A KEY TO THE COMMON WINTER TREES ABOUT MILWAUKEE.

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Editor's note: Although the title of this paper indicates a purely local significance, it is of pretty general significance, first, in that the trees covered by the synopsis are common throughout many of the north central states, and secondly, in that the method of work used by the author of the paper should prove of great assistance to secondary teachers of botany.

—O. W. C.

The following key is the expression of a desire to help students to help themselves in the field work. It does not pretend to be technical, nor to appeal to the systematist, as such. It includes, with one exception, only the common trees to be found in parks and streets of Milwaukee.

The sycamore is included because of its very characteristic and noticeable exfoliation of the bark. The only term used not readily understood or ascertainable, is the word "smocking."

This term is borrowed from the dressmaker, who catches the plaits of a waist together alternately, thereby causing the surface to appear with diamond shaped cavities or reticulations. The white ash is perhaps the best illustration of the application of the term.

In section one, "cone bearing trees" means trees actually bearing cones, though the student is very likely to know that the evergreens of this part of the world are cone bearing whether the cones are present or not. Similarly, in the first part of section two, the tamarack is given because, though technically a cone bearing tree, the cones are not always present.

Section I.—CONE BEARING TREES.

* *Evergreen trees and shrubs.*

1. *Leaves needle shaped.*

A. In pairs.

a. Needles longer than the finger, tree:

Austrian pine, *Pinus Austriaca* 5

Note—The numbers following the names of trees refer to pages of a Tree Study Bulletin in which descriptions of the trees are given. The bulletin may be had on request. Milwaukee Normal School Bulletin, Vol. 2, No. 4.

- b. Needles shorter than the finger, tree.
Scotch pine, *Pinus sylvestris* 7
 - c. Needles short, one inch long, spreading shrub. Gray or northern scrub pine.
P. *Banksiana*
 - B. Needles in fives.
 - a. Needles slender, soft, whitish below.
White pine, *Pinus strobus*
 - C. Needles single, scattered, one-half to three-fourths inch long.
 - a. Needles one-half inch, stiff, very dark green, tree, cone-shaped, branches horizontal, Christmas tree.
Black spruce, *Picea nigra*
 - b. Needles about $\frac{3}{4}$ in., dark green, branches drooping.
Norway spruce, *Picea excelsa* 7
 - c. Needles about $\frac{3}{4}$ in., slender, pale green.
White spruce, *Picea alba*
 - d. Needles about $\frac{3}{4}$ in., stiff, numerous, crowded, distinct blue-green.
Colorado blue spruce, *Picea parryana* 8
 - 2. *Leaves flat, single, usually whitened below. Bole of tree with scattered blisters exuding balsam if pricked.*
Balsam fir, *Abies balsamea* 8
 - 3. *Leaves minute, scale-like, closely shingled on flat branches, aromatic when crushed.*
American Arbor vitae, *Thuja occidentalis* 9
 - 4. *Leaves very small, awl-shaped, spreading, stiff and sharp, very unpleasant to handle when dry.*
Red cedar, *Juniperus Virginiana*
- ** Deciduous cone bearing trees.**
- A. Bole short, head conical, branches whorled.
 - a. Head broad at base in proportion to height; cones an inch or more long.
European Larch, *Larix Europea*
 - b. Head narrow at base in proportion to height; cones $\frac{1}{2}$ to $\frac{3}{4}$ inch long.
American larch, tamarack, *Larix Americana* 7

Section II.—NOT CONE BEARING, I. E., NO CONES PRESENT.
DECIDUOUS.

* *Stem excurrent or appearing so.*

- a. Branches whorled, horizontal.
- b. Head broad at base in proportion to height.

European larch, *Larix Europea*

- b. Head narrow at base in proportion to height.

American larch, tamarack, *larix Americana* 7

- a. Branches alternate, ascending, long, beset with short, stout, peg-like branches about $\frac{1}{2}$ inch long.

Ginkgo tree, *Salisburia adiantifolia* 5

- a. Branches alternate, ascending, almost appressed, bark of branches olive or tan.

- b. Head narrow candle-flame shape.

- c. Bark of bole dark, rough.

Lombardy poplar, *Populus dilatata* 10

- c. Bark of bole sage green, rather smooth.

Siberian poplar

- b. Head wide candle-flame shape.

- c. Bark of bole furrowed, light streaks or cracks in bottom of furrows.

Carolina poplar or cottonwood 10

** *Stem Deliquescent.*

- A. Bark chalky white, peeling off in layers.

- a. Branches stiff, self supporting.

White birch, *Bitula alba* 11

- a. Branches weak, drooping.

Cut-leaved weeping birch. B. *alba*, variety *pendula-laciniata* 12

- A. Bark dark, brownish gray, smoothish, branches stiff.

- a. Lenticels conspicuous, short, black; new growth bristly hairy; spindle-shaped masses of red fruits often present at ends of branches.

Staghorn sumac, *Rhus hirta* 15

Note—To determine the measure of branching, study the *outer ends* of the branches or the top of the tree.

- a. Lenticels inconspicuous; branches stout, ascending, ending in large, varnished buds, small tree.
Horse chestnut (young), *Aesculus hippocastaneum* 17
- A. Bark dark gray, smooth, marked with narrow, vertical, tan colored spots. Head round, thick.
Norway Maple (young), *Acer platanoides* 16
- A. Bark dark gray, smooth, without markings; branches flat, i. e., branchlets all in one plane; buds mucilaginous.
Basswood, linden (young), *Tilia Americana* 17
- A. Bark olive or olive brown, smooth, lenticels prominent; clusters of red berries often present; small tree.
Mountain ash, *Sorbus aucuparia* 15
- A. Bark light gray and smooth throughout.
 - a. Trunk cylindrical; branches alternate, buds long, spindle-shaped.
American beech, *Fagus Americana* 12
 - a. Trunk cylindrical; branches opposite
 - b. Branches drooping, straggling.
Cut-leaved, silver or white maple.
Acer saccharinum, var. *laciniata* 16
 - b. Branches slightly drooping, usually conspicuously marked by numerous short twigs ending in clusters of buds giving the appearance of belt pins stuck along the branches.
(Young) Soft, white or silver maple.
Acer saccharinum 16
 - b. Branches not drooping, stiff, ascending.
Scarlet maple, *Acer rubrum* 16
 - a. Trunk subcylindrical (somewhat or nearly cylindrical) with conspicuous longitudinal ridges. Small tree.
Hornbeam, blue beech, water beech.
Carpinus Caroliniana 11
- A. Bark chippy or scaly.
 - a. Very dark, chips one inch or more long,

concave, covering bole and reaching well along the branches.

Wild black cherry, *Prunus serotina* 15

- a. Very dark below, light gray in the branches; chips large, flat, thin, peeling off.

(Old) Soft, white or silver maple

Acer saccharinum 16

- a. Very dark below, gray in the branches; chips firm, thick; branches stout, ascending, ending in large, varnished buds. (Old) Horsechestnut.

Aesculus hippocastanum 17

- a. Brown or red brown, rough below, smooth above; chips or scales large, thin, paper-like, deciduous, leaving smooth, olive patches.

Sycamore, *Platanus occidentalis*

- a. Gray or brownish gray; scales long, narrow, loose, fibrous, running more or less spirally up the bole. Small tree.

Iron-wood, *Ostrya Virginiana* 11

- a. Gray, scales small, branches stout; some of the round-lobed leaves usually hang on through the winter.

American white oak. *Quercus alba* 14

- a. Dark gray, scales small; light and smooth in branches; branches stout to the ends, opposite; bole somewhat smocked.

Black or water ash. *Fraxinus niger* 17

- A. Bark very rough, ragged, shaggy, peeling off in long, flat, rough strips, rusty red on under side.

Shagbark hickory, *Hicoria ovata* 9

- A. Bark rough, firm, conspicuously smocked.**

- a. Smocking coarse, loose, elongated.

- b. Head feather duster shape, branches thin; buds and bark not mucilaginous.

American or white elm. *Ulmus Americana* 14

Head same, branches stouter, stiffer; more numerous, buds and inner bark mucilaginous.

- Red, slippery or large leaved elm, *Ulmus fulva* 14
- b. Head flat, spreading, branches descending; bole usually shows grafting joint.
- Camperdown weeping elm 14
- a. Smocking coarse, loose, shallow; branches antler-like; leaf scars saucer shaped, conspicuous; often has long pods.
- Catalpa, Indian bean, *Catalpa speciosa* 18
- a. Smocking close, firm, regular.
- b. Head open; bole gray, branches light, stout, doubly curved, ascending.
- White ash. *Fraxinus Americana* 18
- b. Head open, bole gray, branches dark, stout, drooping, usually shows grafting joint on bole.
- European ash. *Fraxinus excelsior* 18
- b. Head irregular, crowded with wiry branches, bole usually misshapen, warty, humpy, leaning, tree ugly in appearance, occasional exceptions, frequently carries its keys through the winter.
- Box elder, *acer negundo* 16
- b. Head round, symmetrical, full, branches continue the smocking in dark lines on a dark smooth bark.
- (Old) Norway maple, *acer platanoides* 16
- ** Broken into deep, quite regular diamond shaped reticulations.
- b. Head rounded; bole gray, smocking shallow.
- Hard, rock or sugar maple, *acer saccharum* 15
- b. Head ovoid; bole very dark, branches flat, i. e., branchlets (alternate) in one plane 17
- (Old) Basswood, linden, *Tilia Americana* 17
- A. Bark furrowed rather than smocked.
- a. Furrows deep and wide, very dark.
- b. Bole and limbs rugged, stout, dark, ridges of bole lighter.
- Black oak, *Quercus velutina* 13
- b. Bole rugged, low; limbs olive with many black scars; whole top of tree bent more or less toward the northeast

- White poplar, *Populus alba* 10
 - b. Bole rugged, tall, limbs tan, spreading.
Cottonwood (old) Carolina poplar.
Populus deltoidea 10
 - b. Bole rugged, low, branches thin and somewhat drooping, tan colored.
White willow, *salix alba* 11
 - b. Bole rugged, low, branches thin, stiff, yellow.
Yellow willow. *S. alba*. var, *vittelina* 11
- A. Bark rough not distinctly chippy, smocked or furrowed.
 - b. Bole very dark; branches stout at base, opposite.
Red oak, *Quercus rubra* 13
 - b. Bole dark; branches stout, contorted, large limbs and upper bole conspicuously marked with narrow, shallow furrows and ridges that show as wavy lines.
Bitternut, *Hicoria minima* 9

In U. S. Farmers Bulletin No. 333, Mr. W. A. Orton presents many most valuable suggestions upon Cotton Wilt. The nature and life habits of the wilt fungus is discussed, as well as its manner and rate of spread. It has been found that the time of planting and use of fertilizers exert considerable influence on the ability of cotton to withstand attacks of the wilt fungus. But in addition to these things it is possible to select varieties of cotton plants that are much more disease-resistant than others, and to care in seed selection cotton growers are asked to give much attention. It is believed that through proper selection and breeding most of the ills of the wilt disease may be eliminated.

O. W. C.

The *Experiment Station Record* states that appropriations of the last Congress to be administered by the Department of Agriculture aggregate \$15,660,106.00. In addition to the lines of work already under way by the department, more extended attention is to be given to investigation of tuberculosis among cattle, standardizing the grading of cotton, food inspection, making of denatured alcohol under farm conditions. A permanent bison range was provided by instructing the President to reserve for that purpose 12,800 acres of the Flathead Indian Reservation in Montana. The American Bison Society has presented the government a herd of bison for this range.

Although the above total appropriation may seem large, it is to be remembered that it is but 1.5 per cent of the entire federal appropriation.

O. W. C.