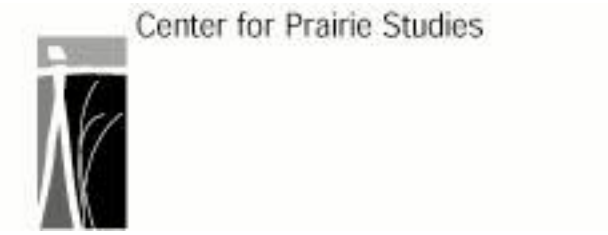
Our Trees

A Guide to Trees In Grinnell

Henry Shoemaker Conard (1927)
Updated and Annotated Third Edition
Larissa Mottl (2003)

GRINNELL COLLEGE



This guide is a publication of the Center for Prairie Studies at Grinnell College. It is an updated and annotated edition of *Our Trees*, Second Edition, by Henry Shoemaker Conard printed in 1927.

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PREFACE

Henry Shoemaker Conard (1874-1971), professor of botany at Grinnell College from 1906-1944, was an internationally recognized botanist. He was also highly respected and admired as a teacher. *Our Trees*, published in 1927 by Grinnell Herald Press, is one of his many outstanding contributions to our knowledge of Iowa's flora. His original book may be examined in the Burling Library archives at Grinnell College.

The inspiration for reprinting *Our Trees* originated from a Grinnell College alumna, Adelia (Dee) Woodward Hayward '39 of Mason City, Iowa. In the fall of 2000, Ms. Hayward sent the Center for Prairie Studies a fragile original, accompanied by a letter in which she described Conard's book as "so eminently readable and full of history about Grinnell." She is right. *Our Trees* truly is a unique botanical guide in the amount of local history it provides. By tailoring an otherwise generic winter tree guide to a specific place, Dr. Conard, true to his reputation as an excellent teacher, made it a very enjoyable and accessible task for students and community members to learn about one of Grinnell's precious natural resources then and now, its trees.

Many Grinnell College alumni have fond memories of Dr. Conard and recall using his keys to learn trees and other plants on campus and in town.

"[Dr. Conard] took us on walks throughout the campus and environs, this in the dead of winter! We plowed through snow up to our knees to look at shrubs and trees to learn to identify them by their bark and growth pattern." Elisabeth Dwight Ellis '38

"We all learned to use the 'flower key' to recognize plants and his 'tree key' to recognize the trees on campus. I can recognize them to this day (or could until I was 90). Love and appreciation of living matter has enriched my entire life." Gwen Thomas Rusk '31

"I had only one semester of classroom instruction from Dr. Conard in 1936 but remember him vividly and fondly—particularly his tours of the campus, describing the many trees and other plantings." Marion McCoy Vipond '39

"At the age of 84 I will admit I probably remember more specifics about his course than any of my major subjects. He taught me a real appreciation of the wonder of nature as found in trees, flowers, and vegetation." Jane Pritchett Brevington '38

"When I was growing up I lived one block away from Dr. Conard on Elm Street in Grinnell. Anytime my parents, the David Pecks, had a question about plants, Dr. Conard was ready with an answer. We children learned the names of all the trees on the college campus and on our street as we were growing up." Kathleen Peck Lewis '36

"My memories of Dr. Conard are warm and inspiring. He, as Professor of Botany, increased my interest in the plant life around us here in Iowa….He was a role model not only for a student of Botany but also for a student of life." G. Robert (Bob) Artley '41

By placing an updated edition of Conard's guide in the hands of students and community members today, it is our hope that his work will once again inspire and challenge.

Larissa Mottl, Manager
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INTRODUCTION TO THE REPRINT EDITION

"Grinnell is justly proud of her trees."
Henry S. Conard

Henry S. Conard intended his booklet *Our Trees* to be used to identify trees in winter. The book's second edition, published in 1927, identifies over 120 species and the locations of over 230 trees. Conard's guide was used by numerous Grinnell College students who enrolled in his botany and horticulture classes and was popular with community members. His guide was written in a conversational tone that allows you to imagine being with him on a walking field trip to learn the names of trees on campus and in town.

Grinnell and Grinnell College have undergone many changes since the guide's second edition was published. The city and campus have grown, requiring infrastructure development (water, sewer, electric, and telephone lines above and below ground) and living space for more people. In the process of making these changes, many of the trees Conard listed were removed. Dutch elm disease in the 1970s decimated the American elm population that had gracefully lined many of the streets in Grinnell. Other trees have succumbed to natural disasters including snow, ice, and wind storms, with the most notable recent disasters of heavy snowfall in October 1997 and winds in excess of 100 mph in late June 1998. Insect pests and diseases are a constant threat to Grinnell's trees, especially those weakened by drought or damaged by storms. Given so many factors that threaten the health and numbers of trees in Grinnell, we have significant reason to celebrate the trees that have survived since the 1920s (see maps in Appendices A and B) and the efforts of public and private landowners to maintain and replenish the diversity of species in our town.

Our third edition of Conard's tree guide contains his original text in its entirety. Contemporary annotations, set within brackets, provide

additional information about some of the people, trees, and locations Conard mentioned. Unmarked additions were made to his keys to provide the Latin and common names used today without cluttering the tables. His nomenclature is always listed first. Volunteers checked the status of most of the trees he listed and were successful in finding many of them (see Appendices A and B), in addition to finding new locations for several species. Boldface type is used to highlight the locations of Conard's trees that are still alive and the new locations of additional specimens. Conard described the locations of several trees in relation to buildings on campus and businesses in Grinnell that are no longer in existence. Consequently, a map is provided in Appendix B to illustrate campus locations in relationship to buildings on campus today. The locations of places in town are included as annotations in the text. Most of the leaf illustrations are from an insert that was provided with the original book. Maya Andelson, a ninth grade student at Grinnell-Newburg High School, contributed six of the illustrations, each marked with her initials. The Iowa State University Extension Service granted permission to use illustrations of conifer leaves and cones from one of their publications.

We encourage you to use the guide to learn the names of trees in your yard, your neighborhood, and your community. Once you have taken this first step, then you have succeeded in building a frame of reference for learning more about each tree species, including which ones are best for brilliant red fall color, for a hot, dry planting site, or for a windbreak along the north side of your yard.

HOW TO USE THIS GUIDE

People identify unfamiliar plants in two ways. One way is to look through a book with illustrations or photographs, often organized by flower color or leaf shape or arrangement, until you find a match to your unknown plant. This is probably the way most beginners learn to identify plants, but it is not always effective or efficient when the plants are not in flower, when the flowers are very similar between species, or when there are hundreds of species in the guide.

An alternative method for identifying a plant is to use a key. In our region, keys can be constructed for identifying species during either the summer or winter. Conard describes a plant key and how to use it on page 14. His key can be used to identify over 100 species in winter by their leaf scars, buds, and twig color and texture. The first step is to decide whether the tree you wish to identify is a **gymnosperm** or an **angiosperm**.

Gymnosperms "Evergreens"

Gymnosperm leaves are needle- or scale-like, or broad and two-lobed and fork-veined. Most are evergreen (pine, spruce, fir, juniper, arborvitae), but a few are deciduous, meaning they lose their leaves in the fall. Ginkgo, baldcypress, and larch are deciduous gymnosperms.

Angiosperms "Broadleaf trees"

Angiosperm leaves are never needle- or scale-like; and they are net-veined. Most angiosperms in our region are deciduous including oak, maple, elm, walnut, ash, and hawthorn.

Now you can consult the table of contents to find a key to all of the species categorized as one or the other.

Conard further organized the genera of broadleaf trees into categories according to characteristics such as leaf arrangement, presence of thorns, or bark color and texture. His categories are included in the table of contents so that you can go directly to the species he placed in each category.

GREAT PLACES TO LEARN TREES IN GRINNELL

With our guide in hand, the best place to learn to identify trees is your yard, where you can look closely at the leaves, twigs, fruit, and bark, and watch how the tree changes through the seasons. As you become comfortable using plant keys, venture out to discover which trees line your street, or your route to school or work. *Be sure to respect private*

property, and observe the trees at a distance if necessary. A few excellent places in Grinnell to observe many species include the Grinnell College campus, Merrill Park, Arbor Lake Park, and the Poweshiek County Fairgrounds. The College campus has nearly 100 tree species, many of which have been planted as memorials. Merrill Park is a great place to learn conifers, as it has at least six representatives of this group. A walk around Arbor Lake will provide examples of over 25 deciduous and evergreen species. Look for identification tags on some of the trees on the fairgrounds.

TREES FOREVER

If you are interested in the planting and maintenance of trees and in educating others in Grinnell about them, consider joining the local chapter of Trees Forever. Trees Forever is a nonprofit organization founded in Iowa in 1989. Its mission is to facilitate the planting and care of trees and forests, through action-oriented programs that empower people, build community, and promote environmental stewardship. Grinnell's chapter of Trees Forever provides expertise and assistance to landowners through the Adopt-A-Tree program and personal consultations. The chapter also organizes volunteer opportunities to help plant and mulch trees on city property. Contact Jack Robertson at 641-236-3682 for more information.

TO LEARN MORE ABOUT IOWA'S TREES

For information on notable tree specimens throughout Iowa, contact the Iowa Department of Natural Resources for a copy of *Famous and Historical Trees of Iowa*, produced in 1996 for the Iowa Sesquicentennial celebration and their list of State "Big Tree" Champions, which includes the locations of the largest known individuals of over 100 species.

SUMMER TREE GUIDES

20 Common Trees of Iowa. Iowa Department of Natural Resources, Forestry Division. To obtain a copy call 515-281-8681.

Forest and Shade Trees of Iowa, *Second Edition*, by Peter J. van der Linden and Donald R. Farrar, published in 1993 by Iowa State University Press, Ames, Iowa. ISBN 0-8138-0734-4.

Trees of North America, by C. Frank Brockman, Golden® Guide revised edition, 1986. ISBN 0-307-13658-2.

OUR TREES

Do you know the trees by name
When you see them growing
In the fields and in the woods?
They are well worth knowing.

Grinnell is justly proud of her trees. The air man [aviator] scarcely sees the houses as he goes over on a summer day. You don't see them yourself from the neighboring high spots when you're out for a drive. You see only a beautiful grove. But you know from the old stories that when the first settlers came there was not a tree in sight. When Brother Matlack says the Pioneers climbed a tree the country for to see, he means just after they swam the "Mississip": It was not so at Grinnell. There was not a tree to climb. It is said that a small willow grew in the slough between the present Mears Cottage and School of Music. We have to thank the pioneers for all of our fruit and shade.

Mr. Warburton used to tell how he went as a boy to the riverbanks in spring to get soft maple seeds and elm seeds, and in the fall for seeds of ash, walnut, hickory, and butternut, and cuttings of willow, and wild seedlings of cottonwood. That is how Iowa was changed from a treeless wilderness of grass to what it now is-hardly a house without its windbreak, lawn trees and orchard. The nurseryman began very early to stimulate tree planting. He brought in the fruit trees and the cultivated ornamentals. A loving, lovable soul was the pioneer nurseryman. He sold trees because be loved them, and wanted other folks to have and love them too. He made a living at it if he could, and pieced out his income by farming or gardening. Eugene Secor of Forest City, Patten of Charles City, Harrison of New York, Nebraska, are outstanding examples. Our own Mr. Willard is second to none as a horticulturist and Christian gentleman. He came to Grinnell in 1868, just the year after the big white birch in Pres. Main's yard was planted. And no man has done more to build up this community than has Mr. Willard.

Prof. L. F. Parker was a tree planter and a fine citizen. [Leonard Fletcher Parker was also professor of Greek and Latin at Grinnell College from 1860-70 and of history from 1888-98. He died in 1911 after his last publication, *History of Poweshiek County*.] The worst thing he ever did was to be a historian. He owned the land where the Women's Quadrangle now stands. He first planted a row of Lombardy poplars all around his property. Then he set a row of soft maples. The poplars made a quick showing, and as quickly became unsightly and were cut down. By that time the maples were going strong. One of these original maples stands south of Mears Cottage, its great trunk still showing the twist of the cyclone of 1882. As soon as the streets were laid out, Prof. Parker set elms along Sixth Avenue, and there they are, and should be for a hundred years. [Dutch elm disease killed most of the American elms in Grinnell in the 1970s. However, one of the elms presumably set by Prof. Parker has survived and stands proudly south of the Bucksbaum Center for the Arts on 6th Avenue.]

Elm trees form an arch over High Street on a winter day.

But why talk about elms and cottonwoods and Lombardy poplars if you don't know one from t'other? Folks are always wishing they knew the trees by sight and by name, but fearing it is an impossible task. It isn't impossible, not even difficult. But it can't be done without some thought and observation and effort. Look at the trees. Get familiar with their general outlines, manner of branching, size of twigs and buds, color and character of bark. By such signs you

can quickly learn to know them in winter. When the leaves are out, you have another complete set of recognition signs.

We propose to show in the following pages how to recognize the hundred or more kinds of trees in and around Grinnell. We are going to give you all of our trade secrets—of which there are none. But we can give you some curious tricks that we have picked up from dozens of books and people, and found useful with dozens of students. We shall describe each kind of tree, and tell you just where it may be seen. Go out and see the tree, and while standing beside it, read over its description and verify every point. Then your lesson is learned. We've seen it done hundreds of times. And if you know of any better tricks, or any other trees we do not mention, please send them in and we will be glad to give them place in our next edition. [Convey suggestions to the Center for Prairie Studies, 641-269-4720.]

Never break even a leaf from a tree, unless it is in your own yard. Never for anything injure a bud. You may do harm from which the tree will never recover—or will recover only after many years.

Keys for Identifying Trees

The whole process of recognizing plants can be briefly put in the form of a “key”. Suppose you are looking at some evergreen or cone-bearing tree, and have no idea of its name. You take the "key" and find at number 1 two lines of description. Does your tree fit the first or the second number 1? Whichever it fits-and it cannot be both-you find at the end of the line the next number to consider, either 2 or 4. Looking down to that number, you find another set of two or three descriptive lines. Which does it fit? So on until you reach the first or Genus name of your tree. Turning to the article or place where that genus is described in full, you can decide from the little key there what kind or species it is. You'll make some mistakes at first, but not if you look sharp enough. And soon it becomes more fun than a crossword puzzle. I spent all my spare time as a kid, and so did a lot of other kids, tracing plants and bugs and butterflies through keys. Once I got their names I could find out more about them, from libraries or from folks who knew. We didn't have crossword puzzles then. I'm glad we didn't.

A Key to Genera of Gymnosperms ("Evergreens")

1.	Deciduous (shedding leaves in winter)	2
1.	Evergreen	4
2.	Cone-bearing; leaves clustered	*Larix* (**Larch**)
2.	No cones evident	3
3.	Leaves needle-shape; bark black	*Taxodium* **(Cypress)**
3.	Leaves broad, 2-lobed, fork veined	*Ginkgo*
4.	Leaves in bunches of 2, 3, or 5, long, needle-shape	*Pinus* (**Pine**)
4.	Leaves one in a place	5
5.	Leaves needle-shaped, slender	6
5.	Leaves scale-like, opposite, pressed close to stem	10
6.	Leaves spirally arranged	7
6.	Leaves opposite or whorled	*Juniperus* (**Juniper**)
7.	Leaves 4-sided in cross section	*Picea* (**Spruce**)
7.	Leaves flat, with distinct upper and lower sides	8
8.	Leaves continued down stem in a narrow ridge	*Tsuga* (**Hemlock**)
8.	Leaves not extending down along stem	9
9.	Leaf scars slightly raised; buds chocolate brown, very sharp	*Pseudotsuga* (**Douglas fir**)
9.	Leaf scars not at all raised; buds yellow, rounded	*Abies* (**Fir**)
10.	Twigs 4-sided	*Juniperus* (**Juniper**)
10.	Twigs flat	*Thuja* (**Arbor vitae**)

THE EVERGREENS

All of our evergreens are close relatives of the pines and firs. They have narrow "needle" leaves, or tiny scale-like leaves as in juniper and arbor vitae. For the green flat spray of arbor vitae is made up of flattened twigs, on which the little scale-like leaves are readily seen.

1. *Pinus* Pine

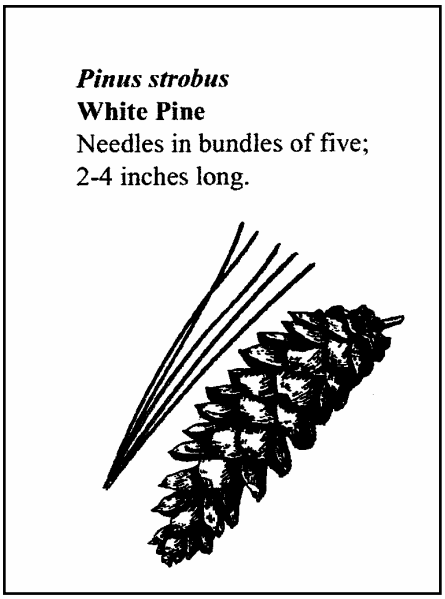
The whole story of pines, for recognition purposes, may be summed up in the following "key". If you find a pine whose exact name you wish to know, begin at number 1, see which line agrees with your tree, then go to the number at the end of the line, and so on until you reach the name.

1.	Leaves in groups of 5	5
1.	Leaves in 2's and 3's on the same tree	*P. ponderosa* **Bull** or **Ponderosa pine**
1.	Leaves strictly in 2's	2
2.	Low and shrubby	*P. montana* or *P. mugo* **Mugo pine**
2.	Tree	3
3.	Branches covered with old cones; Leaves short	*P. banksiana* **Jack pine**
3.	Cones few, not remaining long on tree	4
4.	Leaves 6-14 cm. long; twigs dull orange color	*P. resinosa* **Red pine**
4.	Leaves 6-14 cm. long; twigs dull grey	*P. nigra austriaca* **Austrian pine**
4.	Leaves 4-6 cm. long; bark of upper parts papery, orange	*P. sylvestris* **Scotch pine**

5.	Leaves slender, soft	6
5.	Leaves stiff, curved. 4-7 cm. long	*P. flexilis* **Limber pine**
6.	Leaves dark green; branchlets hairless	*P. strobus* **White pine**
6.	Leaves bluish white on inner side; branchlets hairy	*P. cembra* **Swiss stone pine**

Anybody can tell a pine from anything else in the world. For all the pines have long, slender leaves, and the leaves are set on the branches in clusters with 2, 3, or 5 leaves to a cluster. If they're not clustered, it's not a pine (*Pinus*). Of course, English (and American) names of plants are applied very promiscuously. We have "Ground pine" which creeps on the ground and is no pine at all. And Norfolk Island pine, which is an *Araucaria.* The true pines are listed in the better nursery catalogs under the Latin botanical name of *Pinus* (long I). This is the only way, briefly, to make our meaning clear and unmistakable. We shall always give the Latin names for surety, and so you can use a catalog.

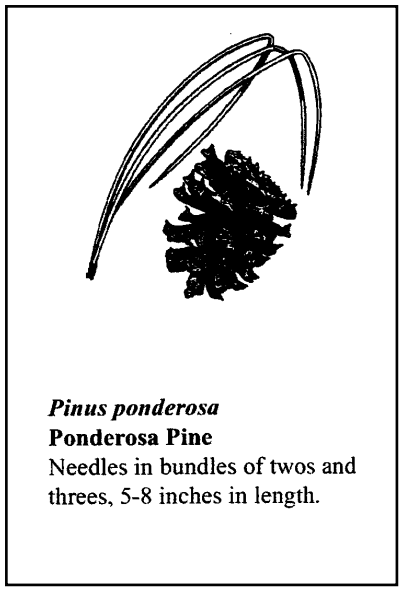
There are nine kinds of pine in Grinnell. The white pine (*Pinus strobus*) is the handsomest of all. It is the only pine TREE here with five leaves in each cluster. That determines it, if it is a grown up tree. The leaves are long (6 to 8 cm.), slender and very dark green. This is the tree that furnishes—must I say furnished—the splendid white pine lumber of Minnesota and the regions to the east. Some say it is the most valuable tree in the world. [White pine is the only native pine in Iowa. Prior to planting for windbreaks and wildlife, it was found in only a few places in Iowa including White Pine Hollow State Preserve in northeastern Iowa, along the Iowa River in Hardin County, and Pine



Creek in Muscatine County.] There are two nice ones in Cooper School yard [which was located on the north side of 6th Avenue between East and Elm Streets.] And a perfectly magnificent row two miles southwest of Westfield church. [Two handsome white pines currently grow on campus southwest of Mears Cottage. There are white pines throughout Grinnell, including on the north side of **Merrill Park** west of the circle drive and along the south boundary of **Hazelwood Cemetery**. A columnar variety can be seen on campus southeast of **Noyce Science Center** by the railroad tracks**,** north of **Goodnow Hall**, and on the west side of the **Chrystal Center**.]

We have two sets of baby pines that are five-leaved. The Swiss stone pine (*P. cembra*) of central Europe has a bluish-white wax on the flat sides of each leaf. The finest specimen, now about five feet tall, is in Professor Matlack's front yard, **1510 East**. [Henry Matlack was a professor of music from 1908-1936.] A little one is coming along in the college nursery [no longer in existence] east of Ward Field. Do you know of any others? I don't. [There are at least two other Swiss stone pines in Grinnell, a very young one in the front yard of **1327 Park Street**, and an older specimen at **2025 Manor Circle**.]

The Rocky Mountain white pine (*P. flexilis*), [more commonly known today as Limber pine] has much stiffer leaves than any other five-leaved pine. [The term "limber" refers to its flexible twigs.] It has made a good start on the campus at Ames, and we have a five-footer in the college nursery. Others?

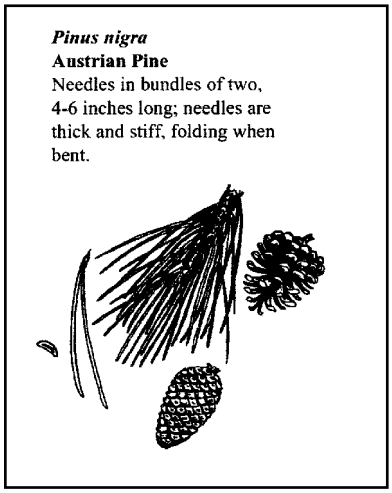


Pinus ponderosa
Ponderosa Pine
Needles in bundles of twos and threes, 5-8 inches in length.

Only one kind of pine has two-leaved and three-leaved clusters on the same tree—even on the same twig. That characterizes the Western yellow pine or bull pine (*P. ponderosa*), [usually known as the Ponderosa pine.] The leaves are long (12 to 16 cm) and very thick and coarse; the twigs are dark grey; and the end buds are long and pointed, like little brown Christmas candles at the end of every twig. This is now known to be the very best heavy-

leaved pine for our region. It resembles the old fashioned Austrian pine, but is more healthy and vigorous. There is a fine clump of bull pines just east of **Goodnow Hall** on the campus, a row at the west end of the college nursery along the M. & St. L, [Minneapolis and St. Louis Line,] and a splendid specimen in Grant Ramsey's back yard, 1426 West. [There are still ponderosa pines along the railroad tracks north of **8th Avenue**, and four nice specimens in **Merrill Park** west of the circle drive.]

The rest of the pines are strictly two-leaved. Two kinds have long leaves, and three short. The Austrian Pine (*P. nigra*) has coarse long leaves, a good deal like those of bull pine. But the end buds on the twigs of Austrian pine are short, rough, and conical, not the least bit candle-like. This tree is native of south-central Europe. There is a big old specimen in Pres. Main's yard, and a lot of big ones along south East St.: 436, 418, and **334**. There are fine ones at the old Woods place on the next hill west of the Community Hospital,—and many others, [namely, on campus southwest of **Noyce Science Center** and along the sidewalk west of **Cleveland Hall**.]

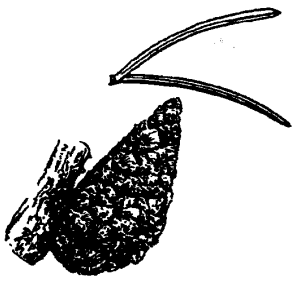


Norway [or Red] Pine (*P. resinosa*) is the common yellow pine of northern Minnesota. You see forests of it when you drive to Itasca Park or Bemidji or Duluth. The leaves are long like bull pine, but more slender and crooked. The skin of the youngest twigs is dull yellow, and this best serves to distinguish it. A big one in the college nursery was growing prodigiously and promised much until a hot day in March, followed by a severe freeze, killed it. There is another one coming on in the nursery. I do not know of any others. [The only red pine we know of in Grinnell stands in the front yard of **1207 Park Street**.]

The two short-leaved TREE pines are Scotch pine (*P. sylvestris*) and Jack pine (*P. banksiana*). Scotch pine is native of northern Europe. The leaves are about 4 to 7 cm. long, and the cones fall off spontaneously every spring. But it is best recognized by the yellow or orange papery bark on branches and trunks 3 to 6 inches in diameter. It is often a shapely and handsome tree,—and often quite deformed. Those picturesque japanesy old fellows south of Chicago Hall on the campus are good examples of the deformed type. There are many others, for example, 334 and 418 East St. [Find a great example of a picturesque Scotch pine southeast of the **10th Avenue railroad crossing** and another example in **Merrill Park** northeast of the entrance sign. **Hazelwood Cemetery** has a row of them along its south boundary.]

Pinus sysvestris
Scotch Pine
Needles in bundles of two, 1 1/2-3 inches long and twisted; bark on older trees is orange and scaly.

Jack Pine is native from northern Minnesota eastward to Maine, on poor ground, forming "pine barrens". Its rather meager coat of very short leaves (2 to 3 cm.) makes it look scraggly. And it never sheds its cones. So the branches are crowded with many generations of black and dead cones. This adds to the unkempt appearance of the tree. Two fine specimens stand just southwest of Mears Cottage. There must be others, but I don't know where. [There are at least two specimens in Grinnell located in the front yard of **429 6th Avenue** and southwest of the railroad crossing on **4th Avenue]**.



Pinus banksiana
Jack Pine
Needles in bundles of two, 3/4-1 1/2 inches long, twisted; cone tips curve toward the branch tips.

The ninth pine is only a shrub in size—a low bushy fellow, with two short leaves to a cluster. This is the Mugo pine (*P. montana* Mughus [*P. mugo*]), excellent for base planting around your house, or beside the front steps. There are several about the Women's Quadrangle, and a nice lot at 927 Elm Street, the old P. G. Norris or

Harry Harris place. [There are several Mugo pines on the north end of the parking lot east of the **Forum** on campus and one by the driveway of **300 13th Street**.]

SPRUCES AND FIRS

3. *Picea* Spruce

	Twigs orange yellow; Leaves green, cones 10-15 cm. long	*P. abies* **Norway spruce**
1.	Twigs ashy-yellow; Leaves ashy; cones 2.5-5 cm. long	*P. canadensis* or *P. glauca* **White spruce**
1.	Twigs pale; Leaves bluish green, very sharp	*P. pungens* **Colorado blue spruce**

4. *Abies* Fir

1.	Leaves 2 cm. long or less	*A. balsamea* **Balsam fir**
1.	Leaves 3 cm. long or more	*A. concolor* **White** or **Concolor fir**

5. *Tsuga* Hemlock

1.	Leaves about 1 cm. long; cones 1.5 – 2 cm.	*T. canadensis*

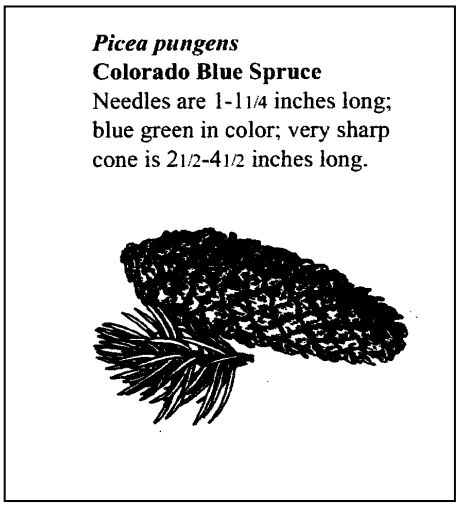
6. *Pseudotsuga* Douglas fir

	Leaves about 2 cm. long; cones 5 – 8 cm.	*P. taxifolia* or *P. menziesii*

Most evergreens have the leaves set singly on the twigs instead of in the bunches characteristic of pines. The leaves may be crowded together, but still they are only one in a place. In all the spruces and firs, the leaf scars, on branchlets which have shed their leaves, form spiral lines round and round the twig. This distinguishes the firs and spruces from the juniper and arborvitae group. In the latter group the leaves, whether scale-like or needle-like, are set on the twigs so that two stand opposite each other on opposite sides of the twig; or there are three at one level, equally spaced around the twig (this arrangement is called “whorled”).

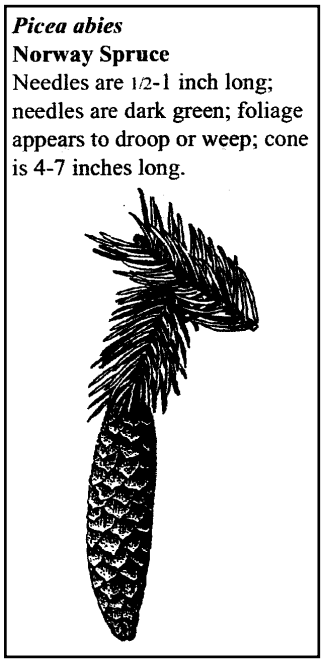
Spruces (*Picea*) have short needle-like leaves, which have no upper and lower surface, but are four cornered or diamond shaped in cross section. When the leaves have shed off, after 3 to 7 years of service, they leave a little point or prickle on the twig: *P.* for *Picea*, “p” for prickle! The cones hang down on the twigs, and the end buds are rough and scaly, with a few stray leaves between the buds. The whole tree is cone-shaped, evenly tapering from the broad-branched base to the slender shoot at the top. Most Christmas trees are spruces.

Of the three commonly cultivated spruces, the very handsomest of all—perhaps the handsomest of all our evergreens—is the Colorado blue spruce (*Picea pungens*). Look at that splendid big one in Grant Ramsey's back yard, 1426 West, planted years ago by Will Staat. How dense its foliage clear to the surface of the ground! How stately and strong its conical figure! How fine its color. The bluest ones are called "shiners," and are very costly; for they must be propagated by grafting. But you can get green ones too, and these are preferred in the newest landscape art. Shiners are a little gaudy—even tawdry. This species can be easily recognized, whether green or blue. Just strike the back of your hand against the leaves. If it hurts, it is *Picea pungens*. For the leaves are very stiff and

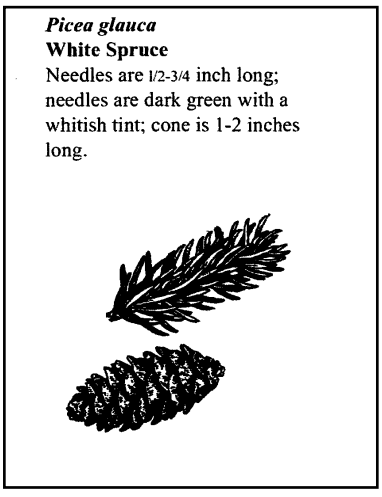


very sharp. The skin of the twigs is of a light yellowish color. There is a fine clump just west of Blair Hall on the Campus, and three in a row at 1837 Sixth Ave. This tree is native of the central Rocky Mountains. [Colorado blue spruce are quite common in Grinnell. A few places to see them include **1416 4th Avenue, 426** and **710 East Street**, and **1227 Main Street**.]

Norway spruce (*Picea abies*) comes from northern Europe. It is the spruce of nearly all the big old windbreaks throughout the country. The cones are one to two decimeters long; the branchlets hang down as long pendants from the horizontal main branches; the leaves are short, blunt, and dark green; the skin of the newest twigs is a deep orange yellow. Two tall ones stand south of Chicago Hall on the Campus; there is a fine row nearly opposite the filling station east of town, and a very close windbreak a mile and a half north of Snow's Corner [at 6th Avenue and Penrose Street. Norway spruce are still very common in Grinnell. A row of them can be seen on campus west of **Mears Cottage**, as well as at **514 High Street, 334 East Street**, and **1117** and **1129 Spencer Street.**]



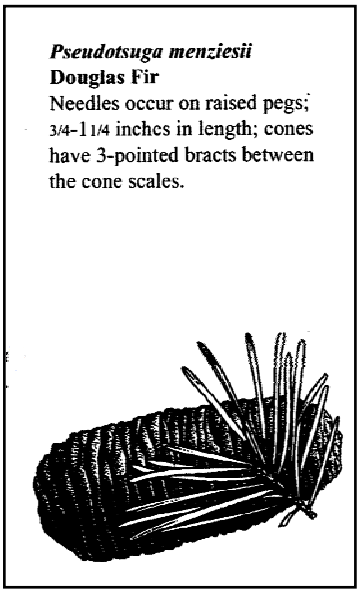
The native white spruce (*Picea canadensis* [*P. glauca*]) of Minnesota and eastward forms a broader, less spiry tree than the Norway. The branchlets do not dangle down; the leaves are of a dull ash or dusty green; the twigs are pale yellow; and, best of all, the cones are only 2.5 to 5 cm. long. When seeds, or seedlings are collected in western South Dakota, we call them Black Hill's spruce. They are believed to be hardier than their eastern brethren. They ought to be. Our finest white spruces are in the old windbreak of the Blakely farm two miles south of town [east of Highway 146 on 410th Avenue.] They are magnificent. A little one stands north of Goodnow Hall. It is a



good tree, but not quite so hearty as the other kinds. [One can find white spruce on campus northeast of the **Alumni Recitation Hall** and **north of Younker Residence Hall**.]

Is there an Engleman spruce in the vicinity? There ought to be. Much like Colorado blue but not blue, blunter leaved, and with the twigs downy when young. We have bought one and set it in the college nursery, but its identity has never been verified.

Easily distinguished from the four cornered leaves of the spruces are the flat leaves of the fir group. The Douglas fir (*Pseudotsuga taxifolia* [*P. menziesii*]) stands out from all the rest by its buds: very smooth, very sharp pointed, dark chocolate brown or mahogany. There is a handsome specimen in the Ricker front yard, 1510 Broad, a fine group on the east front of the Men's Gym, [southwest of **Noyce Science Center**,] and a long row east and north of Snow's Corner. Those eastward have mostly been beheaded by the telegraph linemen. Have we no protection from such vandalism? What should be done with the reckless tree-cutting lineman? He ought to be subdued. The Douglas fir is native from Colorado and Montana to the Pacific. It averages five to six feet in diameter on the Coast, and often reaches twelve feet. Will it do so here? Perhaps, in about two hundred and eighty years. The lumber passes as Oregon pine. The tree does very well about here, but always sheds its lower branches. It does the same in its mountain home. The cones are peculiarly beautiful in color, shape, and fringed decorations. [Look for Douglas fir across the street from **1131 Park Street** on campus.]



Hemlock (*Tsuga canadensis*), once so abundant from Minnesota to Nova Scotia and Carolina, is the most dainty and graceful of our evergreens. Each tiny flat leaf is on a tiny slender stalk, the lower part of which seems to be grown fast to the twig. The cones are tiny too. The branches droop and flutter like glorious plumes. There is a big one in the windbreak north of Number 32 just west of Laros' poultry farm; a

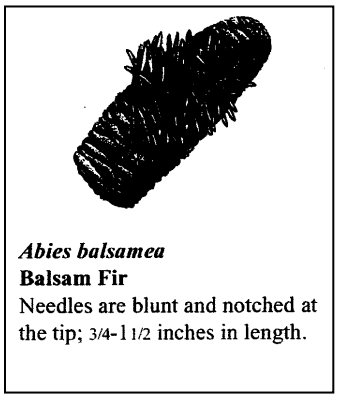
beauty at the old Woods place on the hill west of the Community Hospital; a fine one in John Iverson's front yard northeast of town; and a husky youngster in the back yard of the old Fellows place, 1126 East St. Why not more of them? [Beautiful hemlocks can be found southeast of **Noyce,** and in **Merrill Park**.]

The true firs, or balsams (*Abies*) are scarce and hard to grow. They have blunt, flat leaves, which shed off the branch so as to leave a round, pit-like scar; there is no leaf stalk. The buds are egg-shaped, smooth or resinous, yellow, and crowded so close as to run together; there are no leaves between as in spruces. The cones stand erect on the topmost branches of old trees, where they fall to pieces, instead of falling off the limb whole. I've seen cone-flowers at the Byers place on Main St. in Montezuma, but never any mature cones hereabouts. [Grinnell has at least two balsam firs that we know of. One is in **Merrill Park** north of the entrance sign and a very notable one (greater than two feet in diameter) at **Arbor Lake Park** on the east side with Norway spruce.]

Abies concolor
White (Concolor) Fir
Needles are somewhat pointed, curved towards the branch top and 1 1/2-3 inches in length; silver green in color.

The white fir (*Abies concolor*) has long, pale green leaves (3 to 5cm.) and forms a rather broad, squatty, cone-shaped tree. There's a big one in the south border at the Ricker place, **1510 Broad**; a group west of Chicago Hall; and others [including **715 9th Avenue, 1430 Broad Street, 1004 Elm Street**, and **1520 Linden Street**.] The tree is native of the central Rocky Mountains [and the Pacific Coast states].

Canada balsam (*A. balsamea*) is more tender than the white fir. The leaves are short (2 cm. or less), dark green, and deliciously balsam-scented. This is the tree that gives us our balsam pillows from Minnesota, Michigan, Canada and New England. [Balsam fir is native in northeastern Iowa on very steep, sheltered slopes.] A fine young specimen in the college nursery and one in the Fellows lawn, 1527 Broad, have lost their tops; winter killed. There is one in the cemetery, and some big ones along the road one-half mile south and one-half mile west of Westfield church.



Abies balsamea
Balsam Fir
Needles are blunt and notched at the tip; 3/4-1 1/2 inches in length.

In the college nursery there is a splendid young Siberian [or Veitch] fir (*A. vietchii*), the gift of Mr. E. S. George, brother of C. S., of Graettinger, Iowa. Mr. George is a nurseryman of the old school, a lover of trees. He has shared with us a lot of rare trees which probably exist nowhere in Iowa but in his place and ours. The Siberian [or Veitch] fir is a slender, spiry tree of great beauty, a moderate grower, hardy and healthy. Stanley Talbott got one from Mr. George. Some day it will be common enough; but as yet it probably cannot be bought. [Veitch firs are highly recommended as specimen trees in landscaping because of their hardiness and foliage. Does anyone have one of these splendid trees in Grinnell? The species is native to central and southern Japan.]

JUNIPERS AND ARBOR VITAES

8. *Thuja* Arbor vitae

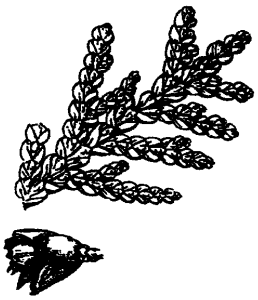
1.	Twigs horizontal with distinct upper and lower sides	*T. occidentalis*
1.	Twigs standing vertically, with both sides alike	*T. orientalis*

9. *Juniperus* Juniper and Red cedar

1.	Sprawling shrub, lm. tall or less	*J. horizontalis* **Horizontal juniper**
1.	Erect shrub; Leaves whorled in 3's, nearly at right angles to stem	*J. communis* **Common juniper**
1.	Tree with scale-like leaves or needle-leaves at a sharp angle with stem.	*J. virginiana* **Eastern red cedar**

The leaves of this group are not spirally arranged, but stand either opposite each other, two at one level on the twig, or three at one level. In arborvitae (*Thuja*) the leaves are minute and scale-like, and pressed close to the twig, and the whole twig is flat and leaf-like. In junipers (*Juniperus*) the leaves are often needle-like; if minute and scale-like, they are all alike, and in four rows, making the twigs nearly square. All of these trees have needlelike leaves when they are very young seedlings.

The only common arborvitae is the American (*T. occidentalis*) [or northern white cedar, native to the Great Lakes states, New England, and southeastern Canada.] The splendid dense hedge in front of the old Woods place, west on Number 32 is of this species, planted many, many years ago. It was as big as it is now when I first saw it in September 1906. The winter of 1925-26 killed a large part of it. But the fine little hedge just back of the filling station east of town is not over five years old. There are big trees of arborvitae along the road one-half mile south and one-half mile west of Westfield Church. There is one south of Chicago Hall; and many others [including one south of **Smith Residence Hall**, at **934 East Street**, one block north of **6th Avenue on East Street**, **920 High Street**, along **Nyanza Drive**, and at **Hazelwood Cemetery**. A columnar variety forms a living fence along the alley behind **Nollen House** on campus.]



Thuja occidentalis
Northern White Cedar
Leaves are flattened and only of the scale type; cones have 4-6 scales; foliage is light green.

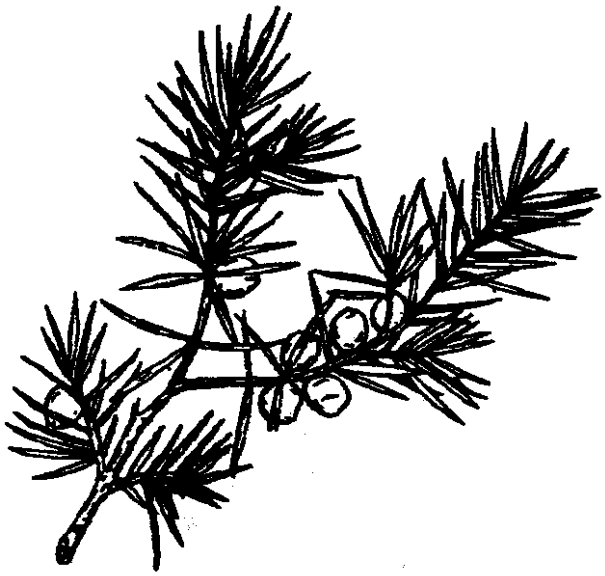
The European arborvitae (*T. orientalis*) is very scarce. I've bought it twice, but got the American both times. Mr. Skinner has some nice ones at the Grinnell Nursery. I saw a big one in bloom in Traer one April Sunday. The flat twigs of this species stand with their edges directed up and down, whereas the American species has the twigs usually horizontal. The real distinction is in the cones. But one very rarely sees cones hereabouts.

[A Western arborvitae (*T. plicata*) can be found growing southwest of a northern white cedar one block north of 6th Avenue on **East Street**.]

Of the junipers only one (*J. virginiana*) is a tree. The Virginia juniper or red cedar—the one of the cedar chest—grows wild from Iowa to New Jersey and Florida. There is a big one in Cooper School yard, [**north of 6th Avenue between East and Elm Streets**], a small one south of Goodnow Hall; and some very fine ones opposite the Woods place west of town and along by the old Willard place north of Laros's. [There are numerous red cedars along **Highway 6 west of Grinnell**, a row along the south boundary of **Hazelwood Cemetery**, and at **Arbor Lake Park**.] Young trees have needle-like leaves, dark green, and coming out at an acute angle from the stem. Mature trees have minute scale-like leaves. The trees are male and female the latter bearing quantities of small blue berries—food for the cedar waxwing. Red cedars are under the ban because they harbor the apple rust. They should not be planted within a quarter of a mile of an apple tree.

The horizontal juniper (*J. horizontalis*) is a low, dense, shrubby evergreen, ideal for base-planting around the house, or at the front steps. It never gets over three feet high, but spreads slowly along the ground. It was long known from Wisconsin to New England, but only two years ago was found growing wild in northeastern Iowa. It flourishes here. Two big old ones in the college nursery were destroyed by a grass fire. Let's have more of them (even if they are a trifle costly).

The so-called common juniper (*J. communis*) will always be uncommon here. It is an erect shrub with many branchlets like a whiskbroom set on its handle. The leaves (about 1 cm. long) are set three at each level, and nearly at right angles to the stem. Each leaf has a whitish, waxy line along the upper side. This species is too tender for our climate. It died for me and for Mr. Rusk and for Harry Harris. But one survives at 909 Elm St., and several appear to be flourishing along the orchard of the old Jones (more recently Hadley) place at Jones' Grove. Shall we try it again? [Today's authorities note that Iowa's native junipers are confined to the northeastern portion of the state, on dry, stony bluffs overlooking the Mississippi River. Common juniper, and related species and varieties, are planted as ornamentals.]



Juniperus communis
Common Juniper
Leaves are awl shaped; cone is dark blue and berry-like.

DECIDUOUS EVERGREENS

Don't mind the title. The trouble is, Mother Nature taught a lot of the near and dear relatives of the pines and spruces to drop their leaves in autumn, like other modern trees. And so we have the ginkgo, the larches, and the southern cypress.

7. *Taxodium* Southern cypress or Baldcypress

1.		*T. distichum*

2. *Larix* Larch and Tamarack

1.	Cones 2.5–3 cm. long; tree symmetrical	*L. decidua* **European larch**
1.	Cones 1-2 cm. long; branches and trunk crooked	*L. laricina* **Tamarack**

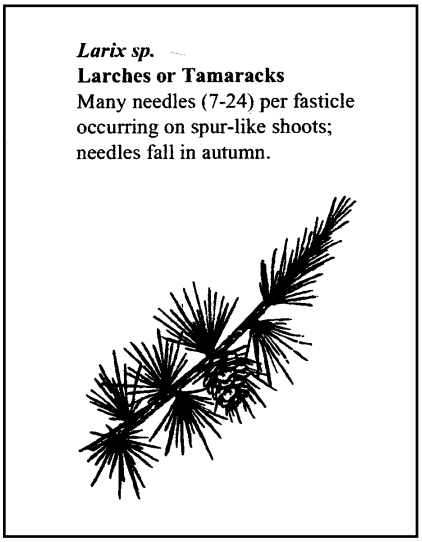
1. *Ginkgo* Maidenhair tree

1.	Introduced from China	*G. biloba*

There is only one southern cypress (*Taxodium distichum*) in town or within two hundred miles, I imagine. That daring soul, Dan Bradley, planted it on the Campus south of **Goodnow Hall** some twenty-five years ago. The tree grows naturally to enormous size in the warm or hot reeking swamps of the Gulf States. It comes up into Dismal Swamp in Virginia, and into southeastern Missouri along the Mississippi. It rather likes three feet of water over its roots. Then it sends up great woody cones— the famous cypress knees—above the water for breathing. Yet here the thing grows, high and dry on the Iowa prairie. Impossible? Yes, but true. Our little tree is about fifteen feet tall, slender, with

blackish, shreddy bark. The tiny twigs have fine green leaves lined up closely on either side, like barbs on a feather. In autumn the entire feathery twig drops off with the leaves, and you can find them on the ground still, at the base of the tree. I dare anybody else to plant a cypress. [There are several baldcypress growing in Grinnell now. The tree south of **Goodnow** is currently 44 inches in diameter. At one time, a groundskeeper dug a trench around the tree to water it in the fall. He was concerned that the tree was losing its leaves! You can find baldcypress growing in the yards of **1202 Hamilton Avenue**, **1228 Spring Street**, in various places on campus, and north of the **Grinnell Middle School.**]

You recognize the larches (*Larix*) by their very evergreen-like growth, all leafless in winter, and with many small brown cones over the branchlets. You can tell the European larch (*Larix decidua*) a mile away by its splendid erect trunk and straight horizontal branches. Remember those on the hilltop on the road to Jones' Grove? There are fine ones on the south Campus, too, [south of **Burling Library**, south of the drive.] Close up, you notice that the branchlets are all covered with little knobs where the clustered leaves used to be, and will be again next summer. And the cones are 2.5 to 3 cm. long-as big as the last joint of a big thumb. The tree is native of northern Europe, and is the only common larch hereabouts.



For the American larch or tamarack or hackmatack (*L. laricina*) of the bogs from Minnesota to Maine, and far up into Canada, is a rare tree here. It always, with us, has a crooked trunk, and astonishingly crooked, curley branches and branchlets. But the best sign is the cone. The cones of this larch will just about cover your little finger nail. They have only eight or ten scales. There is a fine specimen in V. G. Preston's yard 1807 Fourth southwest corner, near the street; and another on the south Campus [south of **Burling Library**, north of the

drive;] and two young ones at the entrance to the Matlack place, 1510 East. We ought to have more, even if they are not very stately.

Finally, Ginkgo-the strangest tree in the world. There is one south of Goodnow Hall, one north of **Blair Hall** [north of **Bucksbaum Center for the Arts,**] and two magnificent ones on the old J. E. Neely place at **Fifth Ave. and Pearl St**., just west of the house. [Ginkgos are often planted in urban areas now because of their ability to tolerate air pollution. Trees of various sizes can be found throughout Grinnell including at **1803 5th Avenue**, **927 Elm Street**, and **1215 Main Street**. A specimen with an unusually shaped crown can be seen near the northwest corner of **Darby Gymnasium** on campus.] Ginkgo is totally extinct in the wild state, and was saved for us by the temple priests of China and Japan. It has the growth of an evergreen; has stubs on the branches like a larch; has leaves half as big as your hand, deeply notched at the outer end, and with the fine forked veining of a fern.

Hence it is often called "Maidenhair Tree." In fact, ginkgo is many ways intermediate between pines and ferns—a veritable "connecting link" –a direct descendant of the great, strange trees of the coal period. Ginkgo does not flower or fruit until about thirty years old; I've watched the Neely trees every May, but no blooms yet. The flower is dull greenish, insignificant. The seeds are plum-like, with yellow meat that smells like concentrated rancid butter. Frank Thone sent us a lot last fall from Washington, D. C., where ginkgo is a very successful street tree. But both flower and fruit are precious to the botanist. For they tell the story of the antiquity of the species and its kinship with the ferns. The kernel of the seed, as big as a kidney bean, is eaten by the Asiatics. And the rancid pulp around the seed is rubbed on meat before cooking to make it tender; for it contains a digestive enzyme.

Broad-Leaf Trees

Perhaps it would be as well to say "deciduous" trees. Anyway, we mean in this and succeeding pages to describe the rest of the trees—those that we have not described as evergreens. Legally they are "hard woods", just as the evergreens are "soft woods". Now it makes no difference if cottonwood or willow wood is softer than pine flooring. The former are "hard woods", and the latter a "soft wood" before the Law. That isn't because the courts are determined always to ignore facts. It is an attempt to find vernacular names for the big words used by scientists. But I guess you know what kinds of trees we are talking about. If you don't just read on and find out.

Winter is an excellent time to learn to know even the deciduous trees. There is little else of plant life to enjoy at this season. And at no time can you see the outlines of the trees so well.

The first step in recognizing trees with accuracy is to notice whether the leaves and branchlets are placed alternately or oppositely or whorled on the twigs. If you can get hold of a twig it is easy to see by the leaf scars and buds. If there are no branches within reach, and no broken ones lying on the ground, you can tell by looking at the twigs as sharply outlined against the sky. If many branchlets are oppositely placed, even if not all, you may safely assume that opposite is the rule. If none are exactly opposite, your leaves have been alternate, one at a node.

The next thing to notice, in actual practice, is the size, that is, diameter, of twigs and buds. You can get measurements if you like, but as soon as possible get the idea in mind. You don't recognize me because you know I am 5 feet, 9 ¼ inches tall. But if you see a 5 foot 7 inch man, you would never think of me. As a matter of fact, the first thing in recognizing a man is a sense, quite unexpressed perhaps, of his size. It is the same in recognizing trees. You know them by the size of the buds, the twigs, the mature trunk, the size of the scales or ridges of the bark. When you look more closely, still other characteristics

become evident, and by this you make sure of your recognition - just as you do with folks. Of course, the leaves, flowers and fruits of trees give the surest means of recognition.

Key to Hardwood Trees (Angiosperms)

1.	Leaves whorled, 3 at a node; trees with long slender pods	**1.** *Catalpa*
1.	Leaves opposite, 2 at a node	**2**
1.	Leaves alternate, one at a node	**5**
2.	Twigs and buds very large (1cm. thick)	**2.** *Aesculus*
2.	Twigs medium size, buds small, brown-velvety	**3.** *Fraxinus*
2.	Twigs medium to small; buds plainly seen, hairless or nearly so	**3**
3.	Buds 2-3 cm. long, 3-4 mm. thick, taper-pointed: shrub or small tree	**5.** *Viburnum*
3.	Buds much smaller	**4.**
4.	Large trees at maturity (except one); leaf scars with 3 dots.	**4.** *Acer*
4.	Small trees (10-15 ft. tall) with large lenticels	**6.** *Syringa*
4.	Small trees (6-8 ft. tall) with indistinct lenticels	**7.** *Euonymus*
5.	Twigs coarse, 1 to 3 cm. thick	**6.**
5.	Twigs less than 1 cm. thick	**8.**

6.	Twigs dark velvety; scarcely a tree	**8.** *Rhus*
6.	Stems prickly all over; scarcely a tree	**9.** *Aralia*
6.	Twigs more or less white waxy	**7**
6.	Twigs yellowish green, smooth barked	**10.** *Ailanthus*
7.	Twigs angular, reddish, slightly waxy; scarcely a tree	**8.** *Rhus*
7.	Twigs round, completely white coated; becoming a large tree	**11.** *Gymnocladus*
8.	Branches bearing definite smooth thorns	**9**
8.	Thornless, or only with rough, pointed short branchlets	**12**
9.	Two short stout thorns at each node on sprouts and suckers	**12.** *Robinia*
9.	One woody thorn at a node	**10**
10.	Thorns with 1 or 2 branch thorns at base	**13.** *Gleditsia*
10.	Thorns unbranched (except on trunks); small trees	**11**
11.	A blackish thorn 2 cm. long at every node	**14.** *Maclura*
11.	Thorns 3 to 6 cm. long, not at every node	**15.** *Crataegus*
12.	Bark peeling regularly in white or yellowish papery sheets	**16.** *Betula*
12.	Bark shedding large, thin, brittle sheets, leaving white or greenish patches	**17.** *Platanus*
12.	Bark various, not distinctly peeling off in sheets	**13**
13.	Bark throughout life smooth, never ridged or scaly	**14**
13.	Bark smooth and conspicuously light colored above (to 2 or 3 dm. diameter) in heavy, blackish ridges and furrows below	**18.** *Populus*
13.	Bark soon becoming ridged or scaly	**15**

14.	Small tree with catkins all winter	**19.** *Carpinus*
14.	Small tree without catkins; buds small, pressed close to stem	**20.** *Amelanchier*
14.	Large cultivated tree with slender pointed buds 1 to 2 cm. long	**21.** *Fagus*
15.	Catkins present all winter	**16**
15.	No catkins in winter	**17**
16.	Bark scales dark brown, 4 to 6 cm. wide; old cone-like fruits present	**22.** *Alnus*
16.	Bark scales whitish, 1 cm. wide; fruits if present, resembling hops	**23.** *Ostrya*
17.	Leaves and branchlets 2-ranked (in 2 rows)	**18**
17.	Leaves in 3 or more rows	**22**
18.	Bark lumpy, or broken and rough ridged	**24.** *Celtis*
18.	Old bark scaly, or regularly ridged and furrowed	**19**
19.	Branchlets (to 5 cm. thick) yellowish-granular	**25.** *Morus*
19.	Branchlets blackish gray	**20.**
20.	Twigs very numerous, 2-4 cm. apart, giving the “fish-bone” effect	**26.** *Ulmus*
20.	Twigs 10 to 20 cm. apart, not so conspicuously 2-ranked	**21**
21.	Buds as broad as long, smooth, reddish	**26.** *Tilia*
21.	Buds oval, 4 to 6 mm. long, dark brown	**28.** *Castanea*
22.	No true terminal bud, the last bud belonging to a definite leaf scar	**23**
22.	True terminal bud present, with subtending leaf scar	**24**

23.	Buds indistinct; twigs crooked at every node	**13.** *Gleditsia*
23.	Buds easily seen, covered by several scales	**29.** *Prunus*
23.	Buds easily seen, covered by one scale, and on long, slender twigs	**30.** *Salix*
24.	Larger lateral buds clustered about terminal	**31.** *Quercus*
24.	Lateral buds scattered along twig	**25**
25.	Terminal bud covered by two equal (stipular) scales	**26**
25.	Terminal bud showing several scales	**27**
26.	Terminal bud large, conical, furry	**32.** *Magnolia*
26.	Terminal bud flat, smooth	**33.** *Liriodendron*
27.	Branchlets smooth and polished, green for 3 or 4 years	**34.** *Sassafras*
27.	Branchlets not green after leaves fall	**28**
28.	Twigs stout, 5-10 mm. thick	**29**
28.	Twigs slender, 2-5 mm. Thick	**31**
29.	Buds sharp pointed, varnished and sticky	**18.** *Populus*
29.	Buds stout, never sticky; pith more or less chambered	**30**
30.	Pith chambered throughout the twig	**35.** *Juglans*
30.	Pith chambered only at nodes	**36.** *Carya*
31.	First (lowest) scale of lateral bud facing out directly away from twig	**18.** *Populus*
31.	First scale not facing directly outward	**32**
32.	Twigs with irregular thin ridges of cork 1 cm. high	**37.** *Liquidambar*
32.	Bark not winged	**33**

33.	Bark becoming shred-like or stringy; twigs scurfy	**38.** *Elaeagnus*
33.	Bark rough or scaly	**34.**
34.	Fruit a prickly bur; bark in long flakes 3 to 5 cm. wide	**27.** *Castanea*
34.	Fruit fleshy, more or less globular; no burs	**35.**
35.	Bark in small scales; lenticels small, elongated lengthways of branch	**39.** *Pyrus*
35.	Bark tending to curl horizontally; lenticels elongated crossways of branch	**29.** *Prunus*

1. *Catalpa* Catalpa

1.	Tree straight. Pods 1 cm. thick, 3-18 dm. long	*C. speciosa* **Hardy catalpa**
1.	Tree crooked. Pods 5-7 mm. thick, 2-3 dm. long	*C. bignonioides* **Common catalpa**
1.	Shrub grafted on a tree trunk	*C. bungei* **Umbrella catalpa**

Of course you don't have to hunt up leaf scars in order to know a catalpa. The long slender pods dangling from the coarse branchlets give it away. And in the pods the pale flat seeds with fringed ends. Early in May the pods split open, and the seeds flutter out and are blown away, just at "planting time." Then comes the rose-breasted grosbeak and pecks out the last remaining seeds and plants them in his gizzard. Did you ever think that some places they don't have rose-breasted grosbeaks? What a glory they miss. "Count your blessings." Young catalpas, or trees without pods, can be recognized by the leaf scars in whorls of three, that is, three at one level around the twig.

There are two—maybe you'd say three—kinds of catalpa in Grinnell. The common catalpa (*C. bignonioides*) is always crooked or leaning, forked, and rotten at the heart. The pods are about as long and

thick as a lead pencil. It is a worthless weed of a tree, though gorgeous with white bloom in June. Maybe it is just irregular and picturesque. There is a lot of them in the middle of the south Campus. This is an American tree, native from Tennessee, and Arkansas southward.

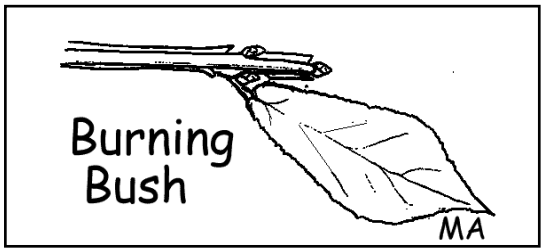
Hardy catalpa (*C. speciosa*) has a straight, erect trunk, and is one of the most durable woods known. It will make good fence posts in twenty years from the seed, and the posts will "last forever." When a crop of posts is cut, the stumps will sprout, and another crop can be cut in fifteen years,—and so on every fifteen years. The pods of hardy catalpa are over a centimeter thick, and from 3 to 7 dm. long. The seeds are big, too. This species is native in the middle South: Illinois and Indiana to Mississippi and Louisiana. There is a grove on the Spalding farm north of town, a younger grove on the Mason place, west on 12th avenue. Sample specimens can be seen on 9th Avenue west of Summer, Hamilton Avenue east of Park, and 1013 Pearl Street. [Today one can find catalpas at **1731 3rd Avenue**, **1028 Elm Street, 1432 Main Street, 403 Park Street, 1228 Spring Street**, and off the northwest corner of **Park Street and Washington Avenue**.]

The umbrella catalpa, sold by nurserymen as *C. bungei*, is the one in Prof. Pierce's south border, 1414 Broad. [George L. Pierce was professor of music from 1907-1942.] It is really a shrubby form of *C. bignonioides* grafted on a sapling of *C. speciosa*. Make one for yourself, if you admire it. The true *C. bungei* has clusters of very slender pods, much slimmer than a lead pencil. It grows at St. Louis, and at Denison, Iowa. It is a nice little tree. Why has no one got it here? Get us one.

OPPOSITE LEAF TREES

Catalpa is our only tree with whorled leaves, three at one level on the stem. And very few trees have opposite leaves–only three genera of real trees (*Aesculus*, *Fraxinus*, *Acer*), and three more of small treelike shrubs or shrub-like trees (*Euonymus*, *Viburnum*, *Syringa*). What is a shrub and what is a tree? Well, any definition is sure to be arbitrary.

But it is usually put thus: A tree is a perennial woody plant with only one stalk or trunk from the ground. A shrub is such a plant with two or more stalks from the ground, clustered on the same root. So the "burning bush" (*Euonymus atropurpurea*) northwest of Blair Hall is a tree, though only six or seven feet tall. The Siberian maple or common lilac is a tree or a shrub according to how you plant and prune it.



2. *Aesculus* Horsechestnut and Ohio buckeye

1	Buds varnished, sticky	*A. hippocastanum* **Horsechestnut**
1	Buds smooth, not varnished	*A. glabra* **Buckeye**

I spot the buckeyes and horsechestnuts at this season by their huge end-buds. But they have equally huge leaf scars, with five to nine dots arranged in the shape of a horse shoe—bundle scars, where the veins for the leaf broke off. Horsechestnut has the buds very sticky, like fresh varnish. It is native of Europe, and is much used over there as a street tree. In Paris the whole tree top is pruned, so that the Champs Elysees has a kind of huge broad hedge all along above your head. Such formal trimming is fitting for the formal geometrical outlines of the street and parking and sidewalks, and the long rows of quite uniform buildings on either side. It wouldn't do in America. Our largest specimen of horsechestnut is at Center Street and Fourth Avenue. There is one at 1121 Main, and a group northeast of the College library. [You can find a very large specimen on campus southeast of **Burling Library** and a 'Briotii' variety with red flowers at **932 Elm Street**.]

Buckeye has smooth brown buds with no sign of gum or varnish. Mr. Marsh has the biggest one in town, in his back yard, **833 East**

[Marsh House Bed and Breakfast.] It is the grand child of a wild Pennsylvania stock twig. And since from Columbia County sixty years ago were planted in Marshall County, Iowa. Mr. Marsh's tree is a seedling of the one in Marshall County. There is another in the College nursery, from seed of a fine tree at Dillon, Iowa, gathered in March, 1907. The biggest buckeyes I ever saw with trunks eight inches through, are just southeast of Des Moines, in the river bottom. But our Ohio friends may have seen bigger. [One can visit **406 4th Street, 1314 Reed Street**, and **1332 Reed Street** for more examples of buckeyes.]

3. *Fraxinus* Ashes

1.	Leaf scars notched above; bark grey	*F. americana* **White ash**
1.	Leaf scars semicircular; upper bark coppery	*F. lanceolata* or *F. pennsylvanica* **Green ash**

The green ash is one of our commonest street trees. Beside the coarse opposite twigs and small velvety buds, we recognize it by a coppery color on the branches, best seen when three or four inches in diameter. The symmetrical paddle-like seeds [samaras] hang on the trees all winter, and are easily recognized. But the trees are male and female, so many of them never bear seed. There are two fine ones in front of Stewart Library, and a queer, broad-seeded one at Eighth and Park. This ash is common in the timber of Iowa and

eastward, [and still as a street tree in Grinnell. There are very large specimens at **1534 Spencer Street** and in the parking on the east side of **Spencer between 9th and 11th Avenues**. A male tree can be seen at **1405 Park Street**.]

In the blackberry bed beside the path in the Botanic Garden is our only white ash (*F. americana*). [The Botanic Garden was located at the present site of St. Paul's Episcopal Church at 6th Avenue and State Street. Find white ashes on campus off the southeast corner of **Burling Library**, southeast of **Quad Dining Hall**, west of **Mears Cottage**, and northeast of the railroad crossing on **8th Avenue**. There surely are many others in Grinnell. They can easily be distinguished from green ash in the fall when the white ash leaves turn maroon and the green ash leaves turn yellow.] And around Des Moines the rather scraggly black ash (*F. nigra*) may be seen. We ought to have several of these interesting species in Grinnell.

4. *Acer* Maples and Boxelders

1.	Flower buds clustered beside leaf buds; trees	**2**
1.	No flower buds visible; trees	**3**
1.	Shrub 5-10 ft. tall	*A. ginnala* or *A. tartaricum* **Siberian** or **Amur maple**
2.	Buds small (2 mm); bark smooth	*A. rubrum* **Red maple**
2.	Buds large (3 mm); bark scaly	*A. saccharinum* **Soft** or **Silver maple**
3.	Leaf buds very sharp pointed	*A. saccharum* **Hard** or **Sugar maple**
3.	Leaf buds broad and oval	**4**
4.	Twigs smooth and shining or waxy, greenish	*A. negundo* **Boxelder**
4.	Twigs dull brown	*A. platanoides* **Norway maple**

Look at the dry seeds that hang on the trees, a pantry for the squirrels all winter. See the lop-sided wing of the seed, on the same pattern as the big blundering seeds of soft maple that fall in the first shower of June. Throw a boxelder seed to the wind and see it spin its way to the ground just like a maple seed. If that isn't enough, compare the woods—with a microscope, if you like. Yes, they, are first cousins, and well deserve the same name *Acer*.

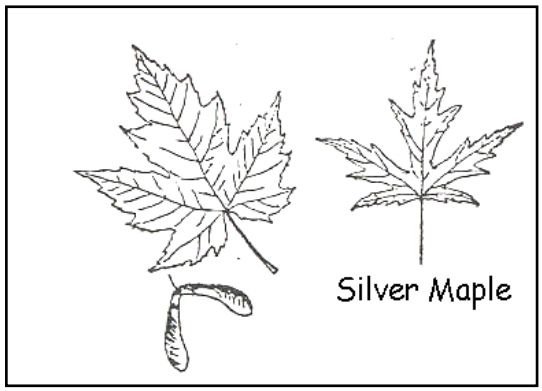
I separate the maples from other trees in my own rambles by the medium sized or small twigs, rather smooth and evenly cylindric, and the distinct buds. It's all in the key. As to different kinds of maple, there is more to be said.

Speaking of boxelder, most of us recognize it by its rather irregular unkept appearance; trunk soon giving away to a broad bushy top; often leaning. The bark is close and hard, with ridges and furrows a centimeter wide and deep, nearly black by nature, but usually greenish by reason of a fine powdery growth of algae. What are algae? Well, for instance, the green powdery growth on boxelders, elms, etc., and the green scums in Arbor Lake. Close up, boxelder twigs are very smooth, purplish or greenish, with more or less of waxy "bloom" like that of a grape. The twigs retain this smooth, shiny surface for three or four years, a condition found in no other tree hereabouts, except our one lone Sassafras in the Botanic Garden. Boxelders are male and female, too. Southwest of Chicago Hall are two big ones, Mr. and Mrs. There are others all over, too numerous to mention. They grow wild everywhere in Iowa, and far up into Alberta, and east to New Jersey. [Look for boxelders at **611 Pearl Street**, at **Lake Nyanza** and **Arbor Lake**, northeast of the railroad crossing on **Reed Street**. A huge one with a gnarled trunk grows at **605 Reed Street.]**

Siberian [or Amur] maple is really a shrub. There is a group around the bird fountain at Cooper School, and a big old one south of the big concrete bridge at the entrance to Hazelwood Cemetery. It is worth having for the brilliant red and orange foliage in autumn. [There are outstanding specimens on campus off the northwest corner of **Norris Hall**. Also find them in **Miller Park** south of **Nyanza Drive** off the one-way road, and at **Arbor Lake Park,** north of the trail around the east arm of the lake.]

The other four maples go two and two, as the animals went into the ark: Soft maple and Red maple; Hard maple and Norway maple.

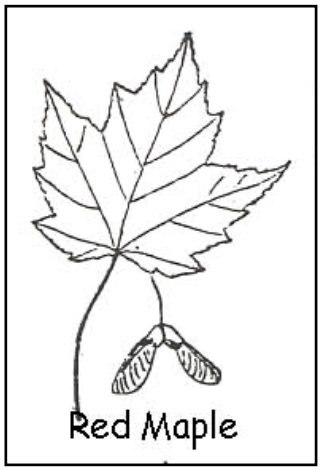
Soft maple should be called Silver maple, according to the official name book of the American Nurserymen and others. It is too common to describe or locate. But we recognize it chiefly by the big clusters of flower buds on the upper twigs. Each leaf scar has its proper bud, and another on each side. And since the leaves are opposite, this makes six buds at each level (node) on the twig. And since the nodes are often only a few millimeters apart, the buds stand in almost solid masses. This species was first brought to scientific notice about 1750 near Philadelphia. It grows wild on river banks all over the eastern United States, and out into Nebraska. The wood is brittle, and the tree begins to break to pieces at about 40 years of age. It will drag along for many years more; but if sentiment does not prevent, over-mature trees should be cut out and replaced before they fall over and do real damage. As to sentiment, I would keep the old cyclone tree south of Mears Cottage until the last particle moulders into dust. [Silver maples are extremely common in Grinnell. Check **Arbor Lake Park** for several examples.]



Wier's cutleaf weeping maple is an ornamental form of soft or silver maple, with very deeply cut leaves, and long, dangling, drooping branchlets. There is one near 7th and Broad in the south yard of the old Lyman place, and a very fine vigorous specimen out at Park

Skinner's—or Skinner's Park; for the Grinnell Nursery [which was probably located near Penrose and 4th Avenue] is quite a museum of trees, shrubs and flowers. [Let us know if you ever see one of these cutleaf weeping maples!] Soft maple is the very first thing to bloom in the spring; average date March 18 to 20.

The red maple is a tree of marshes and meadows, from southeastern Iowa to the Atlantic, and south to Florida. There are two specimens, Mr. and Mrs., at the east end of the south Campus—fine healthy little trees—which are brilliant with bloom in the last week of March, or first week of April. They have clustered buds like those of the silver maple, but only half as big. The leaves, flowers and seeds of the two species are very different. [The brilliant red fall color of two red maples can be seen on **Park Street** opposite 7th Avenue in October. Look for more examples at **Hazelwood Cemetery** southeast of the bridge, and at **305 1st Avenue**.]



Hard maple is properly called Sugar maple, according to the name book. For it is the one commercial source of maple sugar and syrup. Some tolerable sugar and syrup can be made from silver maple, but not enough to pay. We recognize sugar maple at this season wholly by the very sharp usually slender, dark brown buds. Of course the bark on young and old parts is characteristic. So are the barks' of all the trees. But these characteristics are usually quite indescribable. So you will have to see and learn them for yourselves. There is a fine row of young sugar maples along eighth Ave., north of the Campus; big ones in Almy's yard 436 East; two in front of **1102 Broad**; and many others. There are a few on Sugar Creek still, and wonderful groves along the Iowa River. The tree flourishes best in Ohio and New England, but is widespread over the eastern United States. Maple flooring comes from this tree, and so does

birdseye maple. But nobody knows what makes it birdseye. And nobody can tell whether it is birdseye till it is cut and sawed.

[Sugar maples are excellent shade trees and are planted quite commonly throughout Grinnell. There are around 34 cultivars, with many variations in growth habit, leaf color, leaf shape, fall color, and drought and disease resistance. The charcoal of one variety is used to filter Jack Daniels Whiskey. Has anyone tried to tap a tree in Grinnell for sap?]

Norway maple, of northern Europe, has a broad round top, with bark and branches resembling sugar maple. It is easily distinguished by its big rounded green or reddish buds, as broad as long, and rather stouter than the twig itself. They are quite numerous about town, for example, at the old Tripplett place on First Avenue west of East street; just east of Blair Hall; northwest of Prof. Lavell's house 1224 Sixth in the parking of the vacant lot. There is a red leafed variety of this which is quite popular, known as Schwedler's maple. If you want a red leafed maple like that in Mrs. Paul Peck's yard, **913 High**, or Prof. Spencer's south yard at 7th and Park, or in the circle at Merrill Park, [or at **1332 Spencer Street**, **918 Hamilton Avenue**, and **433 Park Street**,] be sure you order Schwedler's. If you order red maple you will get *Acer rubrum*, as one of my friends did; its leaves are pure green; it gets its name from the flowers. [Cecil F. Lavell was professor of history from 1917-1943 and Edward B. T. Spencer was professor of Greek from 1911-1941.]

5. *Viburnum* Black haw or Nannyberry viburnum

1.	Small tree or shrub	*V. lentago*

6. Syringa Tree lilac

1.	Branchlets drooping; bark olive	*S. pekinesis* **Chinese tree lilac**
1.	Branchlets stiff, erect or spreading; bark blackish	*S. japonica* or *S. reticulata* **Japanese tree lilac**

7. Euonymus Burning bush or Wahoo

1.	Fruits purple, with scarlet seeds	*E. atropurpurea*

Just a word about the LITTLE trees with opposite leaves. The wild black haw, named for the bunches of black berries with one big seed in each, is often seen in our woods with a distinct trunk and round top. The one beside the path at the north end of the Botanic Garden, and those in Pres. Main's back yard are only shrubs, suckering freely. The wild "burning bush" or wahoo grows along Skunk River. The one northwest of Blair Hall has been there twenty-five years and is about seven feet tall. It bears 3 or 4-lobed purplish pods which split like bittersweet berries, revealing scarlet coated seeds. [There are several burning bushes on the east side of the campus parking lot a block north of 6th Avenue on **East Street** and **south of the college track**.]

The tree lilacs are not at all appreciated about here. There is a splendid Japanese tree lilac coming on at the southeast corner of President Main's house—the only one in town. At Iowa City and in Minneapolis it flourishes and bears white lilac flowers in masses twice

as big as your head, about the fourth of July. Better get one. The Chinese tree lilac was introduced here a few years ago by Mr. Skinner. I think he still has one. He gave one to the Botanic Garden, where it has grown splendidly, beside its relatives the common lilac, the privets, Forsythias and fringe tree. And Paul Smith planted a couple south of the house at 1333 Elm. That finishes the trees with opposite leaves. [Visit **9 College Park Road** for a couple examples of tree lilacs in the Tabberts' backyard.]

TREES WITH ALTERNATE LEAVES AND VERY STOUT TWIGS

8. *Rhus* Sumac

1.	Branchlets velvety, blackish	*R. typhina* **Staghorn sumac**
1.	Branchlets white-waxy	*R. glabra* **Common sumac**

The trees with conspicuously stout twigs are rather scarce hereabouts. There are two real trees (*Ailanthus* and *Gymnocladus*) and two which are trees only by courtesy of our definition (*Rhus* and *Aralia*). The sumacs are quick growing things, and they sucker very much from their roots, forming thickets. In the garden this means that they come up all around where you don't want them. But then of course you can dig them out. They all have a gummy resinous sap in the bark.

The wild sumac of this region (*R. glabra*) has all along the twigs little shelf-like bumps on which the lateral buds are set. And many of the branches end in a big erect bunch of small red velvety fruits in autumn—"When the down is on the thistle and the sumac plumes are red." The plant isn't worth having in your garden, but it makes a great show of scarlet foliage and crimson fruits along our prairie hillsides in October. There is a finely cut-leaved variety that might deserve

cultivation. I've tried to get it, but never yet succeeded. Try it. The wild kind may be seen near the north end of the path in the Botanic Garden, and out along the County Line.

But the staghorn sumac (*R. typhina*), especially the cut-leaved ("fern leaved") variety, is commonly cultivated. There is a clump in the southwest corner of the lawn at 1114 Main. There is a great clump of them, really tree-like, back of the post office. Both varieties are in the Botanic Garden north of the tool house. [There is a cut-leaved sumac in the front yard of **624 Pearl Street** that may be *R. typhina* or *R. glabra*.] Ask advice of Prof. Rusk before you plant any. If he thinks it is worth while, go ahead. Personally, I think it suckers too much. [William J. Rusk was professor of mathematics and astronomy from 1901-1942.]

9. *Aralia* Hercules club

Hercules Club (*A. spinosa*) is another bad one to sucker. The great ungainly prickly stalks are anything but beautiful at this season. There are few branches or none, and the shoots are 2 or 3 cm thick. Notice the two in Pres. Main's south border, or the clump right in front of the front door at 1510 Broad or the giants just west of the Loggia at the Women's Quadrangle. In summer each shoot bears a circle of enormous leaves divided almost like a tree fern; and above this appears an equally enormous cluster of minute greenish flowers, followed by small black berries. The effect is almost tropical, reminding one of palms and tree ferns. For this reason, *Aralia* has an important place in the garden.

I once got from Ames what purported to be the Chinese Hercules Club (*A. chinensis*); but I never could tell one from t'other. Come over to the Botanical Garden and see if you can. We have in the apple and thorn bed, by the willows, a newly introduced "Club" from the U.S.

Dep't. of Agriculture. It is *Aralia* (or *Echinopanax*) *ricinifolia*; it is a very striking thing, and if it ever suckers, I'll give you one. I don't know any other way to get it. [Native to eastern Iowa, Aralia is considered a novelty plant in landscaping because of its large leaves and clubby stems. Ask permission to see an *Aralia* at **1327 Park Street**. Are there any others in Grinnell?]

10. *Ailanthus* Tree of heaven

The ailanthus or tree-of-heaven (*A. glandulosa* or *A. altissima*) often becomes a large tree. I knew one two feet in diameter near Philadelphia. It suckers badly; that big one sent up a shoot in our neighbor's parlor. The Morrison ailanthus at 1121 Park St. has already got under the porch. Look out. There is another—with the top broken out—south of the post office; another in the Warburton north border 1303 Park, a group at Fourth Ave. and Center St., northeast of the house on the northeast corner. [You can find one now at **610 Pearl Street**, **309 2nd Street**, and in various locations along the **Iowa Interstate railroad tracks**.] You recognize it by the enormous growth in one season—often 6 or 8 ft.; by the yellowish green, speckled bark on young shoots; and by the huge leaf-scars 1 or 2 cm. across. And the soft inner bark has a nasty smell. The trees are male and female, the former being very smelly indeed, especially when in bloom. Try to get the seed bearing kind. Ailanthus is native of south-eastern Asia and adjacent islands, so we can not be surprised that it is often winter killed here. In the southern corners of the State it seems perfectly at home. [Tree-of-heaven is a highly invasive species that should not be planted in Grinnell. As Conard said, it suckers badly.]


Tree-of-heaven

11. *Gymnocladus* Kentucky coffeetree

Of this genus there remain just two species on the face of the earth. Our Kentucky coffee tree (*G. dioica*) is native of the southeastern United States. The other (*G. chinensis*) is native of southeastern Asia—just a hemisphere apart—two sisters separated by time and fate. (Names of trees are feminine in Latin, aren't they, Miss Korns). Our finest Kentucky coffee tree is just south of Prof. Almy's house, 436 East. [Frank F. Almy was professor of physics from 1893-1932.] Prof. Norris has another back of his house, **816 East**. He beheaded it in the fall of 1924 without my permission. [Harry W. Norris was professor of zoology from 1888-1941.] I have some sucker plants in the Botanic Garden to give away. [There is a superb female tree off the southwest corner of **East and 5th Street** and young specimens on the west side of the **Poweshiek County Fairgrounds** and northwest of **Mears Cottage** on campus. Find a male tree at **1705 4th Avenue**, which may be the largest one in Iowa.]

You see a fine grove of them from the train on your way to Des Moines, about a mile this side of the [Iowa State] Fair Grounds. The branches are so big and coarse that the tree looks very naked; hence the name, which means "naked branch." The youngest branchlets are white with wax as if white-washed; that is our chief recognition sign.

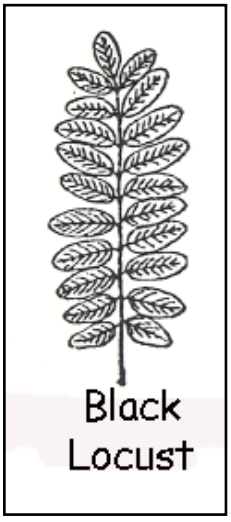
The bark is in graceful little curly plates, with exquisite tints of brown between. Old trees bear great heavy pods a decimeter or more long, 3 or 4 cm wide, nearly one cm thick, inside which are blackish beans as big as your finger tip and as hard as iron. Rub one on a stone, then touch it to the back of your hand. It feels like a red hot poker.

TREES WITH REAL SMOOTH THORNS

There are only four main groups (general) of these, easily distinguished by the key. Wild crab apples and wild plums will tear you up as bad as real thorns; but they are not considered here; their thorns are little rough stubby branchlets.

12. *Robinia* Black locust

The black locust (*R. pseudoacacia*) must get its name from the blackish, ridged and furrowed bark. For the flowers are those lovely hanging clusters of white sweet peas that make the whole tree glorious in early June, and scent the air for a block with delicious perfume; from which also the bees collect a thin**,** water white honey of most delicate flavor, which never (?) turns to sugar. This is one of the three American trees most frequently cultivated in Europe. The British call it Acacia, and Shelley says "the acacia drops a milk white bloom at the gate." It grows wild in eastern North America. You can see one on the parking just west of the **Presbyterian Church** [1025 5th Avenue] and a big one north of 1115 West. If you can't find a sprout with the twin thorns, notice the small flat pods about 5 cm long, with seeds 2 or 3 mm across. This tree has a yellow wood of very remarkable durability in the ground. "Locust posts will last forever; Daddy tried 'em twice." Long lived old man. I've seen fence posts that had been in the ground for thirty years, and needed only to have the ground tamped around them to start them on another thirty. But the growing tree is subject to attack by borers, so the posts are hard to get, and are not on the market.



[There is a sizable tree northeast of **St. Paul's Episcopal Church** by the sidewalk along 6th Avenue and more trees west of the **Presbyterian Church**. **Arbor Lake Park** has a grove of black locust northwest of the picnic area. One of the largest black locusts we have

ever seen is a nearly 4’ diameter tree off the northwest end of the picnic area parking lot at the park. Black locust is an invasive tree in Iowa, spreading vigorously by seed and root suckers. Although the flowers are beautiful (for a short time) and fragrant, this species spreads too readily in natural areas and should not be planted in Grinnell.]

13. *Gleditsia* Honey locust

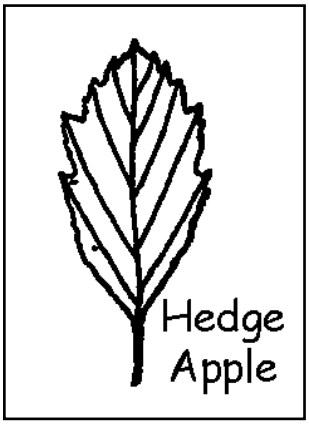
Honey locust (*G. triacanthos*). I don't know where it got its English name. For the preceding one furnishes the honey. But triacanthos (three thorn) is very apt; for most of the big, fierce, reddish thorns have two short, sharp branches near the base. They make admirable daggers—for dolls. Sometimes there is only one branch; and on the trunks of old trees you see great branching thorny masses as big as your head. It is well to notice also that the bark is peculiarly smooth but speckled, nearly black, but slightly coppery above; and the branchlets are so crooked they can hardly lie still, a crook at every node. It is well to notice these features because there is a **thornless** variety *(Gleditsia triacanthos* var. *inermis),* and it is most commonly cultivated. [There are now over 20 varieties of thornless honey locusts.] Both grow wild along Skunk River, and generally from Nebraska to Pennsylvania and Texas. There is another kind in the Gulf States, and three more in southeastern Asia. You can see the thorny form just north of the tool house in the Botanic Garden. The thornless form is familiar in Cooper School yard, where also the characteristic big flat purple pods are in evidence. Oh yes, that's how it gets the name honey locust: the pods have a sweetish pulp in them when first ripe. So it was named after John the Baptist's menu: locusts and wild honey. The sweet, meaty pods of a similar tree from Palestine are sold in this country, in Greek shops mostly, as "St. John's bread" (*Ceratonia siliqua*). But in my own opinion, John Baptist's locusts were big juicy grasshoppers, such as are still eaten by the Arabs

in that region. Ask Paul Harrison, medical missionary and popular speaker at student conventions.

[Honey locust is a very fast growing tree (growing two feet per year) with an open spreading crown. It was widely planted after American elms were lost to Dutch elm disease, and now the honey locusts are deteriorating due to their susceptibility to many diseases and insect pests. You can find honey locusts on the college campus southwest of the **Forum** and at **928 Elm Street**, **515 9th Avenue**, **729 Pearl Street**, and **603 2nd Street**. A tree with thorns can be observed in **Merrill Park**, northwest of the circle drive.]

14. *Maclura* Osage-orange or Hedge-apple

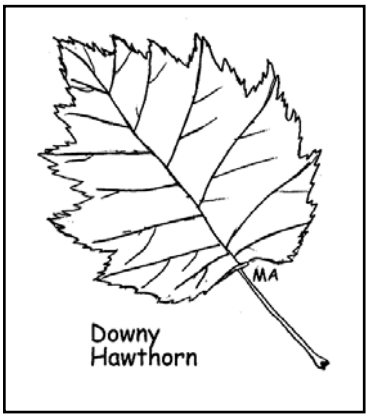
Can't say much about this: osage orange, hedge thorn, *M. pomifera*. It's mostly a shrub hedge, anyway, brought into cultivation from the Ozarks. When it grows up, as on 12th Ave. west of West St., it has rather fibrous, ridgy bark, yellowish in the furrows. The bark of roots is orange color and in many papery layers like birch bark. It makes an irregular tree, male and female. The latter bears those big, rough, hedge balls, 1 to 2 dm in diameter, full of sticky juice, and containing many seeds. [These are the fruit you can buy in grocery stores to keep insects from moving into your house for the winter.] They are first cousins to the bread-fruit and jack-fruit of the tropics. The wood is deep yellow, a source of dye for the Indians and modern "craftsmen." The timber of this and the preceding is about as durable as that of black locust. [You can find osage oranges in a windbreak west of **S & S Electric** on the north side of **Highway 6 west of Grinnell**. Osage orange has become a real nuisance in pastures in southern Iowa. Although they are tough trees, they are generally not recommended for planting in residential areas.]



15. *Crataegus* Wild hawthorn

1	Bark smooth; branches ridged, "sinewy"	*C. margaretta* **Hard Haw**
1.	Bark scaly not sinewy	2
2.	Branched thorns on trunk	*C. macracantha* **Soft Haw**
2.	No thorns on trunk	*C. mollis* **Red Haw** or **Downy Hawthorn**

These are the wild hawthorns which bloom so gloriously white in every thicket late in May—if they only didn't smell like salt fish! The flowers actually contain the same smelly chemical that is found in salt fish. In winter you recognize them as small trees or shrubs, with very nice smooth, slender, slightly curved thorns, just here and there along the branches—not at every node—and slender enough to make good victrola needles when dry. You can see all three kinds in the Botanic garden, next to the willows, the first tall things from the south. The east one, the biggest, is red haw, *C. mollis*. [There is a downy hawthorn at **1131 Park Street**.] Next west is a little soft haw, *C. macracantha*; northwest of that are two hard haws, *C. margaretta*. The fruits of the first are the big firm sweet red haws. The second bears little scarlet, pulpy, mushy haws. The third has red or green or yellowish haws too hard and bitter to bite into. They should be widely used in gardens. Being native, they are very hardy; they are easily transplanted, and easily raised from seed removed from the meat of the fruit and planted in the fall. There was a very fine red haw tree across Sixth Ave. from Cooper School, but it was so mutilated by linemen that it had to be cut down. Can't we prevent that kind of thing? [Visit the Grinnell College **Conard Environmental Research Area** or **Sugar Creek Audubon Nature Sanctuary** for examples of hard haw (*Crataegus margaretta*).]

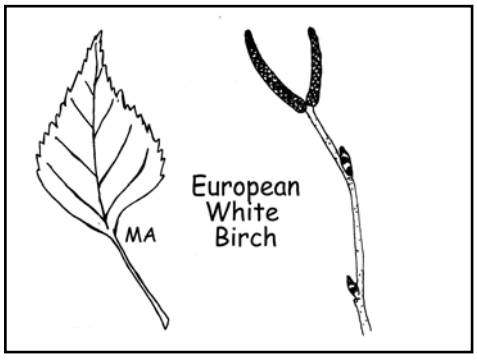


TREES WITH CONSPICUOUSLY LIGHT COLORED BARK

16. *Betula* Birch

1.	Bark pure white, papery, peeling off	2
1.	Bark grey, peeling very thin	*B. lutea* or *B. alleghaniensis* **Yellow birch**
1.	Bark brownish yellow, papery	*B. nigra* **River birch**
2.	Trunk and branches very crooked; seed catkins abundant	*B. populifolia* **Gray birch**
2.	Trunk stout, erect; branchlets straight	*B. alba papyrifera* or *B. papyrifera* **Canoe** or **Paper birch**
2.	Trunk slender, erect; branchlets dangling down	*B. alba pendula* **Weeping birch** or *B. pendula* **European white birch**

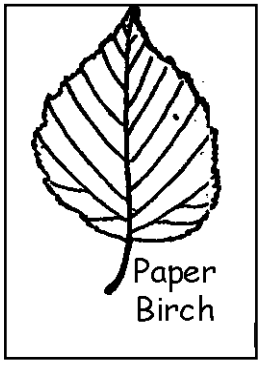
The very word bark suggests birch. Probably the two words have the same origin. How about it, Prof. Wood? At any rate everybody knows a birch when he sees it, and everybody loves the birch bark. Some love it so much that they peel off the trees to carry home. Don't do it. **The tree never recovers; nobody can ever enjoy that tree again.** Witness the lovely group west of the Women's Gym—marred forever by some thoughtless person. Sins may be forgiven, but I wonder if they can ever be as if they had never been committed? Not in the realm of nature.



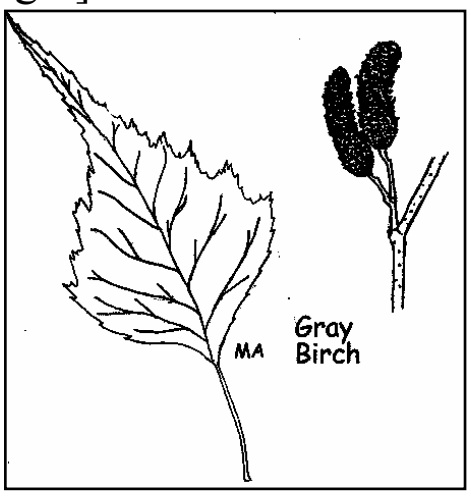
The commonest birch in Grinnell, by far, is the European cut-leaved weeping white birch. It is easily known by its long, dangling, slender, reddish twigs and pure white bark. It never bears seeds here, though it may have a few soft catkins in spring. Usually the trunk is beautifully straight and erect. But the big one in Pres. Main's yard,

planted in 1867, and the big one at 6th Ave. and West at the old Noble place, haven't much trunk. The row on Fifth Ave. west of Pearl St., and those on Seventh Ave. east of Elm [northeast corner of **7th and Elm**] and several near Davis School are more typical. These trees are all raised by grafting; the grafting is done in Europe, and the trees are now very scarce in this country. [European white birch is no longer recommended for planting in the Midwest due to severe problems with insects.]

The canoe birch [or paper birch] is much like the weeping birch as to trunk, branches and bark; but its twigs do not hang down. The leaves too are broadly oval, not cut-lobed. There is a big branched one in Dr. Brock's yard, 1007 East St., and a fine group south of the Turner house, 1510 Broad, and several others. This is the tree of which Hiawatha and many real Indians made their truly wonderful canoes. You can still get birch canoes up north—if you have the "dough." They are remarkably strong, light and graceful. This birch grows wild at Eldora, its very farthest point toward the southwest. [Fortunately the paper birch is more resistant to insects than European white birch and is still recommended for residential planting. The population at Eldora is considered a relict from when Iowa experienced a cooler climate after the last glacier retreated about 10,000 years ago.]

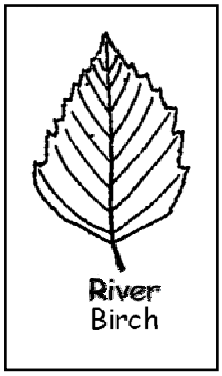


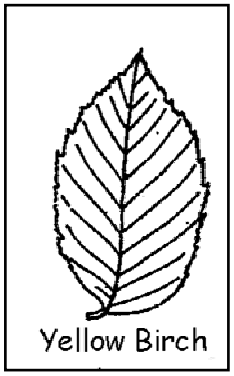
Gray birch is also native of the northern and northeastern woods. It is about as white barked as the others, but the trunk is always crooked or leaning. The branches are crooked, and it bears quantities of seed catkins, which are breaking up now and letting loose millions of tiny bird-like seeds—a body and two wings—to fly away and start new trees. That is how we recognize gray birch. It never makes a large tree. You'll see a fine group by the flag pole on the Campus, one on Fourth



Ave. east of Pearl St., one at 626 Park, and a few others. [A notable specimen can be seen at **1427 Summer Street**.]

The big birches along Skunk River—and all the Rivers from here to eastern Pennsylvania—is the river birch. T. B. Turner and H. W. Matlack have specimens on which I feast my eyes. The last one I put in the Botanic Garden was dug up at once by some kids hunting for fish worms. We'll try again. Matlack's tree is beautiful beyond words. [River birches are frequently used for landscaping in Grinnell and can be found on campus, at **1808 8th Avenue**, **1322 East Street**, along the shoreline of **Lake Nyanza,** and at **Arbor Lake Park.]**

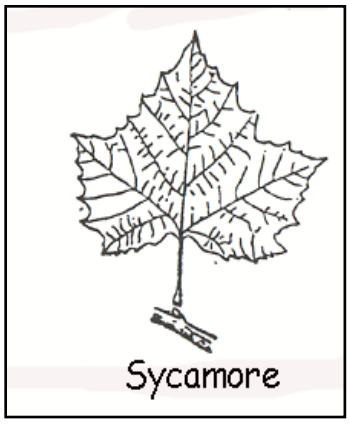




The one that is called yellow birch (*B. lutea*) in the name book is really gray barked and papery. The twigs taste of wintergreen. It grows wild at Eldora, on rocky bluffs of Iowa River. There isn't one in Grinnell. But there ought to be. [Has anyone planted one?]

17. *Platanus* Plane tree or Sycamore

Plane tree is the correct English name for *Platanus occidentalis*. What do you call it? Sycamore? Buttonwood? All right. Grows along Iowa River, and eastward to the coast, attaining immense size. There are some splendid specimens south of the **Men's Gym,** [now southwest of **Noyce Science Center**,] and several along north **Elm and Summer Sts**., and on **Eighth Ave.,** east of Summer. You know them by the blotchy bark, patches 1 to 2 or 3 dm across, some pure white, some greenish; Scales as big as the blotches fall off, dry and brittle, littering the ground. You also notice the globular seed balls hanging all over the tree, 2 to 4 cm in diameter. In late April these balls fall to pieces, distributing the silky seeds. The wood is dense and with a curly grain that will not split, ideal for the big chopping block in the butcher



shop. A leaf blight (fungus disease) often kills the leaves and young twigs in late May and June. Spraying with bordeaux mixture will help if done early and repeated. But the trees generally survive without much injury. [There are very large sycamores at **1333 Elm Street**. You can find sycamores in many of the city parks, including southeast of the circle drive in **Merrill Park**, along the shoreline of the east arm of **Arbor Lake**, and also at **1020 Summer Street**.]

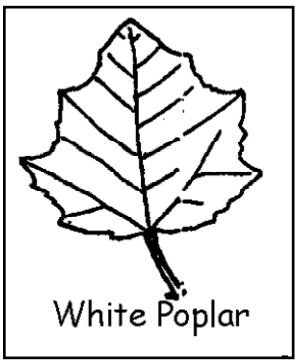
18. *Populus* Poplar, Cottonwood, and Balm

1.	Twigs woolly	*P. alba* **Silver** or **White poplar**
1.	Twigs smooth, polished	2
2.	Branches slender, parallel to trunk	3
2.	Branches stout, spreading	4
3.	Bark greenish	*P. bolleana* **Bolleana poplar**
3.	Bark cream color	*P. nigra italica* **Lombardy poplar**
4.	Leaves with short sharp point; tree small, crooked	*P. tremuloides* **Quakin' aspen**
4.	Leaves with slender tapering point; straight tall tree	*P. deltoides* **Cottonwood**
4.	Leaves oval; buds resinous, odorous	*P. balsamifera* **Balsam poplar**

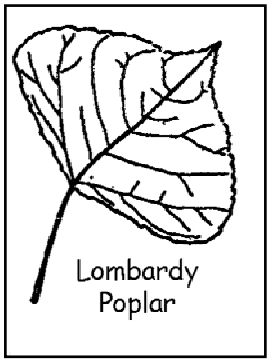
There is really no hope of describing the poplars so anyone could go out and recognize the different kinds right off. They are exceedingly difficult for the best trained observers. One must have the leaves until he is well experienced. But you can go out and study specimens of each kind, noticing the mode of branching, color of bark above and below,

size of twigs and buds. All of the poplars are conspicuous for the light colored bark on the younger parts. It is as if painted with a dull finish paint. On branches over six inches through rough black spots appear. These become larger, and finally, on trunk a foot or more thick, we find a coarsely ridged and furrowed blackish bark. Poplars are always male and female; the latter produce cottony seeds in June. To avoid cotton, plant male trees, propagated from cuttings of known trees. Many of the kinds grow easily from cuttings eight inches long planted deep, in April.

Silver [or white] poplar (*P. alba*) has whitish bark with a distinct tinge of green. The twigs are woolly, and the coarsely toothed leaves are white-woolly beneath. Put one in a basin of water, and it looks like quicksilver. The tree is rarely if ever erect or straight, and has a broad top. The twigs are slender, and buds not noticeably large. There are many scattered over town: on the alley back of Fred Spaulding's, 1109 Main; 520 High St.; southwest corner of Men's Gym. [Find white poplars at **433 Park Street, 1219 West Street, 1023 East Street, 611 Prairie Street, 1200 Reed Street**, and a very large one at **423 6th Avenue**]. An erect columnar form of this is known as *P. bolleana*. There are some very fine specimens of this in Des Moines. Here we have only a tiny one at the southeast corner of the kitchen at the Quad, and a very fine tree which I take to be this in the south border at 927 Elm. Let's have some more. It is the very best columnar hardwood tree.

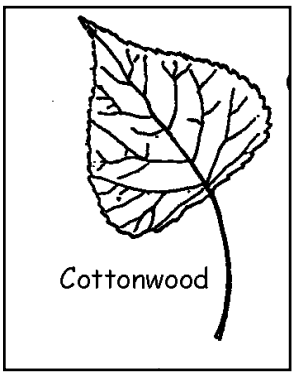


The old fashioned columnar poplar is the Lombardy poplar. All its branches are slender and run up vertically, parallel to the trunk, so that the tree looks like a slender whisk-broom, or, to change the figure, like a hugely tall gatepost. For this tree is often set as a pillar on each side of an entrance. But the branches begin to die as soon as the tree is mature—or sooner—and it becomes unsightly. Also the tree suckers very persistently—as does the silver poplar. So if you want a Lombardy poplar, plant a



Bolleana instead. Lombardy poplar originated "in the plains of Lombardy [a district in Italy] about 1700." [Lombardy poplars are susceptible to a canker disease so they rarely live more than 20-30 years.] A genuine specimen may be seen just east of V. G. Preston's in the parking. Mr. Skinner has another columnar form which he calls Volga poplar. It looks to me like a form of cottonwood (*P. deltoides*) but I'm not sure about it. Nor am I certain about the row on the south side of the J. L. Fellows' lawn, 1527 Broad; they look like Lombardies. [Look for a row of lombardies at **1605 4th Avenue**.]

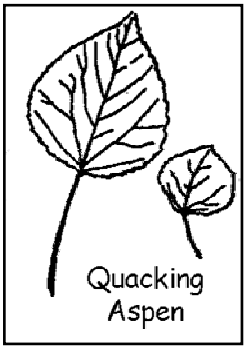
From which it appears that the cottonwood is not so easy to recognize under all conditions. The big tall ones are easy enough. They make the most massive, stately trunks of all our trees. The old bark is in ridges 3 to 5 cm. wide and deep. The upper bark is of a rich creamy color, with a suggestion of tan. The end buds are large and pointed, 1 to 2 cm. long. Two "old settlers" still stand at the southwest corner of the **Campus**; there are two on Washington Ave. west of Main St., and many others [including a young tree at **603 Main Street**, and numerous ones at **Arbor Lake Park** and **Lake Nyanza**.] These have a broad spreading irregular top. Younger trees have a narrow, spindle-shaped top, and the bark is often dark greenish. In this condition they are often called Carolina poplar. There is another different "Carolina poplar," but all I have ever seen were young cottonwoods. For example, East St. above Sixth, and north of Eighth; West St. south of First; back of 931 High. Cottonwood is native all over the eastern United States. It shades off in Nebraska and Colorado into one or two other kinds recognized by some specialists.



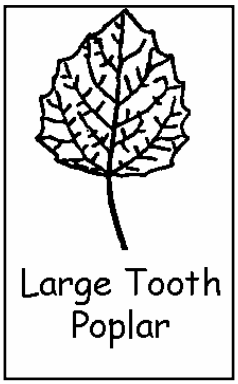
At this season it is not easy to distinguish balsam poplar from cottonwood. But there is only one balsam poplar in town, I believe, so that helps. That one is east of the house on the southeast corner of Fifth and Pearl. It will become evident as soon as the buds begin to open; from them it exhales a delicious balsamic or resinous odor that you notice as you go along the street. The tree suckers very freely. The

leaves are very characteristic, too. It is native of northern Minnesota and eastward through Canada. The European balsam poplar is so much like the American that some botanists do not distinguish them. I'm sure I can't.

Quakin' asp' (short for quaking aspen) has very smooth, very white bark. At a distance you think they are birches. They are usually slender trees, several together, rather crooked, with very irregular top; short lived and quick growing, and freely suckering. There are several at Jones Grove, and some still on Sugar Creek. We have one in the College Nursery that I pulled up in the woods at McGregor in April, 1920. Aspens are found all across the continent. The groves are conspicuous and beautiful against the somber evergreens of the Rocky Mountains. The bark is the favorite food of beavers, and the wood is used to reinforce the beaver dams. I've seen trees 14 inches through, gnawed off and felled by beavers. The quaking part comes from the leaves which are forever wiggling to and fro and rattling against each other. This is because the leaf stalk is flattened sideways, so the leaf moves most easily from side to side. [Find a few young saplings north of 6th Avenue on **Summer Street** and several at **Sugar Creek Audubon Nature Sanctuary**.]

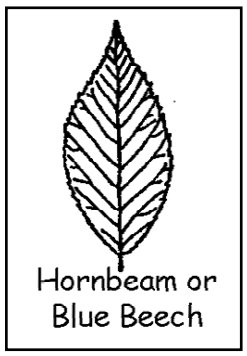


There is another beautiful white barked poplar at Eldora, and at Amana: the large-toothed aspen, *Populus grandidentata.* [A sizable aspen can be observed at **604 Pearl Street**.] Dr. Shimek of S. U. I. [State University of Iowa, Iowa City], says it can't be transplanted. Anyway, I'd like to try. We had in the college nursery, and at 1413 Eighth Ave., a very fine spreading greenish-white-barked Asiatic poplar, probably *P. simonii*, from the U.S. Dep't of Agriculture. But the winter of 1925-6 killed them. It grows easily from cuttings and when I get a new lot started I'll be glad to supply cuttings to anybody who wants to try this very handsome, quick growing tree. We have others on trial which are no good. You can have them, too.



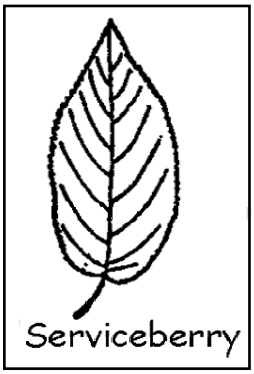
19. *Carpinus* Hornbeam or Blue beech

If you go to the picnic grounds on Iowa River out from Montour, don't miss the little hornbeams (*C. caroliniana*) on the foot of the slope near the farther spring. The biggest is only 2 or 3 inches through. The bark is very smooth, dark gray or slate color, and the trunk has rounded ridges and grooves like tightly drawn muscles. I wish we had one here in the Botanic Garden or at Arbor Lake. But it would be a crime to dig one at Montour or Eldora, where they are so scarce. They are abundant in New England and the Middle Atlantic States. [We have a blue beech or musclewood (*Carpinus caroliniana*) on campus south of the **Book Store**. Are there any others in Grinnell?]



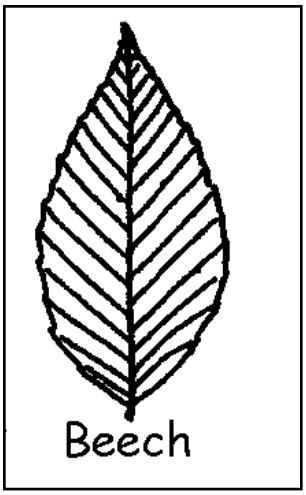
20. *Amelanchier* Juneberry or Serviceberry

In the east it is shad-bush, because its white plumes of flowers appear when that sapid fish is running up the rivers and gracing the dinner tables. Along the bluffs of Skunk River, and rarely on smaller streams, the first show of bloom is from this low tree or tall shrub. Just now you could only know it by its smooth, dark gray bark, and small, crooked or leaning trunk, not over 3 inches through. In June or July the fruits, dark red-brown or red and the size of a small finger-tip, are very palatable. The plant does well in gardens, and I wonder that there is none in Grinnell. [There are many in Grinnell today, including several north of **Herrick Chapel** on campus and east of the **municipal swimming pool**.]



21. Fagus **Beech**

The most graceful, beautiful tree of the eastern woods, native as far west as Chicago, is the beech. The silvery gray bark



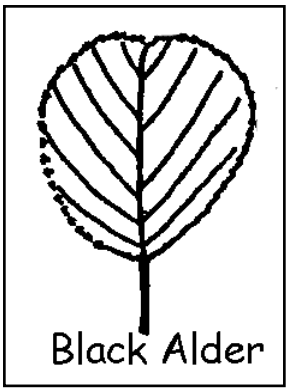
is smooth and granular even on trees three feet through. The branchlets are very slender, making an exquisite lacework against the sky. And the buds, 1 to 2 cm long, 2 to 3 mm thick at the middle, and gently tapering both ways, with neatly laid rich brown scales, are gems of creation. And when the scales loosen and the downy furry leaves peep out, there is nothing in plant life more charming. There was only one beech, I believe, in all this region. It was in front of the house next south of Westfield Church. But it died in 1924, at an age of about 50 years. [There are two beeches on campus. A young tree can be found northeast of **Goodnow Hall**, south of the sidewalk. A copper beech (*Fagus sylvatica* 'Purpurea') grows in front of **Nollen House** on Park Street. This variety has purple leaves, unlike the American beech (*Fagus grandifolia*), which is native to hillsides in the Piedmont of Georgia with oaks and hickories.]

THE CATKIN BEARERS WITH SCALY BARK

Catkins, those dangling furry blossoms that come in spring, are found on many trees. And on several the catkin buds, hard slender and cylindric, are out in the open all winter. This is true of birch, hornbeam and hazel as well as of Alder and Ironwood. But only these last two have both scaly bark and catkins.

22. *Alnus* Alder

English or black alder (*Alnus vulgaris* or *A. glutinosa*) is a very striking tree, because of the hosts of firm, long catkin buds, a cluster on every twig, and because of the hosts of oval (1 to 2 cm. long) loose-scaled, black, dead, seedburs on all the twigs. The trunk is peculiarly conical, stout at base, and very strikingly tapering to a slender top. There is only one tree in these parts, on the northwest corner of First Ave. and High St. A small group on the Campus twenty years ago fell ill from too many grass fires [Grass fires on campus?], and died. More should be planted at once. It blooms about April 1. [Find a group of alders on campus in a small outdoor courtyard adjacent to **Noyce Science Center** on the south side.]



23. *Ostrya* Ironwood or Hop hornbeam

There's one [*Ostrya virginiana*] right in town, south side of Fifth Ave., east of the alley west of East St. Excuse the repetition; taint my fault. I'd a' had it in the Bot. Garden. But it certainly looks lonely as a street tree, poor little thing. The biggest one I ever saw was six inches through. And it is always on a woodsy river bluff, in some lovely, wild, picturesque corner of the God-made country. Honestly, I could shed a tear for that dear, lone, wild thing, condemned to a city parking. But it has the catkins and fine scaled bark of its kind. The seed affairs look like hops, and the seeds in them all grow fairly easily. It is common enough in Iowa, rather scarce in the east. [The white oak and shagbark hickory forest at the **Conard Environmental Research Area** has many ironwoods, most between 2-6 inches in diameter. The deer often find them convenient rubbing posts for their antlers.]

THE TWO RANKED TREES

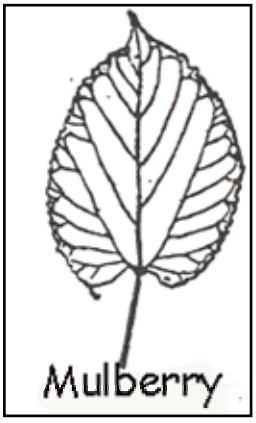
These are the one's you've been waiting for, elms, hackberries, mulberries, basswoods. By two ranked, we mean that the leaves, buds and branchlets are arranged strictly right and left on the shoots—a row on each side of the shoot. You look at such a shoot lengthways, and you see just two lines of buds or branchlets, like the barbs from the midrib of a feather. Consequently, every branch with its branchlets makes a flat spray, like a very loose feather. It is not so with cottonwoods or walnuts or oaks. In these the leaf scars and buds appear on several sides of the twig—really in 3, 5 or 8 rows, but that is not so easily proved.

24. *Celtis* Hackberry

One of our commonest street trees: n. e. corner of **6th and Broad** [about 30 inches in diameter now]*;* n. w. corner of **7th and Park**; east parking of Davis School; Elm St. opposite Cooper School; also big ones in Jones' Grove. When it has diseased bushy black tufts of twigs, called witch's brooms, you can't mistake it; no other tree has these. The hard berries the size of a pea, with a sweet skin, mark it too. The bark will also tell: it is in separate lumps about one cm. big. Sometimes the lumps are in rows or ridges, but usually just scattered about. When Don Almy was a little tad he said it looked as if it had grape nuts all over it; and it does, but rather big grape nuts. We've called it the grape nut tree ever since, and that has helped some hundreds of students to remember it. Thank you, Donald. Our hackberry is *Celtis occidentalis*. It is a good street tree, erect, good trunk, clean. It grows easily and rapidly from seed. [Hackberries are still very common in Grinnell, especially as street trees. There are several very large ones at **733 Elm Street, 817 East Street**, and one with a very unusual bonsai-like growth habit in the backyard of **929 Elm Street**.]

25. *Morus* Mulberry

The only mulberry about town is the Russian, *M. alba tatarica*. The fruits are white or purple, rather dull flavored, but good when cooked, and excellent to attract the birds away from the cherry trees. Mulberry is a small tree, recognizable by its distinctly yellowish bark, granular above, becoming somewhat fibrous when old. There is one at the s. w. corner of 6th and East; one at s. e. corner of Cooper School house; several in the college nursery; a row on the alley at 1512 Fourth Ave. They are becoming weeds, distributed by birds. [This is very much the case today. White mulberries have invaded many of our native woodlands, preventing growth of seedlings of our native trees and ground flora. In Grinnell you might notice white mulberry saplings growing as weeds in hedges and flower gardens. There are several adult trees in **Miller Park** by Lake Nyanza, including a very large, multi-stemmed individual.] The weeping mulberry is made by grafting a creeping kind on an erect sapling at any height desired. The one by the tool house in the Botanic Garden was made by a student some years ago. There is a big one at 1202 Spring St. from which we got our start. I'll give you scions if you want to try the grafting stunt.. [You can find one of a handful of weeping mulberries in town at **1015 Elm Street**.]

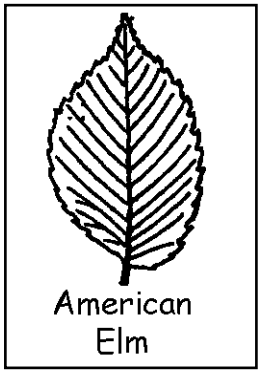


Professor Norris says he used to find the wild black [or red] mulberry, *M. rubra*, along Skunk River. But I have never seen one in Iowa. Can somebody locate one in this region now, or is it extinct? [Red mulberry is native to Iowa's floodplains, ravines, and sheltered slopes. Let us know if you ever see one.]

26. *Ulmus* Elm

1.	Branches corky-winged	*U. racemosa or U. thomasii* **Rock** or **Cork elm**
1.	Branches not winged	2
2.	Bark with layers of white cork	*U. americana* **American elm**
2.	Bark without white layers	3
3.	Tree dense; finest upper twigs erect; bark finely ridged	*U. campestris* or *U. procera* **English elm**
3.	Tree loose, twigs coarse, spreading; bark coarse	*U. fulva* or *U. rubra* **Slippery** or **Red elm**

Ruth Shepherd of Maquoketa was with us some years ago on a tree hike, and we were noticing the very striking twigs of elm sharply outlined against the sky. "O, they look just like fish bones," said Ruth. Everybody laughed, but Ruth was right, and so we've taught it ever since. Notice any twig just back of the tip, with its main stalk and the close set twiglets in a row on either side, like the back bone of a fish with its serried rank of spines above and below. It is most noticeable on the American elm. But the others show it enough to be recognized.


American Elm

The American elm is very plainly marked by white layers about an eighth of an inch apart in the scales of the bark. Break a scale across and if you see white layers, it is an American elm. This is our biggest, grandest shade tree, the tree that makes Grinnell a beauty spot on the prairie. It grows wild in every timber. There are hundreds of them in town; for example, all around the High School. This elm has usually only a short trunk, which quickly forks, and forks again and again. So the top

is very broad, and the branchlets hang down all around. At little distance a good elm is shaped like an enormous vase with lip turned down. No more splendid figure graces the landscape, an expression of gentle, friendly shade, an invitation to peace and quiet and home. It is as warm and breezy and western as the evergreens are stiff and formal and cold. You can tell an elm a mile away, and it beckons you thither. [American elms are still very common in every timber, but only grow to about 8 inches or more in diameter before succumbing to Dutch elm disease. Grinnell has a few notably large elms at **818 Elm Street, 608 8th Avenue**, and one along **6th Avenue** northwest of the Presbyterian Church. More American elms can be found at **Arbor Lake Park**.]

The slippery elm so closely resembles the American elm as to be easily confused with it. But the slippery elm has no white layers in the bark. It has bigger, rounder buds, very fuzzy. The leaves are much harsher to the touch, and the fruits are twice as broad. In town here, the slippery elm is most easily recognized by its signs of ill health. Several dead leaves hang on here and there over the tree. Diseased buds, swollen to rough, black balls one to two cm. across, dot the branches. Notice those near the northwest corner of the City Park on Broad St.; s. w. corner of 10th and Broad; east side of Reed St. above 8th Ave. There is a big healthy tree at the n. w. corner 5th and Elm so healthy it is hard to recognize. The slippery part is the white, inner bark. This is full of mucilage of a rather pleasant flavor. You can chew the bark to get the effect—though barking is rather hard on trees. In that way they differ from dogs. Elm bark used to be found in every drug store. How about it now? Slippery elm is native all over the eastern United States, especially in low ground. [There is a notably large one on the college campus east of **Goodnow Hall**, and others west of the home at **703 Pearl Street**, and south of **Nyanza Drive** in Miller Park.]

The rock elm is characterized by the broad sheets of cork standing edgeways on the branchlets. You can see one along the 6th Ave. path near the west side of the Campus, and one south of the house at 724 East. There are no others about, so far as I know. This elm has a more distinct trunk than any other; and the flowers are set along a main stalk

1 to 2 cm. long, instead of in a cluster as in all our other elms. It grows wild at McGregor, and thence eastward and southward.

The English elm is represented here in only three places known to me: 1126 Broad St., 7th and Park at Hendrixson's; a row north of the drive that crosses the Campus from Park St. to the railroad. The trunk is distinct; the branches run up into a dense whisk-broom-like top; the bark is finely ridged and nearly black. But the best sign after all was discovered some years ago by Harry Inman. He noticed that nearly every twig on the tree makes a rather sudden turn upward 4 or 5 inches from the tip. Get that in your eye, and you can always know an English elm. It is a fine tree, well worth having—although our winters freeze the trunks and split them with terrible frost cracks. [English elm may actually be a hybrid according to today's authorities. It does not produce any seeds and spreads only by suckers.]

[There are a few specimens of another elm in Grinnell called Siberian elm (*Ulmus pumila*) at **Arbor Lake Park**. One of today's leading authorities on woody plants describes this species as a "poor ornamental tree that does not deserve to be planted anywhere!" The wood is brittle, so branches break off readily, and although resistant to Dutch elm disease, elm leaf beetles skeletonize the leaves. It is considered a weedy tree, unfortunately introduced from Siberia and East Asia in the 1800s. It can be distinguished from our native elms by its considerably smaller leaves, 3/4-3 inches long and only 1/3-1 inches wide.]

27. *Tilia* Linden or Basswood

1.	Twigs somewhat loosely hairy, drooping	*T. petiolaris* **Weeping linden**
1.	Twigs smooth, not drooping	2
2.	Twigs often 4 mm. thick	*T. americana* **American linden**
2.	Twigs 2-3 mm. thick	*T. cordata* **European linden**

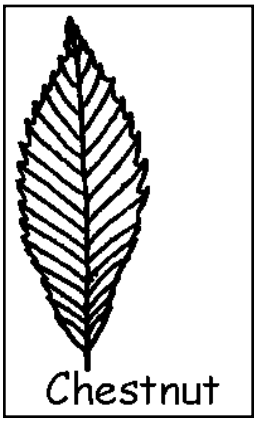
Happily, the name book says linden. That is how I learned it as a youngster. But if you call it basswood, or linn, that is all right. Basswood is a fine old English classic name. The bark is full of long strong fibers that were used by our savage ancestors for cordage and clothing; and so they were by the American Indians. This bark was called bast; hence the technical name bast for the fiber cells of bark, and the name basswood; and the words bind, band, etc., are of the same origin. Linden branches are arranged right and left as in elms, but farther apart. At this season the branches seem to form loose horizontal layers. The old branches usually curve over, like the top of a croquet arch; and from the top of the curve one or more branches shoot upward. It is a curious habit, but very characteristic. Notice one at the southeast corner of the Campus: others on 6th Ave. east of Broad; north side of 9th, east of Broad; and many more. The clearest mark of linden is the seed apparatus. This is a flat, veiny, leaf-like thing 3 or 4 inches long, three quarters inch wide, from the middle of which a stalk comes out, bearing 1 to 5 hard balls as big as small peas. Many of these are hanging on the trees now, or lying on the ground. Linden blooms in June, with clusters of creamy, sweet scented flowers. They furnish a clear honey of very remarkable spicy flavor.

The native wild linden (*T. americana*) is the only one seen in our woods, or commonly on our streets. There are doubtless several European lindens about; Mr. Willard used to sell them. I know only one; in the parking at 1323 Elm. [You will commonly see both American linden (*T. americana*) and littleleaf linden (*T. cordata*) in Grinnell. Representatives of the former species grow at **422 High Street**, **1708 3rd Avenue**, **417 Park Street,** off the southeast corner of **Reed Street and 4th Avenue,** and throughout **Arbor Lake Park**. There are a couple of large lindens on campus southeast of the **Book Store** and north of the **Forum**. Littleleaf lindens were planted north of **Dibble Residence Hall** and have probably been planted in several locations in town.] At Iowa City I saw a magnificent weeping linden—

a glorious, dense, columnar tree; with branchlets drooping to the ground. The leaves are downy beneath. We must get some for Grinnell.

28. *Castanea* Chestnut

The top of a chestnut tree lacks characteristics. The bark of older trunks has flat strips 1 to 3 cm. wide, light gray in color, with irregular, shallow furrows between. The leaves are large and elliptic, 1 to 2 dm. long, with very coarse teeth (hence the name *C. dentata*). The nuts are borne in prickly burs 2 to 4 cm. in diameter. I doubt if you can recognize a chestnut tree without finding the burs. We see the burs here, but not often any contents. In fact the American chestnut belongs in the Middle Atlantic States, in much milder climate than this. There is one by the alley north of the rear of the Ford garage; n. e. corner of 9th and Elm; on the hilltop this side of LeGrande on the Glacier trail; and various others. Occasionally some of the sweet nuts are harvested—if the squirrels don't get there first. One time this tree was the chief timber resource of the eastern states. But about 1900 a disease from China struck it, and the chestnut is practically extinct. Just enough survive to give a hope that it will not be wholly blotted out. As another hope, the U.S. Dep't. of Agriculture has imported the Chinese chestnut (*C. mollissima*) inured to the disease by ages of association. We have three of these extremely rare trees, two in the college nursery and one on the campus northeast of **Goodnow Hall.** [Conard planted this tree in 1915]. They are still small, but healthy and perfectly hardy, and already producing chestnuts. I'd be glad to furnish any of these I can find for planting. [There are other Chinese chestnuts in **Merrill Park** west of the circle drive. We only know of one American chestnut in Grinnell at **1514 Main Street** planted in his backyard by Benjamin Graham, emeritus professor of biology. You can find a small stand of American chestnuts growing along the west edge of the right-of-way about two miles south of I-80 on **Highway 14.** Mary Noe of Kellogg has



successfully propagated American chestnuts from seeds collected from trees growing along a county road northwest of Grinnell.]

TREES WITHOUT END-BUDS (AND SOME WITH)

Some trees finish off the twig with a neat "terminal" bud at the end. Others just quit when frost comes with the ends of the twigs unfinished. Still others definitely end the twig with a bud that belongs to the last leaf, the true end of the twig being a little point beside the last distinct bud. You can tell what has happened thus: every leaf has a bud just above it. If every leaf-scar has its bud, and there is an end-bud beside, it is a true terminal bud. But if the last bud stands over and belongs to a leaf-scar, it is a lateral or auxiliary bud, and not a true terminal. You find these fake terminal buds in elm and sycamore as well as in plums, willows and honey locusts. But we have already distinguished these by other signs.

29. *Prunus* Plum, Cherry, and Peach

Now you don't want me to try to put into good sentences the minute distinctions between all the different kinds of cherries and plums. You'll get it quite concisely in the key, and there isn't much more to be said. And it isn't very satisfactory at that.

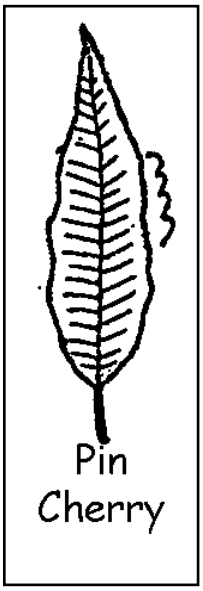
1.	Bark black; end buds absent (plums)	2
1.	Bark brown; end buds present (cherries)	5
1.	Twigs green or purple; end buds present	*P. persica* **Peach**
2.	Fruit purple or greenish (European)	3
2.	Fruit red or yellowish red (American)	4
3.	Twigs velvety	*P. insititia* **Damson**
3.	Twigs smooth	*P. domestica* **Gage prune**
4.	Buds round-ovoid ; scarcely longer than thick	*P. hortulana* **Miner plum**
4.	Buds round-conic, distinctly elongated	*P. americana* **Wild** and **cultivated plums**
5.	Twigs more or less velvety	*P. padus* **Mayday tree**
5.	Twigs smooth	6
6.	Buds round ovoid; bark light red-brown	*P. pensylvanica* **Bird cherry**
6.	Buds distinctly elongated	7
7.	Buds dull brown; scales rough	*P. virginiana* **Choke cherry**
7.	Buds clear brown, glossy	8
8.	Buds 2-4 mm. long, glossy, scales rather fleshy	*P. serotina* **Wild black cherry**
8.	Buds glossy, ovoid fusiform	*9*
9.	Buds glossy, ovoid fusiform	*P. avium* **Sweet cherry**
9.	Buds duller, round-ovoid	*P. cerasus* **Common cherry**

Peach is common enough, but of small value here. There is one in the northwest corner of the Botanic Garden. The bark on 1 to 2 inch branches is pale brown, with long, whitish, elliptic marks (lenticels) on it. Beside the big one in the Garden there is a small purple leaved peach, from Shenandoah, Iowa, presented by Mr. Lake. This is far too severe a climate for the peach. And I didn't even put in the apricot (*Prunus armeniaca*). It lives and blooms at Traer, and there is a fine one five miles east of Searsboro. We have some extra hardy ones in the Botanic Garden and nursery from the Dep't of Agriculture; but they have done no good. We have also from the Department David's peach (*P. davidiana*; not King David's). It grows ten feet high, with red-brown bark, and one spring it bloomed all over with lovely pale pink apricot-flowers about the first of April. But like its early blooming cousin, the apricot, it nearly always gets caught by a spring frost.

Of plums, Damson and Prune are European, and too tender for this climate. The fruits are also much attacked by curculio and brown rot. The trees have black bark, and Damson has crowds of little thorny spur-branches all over. There's one on the alley at 1320 Elm St., and a European plum in the northeast corner of the plum bed in the Botanic Garden. They are not worth while.

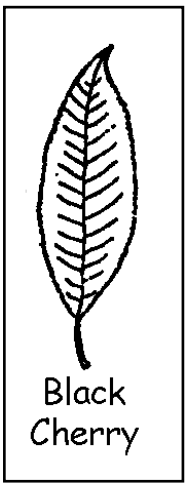
The varieties of native American plums have red or orange colored fruits. But they have been so selected and crossed as to be quite beyond recognition. Nearly all of our cultivated red plums are *P. americana.* [Natives can be found at the **Conard Environmental Research Area** near the trail in Wilson Prairie.] Mr. Matlack and Mr. Skinner both seem to have forms of *P. hortulana*, [goose plum, native to Lee and Van Buren counties.] But the whole problem is still ahead of me. Much could be learned by anybody who would carefully study the wild and cultivated plums of this region.

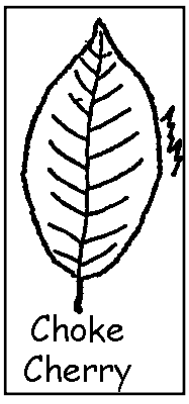
The cultivated cherries are more easily disposed of. All of the red cherries of our gardens, of whatever shade of red, are *P. cerasus*, [probably *Prunus cerasifera* by today's nomenclature.] The big meaty yellow or pink or black cherries, such as are shipped in from California belong to *P. avium*. It is much too tender for our climate. [Native to Europe and western Asia, *P. avium* is believed to be one of the hardiest cherries and should grow well in Iowa.]


Pin Cherry

Our wild bird cherry (*Prunus pensylvanica*) has its flowers in clusters like those of the cultivated cherry. It is a small short-lived tree, never over three or four inches through, suckering wonderfully and therefore always in a dense thicket. See them on the west side of Arbor Lake, directly opposite the bath house; also in Jones' grove, along Skunk River, etc.

The other three cherries have tiny flowers in a long cylindrical bunch on a slender stalk. The earliest to bloom is the European Mayday tree (*P. padus*); a group on the east side of the City Park, and a big old one in Prof. Nollen's back yard, 1015 Eighth. [John S. Nollen worked at Grinnell College from 1893-1903 and from 1920-1940 as a professor of philosophy and religion and later as dean and president.] Next after this comes the choke-cherry, very common in woods and on roadsides. It is rarely big enough to deserve the name of tree; and it suckers freely. There is a good one at 630 Park St., and a big tree at 1316 Fourth. The last cherry to bloom, along in June, is the wild black cherry. It makes a tree 50 to 60 feet tall, and often a foot or even two feet in diameter. It furnishes the real cherry lumber. The bark is black, with a tendency to curl horizontally. There is a big one about the middle of Sixth Ave. path on the Campus, and many others in fence rows and woods everywhere. It bears black cherries the size of peas, in strings, in midsummer. Sometimes they are fairly edible. Certainly they


Black Cherry


Choke Cherry

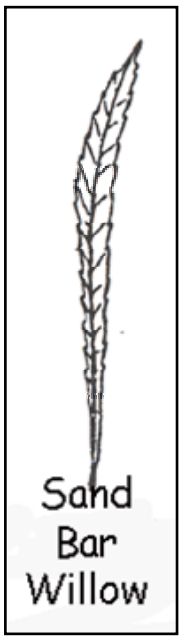
are harmless. [You can find black cherry trees at **Arbor Lake Park**, particularly along the east shoreline, and at the **Conard Environmental Research Area** and **Jacob Krumm Preserve**. Let us know if you see any in Grinnell.] The chokecherry has strings of red or red-brown cherries, very bitter, sour and puckery. It is said that to drink milk after eating these is almost sure death, but I have been unable to get unquestionable authority for the statement. Both of the last two cherries furnish "wild cherry bark" for the drug trade. Wild black cherry is really a splendid tree for all purposes.

30. *Salix* Willow

Another group of extreme difficulty. When any American botanist wants to know the name of a willow, he sends a specimen to C. R. Ball of the Bureau of Plant Industry. Dr. Ball was formerly professor at Ames; he is interested in Iowa. So I sent him all of our willow specimens last fall and he named them for us. As a group they are characterized by very long, usually shiny twigs; and the buds are often flat, somewhat the shape of a duckbill.

1.	Large open trees	2
1.	Slender, pole-like	*S. longifolia* or *S. interior* **River** or **Sandbar willow**
2.	Trunk single; twigs bright yellow, spreading	*S. alba* **Golden willow**
2.	Trunk single; twigs drooping	*S. babylonica* **Weeping willow**
2.	Trunk single; native	*S. amygdaloides* **Peach-leaved willow**
2.	Trunks mostly clustered	3
3.	Branchlets very brittle at base; large tree, cult.	*S. fragilis* **Brittle willow**
3.	Branchlets less brittle; small crooked tree	*S. nigra* **Black willow**

River willow or sandbar willow is a little thing, always in thickets, and on a wet sandbar or riverbank; abundant along Skunk River.

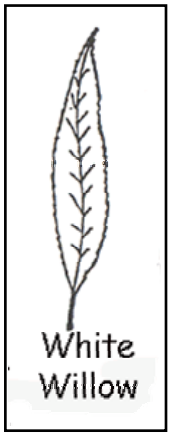


Leaves narrow, parallel sided, with low teeth 3 or 4 mm. apart. None in town. Something happened to the cutting we had started in the Botanic Garden. [The **Conard Environmental Research Area** has thickets of sandbar willow visible from the left fork in the entrance road.]

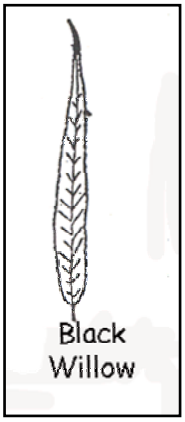
Weeping willow has very long, drooping twigs that may dangle clear to the ground. It is a European tree. I don't know of one that has survived the winter of 1925-26. [Look for weeping willows north of the parking lot at **401 Washington Avenue,** at **1509 4th Avenue,** on the shoreline of **Lake Nyanza,** and north of the railroad tracks between **East** and **High Streets.]**

Peach leaved willow is wild along all our streams, and there is an old one east of the tennis courts at the Women's Quadrangle. The leaves are broadest below the middle, with long tapering tip, very fine teeth on the margin, and whitish beneath. Brittle [or crack] willow is a European tree, brought in by the early settlers. It makes a large spreading top, with very large branches and a very short trunk. It is so brittle that branchlets are forever falling off and littering the ground. Don't plant it. You'll see it on the west side of the Botanic Garden, and along the approach to Ward Field.

Golden [or white] willow is a much better tree, becoming large, but inclining to branch low and lean over. The twigs are distinctly yellow, in some varieties brilliantly so. There is one of the ordinary kind on the south Campus, and a brilliant grove of the extra yellow kind on the south side of Arbor Lake. The leaves are narrow and whitish beneath, without the long tapering point of the peach leaved willow. [Like weeping willow, white willow is native to Europe.]



Black willow is a small tree, with clustered trunks, common along streams. Jones ' Grove; Skunk River; at top of hill as you go to Arbor Lake. The leaves are very narrow, green on both sides. [Several black willows grow along the shoreline of **Lake Nyanza**.]



We have in the Botanic Garden and near the big bridge at Hazelwood Cemetery the very glossy, laurel leaved willow, *Salix pentandra*. It is the easiest of all to recognize when in leaf. But I defy anybody to tell it now. We also have in the Garden, Diamond willow, Regal willow, and one unnamed and unnamable kind; and in the nursery some Asiatic species on trial from the U.S. Department of Agriculture.

Willows are useful for quick growth, or to occupy a wet place, or for the brilliant color of the twigs, or the weeping effect, or the pussies. But the real pussy willows are shrubs, and so are not considered here.

31. *Quercus* Oak

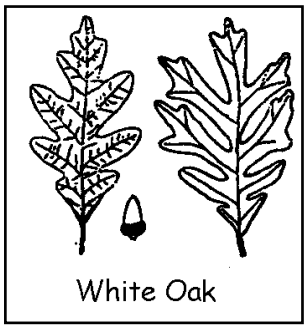
The distinct clustered buds, 4 or 5 of them, at the end of an oak twig make a very good recognition sign. Oak buds are big enough to be noticeable anyway. The trunk and branches, too, have a rugged, muscular appearance that most people instinctively feel. You know an oak just because you know it and it is as hard to tell how you know it as it is to tell why you like it. For everybody does love and honor an oak. We inherit that love from our pagan ancestors, and it comes to us in poetry and story. But to know the different kinds of oak is quite another matter. The very typical specimens are not so bad; but a great many are not typical. There is a grove at Moore Station which doesn't adequately fit any described species. But it must be a form of the very variable black oak. You will really enjoy the oaks when you study the acorn and leaf together with the trunk, bark and branches. "By their fruits ye shall know them."

1.	Leaves round-lobed without bristle points; acorns annual	2
1.	Leaves or their lobes ending in a bristle-like extension of a vein; acorns requiring 2 years to mature	4
2.	Twigs with coarse, corky ridges	*Q. macrocarpa* **Bur oak**
2.	Twigs smooth, hairless	3
3.	Buds cylindric; twigs gray or purple	*Q. alba* **White oak**
3.	Buds somewhat grooved; twigs reddish	*Q. robur* **English oak**
4.	Buds large (7-10 mm.) hairy, angular	*Q. velutina* **Black oak**
4.	Buds moderate to small (to 6 mm.)	5
5.	Buds entirely hairless	6
5.	Buds more or less silky, brown	7
6.	Buds red, 3-5 mm. long	*Q. rubra* **Red oak**
6.	Buds brown, 2 x 3-4 mm.; rather blunt	*Q. palustris* **Pin oak**
7.	Leaves small, oval, not lobed or toothed	*Q. imbricaria* **Shingle oak**
7.	Leaves large, deeply lobed	*Q. coccinea* **Scarlet oak**

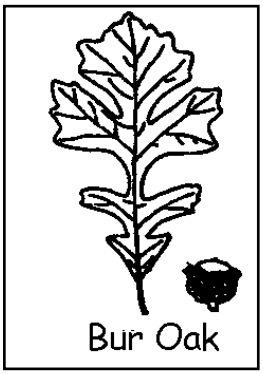
There are two great groups of oaks in this region which may be called white and black. In the first group the leaves have smoothly rounded scallops around the edge, and the main veins end before reaching the margin of the leaf; this is true of white, bur, and English oaks and many others. In the second group, the scallops are sharp pointed, and often have sharp teeth or sub-scallops along the side; and the main veins run out into the very ends of these sharp points; these are the black, red, scarlet, pin and shingle oaks, and their kin. And it takes two years for an acorn of the black oak to grow to maturity. The

wood of all oaks has very large pores in it, but is extremely hard, and durable under cover. In the ground, as posts, oak is not so good as many other woods; it rots rather rapidly.

White oak is so named for the white, thin-scaled bark. The leaves end rather suddenly at the stalk, and are perfectly smooth beneath. It grows wild all over the eastern United States, and is found about here on clayey hills; County Line, Moore, Turner, and two little ones at the southwest corner of the **Campus**. [There are many in the forest at the **Conard Environmental Research Area**, including a few that are over 200 years old.]


White Oak

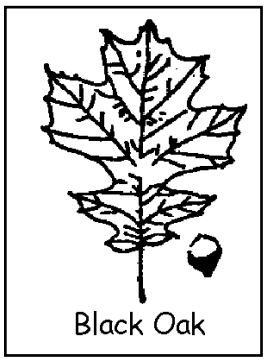
Bur oak is by far the commonest kind in our woods, everywhere in Iowa. The bark is heavily ridged and furrowed, dark gray; the twigs are coarse and have ridges of cork along; the leaves taper to the stalk, and are finely downy beneath with microscopic star-shaped hairs. [Bur oaks are named for the rim of bristles along the edge of the acorn cup]. The scallops of the leaves of white and bur oak are sometimes shallow and sometimes very deep. There is a fine young bur oak at 1310 Elm, [this tree seems to have been replaced by another young bur oak,] a bigger one north of the heating plant on the Campus, and sixteen wild ones at the extreme end of Davis Ave., out in the country but still on the City Limit. [Mature bur oaks can be seen at **1408 Main Street**, northeast of the **Forum** and railroad tracks along the sidewalk on campus, in **Merrill Park**, and in savanna and forest at the **Conard Environmental Research Area**. Look for young trees at **1322 West Street** and **818 Hamilton Avenue**.]


Bur Oak

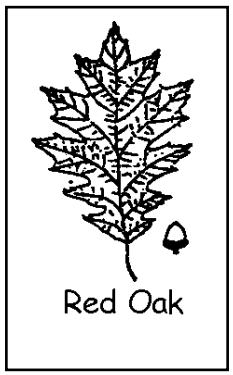
English oak looks quite different, and has very shallow and even scallops on the smooth leaves. There is only one in town: southwest of Chicago Hall on the Campus. It is a good tree, lives hundreds of years in Europe, and should be better known. [One of today's leading authorities on woody landscape plants argues that there are too many

better native oaks to justify extreme excitement over introducing English oaks.]

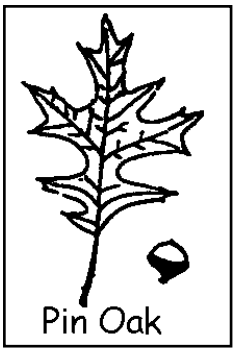
Black oak has such variable leaves it would take two pages to describe them. But its hairy buds mark it. The bark is black, in very hard granular ridges, and the inner living bark is bright yellow. The acorn cup is downy, and as deep as wide. You can see this oak by the alley at 1102 West, and in damp timber anywhere from here to the Atlantic. [Black oaks are usually found on dry ridges and slopes, but may also grow in moist uplands and bottomlands in sandy, well-drained soil. It is usually not used in landscaping because there are other oaks that provide a more attractive growth habit. Visit the **Conard Environmental Research Area** for examples of black oaks.]


Black Oak

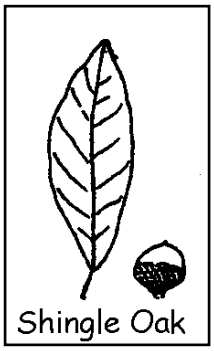
Red oak is the commonest member of this group. The upper branches are smooth and muscular and greenish black; older parts have wide strips of gray bark with shallow furrows between: that combination marks it. The leaves are never very deeply scalloped, and the scallops are wide open. The acorn cup is very shallow, hard and smooth. Dr. Bliss has a fine tree south of his house at **610 Main**, he'll give you a seedling if you ask him. There is another at 710 Broad, and one or two in Mr. Hamlin's yard at 6th and West, and several others [including **1109 Main Street**, **1510 Broad Street**, **Merrill Park**, and very large specimens (over 36" in diameter) at **917 9th Avenue** and in the backyard of **1333 Park Street**. There are also red oaks on campus. One is southwest of the **Bucksbaum Center for the Arts**, three line the sidewalk leading to **Haines Residence Hall** east of the railroad tracks, one grows west of **Younker Residence Hall**, and another can be found west of **Clark Residence Hall**.]

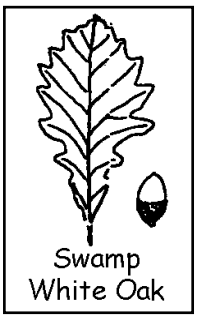

Red Oak

Pin oak belongs in wet ground from southeastern Iowa to Long Island and Virginia. You recognize it because the branches are numerous but small, and they come out at right angles to the trunk, and soon droop down. But the trunk is very stiff and erect. The leaves are very deeply cut and jagged. There is one in the east side of the City Park, one at Hendrixson's, 1333 Park, **one at. B. J. Rickers** [1510 Broad Street]**,** and a handsome group south of the Men's Gym. There is no better tree to be had, and it grows quite rapidly for an oak. Get a lot of them. [Pin oaks are probably the most common oak used in landscaping today. However, they often suffer from iron chlorosis, which is evident when the leaves yellow during the summer. Unless you want to improve the appearance of your pin oak by inserting an iron-nutrient capsule into the trunk, you should avoid planting one in our alkaline soils. There are pin oaks on **central campus**, north of **Younker Memorial Resource Center**, along Park Street next to **Langan, Rawson** and **Dibble Residence Halls**, and at **520 Main Street**.]



Shingle oak is small and rather scrubby, a native of dry prairies in Missouri. The leaf has no scallops at all, but is evenly oval; however, the midrib, the only big vein it has, runs out into a sharp point at the tip. There is one that we found just once and never could locate again three miles southwest of Turner. There are two little ones on the McAra place at Brooklyn. In southern Iowa they are abundant. [The settlers found they could easily make shingles out of the wood. There are three shingle oaks west of the **Quad Loggia** on campus. Let us know if you find any others in or near Grinnell.]



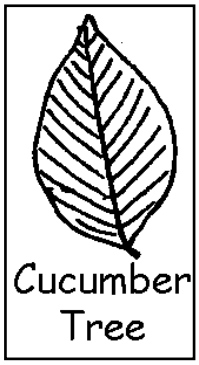


Scarlet oak should grow about here but I've never found it. It is exceedingly like black oak, but the inner bark is reddish, and the buds and acorn cups are not downy. Let's get a few. We should also get overcup oak (*Q. lyrata*), a

noble tree, post oak (*Q. stellata*), swamp white oak (*Q. bicolor*) and some others. [A mature swamp white oak stands southwest of the **Bucksbaum Center for the Arts** on campus.]

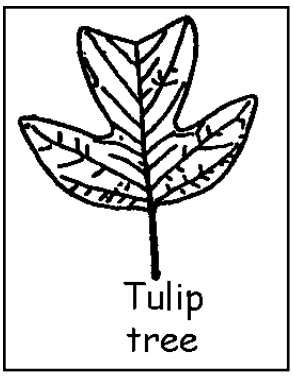
32. *Magnolia* Cucumber tree

We have only one specimen: *M. acuminata*, a stump with two shoots north of the house at 1002 Park St. Somebody please plant another. It belongs southeast, and is scarcely hardy here. The cucumber part is the rough green fruit. This magnolia has dull whitish blooms of no value. The **Ricker place** [1510 Broad Street] has two shrub magnolias that bloom gloriously in April or early May. [There are many magnolias of various species and varieties planted throughout Grinnell. They are easy to spot in late April and May when in bloom. The blooms are often very fragrant.]

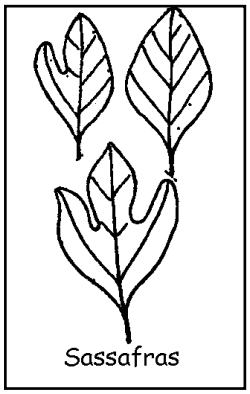


33. *Liriodendron* Tuliptree

There are five of these on the **Campus.** [Two of these still exist, one behind **Harry Hopkins House** at **1131 Park Street** and the other south of **Burling Library**. Also find them at **226 East Street**, **1121 Main Street**, and southwest of the house at **703 Pearl Street**.] You recognize them by the curious whitish fruits at the ends of the twigs, like little candles in fringed holders. The tree is native eastward, a bit tender here, and too brittle for our prairie winds. But when it blooms all over with big yellowish tulips, it is a fine thing and deserves the name of *Liriodendron tulipifera*, the tulip-bearing lily-tree. It is the most magnificent tree in stature, foliage and bloom in the eastern woods, and one of the most venerable geological pedigree. [Tuliptrees can grow to heights of 80 to 100 feet.]



34. *Sassafras variifolium* or *S. albidum* Sassafras

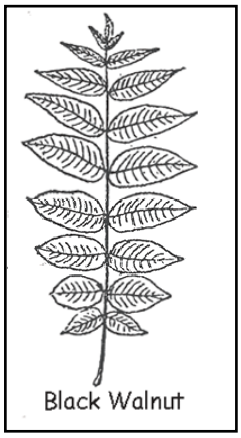


"That sweet wood yclept sassafras." The bark of the roots is sold in drug stores to make sassafras tea, a nauseating (?) drink administered by adults to children in spring to "clear the blood." One little frost bitten treelet in the Botanic Garden, north end of rose bed beside the path. Oskaloosa is just far enough south to have some good big sassafras trees; it is an abundant weed east and south. It is often associated with persimmon (*Diospyros virginiana*) of which there is one specimen in the old Wycoff yard, now McClenon's **1217 Park**; two small trees at Montezuma, and big ones at Oskaloosa.

35. *Juglans* Walnut and Butternut

1.	End bud longer than wide; mature bark in pale flat strips	*J. cinerea* **Butternut**
1.	End bud as wide as long; mature bark ridged, rough, dark brown	*J. nigra* **Walnut**

Now, I recognize these and the hickories first of all by their big coarse twigs, with few alternate branches. But my students don't find it easy to tell what I mean by that. Well then, notice the two or three buds above the leafscar on strong twigs of *Juglans*; or split a dead twig and see how the pith is divided into parallel layers.



Walnut has blackish bark with a tint of brown, evenly ridged and furrowed. The end buds are about as broad as long. You can see a fine row on West St., west side, from about 1315 to 1415, [and others at **1324 Main Street,** the south parking of **1510 Broad Street,** parkings on the south side of **10th Avenue between Spencer and**

Reed Streets, and in the parking northwest of the Carriage House at **1133 Broad Street**.] Butternut has end buds twice as long as thick, and the bark forms broad strips of light gray color. Of course, if you find nuts under the trees, there is no mistaking them. There is a fine specimen north of 1002 High St., and on the north of 1007 East. This and walnut both grow wild in the timber. But I'm not telling where. [Butternuts are very rare in today's timbers along ravines and stream valleys because of harvesting and disease.]

Mr. Skinner and I (thanks to him) have the very fast growing Siberian walnut, and it grows abundantly in the old nursery a mile east of Chester.

36. *Carya* Hickory and Pecan

1.	Bud scales broad, much overlapping each other	2
1.	Bud scales few, narrow, not overlapping, yellow	3
2.	Leaflets 3-5; nutshell thin	*C. ovata* **Shellbark** or **Shagbark hickory**
2.	Leaflets 7-9; nutshell thick	*C. laciniosa* **Giant shellbark hickory**
3.	Bark close and dense, ridged Buds with 2 bright yellow scales	*C. cordiformis* **Swamp** or **Bitternut hickory**
3.	Bark in thin, close scales	*C. illinoinensis* **Pecan**

Again "by their fruits." There is no real possibility of knowing these without seeds and leaves.

However, only two kinds occur in our timber. The shellbark [or shagbark hickory] has the huge, hard plates of bark peeling off, and big, round, thin-scaled buds. It gives us our choice hickory nuts. [**Arbor Lake Park** has a shagbark hickory southwest of the picnic area. You can find many more at the **Jacob Krumm Preserve** and the **Conard Environmental Research Area**.] Swamp **[**or bitternut**]**

hickory has very finely furrowed, close hard bark, and the buds are little, yellow, ridged affairs. This can be seen along the County Line, and in other timbers. [The **Jacob Krumm Preserve** has bitternut hickories in the woods west of the lake.] Mrs. Hendrixson, **1333 Park**, has two splendid young shellbarks; they have beautiful smooth bark with fine white lines lengthways. Near the path in the Botanic Garden is our only giant shellbark, from a seed I got in Mehlin and Clindinin's grocery years ago. Pecan can be seen growing at the old nursery east of Chester. [There is only one tree that we know of in Grinnell at **1717 4th Avenue**.] Great advances are being made at this moment in the cultivation of our native nut trees. Pioneer work is being done by Snyder Bros., nurserymen, of Center Point, Iowa. They can supply stock of a number of rare and remarkable nut trees. The trees are expensive and hard to transplant. But they are destined to come into real prominence as sources of food. [There must be more hickories in Grinnell. Can you find some for us?]

Shellbark or
Shagbark Hickory

Bitternut
Hickory

37. Liquidambar Sweet gum

Another of Dan Bradley's happy experiments. One little tree west of the heating plant on the Campus [now north of the **Forum**. This tree, around 80 years old, has declined in health.] Dare you to get another! It is native of the low coastal plain from New Jersey to Texas, and up to southern Illinois. It would seem impossible for one to live on this high prairie. But here it is. The twigs have thin plates of cork standing edgeways all along them. The leaves are exquisitely star shaped, and take a brilliant crimson coloring in the fall. The curious name, *Liquidambar styraciflua*, refers to the soft balsamic resin of the bark.

38. *Elaeagnus* Russian olive

Scarcely a tree, and never planted for shade, it is used in landscape work for the silvery gray foliage, resembling that of the true olive, to which this is no relation. The bark of *Elaeagnus angustifolia* is dark brownish black, very fibrous and stringy. See the big one at the alley at 1102 West, the group west of the heating plant on the Campus, and the long row west of Arbor Lake. [Russian olives are harder to find in Grinnell today but you can find one example on the north end of the Gracie Park parking lot at **428 East Street**]. The silvery effect is due to innumerable microscopic star-shaped scales of most exquisite design. *Elaeagnus angustifolia* is native of southeastern Europe and adjacent Asia. It has a near relative in the silverberry (*E. argentea*) of northern Minnesota, and the buffalo berry of the Dakotas.

39. *Pyrus* Apple, Pear, and Mountain ash

1.	Twigs densely woolly	*P. ioensis* **Wild crab apple**
1.	Twigs smooth	2
2.	End buds twice as thick as twig (Mt. Ash)	3
2.	End buds smaller	5
3.	Branches all erect; leaves half-pinnate	*P. hybrida* **Oak-leaved mountain ash**
3.	Branches half erect or spreading; Leaves wholly pinnate	4
4.	Buds silky, not gummy	*P. aucuparia* or *Sorbus aucuparia* **European mountain ash**
4.	Buds very gummy	*P. americana* or *Sorbus americana* **American mountain ash**
5.	Buds smooth	*P. communis* **Pear**
5.	Buds or scale margins finely hairy	*P. malus* **Apple**

Mountain ash is distinct from any other tree by the shiny yellowish green bark, and the end buds which are about twice as thick as the twig. The European and American species are terribly alike; but the gummy buds of our native kind are fairly recognizable. And the leaflets of ours are taper-pointed, while those of the European end bluntly. Both differ from the oak-leaved species because the last has a very densely branching top, like a big broom. You can see *P. americana* at 334 East or 609 West; *P. hybrida* at 1208 East, and south of Goodnow Hall. All the rest are *P. aucuparia*: 1208 East, 1121 Main, south of Mears Cottage, etc. [Find European mountain ashes at **932 Reed Street**, corner of **11th Avenue and Broad Street**, and south of the **Quad Dining Hall** on campus. Although the orange-red berries provide some

landscape value, mountain ashes are generally susceptible to many diseases and insect pests.]

What has wild crab to do with pears, apples and mountain ash? Well, if you will forget about the tree, and just examine critically the flowers and fruits, you'll see that they are almost as much alike as a blue violet and a yellow violet. And so we call them all by the same name, *Pyrus*. Wild crab is recognized now by the woolly, reddish twigs, the light gray bark next, and the dark bark on three inch trunks crackled into angular fragments. Also it has many hard, thorn-like, stub-branches that keep you from getting too close. This crab is native of the upper Mississippi Valley. There is nothing in this world more glorious than a patch of wild crabs in bloom, and nothing cultivated that can excel a well grown wild crab tree at flowering time. See the one by the alley at 1202 Broad or the one in Morrison's back yard at 1121 Park, or at Prof Nollen's, 1015 Eighth Ave. And there is a marvelous double flowering variety, Bechtel's crab, at 1030 East, and in the J. L. Fellows' north border. These are splendid beyond all words, but the flowers are just a bit too short lived. [There are at least 400-600 types of flowering crab apples now available across the country. Since crab apples freely hybridize, new forms are produced quite rapidly. Many of these types are very susceptible to apple scab, rust, fire blight, and powdery mildew. Tour Grinnell and the campus in April to find your favorite flowering crabapples.] Pear trees have a crackly bark below, and many hard stub-branches. The branchlets are usually long and rather shiny, and the buds are conspicuous. Most pears are European, and rather tender here. But Keiffer is a cross of European and Asiatic stocks and is more hardy. The breeding of hardy pears for this region and northwest is now in full swing. We'll have many good, new pears inside twenty-five years. [Ask permission to see a pear tree in the backyard of **404 15th Avenue**.]

I've left the apples lumped under the name of *P. malus*. You can't do any better at this season. But only the big eating and cooking apples belong to this name. They have leaves downy beneath, and the flowers red or pink outside. The true Siberian crab, *P. baccata*, has very smooth

leaves, large white flowers, and fruits never bigger than the end of your thumb: These fruits are bright yellow, rarely with a red blush on one side, and the blossom end is an open cup, without anything (calyx) left of the blossom. I've been able to locate only one tree outside of our nursery: at the northwest corner of 5th and Spring St. All the other cultivated crabs are crosses of this with the common apple, and are known as *Pyrus prunifolia*: Whitney, Florence, Transcendent, etc. And Mr. Skinner has a very remarkable crab which is a natural cross of wild crab with common apple. It appeared on the J. R. Rivers farm a mile and a half southeast of Searsboro. Mr. Rivers discovered it and considers it a cross of Iowa Blush and wild crab, as an orchard of that variety is about three quarters of a mile north of where this tree was found. It makes a delicious jell, and is a wonderful keeper. It should not be allowed to die out. I call it the Rivers Crab. In the Botanic Garden we have a new wild pear and a new wild crab apple imported from eastern Asia and a new edible seedling pear raised from seed in the Garden. The nursery has specimens of the new ornamental crabs introduced from Siberia by Hansen of the Brookings, S. Dak. [South Dakota], experiment station. And Dave McBlain and his neighbors have some rare and unnameable pink flowering Siberian crabs, and Merrill Park has a start of all the ornamental crabs known in the nursery trade. All of these can be easily propagated by grafting.

ACKNOWLEDGMENTS

Special thanks go to all who provided encouragement, assistance, and support for updating *Our Trees*. Adelia Hayward ’39 and numerous Grinnell College alumni (1920s-1948) responded to questionnaires for an oral history project on Conard in 2000 by Tor Janson ’01. Their responses revealed the tremendous influence Conard had on their interest in and appreciation for plants and the inherent value in reprinting his book for use by students and community members today.

The two-year process of updating and annotating *Our Trees* required several steps, involving many students, staff, and faculty at Grinnell College, and community members.

Several people helped us check on the status of over 200 trees for which Conard had listed locations and to find new locations for additional specimens. Members of the Grinnell Chapter of Trees Forever were very helpful in completing this task. Ralph Eyberg provided information on campus trees and notable specimens, which supplemented information available from the Grinnell College Tree Guide, a campus tree map produced by Don Snook ’49 and Stan Hall ’49 for the college bicentennial. We thank Benjamin Graham, Jack Robertson, Earl Kinnaird, Debra Martzahn, and Mary Noe for contributing many tree locations in Grinnell and the surrounding area.

Thank you to all who identified the locations of buildings on campus and other places and businesses in Grinnell which are no longer in existence or operating in the same place. Catherine Rod and Wally Walker provided old campus maps identifying where buildings such as Blair Hall stood in 1927 and Jim Powers provided an updated campus map. Joann Orr, Ruth Greenwald, Warner Renaud, Ester Steinert, Marian Dunham, Dorothy Pinder, Karen Groves, Ken Saunders, and Kenneth and Phyllis Saunders identified many locations within and near Grinnell. Places like Snow’s corner, county line timber, the Ford garage, and the McAra place by Brooklyn would otherwise have been difficult to locate.

Dorothy Pinder, courtesy of the Grinnell Herald-Register, provided the image of the American elms lining High Street. We drew upon the artistic skills of Maya Andelson, a ninth grade student at Grinnell-Newburg High School, for leaf illustrations of six species that had not been included in the insert that accompanied the original book. We acknowledge the Iowa State University Extension Service for the use of the conifer illustrations.

Jonathan Andelson, Russell Tabbert, Vincent Eckhart, and Jack Robertson made editorial comments that improved the quality of the supporting materials and annotations.

Finally, this publication would not have been possible without the extensive planning, attention to detail, and ease with which our talented Center for Prairie Studies program assistant, Laureen Van Wyk, integrated each portion of the book into its final place. Thank you to all.

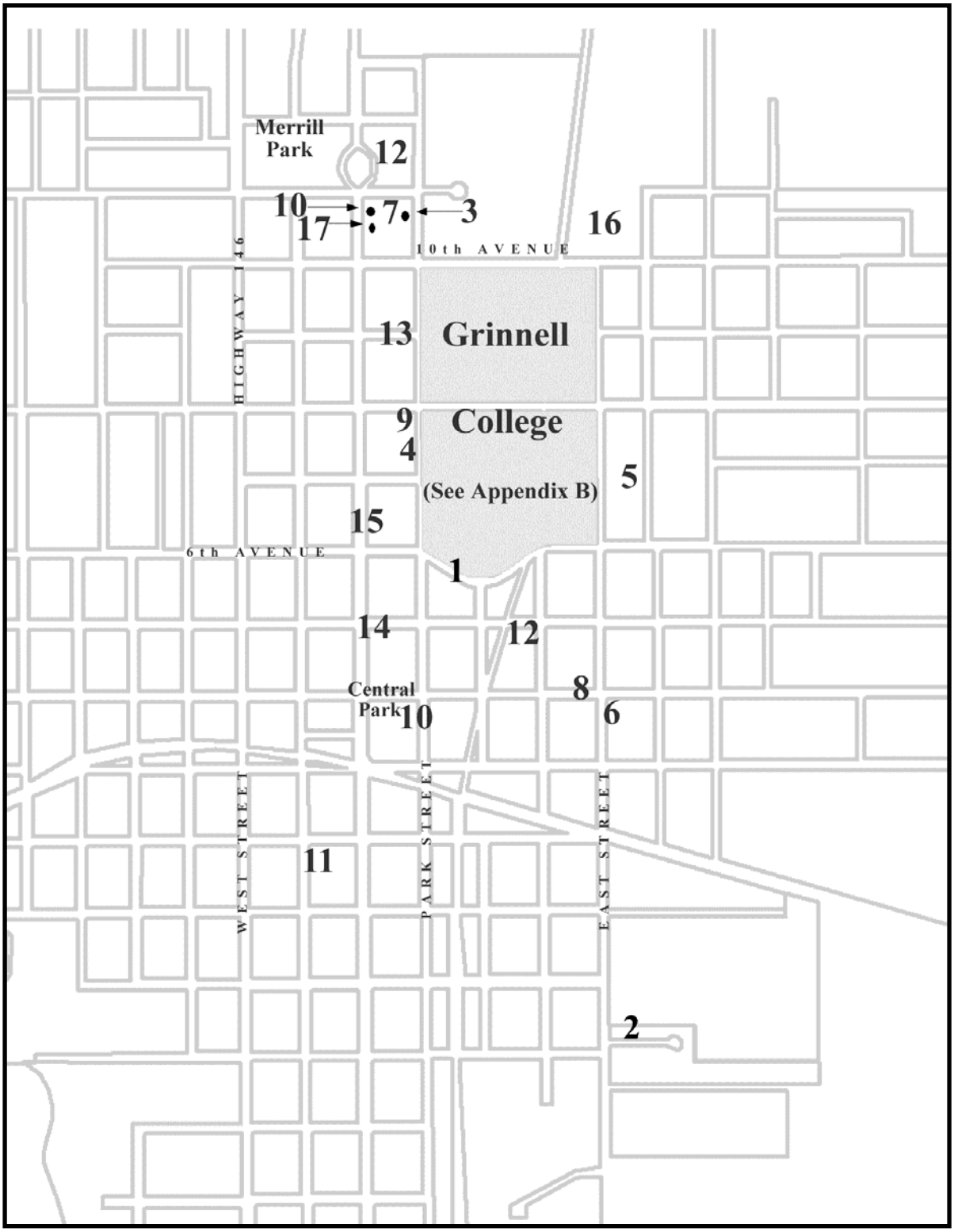
APPENDIX A: MAP OF GRINNELL

This map contains the locations of trees Conard listed that were still alive in Grinnell as of 2003. The locations of campus trees are shown in Appendix B.

Key to tree locations

1	American elm
2	Austrian pine
3	Douglas fir
4	Hackberry
5	Honey locust
6	Kentucky coffeetree
7	Magnolia
8	Ohio buckeye
9	Persimmon
10	Pin oak (2 locations)
11	Red oak
12	'Schwedleri' Norway maple (2 locations)
13	Shagbark hickory
14	Staghorn sumac
15	Sugar maple
16	Swiss stone pine
17	White fir

MAP OF GRINNELL



APPENDIX B: MAP OF GRINNELL COLLEGE CAMPUS

The trees shown on this map were listed by Conard and are still alive as of 2003. Conard refers to trees near six buildings that are no longer in existence on campus, so these are labeled as reference points.

Key to tree locations

1	Baldcypress	8	Pin oak
2	Chinese chestnut	9	Ponderosa pine
3	Cottonwood	10	Silver maple
4	Douglas fir	11	Sweet gum
5	European larch	12	Sycamore
6	Ginkgo	13	Tamarack
7	Gray birch	14	White pine

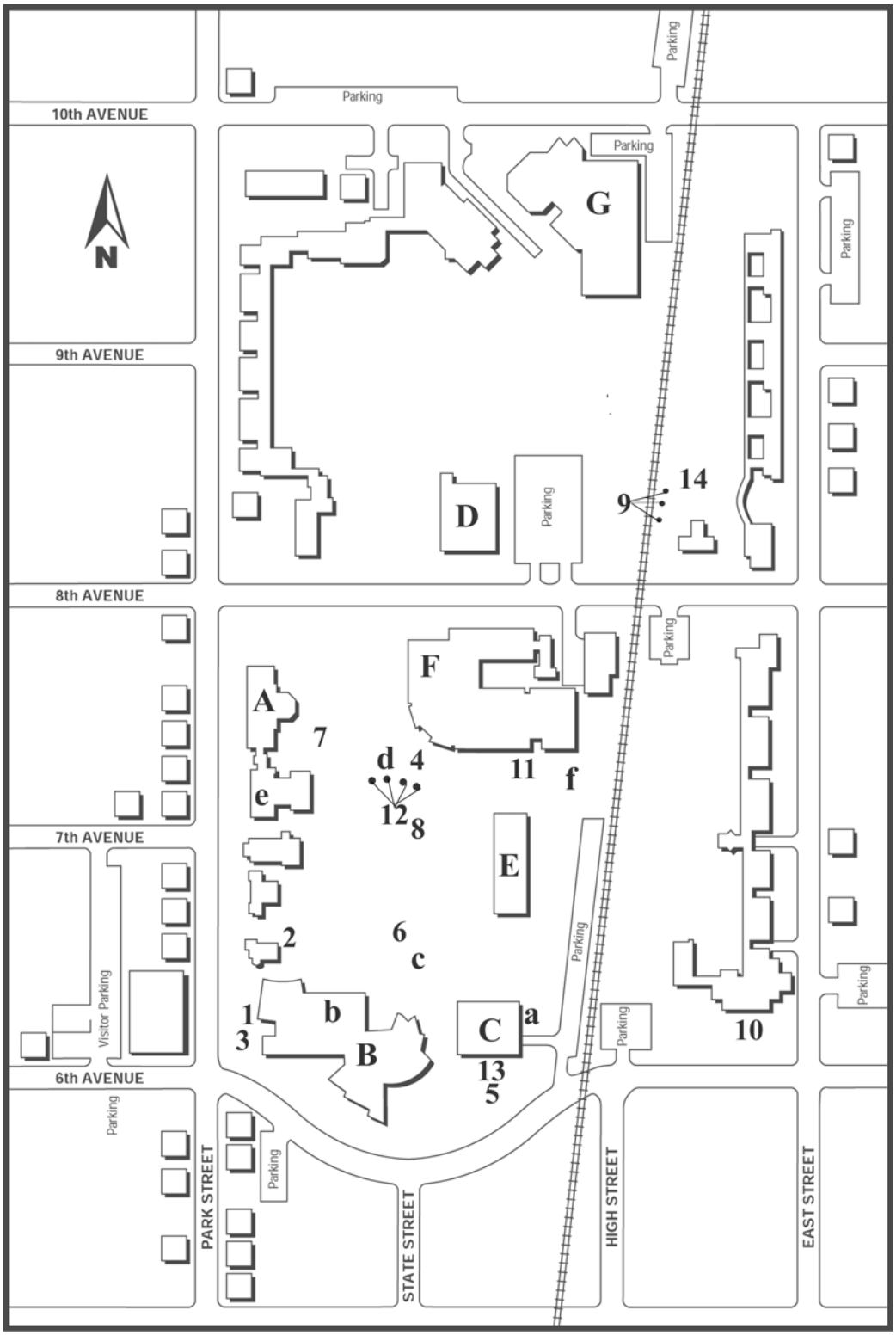
Key to buildings on campus (2003)

A Alumni Recitation Hall (ARH)
B Bucksbaum Center for the Arts (Fine Arts Building)
C Burling Library
D Darby Gymnasium
E Forum
F Noyce Science Center
G Physical Education Complex

Key to buildings on campus pre-1927

a Alumni Hall 1882-1958 (Music Building)
b Chicago Hall 1882-1959 (Magoun Hall)
c Blair Hall 1883-1961
d Men's Gymnasium 1900-1972 (Women's Gymnasium 1942)
e Carnegie Library 1904- (Carnegie Hall 1959)
f Central Heating Plant 1909-

MAP OF GRINNELL COLLEGE CAMPUS



APPENDIX C: LIST OF TREES IN GUIDE BY COMMON NAME

COMMON NAME	SPECIES
Alder	
black	*Alnus glutinosa, A. vulgaris*
common	*Alnus glutinosa, A. vulgaris*
English	*Alnus glutinosa, A. vulgaris*
European	*Alnus glutinosa, A. vulgaris*
Apple, common	*Pyrus prunifolia, P. malus*
Apple, wild crab	*Pyrus ioensis*
Arborvitae	
American	*Thuja occidentalis*
eastern	*Thuja occidentalis*
European	*Thuja orientalis*
western	*Thuja plicata*
Ash	
black	*Fraxinus nigra*
green	*Fraxinus pennsylvanica, F. lanceolata*
white	*Fraxinus americana*
Aspen	
bigtooth	*Populus grandidentata*
quaking	*Populus tremuloides*
Baldcypress, common	*Taxodium distichum*
Balm of Gilead	*Abies balsamea*
Basswood	*Tilia americana*
Bechtel's crab apple	*Pyrus ioensis* cultivar
Beech	
blue	*Carpinus caroliniana*
copper	*Fagus sylvatica* 'Purpurea'
water	*Carpinus caroliniana*
Birch	
canoe	*Betula alba papyrifera, B. papyrifera*
common	*Betula alba , B. pendula*
Dalecarlica' or 'Laciniata'	*Betula pendula variety*

European cut-leaved weeping	*Betula pendula variety*
European white	*Betula alba , B. pendula*
gray	*Betula populifolia*
old field	*Betula populifolia*
paper	*Betula alba papyrifera, B. papyrifera*
poplar	*Betula populifolia*
poverty	*Betula populifolia*
red	*Betula nigra*
river	*Betula nigra*
silver	*Betula alba , B. pendula*
warty	*Betula alba , B. pendula*
white	*Betula alba papyrifera, B. papyrifera*
yellow	*Betula alleghaniensis, B. lutea*
Birdcherry, common	*Prunus padus*
Birdcherry, European	*Prunus padus*
Black locust	*Robinia pseudoacacia*
Black walnut	*Juglans nigra*
Boxelder	*Acer negundo*
Buckeye	
fetid	*Aesculus glabra*
Ohio	*Aesculus glabra*
Burning bush	*Euonymous atropurpureus*
Butternut	*Juglans cinerea*
Buttonball-tree	*Platanus occidentalis*
Buttonwood	*Platanus occidentalis*
Canada balsam	*Abies balsamea*
Catalpa	
common	*Catalpa bignonioides*
eastern	*Catalpa bignonioides*
hardy	*Catalpa speciosa*
northern	*Catalpa speciosa*
southern	*Catalpa bignonioides*
umbrella	*Catalpa bungei*
western	*Catalpa speciosa*
Cedar, eastern red	*Juniperus virginiana*
Cedar, white	*Thuja occidentalis*
Cherry	
black	*Prunus serotina*
common	*Prunus cerasus*
pin	*Prunus pensylvanica*
sweet	*Prunus avium*
wild	*Prunus pensylvanica*

wild red	*Prunus pensylvanica*
Chestnut	
American	*Castanea dentata*
Chinese	*Castanea mollissima*
Chokecherry, common	*Prunus virginiana*
Cottonwood, eastern	*Populus deltoides*
Crabapple, wild	*Pyrus ioensis*
Cypress, southern	*Taxodium distichum*
Devil's-walking stick	*Aralia spinosa*
Elm	
American	*Ulmus americana*
cork	*Ulmus racemosa, U. thomasii*
English	*Ulmus procera, U. campestris*
gray	*Ulmus americana*
red	*Ulmus rubra, U. fulva*
rock	*Ulmus racemosa, U. thomasii*
Siberian	*Ulmus pumila*
slippery	*Ulmus rubra, U. fulva*
white	*Ulmus americana*
Fir	
balsam	*Abies balsamea*
concolor	*Abies concolor*
Douglas	*Pseudotsuga menziesii, P. taxifolia*
Siberian	*Abies vietchii*
veitch	*Abies vietchii*
white	*Abies concolor*
Ginkgo	*Ginkgo biloba*
Hackberry	*Celtis occidentalis*
Haw	
black	*Viburnum lentago*
hard	*Crataegus macracantha*
red	*Crataegus mollis*
soft	*Crataegus margaretta*
Hawthorn, downy	*Crataegus mollis*
Hedge-apple	*Maclura pomifera*
Hemlock	
Canadian	*Tsuga canadensis*
eastern	*Tsuga canadensis*
Hercules-club	*Aralia spinosa*
Hickory	
bitternut	*Carya cordiformis*
shagbark	*Carya ovata*

shellbark	*Carya laciniosa*
swamp	*Carya cordiformis*
Honey locust	*Gleditsia triacanthos*
Honey locust, thornless common	*Gleditsia triacanthos* var. *inermis*
Hophornbeam, American	*Ostrya virginiana*
Hornbeam, American	*Carpinus caroliniana*
Horsechestnut	
common	*Aesculus hippocastanum*
european	*Aesculus hippocastanum*
Indian bean	*Catalpa bignonioides*
Indian cigar	*Catalpa bignonioides*
Ironwood	*Ostrya virginiana*
Juneberry	*Amelanchier arborea*
Juniper	
common	*Juniperus communis*
creeping	*Juniperus horizontalis*
horizontal	*Juniperus horizontalis*
Kentucky coffee tree	*Gymnocladus dioicus*
Larch	
American	*Larix laricina*
common	*Larix decidua*
eastern	*Larix laricina*
European	*Larix decidua*
Linden	
American	*Tilia americana*
European	*Tilia cordata*
littleleaf	*Tilia cordata*
pendant silver	*Tilia petiolaris*
weeping	*Tilia petiolaris*
Locust, black	*Robinia pseudoacacia*
Magnolia	*Magnolia spp.*
Magnolia, cucumbertree	*Magnolia acuminata*
Maidenhair tree	*Ginkgo biloba*
Maple	
amur	*Acer ginnala, Acer tartaricum* spp. *ginnala*
ash-leaved	*Acer negundo*
cutleaf weeping	*Acer* sp.
hard	*Acer saccharum*
red	*Acer rubrum*
river	*Acer saccharinum*
rock	*Acer saccharum*
scarlet	*Acer rubrum*

‘Schwedler' norway	*Acer platanoides 'Schwedleri'*
Siberian	*Acer ginnala, Acer tartaricum* spp. *ginnala*
silver	*Acer saccharinum*
soft	*Acer saccharinum*
sugar	*Acer saccharum*
swamp	*Acer rubrum*
white	*Acer saccharinum*
Mayday tree, European	*Prunus padus*
Mazzard	*Prunus avium*
Mountain ash	
American	*Sorbus americana, Pyrus americana*
European	*Sorbus aucuparia, Pyrus aucuparia*
oak-leaved	*Pyrus hybrida*
Mulberry	
red	*Morus rubra*
Russian	*Morus alba, M. alba tartarica*
white	*Morus alba, M. alba tartarica*
Musclewood	*Carpinus caroliniana*
Nannyberry viburnum	*Viburnum lentago*
Oak	
black	*Quercus velutina*
bur	*Quercus macrocarpa*
English	*Quercus robur*
laurel	*Quercus imbricaria*
pedunculate	*Quercus robur*
pin	*Quercus palustris*
red	*Quercus rubra*
shingle	*Quercus imbricaria*
swamp	*Quercus palustris*
swamp white	*Quercus bicolor*
truffle	*Quercus robur*
white	*Quercus alba*
Oleaster	*Elaeagnus angustifolia*
Osage orange	*Maclura pomifera*
Peach, common	*Prunus persica*
Pear	*Pyrus communis*
Pecan	*Carya illinoinensis*
Persimmon, common	*Diospyros virginiana*
Pine	
Arolla	*Pinus cembra*
Austrian	*Pinus nigra*
bull	*Pinus ponderosa*

eastern white	*Pinus strobus*
jack	*Pinus banksiana*
limber	*Pinus flexilis*
mugo	*Pinus mugo, P. montana*
ponderosa	*Pinus ponderosa*
red	*Pinus resinosus*
Rocky Mountain white	*Pinus flexilis*
scotch	*Pinus sylvestris*
Swiss Mountain	*Pinus mugo, P. montana*
Swiss stone	*Pinus cembra*
western yellow	*Pinus ponderosa*
Planetree, American	*Platanus occidentalis*
Plum	
American red	*Prunus americana*
august	*Prunus americana*
Damson	*Prunus insititia*
goose	*Prunus hortulana*
hog	*Prunus americana*
miner	*Prunus hortulana*
wild	*Prunus americana*
Poplar	
balsam	*Populus balsamifera*
bolleana	*Populus bolleana*
eastern	*Populus deltoides*
lombardy	*Populus nigra 'Italica'*
lombardy black	*Populus nigra 'Italica'*
silver-leaved	*Populus alba*
white	*Populus alba*
Prune, gage	*Prunus domestica*
Quaking aspen	*Populus tremuloides*
Russian-olive	*Elaeagnus angustifolia*
Sassafras	*Sassafras albidum, S. variifolium*
Serviceberry, downy	*Amelanchier arborea*
Shadbush	*Amelanchier arborea*
Sheepberry	*Viburnum lentago*
Silver berry	*Elaeagnus angustifolia*
Small-leaved lime	*Tilia cordata*
Spruce	
Black Hill's	*Picea glauca, P. canadensis*
Colorado blue	*Picea pungens*
Norway	*Picea abies*
white	*Picea glauca, P. canadensis*

Sumac	
common	*Rhus glabra*
smooth	*Rhus glabra*
staghorn	*Rhus typhina*
Sweet gum, American	*Liquidambar styraciflua*
Sycamore	*Platanus occidentalis*
Tamarack	*Larix laricina*
Tree lilac	
Chinese	*Syringa pekinensis*
Japanese	*Syringa reticulata, S. japonica*
Tree of heaven	*Ailanthus glandulosa, A. altissima*
Tulip magnolia	*Liriodendron tulipifera*
Tulip poplar	*Liriodendron tulipifera*
Tuliptree	*Liriodendron tulipifera*
Viburnum, nannyberry	*Viburnum lentago*
Wahoo	*Euonymous atropurpureus*
Whitewood	*Liriodendron tulipifera*
Wild olive	*Elaeagnus angustifolia*
Willow	
bay	*Salix petandra*
black	*Salix nigra*
brittle	*Salix fragilis*
golden	*Salix alba*
laurel	*Salix petandra*
laurel-leaved	*Salix petandra*
peach-leaved	*Salix amygdaloides*
river	*Salix interior, S. longifolia*
sandbar	*Salix interior, S. longifolia*
weeping	*Salix babylonica*
white	*Salix alba*
Yellow poplar	*Liriodendron tulipifera*

APPENDIX D: LIST OF TREES IN GUIDE BY BOTANICAL NAME

SPECIES	COMMON NAME(S)
Acer platanoides 'Schwedleri'	'Schwedler' norway maple
Abies balsamea	Canada balsam, Balsam fir, Balm of Gilead
Abies concolor	White fir, Concolor fir
Abies veitchii	Veitch fir, Siberian fir
Acer ginnala	Siberian maple, Amur maple
Acer negundo	Boxelder, Ash-leaved maple
Acer rubrum	Red maple, Scarlet maple, Swamp maple
Acer saccharinum	Silver maple, Soft maple, White maple, River maple
Acer saccharum	Sugar maple, Rock maple, Hard maple
Acer sp.	Cutleaf weeping maple
Acer tartaricum spp. *ginnala*	Amur maple, Siberian maple
Aesculus glabra	Ohio buckeye, Fetid buckeye
Aesculus hippocastanum	Common horsechestnut, European horsechestnut
Ailanthus altissima	Tree of Heaven
Ailanthus glandulosa	Tree of Heaven
Alnus glutinosa	English alder, Common alder, Black alder, European alder
Alnus vulgaris	English alder, Common alder, Black alder, European alder
Amelanchier arborea	Downy serviceberry, Juneberry, Shadbush
Aralia spinosa	Hercules-club, Devils-walkingstick
Betula alba	European white birch, Silver birch, Warty birch, Common birch
Betula alba papyrifera	Canoe birch, Paper birch, White birch
Betula alleghaniensis	Yellow birch
Betula lutea	Yellow birch
Betula nigra	River birch, Red birch
Betula pendula	European white birch, Silver birch, Warty birch, Common birch
Betula pendula variety	Dalecarlica' or 'Laciniata'
Betula pendula variety	European cut-leaved weeping birch
Betula populifolia	Gray birch, Old field birch, White birch, Poverty birch, Poplar birch
Carpinus caroliniana	American hornbeam, Blue beech, Musclewood, Water beech
Carya cordiformis	Bitternut hickory, Swamp hickory
Carya illinoinensis	Pecan
Carya laciniosa	Shellbark hickory

Carya ovata	Shagbark hickory
Castanea dentata	American chestnut
Castanea mollissima	Chinese chestnut
Catalpa bignonioides	Common catalpa, Southern catalpa, Eastern catalpa, Indian cigar, Indian bean
Catalpa bungei	Umbrella catalpa
Catalpa speciosa	Hardy catalpa, Northern catalpa, Western catalpa
Celtis occidentalis	Hackberry, Common hackberry
Crataegus macracantha	Soft haw
Crataegus margaretta	Hard haw
Crataegus mollis	Red haw, Downy hawthorn
Diospyros virginiana	Common persimmon
Elaeagnus angustifolia	Russian-olive, Oleaster, Wild olive, Silver berry
Euonymus atropurpureus	Burning bush, Wahoo, Eastern wahoo
Fagus sylvatica 'Purpurea'	Copper beech
Fraxinus americana	White ash
Fraxinus lanceolata	Green ash
Fraxinus nigra	Black ash
Fraxinus pennsylvanica	Green ash
Ginkgo biloba	Ginkgo, Maidenhair tree
Gleditsia triacanthos	Honey locust
Gleditsia triacanthos var. *inermis*	Thornless Common Honeylocust
Gymnocladus dioicus	Kentucky coffee tree
Juglans cinerea	Butternut
Juglans nigra	Black walnut
Juniperus communis	Common juniper
Juniperus horizontalis	Horizontal juniper, Creeping juniper
Juniperus virginiana	Eastern red cedar
Larix decidua	European larch, Common larch
Larix laricina	Tamarack, Eastern larch, American larch
Liquidambar styraciflua	American sweet gum
Liriodendron tulipifera	Tuliptree, Tulip magnolia, Tulip poplar, Yellow poplar, Whitewood
Maclura pomifera	Osage orange, Hedge-apple
Magnolia acuminata	Cucumbertree magnolia
Magnolia spp.	Magnolia
Morus alba	White mulberry
Morus alba tartarica	Russian mulberry, White mulberry
Morus rubra	Red mulberry
Ostrya virginiana	Ironwood, American Hophornbeam
Picea abies	Norway spruce
Picea canadensis	White spruce or Black Hill's spruce
Picea glauca	White spruce
Picea pungens	Colorado blue spruce

Pinus banksiana	Jack pine
Pinus cembra	Swiss stone pine, Arolla pine
Pinus flexilis	Rocky Mountain white pine, Limber pine
Pinus montana	Mugo pine, Swiss mountain pine
Pinus mugo	Mugo pine, Swiss mountain pine
Pinus nigra	Austrian pine
Pinus ponderosa	Bull pine, Ponderosa pine, Western yellow pine
Pinus resinosus	Red pine
Pinus strobus	Eastern white pine
Pinus sylvestris	Scotch pine
Platanus occidentalis	Sycamore, American planetree, Buttonwood, Buttonball-tree
Populus alba	White poplar, Silver-leaved poplar
Populus balsamifera	Balsam poplar
Populus bolleana	Bolleana poplar
Populus deltoides	Eastern cottonwood, Eastern poplar
Populus grandidentata	Bigtooth aspen
Populus nigra 'Italica'	Lombardy poplar, Lombardy black poplar
Populus tremuloides	Quaking aspen
Prunus americana	American red plum, Wild plum, August plum, Hog plum
Prunus avium	Sweet cherry, Mazzard
Prunus cerasus	Common cherry
Prunus domestica	Gage prune
Prunus hortulana	Miner plum, Goose plum
Prunus insititia	Damson plum
Prunus padus	European Mayday tree, European birdcherry, Common birdcherry
Prunus pensylvanica	Wild cherry, Wild red cherry, Pin cherry
Prunus persica	Common peach
Prunus serotina	Black cherry
Prunus virginiana	Common chokecherry
Pseudotsuga menziesii	Douglas fir
Pseudotsuga taxifolia	Douglas fir
Pyrus americana	American mountain ash
Pyrus aucuparia	European mountain ash
Pyrus communis	Pear
Pyrus hybrida	Oak-lvd mountain ash
Pyrus ioensis	Wild crab apple
Pyrus ioensis cultivar	Bechtel's crab
Pyrus malus	Apple
Pyrus prunifolia	Common apple
Quercus alba	White oak
Quercus bicolor	Swamp white oak
Quercus imbricaria	Shingle oak, Laurel oak

Quercus macrocarpa	Bur oak
Quercus palustris	Pin oak, Swamp oak
Quercus robur	English oak, Truffle oak, Pedunculate oak
Quercus rubra	Red oak
Quercus velutina	Black oak
Rhus glabra	Common sumac, Smooth sumac
Rhus typhina	Staghorn sumac
Robinia pseudoacacia	Black locust
Salix alba	Golden willow, white willow
Salix amygdaloides	Peach-leaved willow
Salix babylonica	Babylon weeping willow
Salix interior	River willow, Sandbar willow
Salix fragilis	Brittle willow
Salix longifolia	River willow, Sandbar willow
Salix nigra	Black willow
Salix petandra	Laurel-leaved willow, Laurel willow, Bay willow
Sassafras albidum	Sassafras
Sassafras variifolium	Sassafras
Sorbus americana	American mountain ash
Sorbus aucuparia	European mountain ash
Syringa japonica	Japanese tree lilac
Syringa pekinensis	Chinese tree lilac
Syringa reticulata	Japanese tree lilac
Taxodium distichum	Southern cypress, Common baldcypress
Thuja occidentalis	American arbor vitae, White cedar, Eastern arborvitae
Thuja orientalis	European arborvitae
Thuja plicata	Western arborvitae
Tilia americana	American linden, Basswood
Tilia cordata	European linden, Littleleaf linden, Small-leaved lime
Tilia petiolaris	Weeping linden, Pendent silver linden
Tsuga canadensis	Candian hemlock, Eastern hemlock
Ulmus americana	American elm, White elm, Gray elm
Ulmus campestris	English elm
Ulmus fulva	Slippery elm, Red elm
Ulmus procera	English elm
Ulmus pumila	Siberian elm
Ulmus racemosa	Rock elm, Cork elm
Ulmus rubra	Slippery elm, Red elm
Ulmus thomasii	Rock elm, Cork elm
Viburnum lentago	Black haw, Nannyberry viburnum, Sheepberry

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Index entries in **boldface** indicate current tree locations.

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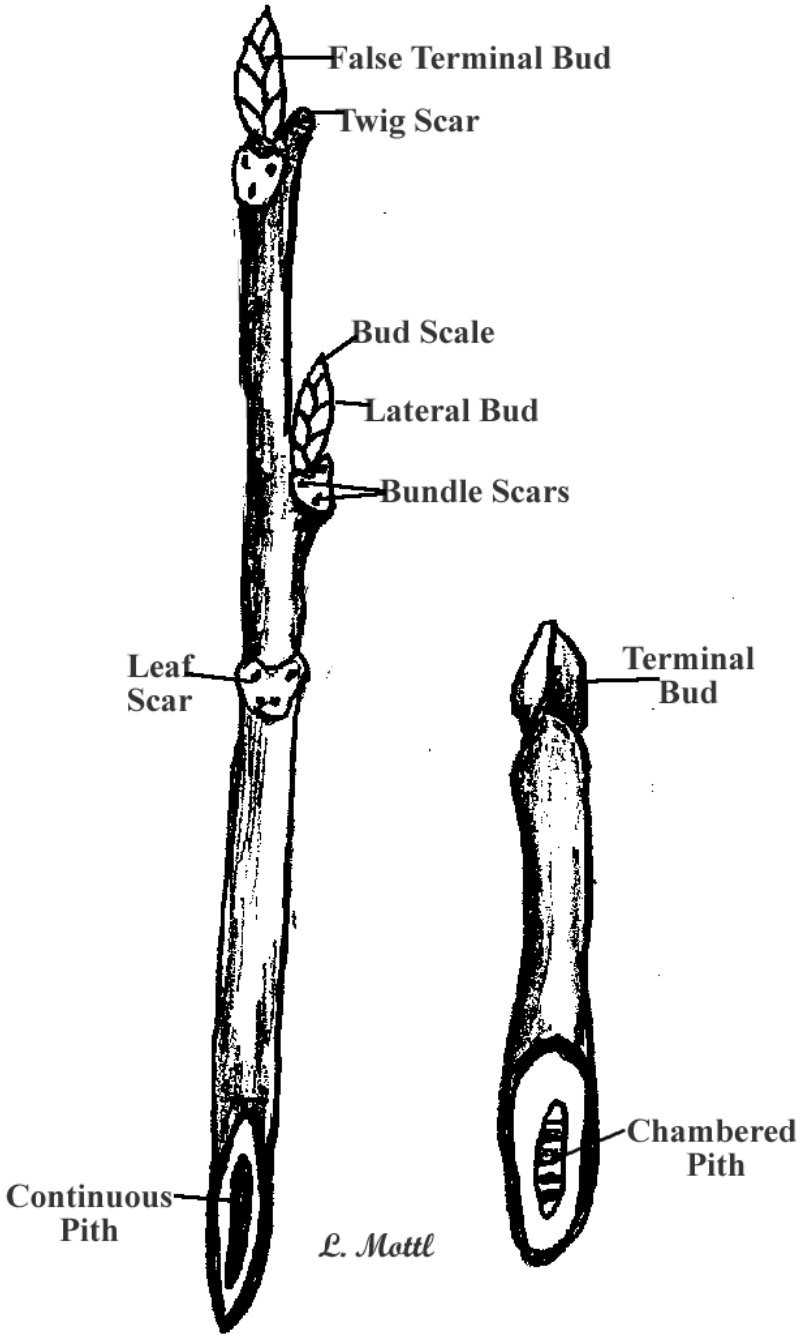
WINTER TWIG DIAGRAM



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