

Twigs and petioles smooth, leaflets glaucous beneath, rare. *Rhus glabra* 23b

Leaflets 11-17, nearly smooth, taper-pointed, a small tree, in swamps. *Pyrus Americana* 28d

See also (a northern shrub or tree, leaflets more downy and less pointed). *Pyrus sambucifolia* 28e

Leaflets 11-19, petioles soft-downy, bark and leaves fragrant, large tree. *Juglans cinerea* 65a

See also (a large southern tree, leaflets sometimes > 20, petioles finely downy). *Juglans nigra* 65b

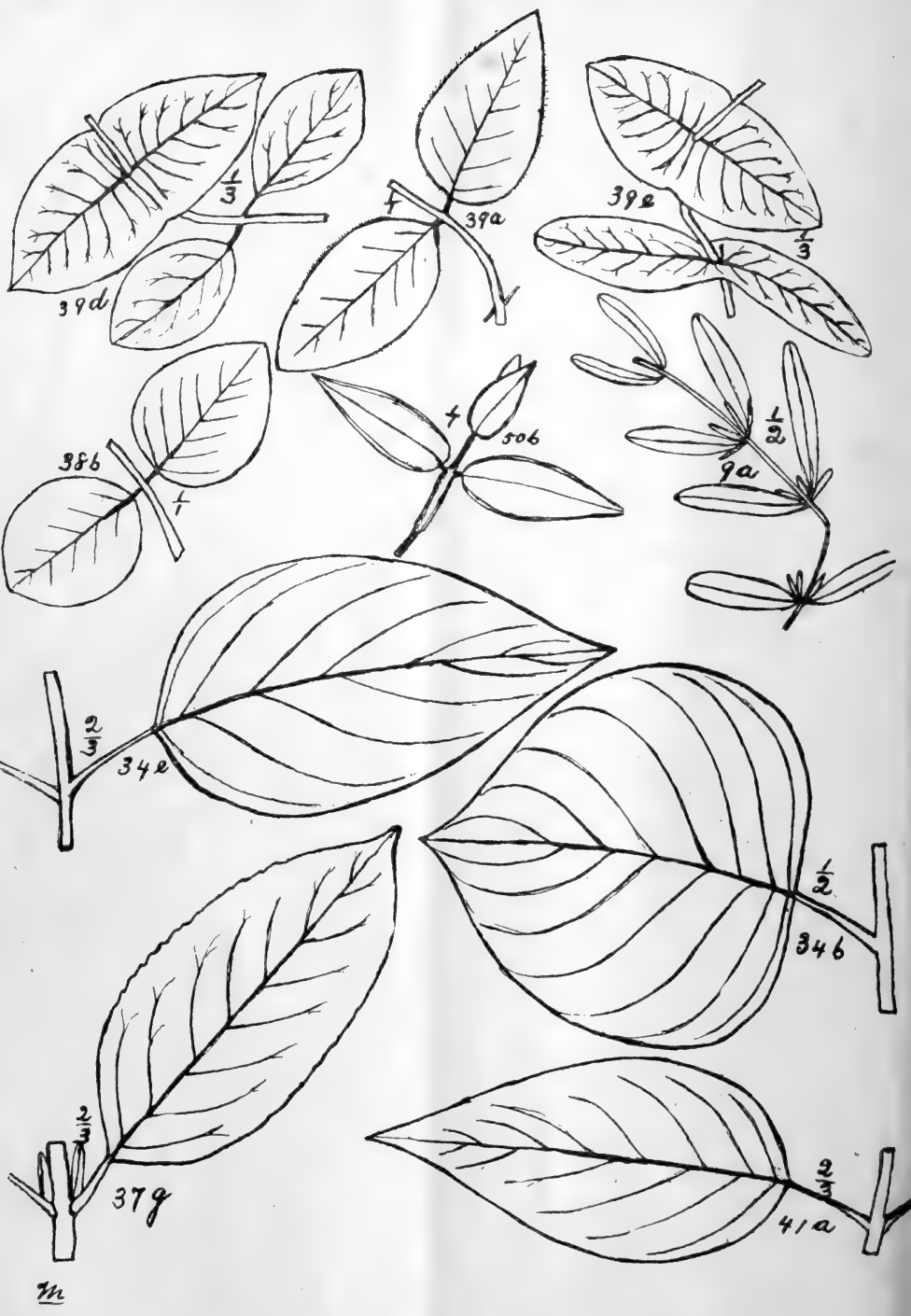
Leaflets 9 or less, finely serrate, trees.

Leaflets mostly 5, long and taper-pointed, bark rough. *Carya alba* 66a

Leaflets 7 or 9, nearly smooth, fragrant, moist soil. *Carya amara* 66d

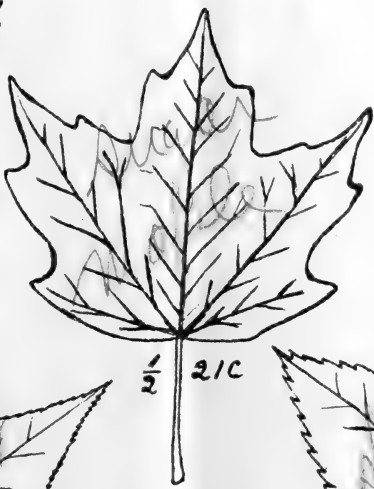
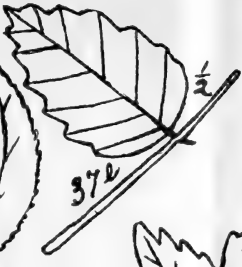
Leaflets 7 or 9, densely pubescent, fragrant, southern. *Carya tomentosa* 66b

Leaflets 3 to 7, often curved, nearly smooth, southern. *Carya porcina* 66c



SIMPLE-OPPOSITE-ENTIRE.

- Upper leaves united in pairs, stems often twining. (Honeysuckles)
 Leaves large, green and very downy on both sides. *Lonicera hirsuta* 39d
 Leaves very glaucous beneath, smooth, much branched. *Lonicera parviflora* 39e
- Petiole short, about $\frac{1}{4}$ in. or less, leaves mostly < 2 in., not long-tapering.
 Margins ciliate, petioles slender, branching shrubs. (Honeysuckles)
 Green on both sides, apex pointed, common throughout *Lonicera ciliata* 39a
 Pale and pubescent beneath, apex rounded, rare, northern. *Lonicera caerulea* 39b
- Leaves oval or rounded, twigs round, not white or silvery beneath.
 Leaves about 1 in. or less, rounded, downy beneath, low shrub. *Symphoricarpos pauciflorus* 38b
 Leaves 1-2 in. oval, nearly smooth, common in dry soil. *Symphoricarpos racemosus* 38a
 See also (a rare shrub in swamps, leaves as in the last). *Lonicera oblongifolia* 39c
- Leaves long and narrow, leathery, evergreen, twigs round. *Kalmia angustifolia* 50a
- Twigs flattened, leaves whitened beneath.
 Leaves revolute, white-glaucous beneath, nearly sessile, low bog shrub. *Kalmia glauca* 50b
 Silvery-scurfy beneath, petiole about $\frac{1}{4}$ in., tall shrub. *Shepherdia Canadensis* 58a
 Leaves glaucous beneath, dotted, width less than $\frac{1}{2}$ in., rare. *Hypericum Kalmianum* 9a
- Petiole about $\frac{1}{2}$ in. or longer, leaves oval or ovate, acute, or tapering, mostly > 2 in. x 1 in., erect shrubs or a small tree. (Dogwoods mainly)
 Twigs bright red, nearly smooth, leaves pale or slightly downy beneath. *Cornus stolonifera* 34e
 Twigs dull purple and downy, leaves pale-brown with fine down beneath. *Cornus sericea* 34c
 Twigs brown or reddish, leaves rough to touch above, downy, southern. *Cornus asperifolia* 34d
- Twigs grey or greenish and nearly smooth.
 Leaves large, round ovate, woolly beneath, twigs warty or dotted. *Cornus circinata* 34b
 Leaves narrowly ovate, pale and pubescent beneath, dry soil. *Cornus paniculata* 34f
 See also (a small tree with rough bark, in south-west only). *Cornus Florida* 34a
 Leaves nearly smooth, green on both sides, twigs green, wet shores. *Cephalanthus occidentalis* 41a
 Leaves mostly finely toothed, often brown-scurfy beneath, wet places. *Viburnum cassinoides* 37g



SIMPLE-OPPOSITE-SERRATE OR TOOTHED OR CRENATE (NOT LOBED).

- Leaves very large, round-cordate, veins rusty or woolly beneath, stems straggling. *Viburnum lantanoides* 37a
- Crenate or nearly entire, often slightly rusty beneath, swamps. *Viburnum cassinoides* 37g
- Coarsely toothed, petiole $\frac{1}{4}$ inch or less, downy beneath, mostly with stipules. *Viburnum pubescens* 37e
- Coarsely toothed, petiole $> \frac{1}{4}$ inch, tall shrub, mostly with stipules, rare. *Viburnum dentatum* 37f
- Petiole nearly 1 in., flattened or winged, teeth fine and curved, not ciliate, tall or tree-like. *Viburnum Lentago* 37h
- Leaves ovate and taper-pointed, petioles $\frac{1}{4}$ to $\frac{3}{4}$ inch long.
- Low erect shrub, in dry soil, margins usually ciliate. *Diervilla trifida* 40a
- See also (a tall shrub with leaves finely serrate, southern). *Euonymus atropurpureus* 16b
- Leaves obovate and obtuse, nearly sessile, low spreading shrub. *Euonymus Americanus* 16a.

SIMPLE-OPPOSITE-LOBED.

- Climbing shrub, leaves 3-lobed and serrate, bristly-hairy. *Humulus lupulus* 6.a
- Petiole with stipules and glands, leaves large with scattered hairs beneath. *Viburnum Opulus* 37b
- See also (a smaller shrub, nearly smooth, northern and rare). *Viburnum pauciflorum* 37c
- Petiole about 1 inch or less, mostly with narrow stipules, very downy. *Viburnum acerifolium* 37d
- Lobes three, long tapering, leaves large, finely 2-serrate, small tree, bark striped. *Acer Pennsylvanicum* 21a
- Sinuses rounded and entire, or deep and narrow with notch at inmost point. (Maples)
- Sinuses rounded, lobes with 5 teeth or less, pale beneath. *Acer saccharinum* 21c
- Sinuses deep, notched, lobes with many teeth, silvery beneath. *Acer dasycarpum* 21d
- Sinuses not rounded, not deep and narrow, not entire, margin serrate, notches acute. (Maples)
- Nearly smooth, pale beneath, mostly 2-serrate, twigs reddish. *Acer rubrum* 21e
- Downy beneath, coarsely serrate, with wrinkled surface, shrub. *Acer spicatum* 21b



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SIMPLE-ALTERNATE-ENTIRE.

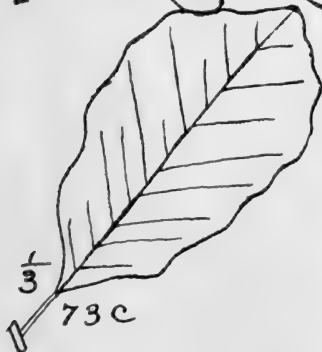
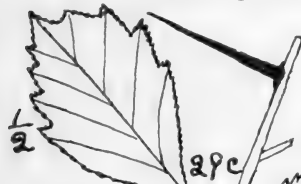
- Climbing by stipules, stems greenish and bristly or prickly, veins curved.
 Stems covered with straight bristles, leaves 5 to 9-nerved. *Smilax hispida* 86b
 Stems with stout scattered prickles, leaves 5-nerved, southern. *Smilax quadrangulata* 86a
- Climbing shrub, stem unarmed, leaves broadly ovate or lobed. *Menispermum Canadense* 5a
- Trailing or prostrate or reclining evergreens, slender and scarcely woody.
 Leaves ovate-cordate, larger than 1 in. x $\frac{1}{2}$ in., stems bristly. *Epigaea repens* 46a
 Leaves ovate, very aromatic to taste, with a few low bristly-pointed teeth. *Gaultheria procumbens* 47a
 Leaves obovate and obtuse, thick and leathery, stem much branched and reclining. *Arctostaphylos Uva-Ursi* 45a
 See also (low heath-like shrub on northern lake shores, leaves shingled, very small). *Hudsonia tomentosa* 8a
 Stems slender, leaves about $\frac{1}{2}$ in. or less, leathery, revolute.
 Leaves about $\frac{1}{4}$ in., ovate, acute, stems mostly < 1 ft. long. *Vaccinium Oxycoccus* 43i
 Leaves oblong, obtuse, smooth, pale beneath, stems 1-3 ft. long, swamps. *Vaccinium macrocarpon* 43j
 Leaves obovate or oval, pale and black-dotted beneath, dry soil. *Vaccinium Vitis-Idea* 43h
 Leaves with wintergreen flavor, pointed, green and bristly beneath, bogs. *Chiogenes hispidula* 44a
 See also (a low, spreading, far northern shrub, much branched, very revolute). *Empetrum nigrum* 52a
- Strongly revolute, white or rusty brown beneath, low marsh evergreens.
 White glaucous beneath, narrow, mucronate, acid to taste. *Andromeda polifolia* 48a
 Rusty-woolly beneath, oblong, obtuse, twigs downy. *Ledum latifolium* 51a
- Woolly or glaucous beneath, mostly narrow and pointed, often revolute, length mostly > 2 in., bark very bitter, shrubs or a small tree. (Willows).
 Petiole about $\frac{1}{4}$ in. or longer, broad, pale and veiny beneath, a small tree. *Salix rostrata* 76e
 Petiole about $\frac{1}{4}$ in. or less, very woolly, somewhat revolute, often in dry soil. *Salix humilis* 76g
 Petiole short, young twigs and leaves beneath white-woolly, shrub in bogs. *Salix candida* 76i
 Leaves small, nearly sessile, smooth, pale beneath, low bog shrub. *Salix myrtilloides* 76l

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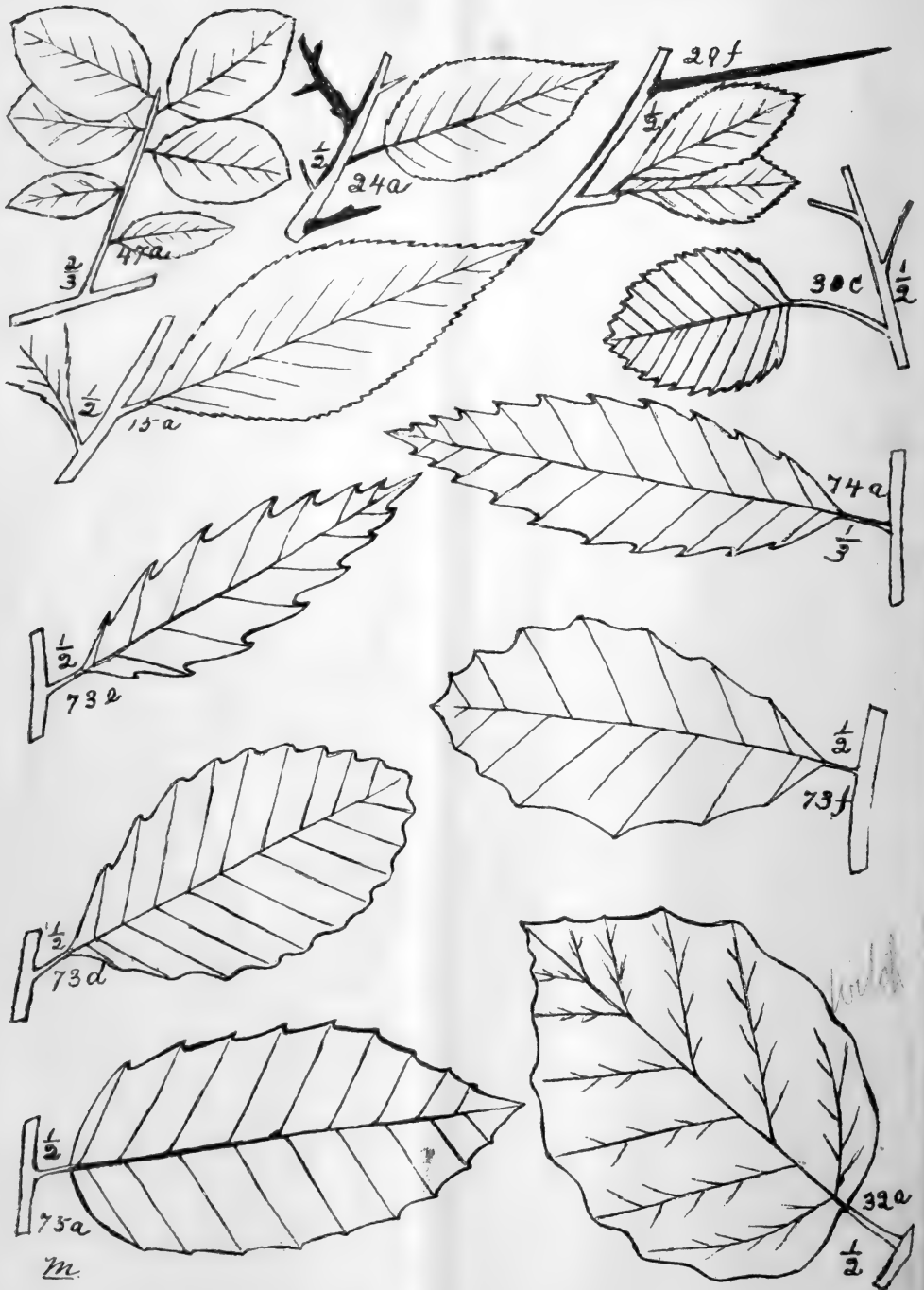
SIMPLE-ALTERNATE-ENTIRE.—*Continued.*

- Erect shrubs, leaves nearly sessile, petioles mostly $< \frac{1}{4}$ in.
 Width mostly 1 in. or more, obtuse, twigs very tough, each
 tipped by a leaf. *Dirca palustris* 57a
- Resinous-dotted, smooth, oval, base acute, apex mostly
 mucronate. *Gaylussacia resinosa* 42a
- Small, leathery, often rusty beneath, or finely toothed.
 swamps. *Cassandra calyculata* 49a
- Scarcely woody, leaves narrow, pointed, almost sessile, in
 dry soil. *Helianthemum Canadense* 7a
- Branching shrubs with slender twigs, often greenish, or
 warty, or downy. (Blueberries)
- Very downy on leaves and twigs, leaves mostly $< 1\frac{1}{2}$ in.
 $\times \frac{1}{2}$ in., low, in swamps. *Vaccinium Canadense* 43d
- Pale or downy beneath, width not $< \frac{1}{2}$ in., height
 often 5 ft. or more. *Vaccinium corymbosum* 43f
- Very pale, or glaucous beneath, rather rare shrubs of the south or far north.
- Leaves < 1 in., rounded, veiny beneath, a low
 northern shrub. *Vaccinium uliginosum* 43g
- Oval or obovate, length 1-4 in., apex acute, or
 tapering, southern. *Vaccinium stamineum* 43a
- Oval or obovate, length 1-2 in., apex rounded or
 mucronate, southern. *Vaccinium vacillans* 43e
- See also (a shrub of the far north, leaves silvery-scurfy on
 both sides). *Elaeagnus argentea* 59a
- Trees or tall shrubs, petioles $> \frac{1}{4}$ in. (the trees are mostly southern).
- Petiole about 1 in. or less, some leaves lobed, aromatic tree. *Sassafras officinale* 55a
- Petiole about 1 in. or more, not lobed, very large, downy
 beneath, tall tree. *Magnolia acuminata* 2a
- Petiole about $\frac{1}{2}$ in. or more, apex tapering, veins curved,
 often slightly toothed, or pale-pubescent beneath,
 a small tree, common. *Cornus alternifolia* 34g
- See also (leaves nearly as last, rough-barked southern tree,
 in swamps). *Nyssa sylvatica* 35a
- Petioles $\frac{1}{4}$ in. to $\frac{1}{2}$ in., shrubs or small trees, in moist soil.
- Leaves mostly < 2 in. $\times 1$ in., petiole slender and often
 purplish. *Nemopanthes Canadensis* 14a
- Leaves mostly > 2 in. $\times 1$ in., base acute, apex acute, or
 tapering, pale beneath, bark very aromatic. *Lindera Benzoin* 56a
- Leaves obovate, length mostly > 6 in., small southern tree. *Asimina triloba* 4a



SIMPLE-ALTERNATE-LOBED.

- Pinnately lobed, long and narrow; fragrant, fern-like shrub. *Myrica asplenifolia* 67b
- Climbing or trailing, leaves large, mostly cordate.
- Margin sharply serrate, lobes and notches acute, nearly smooth. *Vitis riparia* 19b
- Margin toothed, lower surface white-woolly or rusty-woolly. *Vitis aestivalis* 19a
- Lobes not toothed, petiole attached to lower surface of blade. *Menispermum*
Canadense 5a
- See also (a climber escaped from cultivation, lobes irregular and entire).
- Lobes pinnate, sinuses acute, small trees or tall shrubs, thorny. *Solanum Dulcamara* 54a
(Hawthorns)
- Leaves nearly smooth, teeth tipped with fine brown glands.
- Base obtuse or cordate, leaves broadly ovate, petiole slender. *Crataegus coccinea* 29a
- Base acute or wedge-shaped, thorns mostly < 2 in. long. *Crataegus*
rotundifolia 29c
- Base acute or wedge-shaped, thorns > 2 in., petioles stout. *Crataegus*
macracantha 29b
- Leaves, twigs and petioles very pubescent.
- Base obtuse or cordate, teeth tipped with fine glands. *Crataegus mollis* 29d
- Base acute or wedge-shaped, teeth without glands. *Crataegus tomentosa* 29c
- Stems spiny or prickly, lobes palmate, sinuses acute, not tall. (Gooseberries)
- Spines mostly 3 or more at leaf-bases, branches bristly, swamps. *Ribes lacustre* 31c
- Spines 1-3 at leaf-bases, prickles weak and scattered, dry soil. *Ribes cynosbati* 31a
- Spines mostly solitary and pale, branches nearly unarmed, wet soil. *Ribes oxycanthoides* 31b
- Stems unarmed, lobes palmate and serrate, sinuses acute, shrubs. (Currants mainly)
- Stems reclining, leaves ill-scented when crushed. *Ribes prostratum* 31d
- Leaves resinous-dotted beneath, length and width nearly equal. *Ribes floridum* 31e
- See also (rare and northern, leaves broader than long, swamps). *Ribes Hudsonianum* 31f
- Leaves downy beneath, not resinous, base cordate, wet soil. *Ribes rubrum* 31g
- Leaves smooth, bark in layers, height 3-10 ft. gravelly shores. *Spiraea opulifolia* 25c
- Leaves large, hairy or slightly bristly, stipules narrow, lobes tapering. *Rubus odoratus* 26a
(Oaks)
- Lobes pinnate, sinuses rounded, branches unarmed, large trees.
- Lobes acute and bristle-pointed, often with a few bristly teeth. *Quercus rubra* 73g
- Lobes mostly 8 or more, usually toothed, a common tree. *Quercus coccinea* 73h
- Lobes mostly 6 or 8, sinuses deep, shining above, southern. *Quercus palustris* 73i
- Very deeply lobed, much toothed, shining, in wet soil, southern.
- Lobes obtuse and rounded, large trees.
- Smooth and pale or slightly glaucous beneath, mostly in dry soil. *Quercus alba* 73a
- White-hoary beneath, sinuses deep, low ground and shores. *Quercus macrocarpa* 73b
- Margin mostly wavy, soft-downy beneath, southern tree, swamps. *Quercus bicolor* 73c
- Lobes irregular, some leaves merely toothed or entire, southern trees.
- Lobes palmate, apex notched, sinuses rounded, a large tree. *Liriodendron*
Tulipifera 3a
- Lobes palmate, pointed, apex tapering, very broad, a large tree. *Platanus occidentalis* 64a
- Margin entire or 1-3 lobed, petiole slender, aromatic tree. *Sassafras officinale* 55a
- Margin sharply serrate, nearly smooth, length not > 3 in. *Pyrus coronaria* 28a
- Margin toothed, very rough to touch above, downy beneath. *Morus rubra* 63a
- See also (tree with nearly smooth leaves, escaped from gardens). *Morus alba* 63b



SIMPLE-ALTERNATE-SERRATE or Toothed or Crenate (I).

Stems creeping, or trailing, or climbing.

Round-oval or ovate, aromatic, teeth low and bristly, creeping.

Gaultheria

procumbens 47a

Climbing high, quite woody, finely serrate, unarmed.

Celastrus scandens 15a

Climbing by stipules, stems greenish and bristly or prickly, veins curved, nearly entire.

Stem covered with straight bristles, leaves 5 to 9-nerved.

Smilax hispida 86b

Stems with stout scattered prickles, leaves 5-nerved, southern.

Smilax quadrangulata 86a

Branches thorny, base obtuse or cordate, trees or tall shrubs.

Not deeply notched, ovate, taper-pointed, thorns branch-like.

Prunus Americana 24a

Deeply notched, nearly smooth, thorns smooth and pointed.

Crataegus coccinea 29a

Deeply notched, pubescent beneath and on twigs and petioles.

Crataegus mollis 29d

Branches thorny, base acute or wedge-shaped.

Deeply notched, pubescent beneath and on twigs and petioles.

Crataegus tomentosa 29e

Deeply notched, nearly smooth, thorns long, mostly > 2 in.

Crataegus

macracantha 29b

Notched, nearly smooth, thorns rather short, mostly < 2 in.

Crataegus rotundifolia 29c

Not deeply notched, smooth, leaves leathery, thorns 2 in. or much longer.

Crataegus Crus-Galli 29f

Not deeply notched, somewhat downy beneath, thorns mostly < 2 in.

Crataegus punctata 29g

See also (teeth with spiny points, spines 3-pronged, garden shrub).

Berberis vulgaris 6a

Veins pinnate, parallel, not much branched, nearly straight to teeth-points.

Leaves broadly oval, mostly < 2½ in., not tapering, notches acute, shrubs.

Petiole ¼ in. or less, brownish-woolly beneath, rare, swamps.

Betula pumila 68e

Petiole ½ in. or more, leaves rounded, slightly glaucous above.

Amelanchier

rotundifolia 30c

Margins not regularly 2-serrate, teeth at vein-ends mostly, leaves rather large.

Teeth regular and acute, notches flat or rounded, leaves long-pointed, trees.

Petiole short, ½ in. or less, apex tapering, length < 6 in.

Fagus ferruginea 75a

Petiole ½ in. or longer, stout, smooth and green on both sides, very long.

Castanea sativa 74a

Petiole ½ in. or longer, slender, teeth curved, pale with fine down beneath.

Quercus acuminata 73e

Teeth mostly rounded, notches rounded, usually not long-tapering.

Leaves pale and finely downy beneath, base not oblique. (Southern Oaks)

Veins 6-8 pairs, margin wavy or lobed, moist soil.

Quercus bicolor 73c

Veins 8-16 pairs, margin crenate, tree in dry soil.

Quercus prinus 73d

Veins 5-10 pairs, a shrub < 10 ft. high, wavy or unequally toothed.

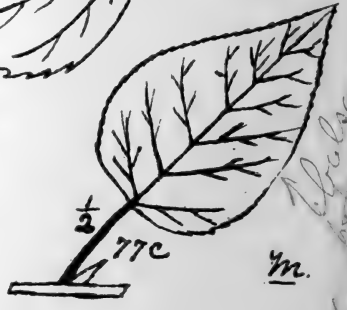
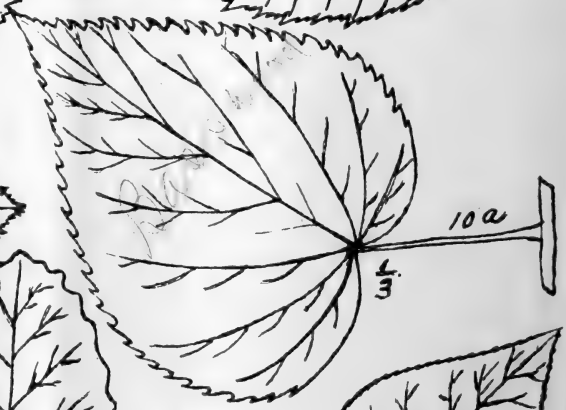
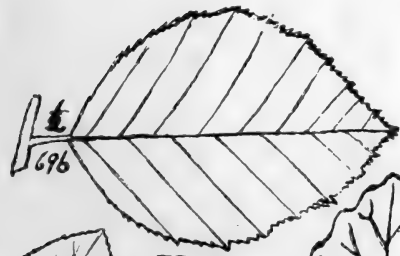
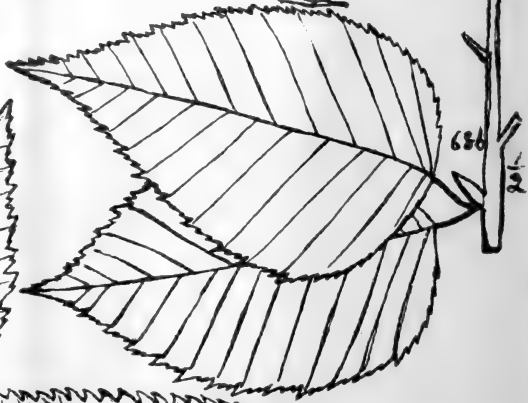
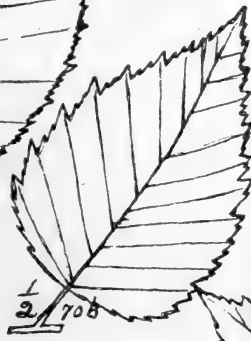
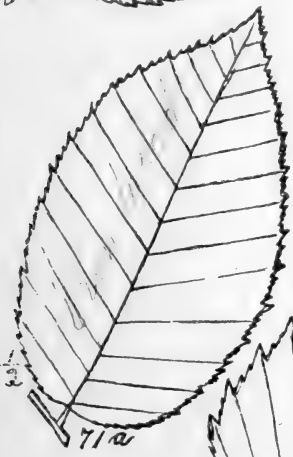
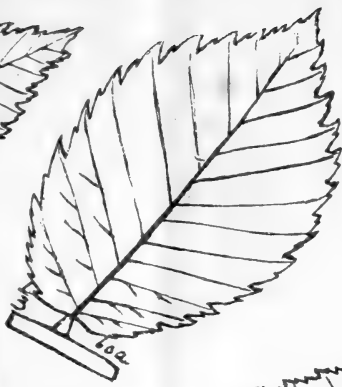
Quercus prinoides 73f

Base oblique, margin wavy, teeth irregular, small tree.

Hamamelis

Virginiana 32a

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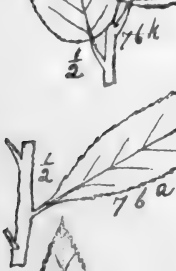
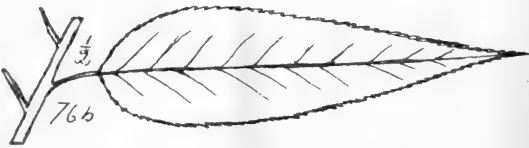
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SIMPLE-ALTERNATE-SERRATE or Toothed or Crenate.—Continued. (II.)

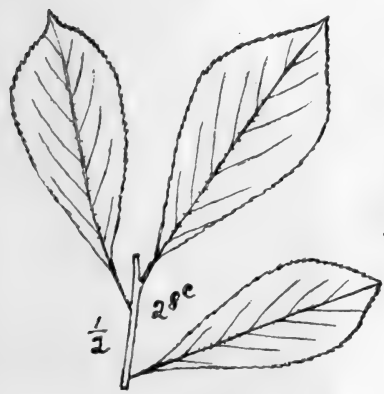
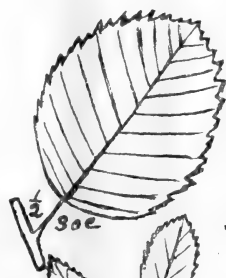
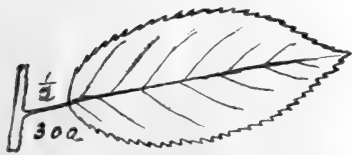
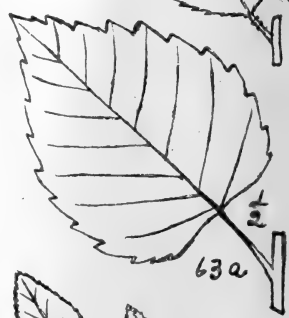
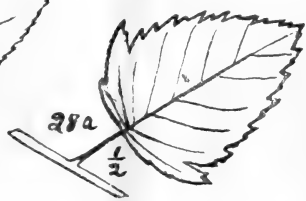
- Veins pinnate, parallel, not much branched, nearly straight to teeth-points.
 Regularly 2-serrate, mostly oval or ovate, toothed between vein-ends.
- Base oblique, petiole about $\frac{1}{4}$ in. or less, blade firm, leaves
 2-rowed, veins plain, larger teeth curved forward. (Elms)
 Somewhat rough above, twigs nearly smooth, branches not
 corky. *Ulmus Americana* 60b
 Very rough to touch above, downy beneath and on twigs,
 often cordate. *Ulmus fulva* 60a
 Quite smooth to touch above, branches with narrow corky
 ridges. *Ulmus racemosa* 60c
- Leaves in alternate pairs on old wood, solitary on new twigs,
 downy beneath. (Birches)
 Petiole about 1 in., twigs downy, teeth somewhat blunt, bark
 paper-like. *Betula papyrifera* 68d
 See also (a rare eastern tree, leaves sharply serrate or
 slightly lobed). *Betula populifolia* 68c
- Petiole $< \frac{3}{4}$ in., twigs with wintergreen taste, sharply serrate, tapering.
 Bark yellow, in layers, base mostly rounded, dull above. *Betula lutea* 68b
 Bark dark, not in layers, base often subcordate, shiny
 above. *Betula lenta* 68a
- Apex tapering, petioles slender, mostly $< \frac{1}{2}$ in., blade thin and soft, not glaucous.
- Length nearly twice width, teeth taper-pointed, small trees.
 Smooth above, veins downy beneath, petiole mostly $> \frac{1}{3}$ in. *Carpinus Caroliniana* 72a
 Downy on both sides, petiole mostly $< \frac{1}{3}$ in., bark brown
 and furrowed. *Ostrya Virginica* 71a
 Broadly ovate, teeth fine, shrubs in dry soil
 Deeply cut between vein-ends, slightly downy beneath. (Hazels)
 Not deeply cut between vein-ends, very downy beneath. *Corylus rostrata* 70b
Corylus Americana 70a
- Not long-tapering, petiole about $\frac{1}{2}$ in. or longer, low ground. (Alders)
 Pale, glaucous and downy beneath, a small tree. *Alnus incana* 69b
 Light green beneath, slightly downy, teeth fine, northern
 shrub. *Alnus viridis* 69a
- See also (petiole long, leaves very large, base oblique and cor-
 date as below). *Tilia Americana* 10a
- Petioles long, mostly 1 in. or more, blade rounded or broadly
 ovate. (Poplars mainly)
 Petiole round; leaves very large, base oblique and cordate,
 teeth sharp. *Tilia Americana* 10a
 Petiole round, leaves and buds shining, teeth flat, hardly
 serrate. *Populus balsamifera* 77c
Populus grandidentata 77b
- Petiole flattened, teeth coarse, notches rounded.
 Petioles flattened, teeth fine, abruptly short-pointed.
 Petiole slender, mostly < 2 in., blade rounded, sometimes
 ciliate. *Populus tremuloides* 77a
 Petiole stout, very long, leaves very large, broadly ovate,
 southern. *Populus monilifera* 77d

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SIMPLE-ALTERNATE-SERRATE or Toothed or Crenate.—Continued. (III.)

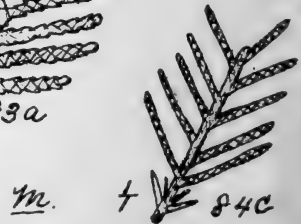
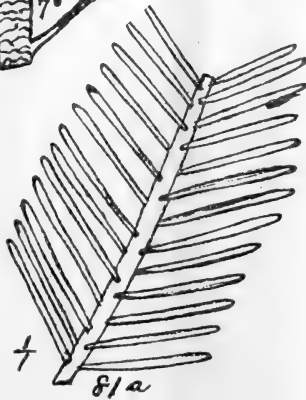
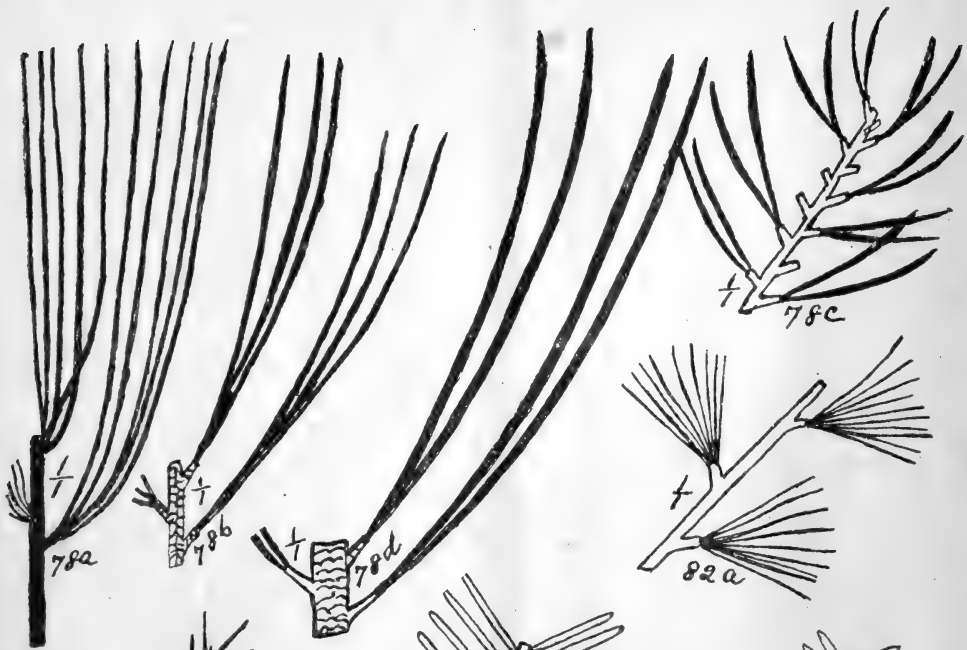
- Leaves mostly narrow and pointed, and > 2 in. long, not
fragrant, teeth low, often glaucous or woolly beneath,
twigs slender, bark very bitter. (Willows)
- Woolly beneath, twigs downy, teeth irregular, or often nearly entire.
Margins slightly revolute, petiole about $\frac{1}{4}$ in., shrubs.
- Downy above and on twigs, a low hoary shrub, in bogs. *Salix candida* 76i
Nearly smooth above, greyish below, tall shrub, often
in dry soil. *Salix humilis* 76g
- Veins very plain, petioles about $\frac{1}{4}$ in. or more, often
obovate, a small tree. *Salix rostrata* 76e
- Glaucous beneath, nearly smooth.
- Not long-tapering, not narrowly lanceolate, teeth often irregular.
- Base and apex acute and nearly entire, sides unevenly
toothed, very pale beneath. *Salix discolor* 76f
- Base rounded or cordate, teeth fine, twigs yellow-
brown and shining. *Salix balsamifera* 76k
- Teeth irregular, mostly woolly beneath, veins plain,
often obovate, small tree. *Salix rostrata* 76e
- Base and apex acute or tapering, mostly silky beneath,
leaves small, a shrub. *Salix petiolaris* 76h
- Apex very long and slender, petiole mostly $> \frac{1}{2}$ in., tree
with dark bark. *Salix amygdaloides* 76b
- Green on both sides, nearly smooth, long-pointed.
- Very glossy, petiole stout with glands, broadly lanceolate. *Salix lucida* 76c
- Narrowly lanceolate, base mostly acute, petioles $< \frac{1}{2}$ in.
- Petiole distinct, teeth fine and close, a small tree with
dark bark. *Salix nigra* 76a
- Nearly sessile, very narrow, teeth wide apart, a branching
shrub. *Salix longifolia* 76d
- Petiole about $\frac{1}{2}$ in. or longer, base mostly rounded, or
subcordate. *Salix cordata* 76j
- Toothed at apex only, nearly sessile, oblanceolate, very fragrant. *Myrica Gale* 67a
- Leaves small, mostly $< \frac{3}{4}$ in. x $1\frac{1}{2}$ in., teeth very fine, nearly
sessile, small shrubs usually under 3 ft. in height, in swamps or poor soil.
- Uppermost leaves very small, leathery, often rusty beneath,
teeth not bristly. *Cassandra calyculata* 49a
- Shining on both sides, teeth bristly, twigs green or yellowish. *Vaccinium*
Pennsylvanicum 43b
- Pale and glaucous beneath, very low, much like the last. *Vaccinium nigrum* 43c
- Leaves ovate, with 3 nerves from base, low shrubs, branching
from deep-red root, in dry soil.
- Base rounded or subcordate, apex tapering, twigs and leaves
downy. *Ceanothus Americanus* 18a
- See also (rare, smaller, leaves less pointed, nearly smooth). *Ceanothus ovatus* 18b



m

SIMPLE-ALTERNATE-SERRATE or Toothed or Crenate.—Continued. (IV.)

- Long and pointed, teeth fine, base not entire and cordate, nearly smooth, petioles about $\frac{1}{2}$ in., with groove above, and usually with glands or teeth at base of blade. (Cherries)
- Teeth strongly incurved, trees with dark or reddish bark.
- Teeth fine but very unequal, usually 20 or more to the inch, petiole slender. *Prunus Pennsylvanica* 24c
- Teeth about 15 or less to the inch, leaves large, petiole stout, bark dark. *Prunus serotina* 24e
- Teeth slender, leaves oval or obovate, abruptly tapering, pale beneath. *Prunus Virginiana* 24d
- See also (a low shrub, base wedge-shaped, toothed at apex). *Prunus pumila* 24b
- Base oblique and entire, petiole short, downy, a small tree, rare. *Celtis occidentalis* 61a
- Base round or cordate and entire, petiole about $\frac{1}{2}$ in. or longer, without glands.
- Some leaves with irregular lobes, or deeply cut, apex pointed, small trees, southern.
- Nearly smooth on both sides, length not > 3 in., sharply serrate. *Pyrus coronaria* 28a
- See also (tree escaped from gardens in southern Ontario). *Morus alba* 63b
- Very downy beneath, and rough to touch above, leaves long. *Morus rubra* 63a
- Petioles round, without groove, teeth abruptly pointed, slightly glaucous above.
- Leaves ovate and pointed, teeth fine, veins curving or branching.
- Nearly smooth, a small tree in dry woods, common. *Amelanchier Canadensis* 30a
- Very downy, especially when young, in moist soil. *Amelanchier Botryapium* 30b
- See also (rare shrub of northern swamps, leaves small, petioles short). *Amelanchier oligocarpa* 30d
- Leaves oval or rounded, not pointed, base mostly entire, shrubs.
- Petiole long, veins nearly straight to teeth-points. *Amelanchier rotundifolia* 30c
- Toothed above middle, veins curving, north-western, rare. *Amelanchier alnifolia* 30e
- Base mostly acute and entire near petiole, shrubs in moist soil.
- Midrib dotted with dark glands above, teeth fine and much incurved.
- Leaves very downy beneath, nearly smooth above. *Pyrus arbutifolia* 28b
- Leaves nearly smooth on both sides, mostly obovate. *Pyrus melanocarpa* 28c
- Densely woolly beneath and on twigs, dark green above. *Spiraea tomentosa* 25b
- Pale and smooth beneath, lower third mostly entire, not taper-pointed.
- Erect and bushy, sharply serrate, petiole $\frac{1}{4}$ in. or less. *Spiraea salicifolia* 25a
- Mostly low and straggling, petiole $\frac{1}{4}$ in. or more, teeth few. *Prunus pumila* 24b
- Leaves 2 in. or longer, oval and pointed, twigs finely downy. *Rhamnus alnifolia* 17a
- Glossy green above, veins downy beneath, obovate, leaves and bark bitter, teeth incurved, apex abruptly taper-pointed. *Ilex verticillata* 13a
- Oblong or oval, nearly entire, petiole slender and often purplish, very bitter, apex often mucronate. *Nemopanthes Canadensis* 14a



CONE-BEARING TREES AND SHRUBS.

- Leaves very small, linear, needle-shaped, awl-shaped or scale-like, mostly evergreen, in clusters, or in rows, or scattered on the branches. (Pines, Cedars, Spruces, etc.)
- Needles in clusters of 2 or 3 or 5 each, trees. (Pines)
- In clusters of 5, slender, length 3-5 in., a large tree, common. *Pinus strobus* 78a
- In clusters of 3, stout, length 3-5 in., rare tree, eastern. *Pinus rigida* 78b
- In clusters of 2, 4-6 in. long, large tree, bark reddish. *Pinus resinosa* 78d
- In clusters of 2, stout and curved, about 1 in. long, northern tree. *Pinus Banksiana* 78c
- Needles in clusters of more than 5, soft and not evergreen. *Larix Americana* 82a
- Needles all solitary, sessile, 4-sided, not flat, not 2-rowed. (Spruces)
- Twigs downy, leaves dark or slightly glaucous, swamps. *Picea nigra* 79a
- Twigs smooth, leaves pale or glaucous, moist woods. *Picea alba* 79b
- Leaves all solitary, flattened, mostly 2-rowed on horizontal twigs.
- Apex rounded or obtuse, not prickly, paler beneath, trees.
- Leaves sessile, midrib dark beneath. *Abies balsamea* 81a
- Petiole distinct but short and oblique, very pale beneath. *Tsuga Canadensis* 80a
- Apex very acute, dark green, not glaucous beneath, low shrub. *Taxus baccata* 85a
- Leaves mostly in circles of 3, prickly pointed, pale above. *Juniperus communis* 84a
- Leaves either awl-shaped and opposite, or scale-like and shingled on twigs. (Cedars)
- Some leaves very prickly, twigs fine and 4-sided, stem erect. *Juniperus Virginiana* 84c
- See also (a straggling shrub on sandy shores, leaves as in last). *Juniperus Sabina* 84b
- Twigs flat, leaves closely shingled, not prickly, swamps. *Thuja occidentalis* 83a



SYLVAN ONTARIO.

- 1a. *Clematis Virginiana* (L.).—Virgin's Bower. Wild Clematis.
A climbing or trailing shrub, common in low woods and along streams. The fruit with its white plumes is very showy in late summer, suggesting one of the popular names "Old Man's Beard."
- 1b. *Clematis verticillaris* (DC.).—Whorled Clematis.
Much less common than the last, and usually trailing over rocks, etc., rather than climbing. It is known to the botanist by its large purple flowers which, unlike the last, have small petals. The teeth of the leaflets are also less regular and acute.
- 2a. *Magnolia acuminata* (L.).—Cucumber Tree.
Rare and local in southern Ontario, but cultivated in various places. Named from the shape and size of the reddish fruit.
- 3a. *Liriodendron tulipifera* (L.).—Tulip-tree. White-wood.
A fine tree in south-western Ontario, and cultivated for its tulip-like flowers in various parts of the Province.
- 4a. *Asimina triloba* (Dunal).—Papaw. Custard Apple.
A small tree in moist soil in the south-western peninsula. The fruit is quite edible.
- 5a. *Menispermum Canadense* (L.).—Canada Moonseed.
A woody climber growing along the streams. The petiole is often attached to the lower surface of the blade, which is commonly lobed. Reported as abundant throughout the province, but I have not met with it in Muskoka.
- 6a. *Berberis vulgaris* (L.).—Common Barberry.
Escaped from gardens, but growing wild. Easily known by the thorny-pointed teeth of the leaves.
- 7a. *Helianthemum Canadense* (Michx.).—Canadian Rock-rose. Frost-weed.
A weed-like plant with somewhat woody stem and conspicuous bright yellow flowers. Found in dry soil, but not very common.
- 8a. *Hudsonia tomentosa* (Nutt.).—Beach Heather.
A low heath-like shrub found on sandy shores in north-western Ontario and reported from Lake Erie. The very small pale leaves are shingled closely on the branches.

9a. *Hypericum Kalmianum* (L.).—Shrubby St. John's Wort.

Reported as common along Lakes Erie and Huron; also at Ottawa. Britton and Brown state that it is found "at Muskoka," but I have not met with it here, in spite of this delightfully definite information. It is interesting as the shrubby representative of the dotted-leaved St. John's Worts.

10a. *Tilia Americana* (L.).—Basswood or Linden.

One of our commonest soft-wooded trees. The lumber is valuable and the flowers yield much honey to the bees in early summer. Often planted for ornament or shade, though rather apt to be broken by high winds.

11a. *Xanthoxylum Americanum* (Mill.).—Prickly Ash.

Quite common in eastern and southern Ontario, but apparently more rare in the northern and north-western districts. Its common name is equally appropriate whether referring to the obvious prickles of twigs and petioles or to the pungent taste of the bark and berries which has given it a place in medicine.

12a. *Ptelea trifoliata* (L.).—Hop-tree.

A small tree found only on the Lake Erie shore. The bitter fruit has been made to do duty as "hops," and hence the name.

13a. *Ilex verticillata* (Gray.).—Winterberry or American Holly.

A very striking feature of the swamps in early winter, while the clusters of bitter red fruit yet remain around the stems. The birds avail themselves of the latter when better fare is denied them by the snow, and it is credited with giving its peculiarly unpleasant flavor to the flesh of grouse in December.

14a. *Nemopanthes Canadensis* (D.C.).—Mountain Holly.

Like the last, this shrub is very common in the northern swamps. The dark-red solitary fruit is equally bitter, but the leaves are usually entire, or nearly so, with slender purplish petioles.

15a. *Celastrus scandens* (L.).—Climbing Bitter-sweet. Waxwork. Staff-tree.

One of our best, or at any rate highest, climbing twiners, and apparently common, at least in western Ontario. The red or orange fruit is very conspicuous in autumn.

16a. *Eubonymus Americanus* (L.), var. *obovatus* (T. & G.). Running Strawberry Bush or Spindle-tree.

Known by the four-angled twigs, which often rest upon the ground and take root. Found only in the south-western peninsula.

- 16b. *Euonymus atropurpureus* (Jacq.).—Burning Bush.

Larger than the last, becoming a small tree, and still more southern in its habitat. Distinguished by its size, by the longer petioles or the purple flowers.

- 17a. *Rhamnus alnifolia* (L'Her.).—Buckthorn.

Reported as common in swamps throughout our range, but I have not seen it in Muskoka. The black fruit contains three seeds, and the stems, in spite of the name, are quite unarmed.

- 18a. *Ceanothus Americanus* (L.).—New Jersey Tea. Red-root.

This shrub, famed as the tea of the Revolutionary armies in the American War of Independence, is widely distributed with us. It is well marked by the three veins or "nerves" from the base of each leaf and by the reddish root. I have noticed it in only one locality in Muskoka.

- 18b. *Ceanothus ovatus* (Desf.).—Smaller Red-root.

Found with the same general range as the last, but much less common. The leaves are smaller, smoother and less pointed, but marked by the same peculiarity of veining.

- 19a. *Vitis aestivalis* (Michx.).—Summer Grape.

Found only near our southern limits, and known by the large blunt-toothed leaves, which are often somewhat woolly.

- 19b. *Vitis Riparia* (Michx.).—Riverside Grape.

Common along streams and easily known by the sharp lobes and teeth of the leaves. The fruit is quite edible in September.

- 20a. *Ampelopsis quinquefolia* (Michx.).—Virginia Creeper.

Cultivated everywhere and growing native in moist woods throughout. Sometimes avoided as Poison Ivy in spite of the obvious distinction shown by its *five*, or rarely more, leaflets.

- 21a. *Acer Pennsylvanicum* (L.).—Striped Maple.

A pretty little tree, often called Dogwood or Moosewood. It is quite common, at least in the northern districts, and is easily distinguished by the striped bark and the large three-pointed leaves.

- 21b. *Acer spicatum* (Lam.).—Mountain Maple, Shrub Maple.

The smallest of our Maples and usually only a shrub growing in clumps. The leaves are easily known by their peculiar wrinkled appearance and are more downy than those of other species. The bark is somewhat striped as in the last.

- 21c. *Acer saccharinum* (Wang.).—Sugar Maple. Hard Maple.

This is the Maple, well deserving its distinction as the emblem of Canada. It is easily first for sugar, fuel, timber, beauty and shade. A variety with dark rough bark and leaves less lobed while greener and more downy beneath, is known as the Black Maple—var. *nigrum* (T. and G.).

- 21d. *Acer dasycarpum* (Ehr.).—Silver Maple. Soft White Maple.
A large tree with white wood, growing especially on rich flats along lakes or rivers. The seed, like that of the next species, is ripened in time to be distributed by the floods of early summer, and the seedlings are firmly established before autumn. On account of its rapid growth the Silver Maple is very largely planted for shade and ornament.
- 21e. *Acer rubrum* (L.).—Soft Red Maple. Swamp Maple.
In some forms the leaves of this species closely approach the last mentioned, but usually they are less deeply lobed and more sharply serrate or 2-serrate. This tree is less attached to the shores, and its bright red foliage adds much to the splendor of our autumn woods.
- 22a. *Staphylèa trifolia* (L.).—Bladder-nut.
Reported as frequent from the Ottawa to the Georgian Bay, but I have not met with it in Muskoka. Easily traced by the compound leaves of three leaflets and the striped branches.
- 23a. *Rhus typhina* (L.).—Staghorn Sumac.
Common everywhere in poor soil. Known by its coarse twigs, covered like the petioles with thick downy hairs, and by the masses of scarlet fruit, sometimes used for dyeing. The bark has been employed successfully for tanning leather.
- 23b. *Rhus glabra* (L.).—Smooth Sumac.
Very much like the last, but with twigs and petioles nearly smooth and leaflets glaucous beneath. Not so common, but probably found throughout the Province.
- 23c. *Rhus copallina* (L.).—Dwarf Sumac.
A southern form, rare in Ontario. The bark is largely used for tanning in the Southern States.
- 23d. *Rhus venenata* (DC.).—Poison Sumac. Poison Elder.
More poisonous than the next, but fortunately much less common, being confined to swamps in the south-western peninsula.
- 23e. *Rhus toxicodendron* (L.).—Poison Ivy.
Found throughout the Province, but in two very different forms. In the north and east it is a straggling shrub; in the south-west a vigorous climber. Both varieties are poisonous to many persons, especially when the leaves are wet, and cause painful blisters where they have affected the skin. Known by the three usually drooping leaflets mounted on a long petiole.
- 23f. *Rhus Canadensis* (Marsh.).—Aromatic Sumac.
A straggling shrub, growing in patches in rocky woods. The aromatic leaves resemble those of its relative, the Poison Ivy, but this plant is quite harmless. It is common in the grounds of the National Sanitarium on Lake Muskoka.

24a. *Prunus Americana* (Marsh).—Wild Plum.

A small thorny tree found throughout Ontario, but apparently less common in the Laurentian districts. Its leaves resemble those of the Cherries, but its coarse thorns and large edible fruit show it to be a true Plum. It is sometimes planted for hedges.

24b. *Prunus pumila* (L.).—Dwarf Cherry. Sand Cherry.

The smallest of our Cherries, and seldom more than a straggling shrub, growing on sandy shores. It is plentiful on the islands of Lake Muskoka and on other waters of the district. The leaves may be known by the ferness of the teeth, the pale lower surface, or by the characteristic "cherry" taste. The fruit resembles that of the Choke-cherry.

24c. *Prunus Pennsylvanica* (L.).—Wild Red Cherry. Pin Cherry. Bird Cherry.

A very common little tree or shrub, growing rapidly in the poorest soil. It shows a special fondness for land newly cleared or burned, which, with the aid of the Poplars and the White Birch, it covers in a very few years.

24d. *Prunus Virginiana* (L.).—Choke-cherry.

Usually a shrub, with obovate pointed leaves, very pale beneath. The petiole generally bears two or more conspicuous glands on its upper surface. The fruit is intensely astringent or "puckery" to the taste, but is not despised by the omnivorous small boy.

24e. *Prunus serotina* (Ehrh.).—Wild Black Cherry.

Our largest species, becoming a fine tree, and yielding valuable lumber. The fruit is much more pleasant to the taste than that of any other wild Cherry, and is used for making wine. The teeth of the leaves are incurved, as in the Red Cherry, but are much less closely set.

25a. *Spiraea salicifolia* (L.).—Common Meadow-sweet.

Common in moist places, and quite a pretty shrub when crowned with its spires of white flowers.

25b. *Spiraea tomentosa* (L.).—Hardhack. Steeple-bush. Downy Meadow-sweet.

Differs from the last in its very downy leaves and twigs and its pink flowers, which have well earned for it the name of Steeple-bush. This seems to be a northern form, and I have found it plentiful in the northern townships of Hastings and Peterboro' counties, as well as in Muskoka.

25c. *Spiraea opulifolia* (L.).—Ninebark.

A shrub found along the St. Lawrence and the Great Lakes, but apparently not common in the interior of the Province. The old bark loosens and separates in thin layers or strips.

- 26a. *Rubus odoratus* (L.).—Purple-flowering Raspberry. Scotch-cap.
Differs from the other raspberries in the large simple lobed leaves, as well as in the color of the flowers. Plentiful along fences, with other species, in older Ontario, but not so common in Muskoka. A form with white flowers (*R. parviflorus*—Nutt.) may be present in western Ontario.
- 26b. *Rubus strigosus* (Michx.).—Red Raspberry.
Abundant everywhere, and furnishing valuable fruit. In the northern districts the Long Blackberry seems partially to take the place of this species, which is correspondingly less plentiful.
- 26c. *Rubus occidentalis* (L.).—Black Raspberry. Black-cap.
Quite common throughout the older parts of Ontario, but apparently rather scarce in the Laurentian districts. Varieties are largely cultivated for the fruit.
- 26d. *Rubus villosus* (Ait.).—High Blackberry. Long Blackberry. Thimbleberry.
The tallest and stoutest species; growing abundantly in open woods, yielding large quantities of fruit in favorable seasons. It is especially common in the Laurentian region, where it follows the lumberman and the bush-fires.
- 26e. *Rubus Canadensis* (L.).—Low Blackberry. Dewberry.
Like the Long Blackberry, but prostrate and trailing. The leaves are nearly smooth, and the long stems are supplied with a few prickles, or nearly unarmed. The fruit is large, and pleasant to the taste.
- 26f. *Rubus hispida* (L.).—Running Swamp Blackberry.
Less woody than the last, but with numerous prickles. It is found throughout Ontario, being particularly common in grassy swamps in Muskoka. The fruit is small and sour.
- 27a. *Rosa setigera* (Michx.).—Climbing or Prairie Rose.
Our only climbing Rose. Found wild in south-western Ontario, and often cultivated.
- 27b. *Rosa acicularis* (Lindl.).—Prickly Rose.
This is the most northern form, and is marked by an abundance of straight prickles. It is found on the shores and islands of New Ontario, and is common along Sparrow Lake in southern Muskoka.
- 27c. *Rosa blanda* (Ait.).—Early Wild Rose.
A very beautiful little shrub when in full bloom along our hilly shores, about the beginning of July. It is common throughout Ontario, and may be known by the fewness or absence of spines on its stems and branches.

- 27d. *Rosa Carolina* (L.).—The Swamp Rose.

This is the species which adorns the marshy shores of our lakes in midsummer. Like its neighbor, the Button-bush, it seems to thrive best with its feet under water. Very plentiful around the northern lakes, though extending south to Florida.

- 27e. *Rosa humilis* (Marsh.).—Dwarf Wild Rose.

Low and bushy, with straight spines. This species, including a variety with shining leaflets (*R. lucida*—Ehrh.), is the commonest form, in dry soil or among rocks.

- 28a. *Pyrus coronaria* (L.).—American Crab-apple.

Our only native representative of the true Apples. Though its fruit is small and acid, this tree is by no means to be despised, for its "wealth and beauty" of foliage, flower and fruit make it well worthy of cultivation. The leaves are very irregular, being often distinctly lobed, but always sharply serrate, and usually nearly smooth. It grows wild in southern Ontario.

- 28b. *Pyrus arbutifolia* (L.).—Red Chokeberry.

A shrub growing in marshes, and along lakes and rivers. The leaves are downy, and the very astringent fruit is red when ripe.

- 28c. *Pyrus arbutifolia*, var. *melanocarpa* (Hook.).—Black Chokeberry.

This is apparently the northern form and resembles the last, but the leaves are nearly smooth and the ripe fruit is black. Both forms are marked by the small glandular bodies scattered along the midrib on the upper surface of the leaves. Abundant in Muskoka.

- 28d. *Pyrus Americana* (DC.).—American Mountain Ash.

Not so well known as its European relative, the Rowan-tree, but sometimes planted in its stead. It is quite common in cold northern woods, and its fruit furnishes winter fare to non-migratory birds, such as the Pine-grosbeak.

- 28e. *Pyrus sambucifolia* (Cham. and Schl.).—Western Mountain Ash.

Still more northern than the last. A few years ago, Mr. Beadle, of Toronto, in looking up material for the Vanderbilt Arboretum found a few trees in a semi-wild state at Emsdale on the Northern Railway. This is probably near the southern limit of the species.

- 29a. *Crataegus coccinea* (L.).—Scarlet Hawthorn. Red Haw.

This, with the two following species (which are sometimes considered merely varieties of it), forms the greater part of the Hawthorns in the east and north of the province. Professor Sargent is making a revision of this genus, which is certainly in some confusion at present. The classification followed here is mainly that of Britton and Brown.

- 29b. *Crataegus macracantha* (Ladd.).—Long-spined Thorn.
Common in Muskoka and eastern Ontario, but very variable in leaves and thorns. The flowers are about a week later than in *C. coccinea* and *C. rotundifolia* and, like the former, bear pink anthers, while those of the latter are white.
- 29c. *Crataegus rotundifolia* (Borck.).—Round-leaved Hawthorn.
A common form in Muskoka, marked by shorter thorns and leaves nearly as in the last but less deeply cut. Specimens which have been cropped by cattle often develop very many long and stout thorns.
- 29d. *Crataegus mollis* (Scheele).—Red-fruited Thorn.
Differs from *C. coccinea* mainly in its larger leaves, which are very downy beneath. It is apparently not common, though distributed over the Province.
- 29e. *Crataegus tomentosa* (L.).—Pear Thorn.
Very downy on twigs, petioles and lower surfaces of leaves. The leaf-bases are, however, unlike the last in being acute or wedge-shaped and the petioles more or less winged. It seems to be confined to our southern border.
- 29f. *Crataegus Crús-Gállii* (L.).—Cockspur Thorn.
This species and the next differ from the preceding forms in the leaves, which are merely serrate or 2-serrate, and not cut-lobed. The thorns are very numerous, long and slender, sometimes reaching four inches. Common in the Niagara and Erie districts.
- 29g. *Crataegus punctata* (Jacq.).—Large-fruited Thorn.
Resembling the last, but with shorter thorns that are often branched. The small leaves also are more downy beneath and very finely serrate. Found along our southern border from the St. Lawrence to the St. Clair.
- 30a. *Amelánchier Canadénsis* (T. & G.).—Canadian Juneberry. Shad-bush.
May-cherry. Bill-berry.
The largest of the Juneberries, and becoming a tree even in the north. All of our species have a peculiar dull bloom on the upper surfaces of the leaves, which, with the round glandless petioles, distinguishes them from their cousins, the Cherries. The bark has the peculiar "cherry" taste, while the fruit shows a close relationship to the Apples. This species is usually found in dry woods and has its leaves nearly smooth when fully grown.
- 30b. *Amelánchier Botryápium* (D. C.).—Swamp Juneberry. Bill-berry.
Smaller than the last, and preferring moist woods. The leaves are very downy, especially when young. Common in Muskoka, and appearing in at least two varieties.

- 30c. *Amelánchier rotundifolia* (Roem.).—Round-leaved Juneberry.

There appear to be many forms uniting the two preceding species with this one, which is marked by its smaller size, rounded and nearly straight-veined, long-petioled leaves, and later flowers and fruit. Common in Muskoka in various forms.

- 30d. *Amelánchier oligocárpa* (Roem.).—Small Swamp Juneberry.

Our smallest species, found in a few places in cold northern swamps. It is present in Muskoka, but by is no means common. The clusters never contain more than four flowers or berries, and the shrub rarely exceeds five feet in height.

- 30e. *Amelánchier alnifolia* (Nutt.).—Saskatoon. Western Juneberry.

In May, 1900, I met with a Juneberry on a little island in Sparrow Lake (an expansion of the Severn River) which differed so far from our usual forms and approached so closely to authors' descriptions of *A. alnifolia* that I sent specimens to Professor Macoun, asking if it could belong to that species. He confirmed my identification as the eastern form of the species, which had not been previously noticed east of Lake Nipigon. It is interesting as our representative of the "Saskatoon," the fruit-tree of the north-western plains.

- 31a. *Ribes cynósbati* (L.).—Wild Gooseberry.

The common gooseberry of open woods with prickly berries and slender spines, mostly at leaf bases.

- 31b. *Ribes oxycanthoides* (L.).—Smooth Gooseberry.

Known by the smooth fruit, but the stems are only slightly prickly and the pale spines are found singly below the leaf bases. It is not common in the south.

- 31c. *Ribes lacústre* (Poir.).—Swamp Gooseberry.

The branches of this species are very bristly and the spines at leaf bases are mostly in groups. Common in cold northern swamps.

- 31d. *Ribes prostrátum* (L'Her.).—Fetid Currant. Skunk-berry.

A straggling or prostrate shrub, frequent in northern woods. The crushed leaves and bark have an offensive odor, and the taste of the bristly red berries is equally unpleasant. The commonest currant in Muskoka.

- 31e. *Ribes flóridum* (L'Her.).—Wild Black Currant.

Found throughout the Province, but not very abundant. Known by the leaves, which are resinous-dotted beneath and often large.

- 31f. *Ribes Hudsoniánnum* (Richards).—Northern Black Currant.

In May, 1891, this species was found by Mr. Scott, now Principal of the Toronto Normal School, on an expedition in company with the

writer. This was in a swamp just south of Madoc village, in the county of Hastings, and I have not heard of its occurrence elsewhere in older Ontario. It is found in the north-western part of the Province and far north. The leaves resemble those of the black garden currant, and the sweet-scented flowers are in an erect cluster.

31g. *Ribes rubrum* (L.).—Wild Red Currant.

This is the same species as the cultivated Red Currant, but grows wild in the north. It resembles *R. prostratum*, but is erect and not ill-scented, while the flower-clusters grow from separate buds, not with the leaves.

32a. *Hamamelis Virginiana* (L.).—Witch-Hazel.

A rather tall branching shrub, often growing in clumps in moist soil. The yellow flowers appear in October while the fruit of the previous year yet remains, which fact, with its fame as a divining rod, may account for the popular name. It is reported as rare east of Toronto, but I have found it rather common in parts of Durham county, and frequent in Muskoka. An extract of the bark has medicinal properties.

33a. *Aralia hispida* (Vent.).—Bristly Sarsaparilla.

This scarcely deserves the rank of a shrub, though its short bristly stem is quite woody. The leaves are twice-pinnate; *i.e.*, compound with the parts again divided pinnately into lesser parts or leaflets. Rather common in sandy soil, at least in the north. It is a near relative of the Wild Sarsaparilla and of the Ginseng of commerce.

34a. *Cornus Florida* (L.).—Flowering Dogwood.

Our largest species, frequent in south-western Ontario and bearing very conspicuous flowers and fruit. Its nearest relative in the north is an herb of a few inches in height but with similar heads of flowers surrounded by showy white leaves. Fruit bright red.

34b. *Cornus circinata* (L'Her.).—Round-leaved Dogwood.

Common throughout the Province in rich woods. The large leaves are nearly round and thickly downy on the lower surface. The twigs have green bark with peculiar warty markings of darker color. Fruit light blue.

34c. *Cornus sericea* (L.).—Silky Dogwood.

Resembling the Red Osier Dogwood, but smaller and less brightly colored, with more downy leaves. It is common along Sparrow Lake and the Severn River. Fruit blue.

34d. *Cornus asperifolia* (Michx.).—Rough-leaved Dogwood.

Found only along Lake Erie and known by the leaves, which are rough to the touch above and downy beneath. Fruit white.

- 34e. *Cornus stolonifera* (Michx.).—Red Osier Dogwood.
Growing in clumps in wet soil, and easily known by its bright red bark. Fruit dull white. This species with *C. sericea* furnished to the Northern Indians a substitute for tobacco.
- 34f. *Cornus paniculata* (L'Her.).—Panicled Dogwood.
I have not seen this species in Muskoka, but it is very common in eastern Ontario. It seems better adapted to dry soil and exposed positions than any of its relatives. The fruit is white.
- 34g. *Cornus alternifolia* (L.).—Alternate-leaved Dogwood.
A small tree or shrub, apparently common throughout Ontario. Distinguished from its nearest relatives by the greenish pale-striped bark and alternate leaves, often with the margin somewhat irregular, as if very finely toothed. Fruit deep blue.
- 35a. *Nyssa sylvatica* (Marsh.).—Black or Sour Gum. Tupelo. Pepperidge.
A southern tree found only along the Lake Erie shore.¹ The bark is rough and the soft wood resists all efforts at splitting. Related to the Dogwoods, and especially *C. alternifolia*.
- 36a. *Sambucus Canadensis* (L.).—Sweet Elder.
Common in moist soil and along streams. This species is usually described as nearly smooth, but in Muskoka at least it is very markedly downy throughout the season. Known by the white pith of the stems and the larger number of the leaflets, which often have at their bases stipule-like growths, called stipels. Fruit nearly black, in late summer.
- 36b. *Sambucus racemosa* (L.).—Red-berried Elder.
Usually found in dryer soil than the last, and becoming almost a tree in southern Ontario. The heart of the stems is brownish and the leaflets are usually only five in number without stipels. Blossoms about the end of April and ripens its red fruit in early summer. The leaflets of both species are often again divided.
- 37a. *Viburnum lantanoides* (Michx.).—Hobble-bush.
Common northward, and conspicuous by the clusters of white flowers in spring and by the very large paired leaves on straggling stems. Found always in shaded situations, and often confounded in name with the Dogwoods.
- 37b. *Viburnum Opulus* (L.).—High-bush Cranberry.
The bright red, acid fruit of this species makes a substitute for the Cranberry, and it is sometimes cultivated in moist gardens for this purpose or for hedges. Plentiful in Ontario, and resembling the maples, but easily distinguished by the glands and stipules of the shorter petioles.

- 37c. *Viburnum pauciflorum* (Pylaie.).—Few-flowered Viburnum.
A straggling shrub resembling the last but smaller and bearing fewer flowers. This is a northern form and probably is not found in older Ontario.
- 37d. *Viburnum acerifolium* (L.).—Maple-leaved Arrow-wood.
A common shrub resembling the Maples in its leaves but with much shorter petioles, usually bearing narrow stipules. The leaves and twigs are quite downy and the ripe fruit is purple.
- 37e. *Viburnum pubescens* (Pursh.). Downy Arrow-wood.
Common throughout Ontario, and found like the last, in hilly or rocky woods. The leaves are coarsely toothed and downy beneath on very short petioles. The fruit is dark purple.
- 37f. *Viburnum dentatum* (L.).—Arrow-wood.
A rather rare form found in southern Ontario. It resembles the last, but is nearly smooth and with petioles considerably longer. A variety met with in Muskoka has downy leaves on petioles of $\frac{1}{2}$ in. or longer, and I have not been able to satisfy myself as to whether it belongs to this species or the last.
- 37g. *Viburnum cassinoides* (L.).—Withe-rod.
One of the commonest shrubs in northern swamps, though rare in southern Ontario. Known by the small rounded teeth of the leaves and in late summer by the long rusty buds. The slender straight stems are very tough and are often used for basket-work. The fruit is dark blue.
- 37h. *Viburnum Lentago* (L.).—Sheepberry. Sweet Viburnum.
Our largest species bearing bunches of dark fruit with a sweetish taste. The leaves are rather finely serrate with winged petioles. Plentiful along the Severn River and on islands in Lake Muskoka.
- 38a. *Symphoricarpos racemosus* (Michx.).—Snowberry.
Often cultivated for the white berries, and found native in older Ontario. The leaves are sometimes slightly wavy or toothed, but not pointed.
- 38b. *Symphoricarpos pauciflorus* (Button.).—Low Snowberry.
Like the last but very low, with small leaves and few flowers. This is the form found commonly in Muskoka.
- 39a. *Lonicera ciliata* (Muhl.).—Fly-Honeysuckle.
This is probably the most abundant of our native Honeysuckles, and is found throughout the province. Known by the slender branching twigs, the ciliate margins of the leaves and the red berries in pairs.

- 39b. *Lonicera carulea* (L.).—Mountain Honeysuckle.
Similar to the last but much less common, being strictly a northern form. The leaves are obtuse and less distinctly ciliate than the last, while the fruit is blue or bluish black.
- 39c. *Lonicera oblongifolia* (Hook.).—Swamp Honeysuckle.
A rare species, found occasionally in swamps. The red or purplish berries are in pairs, and the leaves resemble those of the Fly-Honeysuckle, but are not ciliate.
- 39d. *Lonicera hirsuta* (Eaton.).—Hairy Honeysuckle.
A vigorous climber, easily known by the large hairy leaves united in pairs at the summits of the stems. Plentiful in Muskoka and reported from most parts of Ontario.
- 39e. *Lonicera parviflora* (Lam.).—Glaucous Honeysuckle.
Marked by the very glaucous lower surfaces of the leaves, which, like the last, are united in the higher pairs. A common shrub, sometimes climbing.
- 40a. *Diervilla trifida* (Moench.).—Bush Honeysuckle. Gravel-weed.
A common shrub, with short erect stems. The serrate margins of the leaves are often ciliate with short hairs, and the yellow flowers are in groups of three. Found in poor soil and on gravelly hillsides.
- 41a. *Cephalanthus occidentalis* (L.).—Button-bush.
Found plentifully on wet shores, often with roots under water. The sweet-scented flowers are in spherical heads and the fruit, unlike that of Dogwoods and Viburnums, is dry. The upper leaves are often in threes and the lower pairs have broad stipules between in early summer. The leaves and greenish twigs have a slightly acid taste and are eaten by cattle.
- 42a. *Gaylussacia resinosa* (T. and G.).—Black Huckleberry.
Commonly found in swamps in southern Ontario and in dry soil in the north. Known by the resinous leaves, which are nearly smooth and tipped by a fine point in most cases. The black fruit is edible, but not equal to the blueberries.
- 43a. *Vaccinium stamineum* (L.).—Squaw Huckleberry.
A rare species, found occasionally along our southern border. The fruit is greenish in color and, unlike most of its relatives, is not edible.
- 43b. *Vaccinium Pennsylvanicum* (Lam.).—Low Blueberry, Blue Huckleberry.
This is the Blueberry of northern Ontario, where the rocky hillsides are often covered by the little bushes. The fruit is gathered in immense quantities during July and August and shipped to the centres of

population farther south. It may be known by the greenish twigs, the nearly smooth (not glaucous) leaves, with exceedingly fine bristle-pointed teeth, and by the abundance of sweet berries covered with a delicate blue bloom. A narrow-leaved form (var. *angustifolia*—Gray) is also found in northern Ontario.

43c. *Vaccinium nigrum* (Britton).—Low Black Huckleberry.

Similar to the last but smaller, and bearing black fruit without a bloom. By a curious compensation of Nature, however, the leaves are quite glaucous beneath and often above. Very common in Muskoka and probably found everywhere with the last species, but not usually recognized in our Floras.

43d. *Vaccinium Canadense* (Kalm.).—Canada Blueberry.

This species is usually found in swamps, but although the fruit is abundant and excellent it is less plentiful than the Blueberry of the hillsides. The entire leaves and the twigs are thickly downy.

43e. *Vaccinium vacillans* (Solander).—Blue Huckleberry.

Found in sandy soil in south-western Ontario. The twigs resemble those of the common Blueberry, but the pale leaves are generally entire and glaucous beneath, with netted veins and with the apex somewhat mucronate. This species seems to be sometimes confused with *V. nigrum* above.

43f. *Vaccinium corymbosum* (L.).—Swamp Blueberry.

A tall shrub found usually in cold swamps. The leaves are larger than in our common species, with margins entire and sometimes ciliate. There are several varieties, often considered as distinct species. A form with leaves very downy beneath and mucronate at the apex, with black berries (var. *atrocoerum*—Gray), is found in Ontario.

43g. *Vaccinium uliginosum* (L.).—Bleaberry.

A form found only in the extreme north or on high mountains. The smooth veiny leaves are nearly sessile, with a rounded appearance; the small berries resemble common species in the blue bloom and in taste. Found also in Northern Europe and Asia.

43h. *Vaccinium Vitis-idaea* (L.).—Mountain Cranberry.

A low creeper, resembling the Cranberries, but found in dry rocky soil. Reported as common to Ontario except in the south, but I have not been able to find it in Muskoka. The evergreen leaves are thick and leathery with rounded apex and black dots beneath, and the fruit is similar to that of the true Cranberries.

- 43i. *Vaccinium oxycoccus* (L.).—Small Cranberry.
Differs from the next chiefly in size, being smaller in every respect. The leaves do not exceed $\frac{1}{4}$ in. in length and the whole stem is rarely more than a foot long. Found in nearly the same localities as the next and common around Muskoka lakes.
- 43j. *Vaccinium macrocarpon* (Art.).—Large Cranberry.
A slender creeper in cold bogs. The reddish acid berries are much esteemed for "cranberry sauce," and large quantities are imported from the Eastern States for local use. They are brought to market by Muskoka settlers, but not in large quantities. The delicate vines and small revolute leaves are not likely to be mistaken for any other species except the last.
- 44a. *Chiogenes hispídula* (T. and G.).—Creeping Snowberry.
A very slender creeper found in swamps in the north. The small leaves have the well-known flavor of wintergreen and the fruit is white. Common in Muskoka marshes.
- 45a. *Arctostáphylos Uva-Ursi* (Spreng).—Bearberry.
Common on northern islands and hillsides, where its trailing stems often nearly cover the ground. The evergreen leaves are smooth and leathery, and the red fruit grows in clusters at the ends of the twigs.
- 46a. *Epigæa repens* (L.).—Trailing Arbutus. Mayflower.
This pretty creeper, though, like the next, barely entitled to the name of shrub, is admitted here partly on account of its historic fame and wide popularity. It is found throughout northern Ontario, and is abundant in Muskoka. The fragrant pink and white flowers with the evergreen leaves make a favorite bouquet in early spring.
- 47a. *Gaulthéria procumbens* (L.).—Wintergreen.
Plentiful at least in eastern and northern Ontario, and well-known for the bright-red aromatic berries that remain throughout the winter.
- 48a. *Andróméda polifólia* (L.).—Wild Rosemary.
A marsh shrub, recognized by the narrow, revolute leaves, with the lower surface very white. Plentiful in bogs.
- 49a. *Cassándra calyculáta* (Don.).—Leather-leaf.
A leafy little shrub growing in very wet soil or in bogs. The leaves decrease gradually in size towards the summit of the stems, and are usually finely-toothed, mucronate, and more or less rusty beneath.
- 50a. *Kálmia angustifólia* (L.).—Sheep-laurel.
Reported as common in northern swamps, but not seen in Muskoka.

50b. *Kalmia glauca* (Ait.)—Swamp-laurel.

Abundant in cold bogs, and very conspicuous when the pretty pink flowers are in bloom in early summer. Easily known by the flattened twigs and the revolute evergreen leaves, very glaucous on the lower surface.

51a. *Ledum latifolium* (Ait.)—Labrador Tea.

A low bog shrub with revolute evergreen leaves covered with rusty wool beneath. The Indians use the dried leaves as tea, and it has been classed by white men as a very good substitute.

52a. *Empetrum nigrum* (Linn.)—Black Crowberry.

A low evergreen shrub, found only in the extreme north, where it forms dense beds in bogs or on rocky soil. The stems are much branched, with very small thickly-crowded leaves and black fruit, which provides abundant food for the northern birds.

53a. *Fraxinus Americana* (L.)—White Ash.

A fine tree, furnishing excellent timber, which is much used for implements, handles, etc. It is found throughout Ontario in good soil, usually avoiding the swamps. The bark is light-colored and the smooth leaves, mostly with seven leaflets, are very pale beneath.

53b. *Fraxinus pubescens* (Lam.)—Red Ash. Rim Ash.

Similar to the last, but smaller, and found in the same districts, though usually along lakes or rivers. The twigs, petioles and lower surfaces of the leaflets are very downy, as is not the case with any other of our Ashes. Common on the shores of the Severn River and Lake Muskoka.

53c. *Fraxinus viridis* (Michx.)—Green Ash.

Specimens of the Red Ash show various degrees of pubescence as described above, and I have classed a smooth form found in similar situations and with lower surfaces of leaflets green as belonging to this species. It seems probable that these trees run into each other by intermediate forms, and I have received contradictory determinations (based on the fruit) from Canadian and American experts.

53d. *Fraxinus quadrangulata* (Michx.)—Blue Ash.

A large tree found along the Lake Erie shore. The twigs are somewhat four-sided, and the leaflets finely serrate.

53e. *Fraxinus sambucifolia* (Lam.)—Black Ash.

A large tree, sometimes forming extensive swamps. The bark is dark, and the soft wood, though not equal to that of its relatives in the eye of the lumberman, is a staple with the Indians, who, by splitting and pounding, reduce it to the thin and even strips used for basket-making. The leaflets are nearly sessile, sharply serrate, and usually more numerous than in other species.

- 54a. *Solanum Dulcamara* (L.).—Nightshade. Bittersweet.
This European climber makes itself quite at home in older Ontario, where it no longer needs the protection of man. The blue flowers and red berries show its relation to the Tomato family, while the deeply lobed or nearly entire leaves distinguish the species.
- 55a. *Sassafras officinale* (Nees.).—Sassafras.
A large tree, common in south-western Ontario, and known by the rough aromatic bark and irregularly lobed or entire leaves.
- 56a. *Lindera Benzoin* (Blume.).—Spice-bush.
A rather tall smooth shrub found in moist places in various parts of older Ontario, but apparently nowhere abundant.
- 57a. *Dirca palustris* (L.).—Leatherwood. Moosewood.
A peculiar looking shrub with twigs which served as cordage for the early settlers. The base of each petiole covers a bud of the next season, thus giving a jointed appearance to the branches, with apparently a leaf instead of the usual bud at the end. The leaf-margins are sometimes ciliate. Common in Maple woods; plentiful in Muskoka and throughout northern Peterboro' and Hastings to the Ottawa River, though Professor Macoun found it rare in the southern part of the latter county.
- 58a. *Shepherdia Canadensis* (Nutt.).—Buffalo-berry.
A shrub with silvery or rusty scales covering the lower surfaces of the leaves. Common in central and new Ontario, but not noticed in Muskoka.
- 59a. *Eleagnus argentea* (Pursh.).—Silver-berry.
A species similar to the last, but found only in the extreme north, and easily known by the alternate leaves clothed on both sides with silvery scales.
- 60a. *Ulmus fulva* (Michx.).—Slippery or Red Elm.
Best known by the bark, which has medicinal value and is used as chewing-gum by the country boy. The leaves are large with wrinkled surface, very rough above and downy beneath, with the veins usually more branched than in the next. It seems to be lacking in the Laurentian parts of Muskoka though common along the Severn River.
- 60b. *Ulmus Americana* (L.).—White Elm.
Our largest elm, valuable for timber, and frequently planted for shade or ornament. In large trees the branches curve quite gradually from the trunk, making it very suitable for avenues and distinguishing it in appearance from the last species. The young leaves are often rough above, but not so evidently and visibly so as in the Slippery Elm.

- 60c. *Ulmus racemosa* (Thomas).—Cork or Rock Elm.

Farmers and lumbermen distinguish two forms of this species, the magnificent "Rock" Elm of the original woods and the second-growth "Scrub" Elm in clearings and along fences, the former being respected as one of our hardest and toughest woods. It may be known by the corky ridges on the branches while the leaves are smaller and smoother to the touch than those of the other species.

- 61a. *Celtis occidentalis* (L.).—Nettle-tree. Sugar-berry.

A small elm-like tree, found here and there in Ontario, but nowhere plentiful. The net-veined leaves are sharply serrate toward the tapering apex with the oblique base mostly entire. The cherry-like black fruits appear singly in the axils of the leaves.

- 62a. *Humulus lupulus* (L.).—Wild Hop.

A native plant, found also in the Old World, and extensively cultivated for its bitter hops. Though scattered over the Province it appears not to be very plentiful except towards the north-west.

- 63a. *Morus rubra* (L.).—Red Mulberry.

A native tree along the Lake Erie shore. The leaves are rough above and very downy beneath, often lobed on young shoots. The clusters of dark-red fruit are very pleasant to the taste.

- 63b. *Morus alba* (L.).—White Mulberry.

Famous as the food of the silk-worm and now growing wild in some districts of southern Ontario. The leaves are often oblique at base, on slender petioles, with the surface smooth and shining, and often lobed in various ways.

- 64a. *Platanus occidentalis* (L.).—Buttonwood.

Sycamore

This is probably our largest native tree, but is found only in the south-western portion of the Province extending east as far as Toronto. The leaves are very large and broad and the wood difficult to split. The round heads of dry fruit remain throughout the winter.

Bark, grey, in irregular Cambium exposed and white

- 65a. *Juglans cinerea* (L.).—Butternut.

A common tree in older Ontario but apparently not adapted to the Laurentian districts. In Muskoka its northern limits appears to be near the Severn River where it is very abundant. The large leaves are quite downy and, like the bark, are fragrant. The fruit is too well known to need mention.

- 65b. *Juglans nigra* (L.).—Black Walnut.

A very valuable species, native in south-western Ontario and sometimes planted on a large scale for its excellent brown timber. It has been

proposed to introduce it in the denuded Laurentian districts by planting the nuts, and the experiment, if attempted, will be watched with interest. The leaflets are commonly more numerous and less downy than in the last species.

- 66a. *Carya alba* (Nutt.).—Shell-bark Hickory. Shag-bark. White Hickory.
A valuable tree, with timber much esteemed for strength and toughness; found commonly in the western peninsula and eastward along Lake Ontario. I had quite decided from search and inquiry that the Hickories were unknown in Muskoka, when I was handed recently for identification a number of nuts taken from the hollow in a stick of firewood which had been cut within a few miles of Gravenhurst. They evidently belonged to this species, having been discovered and appropriated by that very industrious botanist, the Red Squirrel. I have not yet had an opportunity to determine whether the latter acquired them by honest means. The leaflets in this species are usually five in number and the bark is very rough.
- 66b. *Carya tomentosa* (Nutt.).—White-heart Hickory.
A rather scarce tree along Lake Erie, with twigs, petioles and leaves very downy and fragrant when crushed. The fruit is edible and sweet.
- 66c. *Carya porcina* (Nutt.).—Pig-nut Hickory.
Found in the same localities as the last, but rather more plentiful. The leaflets are usually seven in number or fewer, nearly smooth, and the fruit very bitter.
- 66d. *Carya amara* (Nutt.).—Bitternut. Swamp Hickory.
The commonest species in Ontario, though far from being the most valuable. The leaflets are usually seven or nine in number, slightly downy and quite fragrant when crushed. The nuts are bitter.
- 67a. *Myrica Gale* (L.).—Sweet Gale.
Abundant along wet shores and easily known by its fragrance, which resembles that of the last species. The leaves are entire except near the apex and the pale dots beneath contain the aromatic resin that furnishes the characteristic fragrant odor.
- 67b. *Myrica asplenifolia* (Endl.).—Sweet Fern.
Common on sandy soil, especially in the northern districts. The fern-like leaves with their peculiar fragrance cannot be mistaken for those of any other woody plant.
- 68a. *Betula lenta* (L.).—Black or Sweet Birch.
This species somewhat resembles the Black Cherry in bark and appearance, while the twigs and leaves, as in the next species, have a strong flavor of Wintergreen. The leaves are described as shining above, but this is most noticeable in sunlight while they remain on the tree.

68b. *Bétula lutea* (Michx.).—Yellow Birch.

A large forest tree, common everywhere. The leaves are not easily distinguished from those of the last, but the yellow papery bark generally a sufficient mark of this species.

68c. *Bétula populifolia* (Marsh.).—American White Birch.

An eastern species found rarely along the St. Lawrence. The chalky white bark resembles that of our Paper Birch, but it peels much less readily. Common in the Atlantic Provinces.

68d. *Bétula papyrifera* (Marsh.).—Paper or Canoe Birch. White Birch.

Common everywhere and familiar as the source of the paper-like birch-bark and the Indian canoe. Young trees, with dark-reddish bark, may be known by the downy paired leaves on rather long petioles and lacking the aromatic taste of the yellow and black species.

68e. *Bétula pumila* (L.).—Low Birch.

A shrub in northern bogs known by the coarsely-toothed leaves on short petioles and covered with brownish wool beneath.

69a. *Alnus viridis* (DC.).—Green Alder.

A shrub of the far north, probably not found in older Ontario. The leaves are very finely serrate, and, unlike the next, are green on both sides.

69b. *Alnus incana* (Willd.).—Black or Speckled Alder.

A very common shrub or low tree along every stream or river. It resembles the Birches in the speckled bark, but the leaves are less tapering, somewhat glaucous beneath and not commonly found in pairs. The fine veins connecting the parallel ribs give a ladder-like appearance on the lower surface.

70a. *Corylus Americana* (Walt.).—Hazelnut.

Not so common as the next, and found only in the southern parts the Province. The husks of the nuts do not form a beak as in the next, the leaves are finely woolly beneath, and the margins are finely serrate without deep hollows between the vein-ends.

70b. *Corylus rostrata* (Ait.).—Beaked Hazelnut.

The common Hazel of northern Ontario, and found also throughout the south. The edible nuts are covered by a bristly husk lengthened into a narrow beak. The leaf-margins are hollowed between vein-ends, and the surfaces are less downy than in the last.

71a. *Ostrya Virginica* (Willd.).—Ironwood. Hop-Hornbeam.

A small tree common throughout the Province, and somewhat resembling the Elms. The bark is marked by long and narrow furrows. The hard, heavy wood is often used for hand-spikes, binding-poles, etc.

- 72a. *Carpinus Caroliniana* (Walter).—Blue Beech. Water Beech. Hornbeam.
A small tree with ridged trunk, found in clumps in wet soil throughout older Ontario. The smooth bark has some resemblance to that of the Beech, but in leaves and fruit and wood it resembles very closely the Ironwood. It enters Muskoka along the Severn River.
- 73a. *Quercus álba* (L.).—White Oak.
A common tree, growing to a large size in the south, though generally small in the north. Like all the White Oaks, this species yields very valuable timber.
- 73b. *Quercus macrocarpa* (Michx.).—Mossy-cup Oak. Blue Oak.
This is the much-esteemed Blue Oak of farmers and lumbermen, and is found in wet soil and along shores throughout the Province. The leaves are hoary, with fine greyish wool beneath, and are generally lobed deeply, especially near the middle. The large acorns with fringed cups distinguish this species in autumn.
- 73c. *Quercus bicolor* (Willd.).—Swamp White Oak.
Found mainly in the south in moist soil. The leaves are hoary beneath, but the margins are wavy oftener than lobed. The acorns are produced on long stems, and are quite edible.
- 73d. *Quercus prinus* (L.).—Rock Chestnut Oak.
A large tree along the Lake Erie shore, with brown ridged bark. The leaves have coarse rounded teeth and slender petioles, often an inch or more in length.
- 73e. *Quercus acuminata* (Sarg.).—Chestnut Oak or Yellow Oak.
This species is also a southern form, and shows its close relation to the Chestnut and even the Beech in the toothed and pointed leaves, which are quite different from the lobed forms of the north. This tree has rather narrow leaves, pale and downy beneath, with coarse hooked teeth. Unlike the Chestnut, however, the leaves seldom exceed six inches in length.
- 73f. *Quercus prinoides* (Willd.).—Scrub Chestnut Oak.
A shrub closely related to the two preceding species and found along Lake Ontario, as well as in the south-western peninsula. The leaves have coarse teeth, mostly obtuse, but scarcely rounded.
- 73g. *Quercus rubra* (L.).—Red Oak. Black Oak.
The commonest representative of the Red or Black Oaks, which include this and the two following species, all being marked by the bristle-tipped lobes of the leaves, and acorns that require two seasons to ripen. The timber is coarse-grained, and much inferior to that of the white varieties.

73h. *Quercus coccinea* (Willd.).—Scarlet Oak.

Similar to the last, but confined to the south-west. The leaves have usually fewer teeth on the lobes, with a somewhat shining surface, especially above, while the cups of the fruit are less saucer-shaped, covering about half of the acorn. A form of this species (var. *tinctoria*—Gray) has duller leaves, somewhat downy beneath, and still deeper cups.

73i. *Quercus palustris* (Du Roi).—Swamp Oak. Pin Oak.

A swamp tree with leaves very deeply lobed, smooth and shining on the upper surface, the lobes mostly with several teeth. Like the last, found only in the south-western peninsula.

74a. *Castanea sativa* (Mill), var. *Americana* (Michx.).—Chestnut.

A large tree of the south-west. The leaves resemble somewhat those of the Beech, but are much longer, with sharp tapering teeth.

75a. *Fagus ferruginea* (Ait.).—Beech. Red Beech.

Farmers distinguish two varieties of this tree, with white and red woods, respectively, but the difference appears to be altogether dependent upon soil and other conditions. It is easily known by the smooth grey bark and spreading branches, with leaves toothed only at the ends of the very straight and plain veins.

76a. *Salix nigra* (Marshall).—Black Willow.

The largest of our Willows, forming a small tree with dark brown bark. The leaves are nearly smooth and green on both sides, with petioles usually less than one-half inch, and the base not at all cordate. Not very common, and probably displaced in many districts by the next species. A variety with long and narrow leaves (possibly var. *falcata*—Torr.) grows along Sparrow Lake in southern Muskoka.

76b. *Salix amygdaloides* (Anders).—Peach-leaved Willow.

In Ontario this rather handsome tree appears to be commonly mistaken for the last species, which it resembles closely in flower and fruit as well as in the appearance of the bark and twigs. The leaves, however, are distinctly *glaucous* beneath, quite broad at the base, with long-tapering apex and with slender petioles, often nearly an inch in length when fully grown. Although satisfied for some years as to the identity of this species, I was unable to find any mention of its occurrence in this Province, and finally, in the spring of 1900, appealed to Professor Macoun, who determined my specimens as above, adding that it had not been reported previously. Since then Professor Macoun has sought and found this species in the east, and I have noticed it in various places throughout northern and central Ontario, where it seems to be rather common.

- 76c. *Salix lucida* (Muhl.).—Shining Willow.
A beautiful shrub with smooth shining leaves, somewhat resembling those of the Cherries. The petioles have usually two or more glands and the stipules commonly remain during the summer. Its yellowish twigs are smooth and shining, and it prefers wet situations.
- 76d. *Salix longifolia* (Muhl.).—Long-leaved Willow.
A river-bank species, marked by the very long and narrow leaves, nearly sessile, green on both sides and with low teeth wide apart.
- 76e. *Salix rostrata* (Rich.).—Livid Willow.
A tall shrub or small tree very common throughout Ontario. The leaves are dull green and more or less downy above, glaucous and generally woolly beneath, with very plain netted veins. The margins are unevenly serrate, with a few low teeth or nearly entire.
- 76f. *Salix discolor* (Muhl.).—Glaucous Willow.
This very common tree-like Willow may be known by the leaves, which are white-glaucous beneath but not downy, and unevenly toothed along the sides, while nearly entire at the ends. The flowers of this "Pussy Willow" are very conspicuous in early spring.
- 76g. *Salix humilis* (Marshall).—Prairie Willow.
A shrub with downy twigs and rather narrow leaves, which are nearly entire and often somewhat revolute, with the lower surface densely grey-woolly. Usually found in dry soil, but not very common.
- 76h. *Salix petiolaris* (Smith).—Slender Willow.
A swamp shrub, growing in clumps with tough twigs, often used for basket-work. The leaves are small and narrow, with fine blunt teeth, and the lower surface pale and glaucous, with fine silky down, especially when young. One of the commonest species in Muskoka.
- 76i. *Salix candida* (Willd.).—Hoary Willow.
A bog shrub, marked by the woolly twigs and surfaces of the narrow leaves. Reported as common in northern Ontario, but rather rare in Muskoka.
- 76j. *Salix cordata* (Muhl.).—Heart-leaved Willow.
In spite of the name the leaves of this species are usually not cordate. Though common in southern Ontario and to the north-west, I have not met with it in Muskoka. It is described as being very variable in different localities.
- 76k. *Salix balsamifera* (Barratt).—Balsam Willow.
A low Willow of the northern swamps and perhaps not found in older Ontario, though very common in Muskoka. It may be known by the broad leaves, glaucous and veiny beneath, with fine teeth, and by the shining brownish-yellow twigs.

76l. *Salix myrtilloides* (L.).—Bog Willow. Myrtle Willow.

Our smallest species and found only in cold bogs. The smooth, slender stems are commonly about two feet high or less, with small entire leaves, which are quite smooth, and pale or glaucous beneath.

NOTE.—Many specimens of willows are plainly the result of crosses between distinct species, and are then known as hybrids; e.g., *S. humilis* × *discolor*. Owing to this fact and the very variable leaf-forms this Genus is one of the most difficult for beginners.

77a. *Pópulus tremuloides* (Michx.).—American Aspen. Poplar.

Perhaps the commonest of the Poplars, and especially abundant where fire has destroyed the original forest. In such places it serves a valuable purpose by furnishing shade to the seedlings of Pine and other valuable trees, which in time again displace their protectors. The wood is little valued except for pulp or fuel. The bitter leaves and bark form a favorite food of the Porcupine, who seems to be almost the only friend of the much despised "Popple."

77b. *Pópulus grandidentata* (Michx.).—Large-toothed Aspen. Poplar.

A common tree, especially in the north, with soft wood, as in the last species. The leaves are smooth in summer, but densely woolly when first unfolded a week or more after those of the last species.

77c. *Pópulus balsamifera* (L.).—Balm of Gilead. Balsam poplar.

A large tree, well known for its resinous sticky coating on the buds and young leaves. It is distinguished from the other native poplars by the rounded petioles of the leaves (which for this reason do not tremble like the others), and is much less common in most parts. A variety with the upper surfaces and the petioles of the leaves somewhat downy and cordate at the base (var. *cándicans*—Gray), is commonly cultivated under the name Balm of Gilead, and is also found wild.

77d. *Pópulus monolifera* (Ait.). Cottonwood. Necklace Poplar.

A large tree found along our southern borders. The leaves are larger than in any of our native species, and with petioles comparatively stout.

78a. *Pinus strobus* (L.).—White Pine.

Our most important timber tree, and originally as abundant as valuable, although, like the other Conifers, it was never plentiful in the extreme south-western peninsula. As a forest tree it has largely disappeared before the lumberman and the fires throughout older Ontario. This need not to be regretted where agriculture has been rendered possible, but the bare rocks of the unproductive Laurentian districts, once covered by a magnificent forest, form now a most complete picture of desolation. It is to be hoped that the efforts being made to encourage the reforestation of these wildernesses will be crowned with success, and that the districts farther north will be carefully protected from such a future.

78b. *Pinus rigida* (L.).—Pitch Pine.

A small tree with long leaves in bundles of three. Reported only from the eastern districts along the St. Lawrence.

78c. *Pinus Banksiana* (Lambert).—Grey Pine. Scrub Pine. Jack Pine.

This species is rather rare in older Ontario, but is abundant in the north-western districts. With us it is a small tree, though much larger towards the north-west. The short leaves grow in pairs, and the stout curved cones cling for several years to the branches. Not uncommon on the islands of Lake Muskoka. This is one of the pulp-wood trees of great future value to New Ontario.

78d. *Pinus resinosa* (Ait.).—Red Pine. Norway Pine.

Less common and less valuable than the White Pine, though found in nearly the same localities in poor soil. The lumber is *culled* along with inferior qualities of the white species with which it is cut, though preferred for building purposes when great strength is required. The tree is easily known by the long half-round leaves growing in pairs, and by the reddish bark.

79a. *Picea nigra* (Link.).—Black Spruce.

This is the swamp Spruce, while the next seems to prefer the more open woods. The cones of this species remain through the winter, and are shorter (about one inch or less) and stouter, often with a purplish tinge.

79b. *Picea álba* (Link.).—White Spruce.

This species and the last are the great pulp-wood trees of northern Ontario. They are not easily distinguished by the leaves alone, though in the present species these are usually longer and paler. The twigs, which in the last are finely downy, are here quite smooth, and the cones are commonly about two inches long and pale, or somewhat brownish in color.

80a. *Tsuga Canadensis* (Carr.).—Hemlock. Hemlock Spruce.

A large tree found commonly in moist woods. The timber is not highly valued, although large quantities are cut yearly for the bark, which is used extensively in tanning. The leaves are flat and pale beneath on short slanting petioles.

81a. *Abies balsamea* (Miller).—Balsam Fir. Canada Balsam.

A slender and graceful tree in moist soil, and often planted for ornament. It is distinguished from the Spruces by the flattened leaves, which appear to grow from opposite sides of the twigs, as in the Hemlock. The soft gum which forms in "blisters" on the bark is valued as a healing ointment, and yields the "Canada Balsam," used as a transparent cement for microscopical slides, etc.

- 82a. *Làrix Americana* (Michx.).—Larch or Tamarac.

The Tamarac is peculiar among our cone-bearing trees from its habit of shedding the needle-like leaves in late autumn, along with the broad-leaved species. Its resinous wood is harder than in the evergreen species and is more durable, whether as timber or fuel. The sombre "Tamarac Swamp" is a common feature of our landscapes.

- 83a. *Thùya occidentàlis* (L.).—White Cedar.

A very common tree in swamps, with light timber, valued for posts, etc., being very durable underground. The small leaves are shingled in four rows on the slender flat twigs and resemble no other species except the Red Cedar, which has square twigs and some of its leaves awl-shaped and prickly.

- 84a. *Juníperus commúnis* (Linn.).—Common Juniper.

The typical Juniper is an erect shrub or small tree, found throughout Ontario, but not plentiful. The common form (var. *alpina*—Linn.) grows in dense round patches in poor and dry soil, and is seldom over three feet in height. It is marked by the stout sharp-pointed leaves arranged in circles of three around the stems and often quite pale on the upper surface.

- 84b. *Juníperus Sabína* (L.), var. *procúmbens* (Pursh.).—Low Red Cedar.

A low shrub usually creeping or straggling on sandy shores. The leaves are very much as in the next and the distinction is mainly in size and habit.

- 84c. *Juníperus Virginiána* (L.).—Red Cedar. Savin.

A shrub or low tree, with aromatic red wood, found commonly in dry soil on shores and islands. The small flat leaves are shingled on slender four-sided twigs, but those on young shoots are often awl-shaped and opposite with spiny points. The wood is used for making pencils.

- 85a. *Táxus baccáta* (L.), var. *Canadense* (Gray.).—Ground Hemlock.

A low shrub in moist woods or swamps. The leaves resemble those of the Hemlock, but are sharply pointed and not whitened beneath. The fruit is red and berry-like, enclosing a single seed.

- 86a. *Smílax quadrangulàris* (Willd.).—Green Brier. Cat Brier.

A southern form found only along the Lake Erie shore and known by the stout prickles and the few-veined leaves. This species and the next are interesting as our representatives of the woody endogens which are so highly developed in tropical regions.

- 86b. *Smílax hispída* (Muhl.).—Bristly Smilax.

A somewhat woody climber with the stem thickly armed by straight bristles. The veins of the leaves, usually seven in number, run from end to end, and the petioles have often a pair of tendrils which are apparently stipules. The leaf-margins are sometimes finely toothed. This form is common throughout the province and plentiful in Muskoka.

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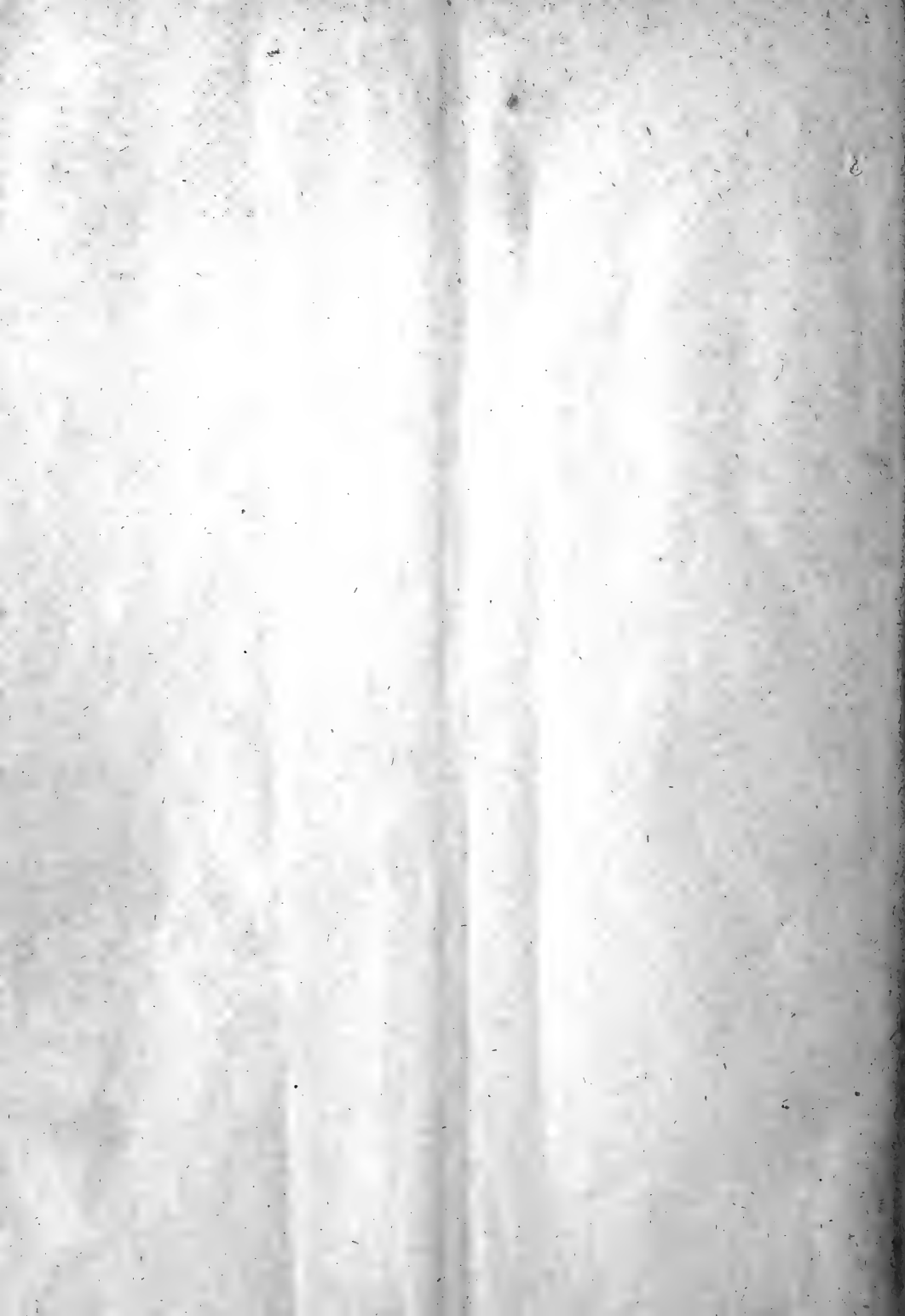
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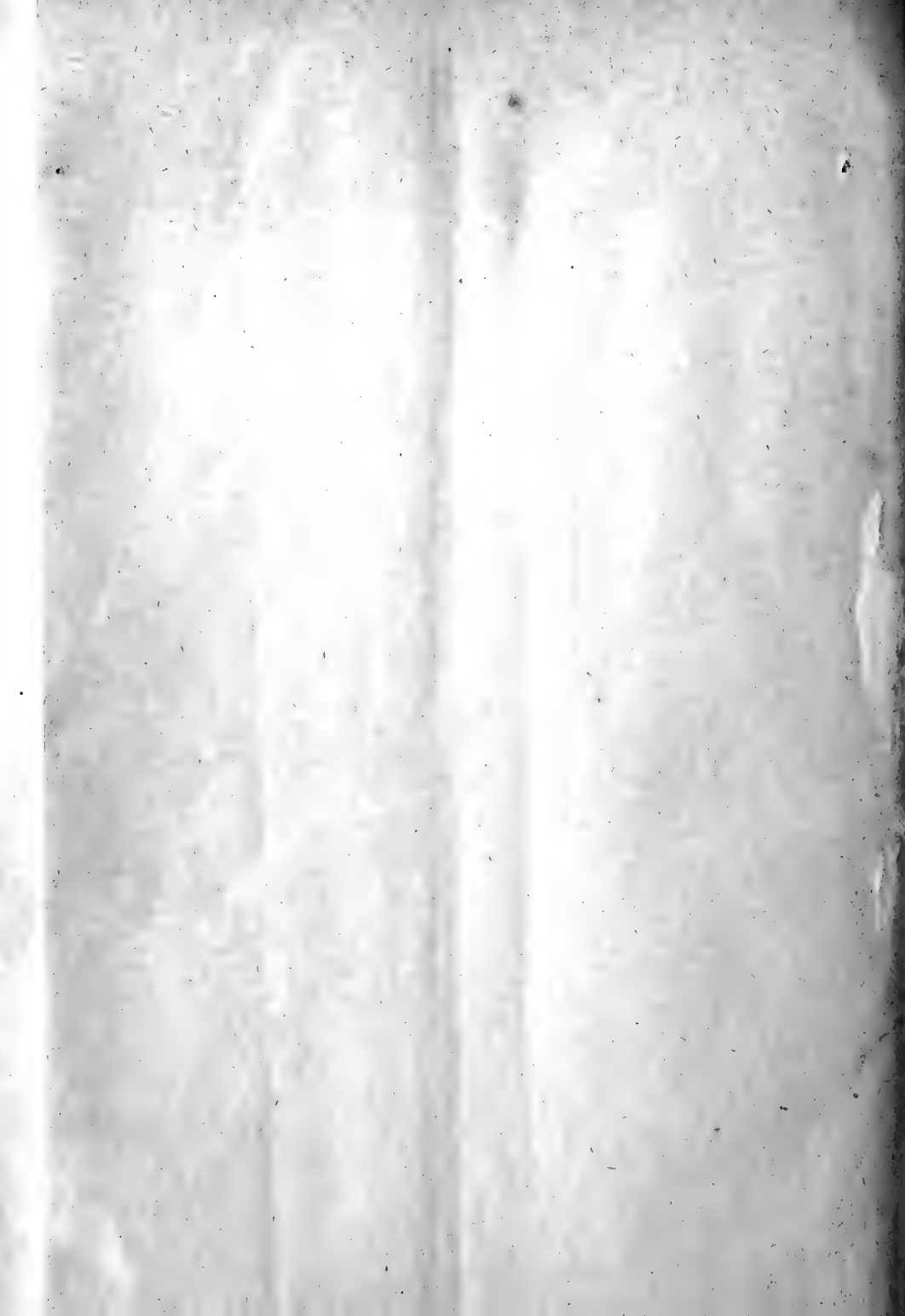
















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