Annual report of the Wisconsin State Horticultural Society for the year 1904. Annual meeting at Madison, February 2, 3, 4, 5. Vol. XXXIV 1904

Wisconsin State Horticultural Society
Madison, Wisconsin: Democrat Printing Co., State Printer, 1904

https://digital.library.wisc.edu/1711.dl/P32CVGTSAB2NH8G

Compliments of

F. Cranefield,

Secretary Wis. State Hort. Society.

ANNUAL REPORT

OF THE

WISCONSIN

State Horticultural Society

For the Year 1904.

Annual Meeting at Madison, February 2, 3, 4, 5.

VOL. XXXIV.

F. CRANEFIELD, Secretary,

MADISON, WIS.

MADISON, WIS.
DEMOCRAT PRINTING CO., STATE PRINTER.
1904.

LETTER OF TRANSMITTAL.

MADISON, Wis., May 1, 1904.

To His Excellency ROBERT M. LAFOLLETTE,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Thirty-fourth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

TABLE OF CONTENTS.

ACT OF RE-ORGANIZATION

AND LAWS RELATING TO THE

WISCONSIN STATE HORTICULTURAL SOCIETY.

CHAPTER 151, LAWS OF 1879, AS AMENDED BY CHAPTER 14, LAWS OF 1887.

Section 1. The executive committee of the Wisconsin State Horticultural Society shall hereafter consist of the president, secretary and treasurer of said society, and of one member from each congressional district of the state, said members from the congressional districts to be chosen annually by the county and local horticultural societies in their respective districts.

Section 2. The present officers and executive committee of said society shall hold their respective offices until the Tuesday next succeeding the first Monday in February, and until their successors are appointed.

Section 3. It shall be the duty of said society to aid in the formation and maintenance of county and local horticultural societies, to promote the horticultural interests of the state by the holding of meetings for discussion; by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state.

Section 4. The annual meeting of the society for the election of its officers, the transaction of general business, and the consideration of questions pertaining to horticulture, shall be held at such time and place as may be determined at the last preceding annual meeting. In case of the failure of such meeting to so determine, the executive board may call such meeting by giving at least thirty days' notice to each member of the society.

Section 5. All vacancies in the offices of said society may be filled by the executive committee; and should there be a failure to elect a

member of the executive committee in any district, the vacancy may be filled by a two thirds vote of the members of the society present at any regular appointed meeting.

Section 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state of the transactions of the society, including an itemized account of all moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

EXTRACT FROM CHAPTER 526, LAWS OF 1889.

Section 5. And further, there shall be printed annually upon the approval and order of the commissioners of public printing, * * * seven thousand copies of the transactions of the Wisconsin State Horticultural Society, the same to embrace such abstracts of reports of county and other horticultural societies, and such matters pertaining to the horticultural interests of the state as shall be deemed important, provided that the whole number of printed pages shall not exceed two hundred. * * * Two thousand copies of each of said reports to be bound separately in cloth, all others singly in paper.

Section 6. The reports provided for in the preceding section shall be distributed as follows, through the superintendent of public property: Fifteen copies to each member of the legislature, fifty copies to the State Horticultural Society, ten copies to each county agricultural society, and district industrial association, which embraces two or more counties and furnishes the State Agricultural Society a report of its proceedings, to each of the four societies named in the preceding section, fifty copies of each of the reports of the other three societies, twenty-five copies of each of the reports to the library of the state university; to the governor, lieutenant-governor, secretary of state, state treasurer, attorney general, state superintendent of public instruction, railroad commissioner and insurance commissioner, twenty-five copies each; to the state superintendent of agricultural institutes, fifty copies; to the superintendent of public property, commissioner of labor statistics, adjutant-general, quartermaster general, state board of health, each ten copies; to each public library in the state, two copies; to each state normal school, two copies; to each of the state charitable and penal institutions, one copy; and the remaining copies to the respective societies for distribution by their secretaries.

Section 7. In no case shall the number of printed pages in any report provided for in the act exceed the maximum number specified, except upon written request of the officers submitting the same, and then only upon previous written approval of a majority of the commissioners of public printing, such application and approval to be filed with the secretary of state.

EXECUTIVE COMMITTEE; SECRETARY'S REPORT.

Section 1459a, Statutes of 1898.

Section 1459a. The executive committee of said society shall consist of the president, secretary and treasurer thereof, and one member from each congressional district in the state, these to be chosen annually by the county and local horticultural societies in the respective districts at such time and in such manner as the state society may prescribe. The executive committee may fix the time and place for holding the annual meeting of the state society, if the last meeting thereof failed to do so, and may call such meeting by giving at least thirty days' notice to each member; said committee may also fill all vacancies in the offices of the society, and if a member of such committee is not elected from any congressional district the vacancy may be filled by a vote of two-thirds of the members of the society present at any regularly appointed meeting. The secretary of the society shall make, in October of each even numbered year, a report to the governor of the transactions thereof, including an itemized account of all moneys expended since the last report was made.

No. 224, S.] [Published May 16, 1903.

CHAPTER 259.

AN ACT to amend section 1459 of the statutes of 1898 as amended by chapter 320 of the laws of 1901, relating to the state horticultural society and making an appropriation.

The people of the State of Wisconsin, represented in senate and assembly, do enact as follows:

Section 1. Section 1459 of the statutes of 1898 as amended by chapter 320 of the laws of 1901 is hereby amended by striking out the words "twenty-two hundred and fifty dollars" where the same appear in said section 1459 as amended, and by inserting in lieu thereof the words "four thousand dollars," so that said section when so amended shall read as follows: Section 1459. The Wisconsin state horticultural society is a body corporate by that name, with the general powers and privileges of a corporation so far as applicable. It shall be the duty of the society to aid in the formation and maintenance of county and local horticultural societies, to promote the horticultural interests of the state by holding meetings for discussion thereof, by

the collection and dissemination of information in regard to the cultivation of fruits, flowers and trees adapted to the soil and climate of this state, and in other proper ways to advance the fruit and tree growing interests thereof; and for such purposes only it may take, hold and convey real and personal property, the former not exceeding five thousand dollars in value. For the purpose of aiding in the accomplishment of such subjects the society shall be entitled to receive four thousand dollars annually from the state treasury, two hundred and fifty dollars of which shall be for the maintenance of experiment stations.

Section 2. This act shall take effect and be in force from and after its passage and publication.

Approved May 14, 1903.

CONSTITUTION AND BY-LAWS.

CONSTITUTION.

Article 1. This society shall be known as the Wisconsin State Horticultural Society.

Article II. Its object shall be the advancement of the art and science of horticulture throughout the state.

Article III. Its members shall consist of *annual* members, paying an annual fee of one dollar, which also shall entitle the wife of such member to the privileges of full membership; of secretaries of local horticultural societies reporting to the state society, who shall be considered members *ex-officio*; of *life* members paying a fee of five dollars at one time; of *honorary life* members, who shall be distinguished for merit in horticultural and kindred sciences, or who shall confer any particular benefit upon the society; and *honorary annual* members, who may by vote, be invited to participate in the proceedings of the society.

Article IV. Its officers shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, Superintendent and an Executive Board, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. In addition to the foregoing officers, the presidents of all local horticultural societies reporting to this society shall be deemed honorary members and *ex-officio* vice-presidents of this society. All officers shall be elected by ballot, and shall hold their office for one year thereafter, and until their successors are elected; provided, the additional executive members may be elected by the county or local horticultural societies of their respective districts.

Article V. The society shall hold its annual meeting for the election of officers, commencing on the first Monday in February. It may also hold a meeting in December of each year, at such place and time as may be decided upon by the society, or the executive committee for the exhibition of fruit and for discussions, and such other meetings for

discussions and exhibitions as the executive committee may direct, at such time and place as the executive board shall designate.

Article VI. This constitution, with the accompanying by-laws, may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

I. The president shall preside at meetings, and, with the advice of the recording secretary, call all meetings of the society, and have general supervision of the affairs of the society, and shall deliver an annual address upon some subject connected with horticulture.

II. The vice-president shall act in the absence or disability of the president, and perform the duties of the chief officer.

III. The secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies of the condition and progress of horticulture in the various districts of the state and report the same to the society. It shall be the duty of the secretary to make an annual report to the governor of the state of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The treasurer shall keep an account of all moneys belonging to the society and disburse the same on the written order of the president countersigned by the secretary, and shall make an annual report of the receipts and disbursements, and furnish the secretary with a copy of the same on or before the first day of the annual meeting. The treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties subject to the approval of the executive committee.

V. The executive board may, subject to the approval of the society, manage all its affairs and fill vacancies in the board of officers; three of their number, as designated by the president, shall constitute a finance committee.

VI. It shall be the duty of the finance committee to settle with the treasurer and to examine and report upon all the bills or claims against the society which may have been presented and referred to them.

VII. The standing committees of this society shall be as follows: 1st, Committee on finance, consisting of three members; 2d, Committee on nomenclature and new fruits, consisting of three members; 3rd, Committee on observation, as now provided. Said committee to be appointed annually by the executive committee of the society.

MEMBERS OF THE SOCIETY.

LIFE MEMBERS.

Ames, W. L. ..... Oregon, Wis.
Allis, Frank W ..... Madison, Wis.
Babcock, O. W ..... Omro, Wis.
Barnes, A. D ..... Waupaca, Wis.
Chappel, F. H ..... Oregon, Wis.
Chandler, Jr., S. S ..... Waupaca, Wis.
Converse, D. C ..... Ft. Atkinson, Wis.
Carpenter, L. A ..... Fond du Lac, Wis.
Edwards, F. C ..... Ft. Atkinson, Wis.
Eaton, B. A ..... South Milwaukee, Wis.
Foley, M. F ..... Baraboo, Wis.
France, N. E ..... Platteville, Wis.
Floyd, Henry ..... Eureka, Wis.
Hager, W. S ..... West Depere, Wis.
Harden, F. A ..... Weyauwega, Wis.
Herbst, J. L ..... Sparta, Wis.
Johnson, Franklin ..... Baraboo, Wis.
Kellogg, Geo. J ..... Lake Mills, Wis.
Kellogg, M. S ..... Janesville, Wis.
Kreutzer, A. L ..... Wausau, Wis.
Kierstead, E. H ..... Oregon, Wis.
Loope, T. E ..... Eureka, Wis.
Marshall, S. H ..... Madison, Wis.
McGregor, E. L ..... Appleton, Wis.
Raymer, George ..... Madison, Wis.
Riordan, D. E ..... Eagle River, Wis.
Seubert, John ..... Cologne, Minn.
Seymour, A. N ..... Mazomanie, Wis.
Simonson, Andrew ..... Racine, Wis.
Taylor, Will L ..... Mt. Hope, Wis.
Tilson, Mrs. Ida E ..... West Salem, Wis.

Toole, Wm. ..... Baraboo, Wis.
Underwood, J. M. ..... Lake City, Minn.
Vaughn, B. ..... Grand Rapids, Wis.
Webb, W. H. ..... Superior, Wis.
Wright, Arthur ..... Milwaukee, Wis.

HONORARY LIFE MEMBERS.

Bailey, L. H. ..... Ithaca, N. Y.
Case, F. W. ..... Chicago, Ill.
Hinkley, M. E. ..... Mt. Vernon, Iowa.
Patten, C. G. ..... Charles City, Iowa.
Periam, Jonathan ..... Chicago, Ill.
Phoenix, F. H. ..... Delavan, Wis.
Philips, A. J. ..... West Salem, Wis.
Stickney, J. S. ..... Wauwatosa, Wis.
Trelease, Wm. ..... St. Louis, Mo.
Tuttle, A. G. ..... Baraboo, Wis.
Wiley, O. S. ..... Madison, Wis.

ANNUAL HONORARY MEMBERS.

Marshall, C. A. ..... Cresco, Iowa
Patten, C. G. ..... Charles City, Iowa
Watrous, C. A. ..... Des Moines, Iowa

ANNUAL MEMBERS.

Abbott, C. A. ..... Appleton

Bussey, W. P. ..... Omro
Blackman, H. B. ..... Richland Center
Bennett, Wm. F. ..... Norwood Park, Ill.
Broome, R. ..... Stoughton
Bingham, D. F. ..... Sturgeon Bay
Bodenstein, F. ..... Madison
Beckenstratter, H. ..... Madison
Brown, J. C. ..... Madison
Binkendorff, Gus H. ..... Madison
Bellows, D. G. ..... Madison
Bathrick, H. R. ..... Hewitt

Cranefield, F. ..... Madison
Conover, F. K. ..... Madison
Christman, A. H. ..... Madison
Church, Geo. S. ..... Allenville
Cole, W. B. ..... Pleasant Valley

Diley, J. F. ..... Rush Lake
Davis, L. R. ..... Madison
Doty, E. P. ..... Janesville

Edwards, J. T. ..... Medford
Emery, L. J. ..... Oconomowoc
Everett, E. ..... Madison
Everett, C. H. ..... Racine
Elsom, J. C. ..... Madison

Fagg, Peter ..... Madison
Frees, A. B. ..... Omro

Guilford, W. S. ..... Racine
Goodell, Alfred ..... Reedsburg
Greiling, L. ..... Green Bay
Gething, J. T. ..... Madison

Harris, S. L. ..... Medford
Harris, F. ..... Medford
Ham, P. A. ..... Waupaca
Hillier, B. S. ..... Waunakee
Hanchett, Wm. ..... Sparta
Howie, John ..... Waunakee
Hatch, C. A. ..... Richland Center
Huffman, J. ..... Monroe

Hall, Mrs. C. H. ..... Madison
Henry, A. T. ..... Madison
Hall, Dr. C. H. ..... Madison
Hoopes, R. D. ..... Brynum, Md.
Hatch, L. M. ..... Oakfield

Jenkins, W. J. ..... Omro
Jeffrey, Geo. J. ..... Milwaukee
Johnston, Frank R. ..... Appleton

Kellogg, L. G. ..... Ripon
Kelley, A. N. ..... Mineral Point
Kehoe, C. ..... Madison

Korthals, Aug. C.....Summit Lake
Kieffer, M. .....Fredonia
Kauffman, H. .....Marshfield

Landwier, G. .....Medford
Laiten, L. F. .....Omro
Liebe, John .....Grand Rapids

Menn, Benny .....Norwalk
Menn, J. J.....Norwalk
Menn, Ella .....Norwalk
McKay, John M.....Pardeeville
McKay, W. G. .....Pardeeville
Milward, J. G.....Madison
Main, F. J. .....Madison
Morris, Geo. .....Ridgeway
Myrland, O. L.....Belleville
Moyle, W. J.....Union Grove
Muchleisen, G. .....Alma
McLean, A. C.....Eatontown, N. J.
Malde, O. G.....Grand Rapids

Nelson, M. .....Viroqua
Nash, Charles C.....Three Rivers, Mich.

Oaks, Charles .....Omro
Ovenden, Frank .....Madison
Olson, Geo.....Madison
Oren, Hermann .....Madison

Pearsons, C. L.....Baraboo
Parsons, A. A. .....Omro
Phillips, H. A.....Madison
Palmer, L. H. .....Baraboo

Richardson, C. L.....Chippewa Falls
Roblee, W. M.....Appleton
Richmond, T. C. .....Madison
Richmond, Miss L.....Madison
Ray, Joseph .....Madison
Reek, Joseph .....Madison
Reeve, J. S. .....Neenah
Ruste, C. O.....Appleton
Rounds, Wm. .....Blue Mounds
Renschler, F. .....Baraboo
.....Madison

Rentschler, Geo. .....Madison
Ramsey, Henry .....Madison, Univ. of Wis.

Smith, Irving.....Green Bay
Smith, S. S.....Green Bay
Smith, Geo. B.....Green Bay
Spry, John .....Ft. Atkinson
Senb, T. A.....Madison
Sandsten, Prof. E. P. .....University of Wisconsin, Madison
Saxe, Arthur .....Whitewater
Sandell, Harvey .....Madison
Slaby, Edward G.....Kewaunee
Strand, O. M.....Rice Lake

Toole, Wm. .....Baraboo
Toole, W. A.....Baraboo

Vallejo, C. A.....La Rioja, Argentine Republic, S. A.

Wilkins, A. P.....Delavan
Wrabetz, Frank .....Madison
Wisswig, W. P. .....Madison
Willett, Geo. .....Madison
Williamson, W. D.....Madison
Woodburn, C. R.....Madison
Wetor, Frank.....Random Lake

BUSINESS CARDS OF MEMBERS.

Barnes, A. D., Waupaca, Arctic nursery and fruit farm.
Chappell, F. H., Oregon, grower and dealer in nursery stock.
Coe, Converse & Edwards Co., Ft. Atkinson, general nursery
Foley, M. F., Baraboo, nursery.
France, N. E., Platteville, State Bee Inspector.
Hanchett, Will, Sparta, small fruit grower.
Harden, F. A., Weyauwega, small fruit grower and nursery.
Hatch & Bingham, Sturgeon Bay, nursery and small fruits.
Herbst, J. L., Sparta, small fruit and poultry.
Howie, John, Waunakee, orchard fruits.
Jeffrey, Geo. J., Milwaukee, small fruit and orchard.
Kellogg, L. G., Ripon, small fruit a specialty.
Kellogg, George J., & Sons, Janesville, Belle Cottage Fruit Farm.
Loope, T. E., Eureka, orchard and small fruits.
Marshall, S. H., Maple Bluff Farm, Madison, Wis., plums and cherries.
McKay Bros., Pardeeville, nursery.
Moyle, W. J., Union Grove, nursery.
Philips, A. J., West Salem, Guernsey cattle and nursery.
Ray, Joseph, Madison, small fruits.
Rentschler, F., Madison, florist.
Rentschler, Geo., Madison, nursery and florist.
Seymour, A. N., Mazomanie, small fruits.
Smith, G. B., Green Bay, gardener and seed potatoes.
Smith, I. C., Green Bay, vegetables and small fruits.
Spry, John, Ft. Atkinson, grower of small fruits and plants.
Tuttle, A. G., Baraboo, small fruits.
Toole, William, Baraboo, pansy specialist.
Underwood, J. M., Lake City, Minn., Jewell nursery.
Wilkins, A. P., Delavan, nursery.
Williamson, W. D., Madison, lath tree protectors.

OFFICERS AND COMMITTEES FOR 1904.

President, T. E. Loope.....Eureka
Vice-President, Geo. J. Kellogg.....Lake Mills
Secretary, F. Cranefield .....Madison
Treasurer, L. G. Kellogg.....Ripon
Corresponding Secretary, W. A. Toole.....Baraboo

EXECUTIVE COMMITTEE.

T. E. Loope, Chairman.....Ex-Officio
F. Cranefield .....Ex-Officio
Geo. J. Kellogg .....Ex-Officio
L. G. Kellogg .....Ex-Officio
1st Dist., W. J. Moyle.....Union Grove
2d Dist., S. H. Marshall.....Madison
3d Dist., Wm. Toole .....Baraboo
4th Dist., Arthur Wright.....Milwaukee
5th Dist., F. W. Harland.....Waukesha
6th Dist., Geo. C. Hill.....Rosendale
7th Dist., J. J. Menn.....Norwalk
8th Dist., W. P. Bussey.....Omro
9th Dist., Irving Smith .....Green Bay
10th Dist., A. L. Kreutzer.....Wausau
11th Dist., C. L. Richardson.....Chippewa Falls

COMMITTEE ON NOMENCLATURE.

A. L. Hatch.....Sturgeon Bay.
A. J. Edwards.....Ft. Atkinson.
A. A. Parsons.....Omro.

COMMITTEE ON LEGISLATION.

Charles Hirschinger.....Baraboo.
S. H. Marshall.....Madison.
A. L. Kreutzer.....Wausau.

COMMITTEE ON FINANCE.

W. P. Bussey.....Omro
Irving C. Smith.....Green Bay

COMMITTEE ON REVISION OF FRUIT LIST

Geo. J. Kellogg.....Lake Mills.
A. L. Hatch.....Sturgeon Bay.
J. L. Herbst.....Sparta.

COMMITTEE ON RESOLUTIONS.

D. C. Converse.....Ft. Atkinson
F. C. Edwards.....Ft. Atkinson
W. J. Moyle.....Union Grove

COMMITTEE ON TRIAL ORCHARDS.

Ex-Officio .....President and Secretary
S. H. Marshall.....Madison
L. G. Kellogg.....Ripon
A. J. Phillips.....West Salem

SUPERINTENDENT OF ALL TRIAL ORCHARDS FOR 1904.

The Secretary.

TRIAL ORCHARDS.

Wausau.....Marathon County
Eagle River.....Vilas County
Medford .....Taylor County
Poplar .....Douglas County

LISTS OF FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN.*

APPLES—GENERAL LIST—ALPHABETICAL.

Fameuse (snow), Golden Russet, Longfield, McMahan, Northwestern Greeening, Oldenburg (Duchess), Scott Winter, Talman (sweet), Wealthy, Windsor.

THREE VARIETIES FOR FARM ORCHARD.

Northwestern Greening, Oldenburg, Wealthy.

CRABS.

Martha, Sweet Russet, Whitney.

PLUMS.

Of the three classes of plums commonly cultivated, viz., European, Japanese, and Native or American, the last named is the most reliable.

NATIVE.

Surprise, Quaker, Wyant, Forest Garden, Hammer, Ocheeda.

EUROPEAN.

Lombard, Reine Claude (Green-gage), Moore's Arctic.

JAPANESE.

Abundance, Burbank, Red June.

*The behavior of varieties of fruits is influenced very largely by environment. The conditions of soil, exposure and latitude over such an area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. The following provisional lists were prepared jointly by the Committee on Revision of Fruit Lists and the Secretary. Hardiness of plant and fruit bud has been the leading thought in the selection of varieties. The lists on pp. xxv to xxxv are taken from the Catalogue of the Am. Pomological Society and are intended as a guide in the identification of fruits.—Editor.

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Concord, Delaware, Worden, Moore's Early.

BLACKBERRIES.

(Ancient) Briton, Eldorado, Snyder.

*STRAWBERRIES.

*Varieties starred have imperfect flowers and must not be planted alone.

Bederwood, *Crescent, Dunlap, Gaudy, *Haverland, *Warfield.

FOR THE FARM GARDEN.

Bederwood, *Warfield.

RASPBERRIES.

Black: Conrath, Gregg, Kansas.
Red: Cuthbert, Loudon, Marlboro.
Purple: Columbian.

CURRANTS.

Red: Red Dutch, Long Bunch Holland, Victoria.
White: White Grape.
Black: Lee's Prolific, Naples.

GOOSEBERRIES.

Downing.

PEARS.

On account of the prevalence of blight and winter killing, pears are not generally recommended for Wisconsin. Good crops are occasionally produced under favorable conditions, especially in the southeastern part of the state. The following list includes both early and late varieties. List prepared by W. J. Moyle.

Bartlett, Clapp Favorite, Early Bergamot, Flemish Beauty, Idaho, Kieffer, Lawson, Seckel, Sheldon, Vermont Beauty.

---

*Varieties starred have imperfect flowers and must not be planted alone.

TREES AND SHRUBS RECOMMENDED.

EVERGREENS.

For screens and windbreaks—Norway Spruce, White Spruce, White Pine.

For hedges and screens for shearing—Norway Spruce, American Arbor Vitae, Red Cedar.

For lawns and cemeteries—Norway Spruce for backgrounds. For groups—American Arbor Vitae. Siberian Arbor Vitae, Red Cedar, White Spruce, Colorado Blue Spruce.

For small lawn decoration—Arbor Vitae, Savin Juniper, Mugho Pine.

DECIDUOUS TREES.

The more desirable ones are starred, and a further selection of five is indicated by double stars:

**American Elm, *Box Elder, Black Cherry, Carolina Poplar, **Green Ash, *Hackberry, Honey Locust, Larch, **Linden, **Norway Maple, *Scarlet Maple, **Silver Maple. *Sugar Maple, Scarlet Oak, *White Oak, White Ash.

DECIDUOUS ORNAMENTAL TREES.

This class includes smaller deciduous trees of more value for ornament than for shade or defense.

Cut-leaved Weeping Birch, Tartarian Maple, Ginnala Maple, Kentucky Coffee Tree, Mountain Ash, Weeping Willow, Russian Mulberry.

LIST OF SHRUBS RECOMMENDED.

Common Barberry, Purple-leaved Barberry, Thunberg's Barberry, Desboi's Weigela, Silver Berry, Strawberry Tree, Sea Buckthorn,

Garden Hydrangea, Ruprecht's Honeysuckle, Tartarian Honeysuckle, White Honeysuckle, Slender Honeysuckle, Tea's Weeping Mulberry, Mock Orange, Mock Orange (large fl.), Shrubby Cinque Foil, Russian Almond, Rhodotypos, Smoke Bush, Missouri Flowering Currant, Rose Acacia, Japanese Rose, Golden Elder, Ash-leaved Spiraea, Bumalda Spiraea, Anthony Waterer Spiraea, Billard's Spiraea, Douglas's Spiraea, St. Peter's Wreath Spiraea, Japanese Spiraea, Plumleaf Spiraea, Meadow Sweet Spiraea, Three-lobed Spiraea, Van Houten's Spiraea, Japanese Lilac, Countess Jossika's Lilac, Persian Lilac, Chinese Lilac, Common Lilac, Amur Tamarix, Snowball.

ROSES.

Hardy garden—Harrison Yellow, Persian Yellow, Madame Plantier.

Twelve varieties hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Dinsmore, Marshall P. Wilder, Coquette des Blanches, Earl of Dufferin, Jules de Margottin, Vick's Caprice, Magna Charta, Prince Camille de Rohan, General Washington.

Moss roses, four varieties—Perpetual White, Salet, Paul Fontine, Henry Martin.

Climbers, five varieties—Prairie Queen, Russel's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler.

FRUIT LIST.

A LIST OF FRUITS GROWN BY MEMBERS OF THE WISCONSIN STATE HORTICULTURAL SOCIETY,

As catalogued by the American Pomological Society.

APPLES. (Pyrus.)

Section I.—CRABS—*P. prunifolia.*

[KEY.—Size, scale 1 to 10; 1, very small; 10, very large. Form: c, conical; i, irregular; o, oblate; ob, oblong; ov, ovate; r, round Color: d, dark; g, green; r, red; ru, russett; s, striped; w, white; y, yellow. Flavor: a, acid; m. mild; s, sweet. Quality, scale 1 to 10; 1, very poor; 10, best. Season: e, early; m, medium; l, late; v, very. Use: c, cider; d, dessert; k, kitchen; m, market. Abbreviations of names of places of origin: Am, America; Eng, England; Eur, Europe: Fr, France; Ger, Germany; Hol, Holland; Ont, Ontario; Rus, Russia; Scot, Scotland.]

NAME.	DESCRIPTION.						
	Size.	Form.	Color.	Quality.	Season.	Use.	Origin.
Brier	7	r	r	5	e m	k m	Wis.
Martha	5	o	y r	5-6	e	k m	Minn.
Minnesota	10	ob	y r	5	l	k m	Minn.
Transcendent	7-8	r	y r	5-6	e	k m	Am.
Whitney	8	r c	r	8-9	e m	d k m	Ill.
Gibb	6	o	y r	9	e	k	Wis.
Spitzenberg	5	ob	r	10	l	k d	Wis.
Lyman							
Section II.—APPLES—*P. Malus.*							
Avista	9	r c	y g	5-7	l	d k m	Wis.
Arabka	9	ob c	y g	5-7	e	d k m	Russ.
Alexander	9-10	o c	y r s	5	m	k m	Russ.
Anisim	4-5	r c	y r	7	m	d m	Russ.
Antonovka	6	ov c	y	7	m	k m	Russ.
Arctic	7-8	r c	y r	8	l	k m	N. Y.
Babbitt	5-6	r	r	5-6	l	d k m	Mo.

Section II —APPLES—Continued.

NAME.	DESCRIPTION.						
	Size.	Form.	Color.	Quality.	Season	Use.	Origin.
Bailey	8-9	r	r	7-8	l	d m	N. Y.
Ben Davis	6-9	r o v	y r s	4-5	l	m	Ky.
Blue Permain	8-9	r c	d r s	6	l	d m	Am.
Charlamoff	5-6	r c	g r s	6	e	d m	Rus.
Dominion Winter							
Early Harvest	5-6	r o	y w	9	v e	d k	Am.
Early Joe	3-4	o c	y r s	8-9	e	d	N. Y.
Eureka	6-8	r o b	g y r	6-7	l	d k m	Wis
Fall Orange	8-9	r	y r	3-4	m	k	Mass.
Fall Spitzenberg	6-8	r c	g y	7-8	l	d k m	Va.
Fall Wine	5-6	r o	y r	8-9	m	d	Am.
Fameuse	5-0	r o	y r s	8-9	m	d m	Fr.
Golden Russet	4-6	r o	y r u	5-6	v l	d m	Eng.
Grimes Golden	5-6	r o c	y	9-10	l	d	Va.
Haas	5-7	o c	g y r	4-6	e m	k m	Mo.
Hibernal	5-7	o b c	r s	3-5	m	k m	Rus.
Jonathan	5-6	r c	y r	8-9	l	d k m	N. Y.
Longfield	5-6	r c	y	4-5	e	k	Rus.
Louise		r o	w e	5-6	l	d	Ont.
Lowe	8-9	o b	y	6-7	e	k m	Am.
Lowell	8-9	o b	y	7-8	e	k m	Am.
Lubsk Queen	6-7	r	r	6-7	l	d m	Rus.
McMahan	8-9	r o	y r	4-5	m	d m	Wis.
Maiden Blush	5-6	o	y r	5-6	e	k m	N. J.
Maliuda	6-7	r c	y r	5-6	v l	d k m	Vt.
Mann	6-7	r o	y g	4-5	v l	m k	N. Y.
Milwaukee	7-8	r o	y r s	5-6	l	k m	Wis.
Minkler	6-7	r c	g y r	6-8	l	m	Pa.
Newell	7-8	r o b	y r s	5-6	l	k m	Wis.
Northern Spy	8-9	r o c	y r s	8-9	m l	d k m	N. Y.
Northwestern Greening	8-9	r c	g y	6	l	k m	Wis.
Okabena	5	r o b	r s	4-6	m e	k m	Minn.
Oldenburg	5-6	o	y r s	4-5	e	k m	Rus.

Section II—APPLES—Continued.

NAME.	DESCRIPTION.						
	Size.	Form.	Color.	Quality.	Season.	Use.	Origin.
Patten Greenings	8-9	r	y	5-6	m l	k m	Iowa.
Peerless	5	o r	s	5-6	l	m	Minn.
Perry Russett	5-6	r c	y ru	5 6	m l	d k	N. Y.
Peter	7-8	r	g y	6-7	m	k m	Minn.
Pewaukee	8-9	r o	y r s	4-5	l	k m	Wis.
Plumb Cider	5-6	r c	y r s	5-6	m	d m	Wis.
Pound Sweet	8-9	r	g w	5-6	m l	k	Conn.
Pit sfield Stripe							
Raspberry	3-4	ob i	r	6-7	m e	k m	Rus
Red Astrachan	7-8	r c	r g y	5 6	e	k m	Rus.
Repka Malenka	3-4	r c	r s	5	l m	k	Rus.
Roman Stem	5-6	r	w y r	8-9	l	d k	N. J.
Salome	5-6	r ob	y r	7 8	v l	d k m	Ill.
Scott Winter	5	r c	r s	5-7	l	k m	Vt.
Sops of Wine	5-6	r	y r	5-6	e	d	Eur.
Switzer	5-6	r	w r	6-7	e	k	Rus.
Tetofski	5-6	r o c c	y r s	4-5	e	m	Rus.
Talman Sweet	5-6	r o	y	6-7	l	k m	R I.
Twenty Ounce	9-10	r	y r s	6-7	m l	k m	Conn.
Utter	7-8	r	y r	6 7	m	d m	Am.
Walbridge	5-6	o c	y r s	5 6	l	m	Ill.
Wealthy	6-7	r o	y r s	6-7	m	d k m	Minn.
Willow Twig	6-7	r o c	y r	5-6	v l	m	Va.
Winsdor	5-6	r	y r	6	l	m	Wis.
Wolf River	9-10	r o	w r s	5-6	m	k m	Wis.
Yellow Transparent	6?-	r c	w y	5 6	e	k m	Rus

BLACKBERRIES AND DEWBERRIES. (*Rubus.*)

BLACKBERRIES (*R. villosus*).

[KEY.—Size, scale 1 to 10: 1, very small; 10, very large. Form: c, conical; o, oblong; ov, oval; r, round. Color: b, black. Quality, scale 1 to 10: 1, very poor; 10, best. Season: e, early; m, medium; l, late; v, very. Use: d, dessert; k, kitchen; m, market. Abbreviations of names of places of origin: Am., America,]

NAME.	DESCRIPTION.					
	Size.	Form.	Color.	Quality	Season.	Origin.
Briton	5-6	o ov	b	5	m	Wis.
Early Harvest	4-5	ro	b	7-8	e	Ill.
Eldorado	7-9	o	b	7-8	e	Ohio.
Minnewaska	9	o v	b	6	m	N. Y.
Snyder	6-7	o	b	7-8	m l	Ind.
Stone	5	ro	b	7-8	l	Wis.
Triumph	5-6	o ov	b	6	l	Am.
Badger	6-7	o ov	b	6	m	Wis.

DEWBERRIES. (*R. Canadensis.*)

Lucretia	9-10	o ov	b	6	e	W. Va.

CHERRIES. (*Cerasus vulgaris.*)

[KEY.—Size, scale 1 to 10; 1, very small; 10, very large. Form: c, compressed; h, heart shaped; o, oblate; r, round. Color: a, amber; b, black; p, purple; r, red; y, yellow. Quality: scale 1 to 10; 1, very poor; 10, best. Season: e, early; m, medium; l, late; v, very. Use: d, dessert; k, kitchen; m, market. Abbreviations of names of places of origin: Am., America; Eng., England; Eur., Europe; Fr., France; Ger., Germany; Ont., Ontario; Rus., Russia.]

NAME.	Class.	DESCRIPTION.					
		Size.	Form.	Color.	Quality.	Season	Origin.
Dyehouse	Morello.	5-6	r o	r	5-6	v e	Ky.
Late Kentish	Morello.	5-6	r	r	4-5	l m	Am.
May Duke	Morello.	6-7	r h	r	8-9	e	Fr.
Montmorency	Morello.	7-8	r	r	7-8	e m	Fr.
Morello	Morello	6-7	r h	r b	5-6	l	Eng.
Ostheim	Morello.	6-7	e	r b	6-7	m	Rus.
Richmond	Morello.	5-6	r	r	5-6	e	Eur.

CURRANTS. (*Ribes.*)

[KEY.—Size, scale, 1 to 10: 1, very small; 10, very large. Form: r round. Color: b, black: r, red; w, white. Quality, scale 1 to 10: 1 very poor; 10 best. Season: e, early; m, medium; l, late. Use: d, dessert; k, kitchen; m, market. Abbreviations of names of places of origin: Am., America; Eng, England; Eur., Europe; Fr., France; Ont., Ontario.

NAME.	DESCRIPTION.					
	Size.	Form	Color.	Quality.	Season.	Origin.
Prince Albert	7-8	r	r	7-8	e	Eur.
Cherry	9-10	r	r	5-6	m	Eur.
Fay	9-10	r	r	5-6	m	N. Y.
Holland	5-6	r	r	4-5	e m	Eur.
Market London	5-6	r	r	4-5	m	Eng
North Star	5-6	r		5-6	l	Minn.
Red Cross	9-10	r	r	9 10	m	N. Y.
Red Dutch	6 7	r	r	8-9	m	Eur.
Raby Castle	6-7	r	r	6-8	m	
Victoria	6-7	r	r	5-6	m	Eng.
White Dutch	6-7	r	w	9-10	m	Eur.
White Grape	7-8	r	w	8-9	m	Eur.
Wilder	8-9	r	r	7 8	m	N. Y.
Lee Prolific	8-9	r	b	6-7	m	Am.
Naples	6 7	r	b	6-7	m	Eur.

GOOSEBERRIES. (*Ribes.*)

[KEY.—Size 1 to 10: 1, very small; 10, very large. Form: o, oval; r, round. Color: g, green; r, red; w, white; y, yellow. Quality, scale 1 to 10: 1, very poor; 10, best. Season: e, early; m, medium. Use: d, desert; k, kitchen; m, market. Abbreviations of names of places of origin: Am., America; Eng., England; Ont., Ontario.]

NAME	DESCRIPTION.					
	Size.	Form	Color	Quality.	Season.	Origin.
Chatauqua	8-9	r o	g w	9-10	m	N. Y
Champion	5-6	r o	g y	5	e	Am
Downing	5 6	r	g	5-6	m	N. Y
Industry	9-10	r o	r	6-7	e	Eng.
Houghton	2 3	r o	g r	7-8	m	Mass.
Pearl	5-6	r	g	9 10	m	Ont.
Red Jacket	5-6	r o	r	8	e	Ont.
Smith	5 6	o	y g	9	e	Vt.
Triumph	8-9	r o	g w	7-8	e	Pa.
Columbus	8-9	r o	g y	9-10	m	Am
Queen	8 9	r o	y g	7-8	m	Wis

GRAPES. (*Vitsi.*)

[KEY.—Size, scale 1 to 10: 1, very small; 10, very large. Form: o, oval; r, round. Color: a, amber; b, black; g, green; r, red; w, white; y, yellow. Quality, scale 1 to 10, 1, very poor; 10, best. Season: e, early; m, medium; l, late; v, very. Use: d, dessert; m, market; w, wine. Abbreviations of names of places of origin: Am., America; Ont.; Ontario]

NAME.	DESCRIPTION.					
	Size.	Form.	Color.	Quality.	Season.	Origin.
Agawam	8-9	r o	r b	6-7	m	Mass.
Brighton	7-8	r	r	7-8	e	N. Y.
Concord	7-8	r	b	5-6	m	Mass.
Delaware	2-3	r	r	10	m	N. J.
Diamond	6-7	r	g w	7-8	m	N. Y.
Janesville	5-6	r	b	3-4	e	Wis.
Lindley	5-6	r o	r	5-6	m	Mass.
Mossasoi	7-8	r	r	5-6	m	Mass.
Moore Early	8-9	r	b	6-7	e	Mass.
Niagara	8-9	r	w	7 8	m l	N. Y.
Salem	9-10	r	b	7-8	m	Mass.
Vergennes	7-8	o	r	8-9	m	Vt.
Wilder	9-10	r	b	7-8	m	Mass.
Woodruff	8-9	r	r	6-7	e m	Mich.
Worden	7-8	r	b	7-8	e m	N. Y.
Merrimac	8-9	r	b	7	m	Mass.
Campbell's Early						
McPike						

PLUMS. (*Prunus.*)

[Key.—Size, scale 1 to 10; 1, very small; 10, very large. Form: c, compressed; f, flattened; o, oval; ob, obovate; obl, oblong; r, round. Color: b, black; br, brown; g, green; p, purple; r, red; v, violet; w, white; y, yellow. Quality: scale 1 to 10; 1, very poor; 10, best. Season: e, early; m, medium; l, late; v, very. Use: d, dessert; k, kitchen; m, market; c, curing. Abbreviations of names of places of origin: Am., America; Belg., Belgium; Eng., England; Eur., Europe: Fr., France; Ger., Germany; Jap., Japan; Ont., Ontario; Rus., Russia.]

Name.	Class.	Description.					
		Size.	Form.	Color.	Quality.	Adhesion.	Season.
Native.—*P. Americana* and *p Angustifolia.*							
Aitkin		8	o	r	6		m e
Black Hawk		8	r o	r	8		m l
Brittlewood							
Chas. Downing		6-7	r o	r	5-6		m e
De Soto		5-6	r o	y r	5-6		m
Forest Garden							
Gaylord		8	r o	r y	7		l
Hammer							
Hawkeye		5-6	r	r	5-6		m l
Ochedaa		6	r o	r y	8		m l
Quaker		8	r o	r y	8		e
Rockford		5-6	r o	y r	8-9		m
Rollingstone		6-7	r o	r	6-7		m
Springer							
Stoddard		8	r	r	5		m e
Surprise		7-8	o	d r	9-10		m
Weaver		5-6	o c	r	5-6		m
Wolf		6	r o	r	6-7		m
Wyant		6	r o	y r	f		m
European.—*P. domestica.*							
German Prune		6-7	o	p	6-7		m
Green Gage		4	ov	g	9-10	f	m
Lombard		5-7	r o	v r	g	c	l
Moore's Arctic		6	r o	b	5-6		c
Purple Egg		7-8	o	r p	7-8		m
Yellow Egg		8	o	y	3-4		e
Japanese.—*P. Triflora.*							
Abundance	Jap.	6-7	r o	br r	4-5		e m
Burbank	Jap	6-8	r	p y	4-5		m l
Red June	Jap	5-6	ov	r	4-5		v e
Wickson	Jap	8-9	r w	br	8-9		m

RASPBERRIES. (*Rubus.*)

KEY.—Size, scale 1 to 10: 1, very small; 10, very large. Form: c, conical; o, obtuse; r, roundish. Color: b, black; c, crimson; p, purple; r, red; s, scarlet; y, yellow. Quality, scale 1 to 10: 1 very poor; 10, best. Season: e, early; m, medium; l, late. Use: d, dessert; k, kitchen; m, market. Abbreviations of names of places of origin; Eng., England; Eur., Europe; Fr., France; Ont., Ontario.]

NAME.	DESCRIPTION.					
	Size.	Form.	Color.	Quality.	Season.	Origin.
Columbian	9-10	r	p	6-7	e	N. Y.
Conrath	8-9	o v	b	8-9	e	Mich.
Cumberland	9-10	o v	b	9-10	e	Pa.
Cuthbert	7-8	r c	r	6-7	m	N. Y.
Eureka	6-7	r	b	5-6	e m	Ohio.
Gregg	7-8	r o	b	5-6	m	Ind.
Golden Queen	7-8	r c	y	6-7	m	N. J.
Kansas	6-7	r	b	6-7	m	Kans.
Loudon	6-7	r c	r	5-6	m	Wis.
Marlboro	7-8	r	r	4-5	m	N. Y.
Miller	7-8	r	r	7-8	e	Del.
Nemeha	7-8	r o	b	5-6	e	Nebr.
Ohio	5-6	r	b	4-5	e	Ohio.
Older	5-6	r	b	5-6	e m	Iowa.
Palmer	6-7	r	b	5-6	e	Ohio.
Shaffer	8-9	r	p	6-7	m	N. Y.
Souhegan	3-4	r	b	5-6	m	N. H.
Turner	4-5	r c	r	7-8	m	Ill.

STRAWBERRIES. (*Fragaria.*)

[KEY.—Sex: s, staminate; p, pistillate. Size, scale 1 to 10; 1, very small; 10, very large. Form: c, conical; co, compressed; l, long; o, oblate; ob, oblong; ov, ovate; r, round; i, irregular Color: c, crimson; d, dark; l, light; r, red; s, scarlet. Quality, scale 1 to 10; 1, very poor; 10, best. Season: e, early; m, medium; l, late. Use: d, dessert; m, market. Abbreviations of names of places of origin: Am., America; Austr., Australia; Can., Canada; Ont., Ontario.]

NAME.	DESCRIPTION.						
	Size.	Form.	Color.	Quality.	Sex.	Season.	Texture.
Aroma							
Bederwood	4-5	r c	p r	g	s	m	f
Bubach	8-9	r ob	b c	v g	p	m	f
Brandywine	8	o c	c	g	s	l	m
Brunette	6	r	d r	g	s	m	m
Clyde	8	ob r c	s	g	s	m	m
Crescent	7	c	d s	g	p	m	f
Enhance	7	r c	p r	g	s	m l	m
Glen Mary	7	co	b r	g	s	m	m
Gandy	7	r c	p r	g	s	l	f
Haverland	7	ob	b c	v g	p	m	s
Jessie	8	ob c	b c	v g	s	m	s
Lovett	7	r c	p r	g	s	m	m
McKinley	7	of c	d r	g	s	m	f
Marshall	8	co	d r	g	s	m l	f
Michel E	6	r c	p r	v g	s	e	f
Margaret	7	c	d r	g	s	m l	f
Parker Earle	7	c	p r	g	s	l	f
Splendid	6	r ob	p r	f	s	m	f
Wolverton	6	c	d r	f	s	m	f
Warfield	6	c	d r	v g	p	m	f
Wm. Belt	8	c o	b r	g	s	m	m
Van Deman	6	r c	d c	g	s	m	f
Klondyke	9	l	l r	g	s	l	m
Dunlap	8	c	d r	v g	s	m	f

PROCEEDINGS OF THE ANNUAL MEETING*

OF THE

Wisconsin State Horticultural Society

Held at Madison, Feb. 2, 3, 4 and 5, 1904.

PART I.

TUESDAY—MORNING SESSION.

The meeting was called to order at 9 A. M. by President T. E. Loope.

Invocation by Mr. C. E. Marshall, of Iowa.

The President announced the following committees:

On Fruit: Messrs. C. L. Watrous, L. G. Kellogg.

On Reception: S. H. Marshall, A. J. Philips.

WEDNESDAY MORNING.

Mr. Barnes offered the following resolution:

Resolved, That no person shall be allowed to vote for the election of officers for this society unless they shall have been members in good standing for the past preceding year.

*For convenience the proceedings are divided into three parts: Part 1 includes business transactions, reports of secretary, treasurer, the different committees and list of awards, etc.; Part 2 includes reports from local societies and delegates to other societies, etc.; Part 3 includes papers and discussions.—F. CRANEFIELD, Editor.

This resolution to be in effect and force from its passage.

Dated at Madison, February 3, 1904.

On motion of Mr. Irving Smith, the resolution was referred to the Executive Committee for action.

Motion by Mr. Marshall, seconded by Mr. Johnson, that a telegram of greeting be sent to the two ex-presidents of the Society who were unable to be present, was carried.

The President appointed Mr. Johnson to prepare such telegrams. At the suggestion of Mr. Wilkins, the name of Mr. Phoenix was added to the list of those to whom a telegram was to be sent.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President:—Your Committee on Resolutions report the following:

Resolved, That the thanks of the Society be extended to Supt. McKerrow for keeping the interests of horticulture so prominently before the people at the Farmers' Institutes.

Resolved, The thanks of the Society be extended to Supt. of Public Property Bryant for courtesies extended us during the convention.

On motion of Mr. Johnson these resolutions were adopted.

Resolution introduced by A. D. Barnes:

Resolved, That this Society do and hereby does authorize the establishment and maintenance of a seedling fruit trial station for the purpose of procuring, originating, propagating, testing and disseminating seedling fruits, and that the sum of two hundred and fifty dollars be and are hereby appropriated from any available funds of our treasury annually for this purpose; and that our executive board be authorized and are hereby empowered and instructed to locate the said trial station and to engage a suitable person to have charge and control of this work, whose duty it shall be to select the best of seeds, scions, roots and cottings, to grow, propagate and care for them, to keep careful and accurate records of their progress and to disseminate them according to the directions of our executive board. All products, proceeds and benefits of this

station to be under the control and ownership of this Society. This resolution to be in effect and force from its adoption.

The resolution offered by Mr. Barnes regarding seedling fruit station was, on motion of Mr. L. G. Kellogg, referred to the executive committee for action.

Mr. Johnson: It seems to me with regard to these resolutions, we should have a definite recommendation of the executive committee; I therefore move that they be referred to the executive committee, and they be instructed to report either to this meeting, or to take such action as they see fit.

The foregoing motion was seconded by Mr. Philips and carried.

Resolutions introduced by Geo. J. Kellogg:

Resolved, That A. J. Philips be requested to prepare a report on our Trial Orchards and that we respectfully request Mr. Geo. McKerrow to publish them in his next bulletin that they may reach the farmers who need this information.

Resolved, That at the next annual meeting our constitution be so changed that the election of recording secretary and orchard committee shall be done by the executive board.

Mr. Marshall: I move that the first resolution, in regard to election of secretary, be voted upon now, and the other resolution in regard to trial orchard be referred to the executive committee. Motion carried.

On motion of Mr. Marshall, the resolution regarding election of secretary, was laid on the table.

THURSDAY MORNING.

Mr. Barnes moved that the resolution offered by him on the previous day, which was referred to the executive committee, be laid over for one year. Carried.

PRESIDENT'S ADDRESS.

T. E. Loope.

Again we meet in annual session. It will be well to review the important items in the past year's work and look forward to the matters which must engage our efforts in the coming year.

The office with which you invested me a year ago has not been a sinecure. During the year several things of considerable importance have arisen to claim attention.

Among the most important items and which required the exercise of the best judgment and close attention of your legislative committee was a bill introduced in the senate by Senator Hudnall of Superior to increase our annual appropriation to $4,000. This became a law and the generous action of the legislature places our Society in a position to perform still greater services to the people of the state than ever before. It adds also to the responsibility resting on us as a horticultural body and should call for our utmost endeavor to deserve it. It calls for earnest progressive effort to develop the horticultural possibilities of all the different sections of our great commonwealth.

That this large sum was secured to us shows that earnest work was required of those who were our friends in the legislative halls as well as those who had it in charge, and that their work was well done goes without saying. I believe the state is to be congratulated upon the results. In consequence of increased funds we have established an additional trial orchard at Poplar in Douglas county, about 20 miles east of Superior, and have leased 15 acres of land and fitted a part of the tract for planting the coming spring. Mr. S. H. Marshall, Sen. D. E. Riordan and myself were appointed a committee to select the site and arrange details. These will be presented during the meeting. I also suggest that another trial orchard be established in the western part of the state during the coming season.

I want to urge upon you the necessity of making these stations an object lesson of the people of the different parts of the state, and that full and minute reports be required of those who have them in charge. Also I believe that we should institute a

series of experiments in seedling apples and cross fertilization of different varieties looking to the evolution of new and superior fruit. We must accomplish something to live up to our opportunities. These reports and findings should have the largest circulation among our people not only in our published transactions but in the state press.

Special work in different lines should be instituted and thoroughly caried forward. This is the mission of our trial orchards as I believe. We have members who are excellently equipped for these duties. The board of managers of the Louisiana Purchase Exposition for Wisconsin have generously allotted us $5,000 to make an exhibit of horticultural products at St. Louis the coming season.

In pursuance of this object we have collected and put in cold storage in St. Louis about 600 boxes of apples under the supervision of S. H. Marshall, who was appointed superintendent of collections. It is to be hoped that every member of our society will take an especial interest in this exhibit and assist in every way possible to make it a success.

We should make an appeal to all who are interested in the horticultural interests of the state and who have a pride in her welfare and development not to let this branch of her industries suffer through neglect or indifference.

We have the great fruit states to compete with but if we do our best, I am confident we need not be ashamed of Wisconsin's exhibit. The commissioners are showing their desire to cooperate with our Society in this matter and we should heartily enter into the spirit of the undertaking and collect only the best the state affords to send forward. The coming exposition will undoubtedly be the greatest we shall ever be engaged in. Don't forget that it will require our utmost diligence to make a suitable display in competition with other more favored regions than ours.

A motion by Mr. Barnes, extending greetings of the Society to Senator Hudnall, as an expression of appreciation of his services in connection with securing the appropriation referred to in the President's address, was carried, and the Secretary instructed to write a letter to Senator Hudnall conveying the message.

On motion of Mr. Edwards, the recommendations contained in the President's address were referred to the executive committee.

REPORTS ON TRIAL ORCHARDS.

Wausau, By Mr. Philips.

After an absence of over three years I find myself again among my tree friends in this place. How time flies! During this time our comrades, Prof. Goff, J. S. Harris, J. C. Plumb and B. S. Hoxie, have passed away. I ofttimes wish that those men could have lived to have seen more of the outcome of their labors. I see so much here to remind me of Prof. Goff, as he had a voice in locating the orchard and furnished many trees for the same. I find that most of the trees have made a good growth. Some thirty varieties of apples fruited last year and more will fruit this season if nothing happens to prevent.

The first experiment I will speak of is the planting of thirty-six N. W. Greening trees. Eighteen were three years old and average about eleven inches in circumference. Nine were five years old and average about twelve inches, the largest being fourteen inches. The other nine were two years old from Sturgeon Bay and they average eleven and one-half inches, the largest being thirteen inches; the point proved being that young trees are best to plant. Hibernal and Duchess run about alike, measuring eleven inches. The three trees that lead, both on their own roots and top worked, are seedlings from three different states, to-wit, N. W. Greening of Wisconsin, Pattens Greening of Iowa, Okabena of Minnesota.

The next experiment I will speak of is one of my own originating to decide the best way to grow an orchard. First in 1896 I planted a two-year-old Virginia which I top grafted in 1897 with Wealthy scions. The same year I planted sixteen feet away six Wealthy root grafts intending to allow the best one to stand for a tree; then sixteen feet away I planted a three-year-old Wealthy tree, and as one swallow does not make a summer I repeated this planting in same row. Now for the results in seven years, which I consider a valuable lesson for

young and middle aged planters. First the top worked tree is eleven and one-half feet high and eight inches in circumference, the root graft saved is twelve feet high and five and one-half inches in circumference, and the three-year-old tree is twelve and one-half feet high and eight inches in circumference. Of Okabena planted same way. The top worked tree is thirteen feet high and twelve inches in circumference. The root graft ten feet high and eight inches in circumference, and the three-year-old tree is thirteen feet high and twelve and one-half in circumference. I have nine of the foregoing experiments, the others I will give in later articles.

Prof. Goff sent a seedling crab about five years old without a name. It has grown fine, is fourteen inches in circumference, but has shown no fruit. Think girdling will be next in order. He also sent a Shields crab grafted on body with Dominion winter. The union is good, the Shields being twelve inches in circumference, and the Dominion being thirteen. No fruit yet.

The Iowa Blush sent by G. J. Kellogg seems to be at home and is a beautiful tree and has blossoms. The Harry Kaump seems to be a poor tree here on its own roots and is one of the best top worked. Hamilton Blush and Milwaukee sent by Prof. Goff are very fine trees full of blossoms, and to me seem to be the same variety. Three trees that were sent labeled Gideon are all different, only one, I think, is rightly named. Two trees of May Seek No Further sent by A. D. Barnes are very badly blighted and will be destroyed. The Mary from Springer's lot and the Matterson seedling sent by Prof. Goff are both good trees and full of bloom and will be desirable if fruit is good. The Thompson seedlings from Iowa, sent by the Jewell Co., of Lake City, are a fine lot of trees and will be reported on by number when the fruit is tested. Peerless are growing fine, but two trees sent by J. P. Andrews for that variety are not Peerless and can not be named until they bear fruit. Yellow Transparent looks sickly, and a crab sent by Prof. Goff and originated by Uncle Springer and named for him has blighted to death and will be destroyed. The Morgan sent by Prof. Goff is a fine, thrifty tree full of blossoms; it originated in Vernon county and if it keeps on doing well will be valuable as it is a winter variety. The Tyrol sent by Prof. Goff proves to be the Longfield. This shows that people who send scions to the station often make mistakes, as already two seedlings have

been offered for the Minnesota one thousand dollar premium which on examination proved to be Walbridge. A very fine tree and upright grower came from C. G. Patten, labeled Malinda. I shall watch for the fruit as it has blossoms on it.

This is about long enough and the quarter has not been told. A description of the behavior of the orchard will be an interesting topic for next winter institutes. I wish all growers could inspect it in the bearing season. All the trees I have mentioned are the first year's planting, to-wit, 1896. Other plantings will be taken up later on.

While at Wausau I visited the new agricultural college and training school. It is a fine building and well equipped with modern appliances for the education of boys and girls. Truly Marathon and Dunn counties are favored places for securing practical education. This school is under the careful management of Prof. Johns, who is a former La Crosse county boy. I spoke to the school on the importance of good teachers and explained to them the work we were doing in the trial orchard and invited both teachers and pupils to visit and inspect it. Accordingly on Friday, the 15th of May, Prof. Johns came with over twenty of his students. I showed the practical lessons to be obtained from the object lessons I have given in this article. By getting those young people interested I think it will lay the foundation for an increased interest among the people of the whole county. The excellent fairs they are having in recent years, their commodious buildings on the fair ground, is awakening a great interest in improved live stock, many fine herds of which are now owned near Wausau. Many intend to be present at the annual Guernsey meeting in this county June 3d, at the Rietbrock stock farm at Athens.

VALUE OF TRIAL ORCHARDS.

The advantages of a trial or experimental orchard to the people of Wisconsin is a subject that has interested the writer more or less for the past thirty years, but since we located and I planted the orchard at Wausau this subject has interested me much more forcibly, for the following reasons:

Our State Horticultural Society is kept up and made capable of doing much good by appropriations from the legislature of the people's money—hence it seems to me that as a society we ought

to do all we can to make this orchard of as great a benefit to the taxpayers as we possibly can. Three visits there this season—one in May, one in June, and one in November—has convinced me that there are two very important factors to be used to bring this about.

First, we must take pains to publish what we are doing, how we are doing it, and what varieties of apples, cherries and plums we find that are best adaptable to our state and especially to the cut over and timber lands of northern Wisconsin, where so many are buying homes in which to rear and educate their families, and where every settler has an orchard to furnish fruit for home use.

Second, after the foregoing is done there must be an effort made by some one in every county, or, better, in every township, to get the people to read these published reports—whether they are our state reports or the published reports as seen in our agricultural papers or in agricultural departments now conducted in many of our state and county papers. To be benefited the people must be brought in touch with this work.

I have thought much of this since my visit to the Wausau orchard. After that visit I wrote a lengthy statement of the planting and present condition of the trees and was surprised in June to find men in the western part of that county that did not know we had planted a trial orchard there, though it had been planted then years before. Of course Marathon county is very large, containing forty-four townships.

I find in November that the trees are well filled with fruit buds for next season, and a nice covering of snow is on the ground, and trees are going into winter in fine shape. Hon. A. L. Kreutzer, who has been the owner of the land since Mr. Single sold it to him, has now sold to a Mr. Genzman, who seems to be quite interested in the future of the trees. Mr. Kreutzer is still much interested in it and will do all he can to have the farmers visit and get information from him.

The trees set last spring were two of the excellent hybrid cherry or plum, the Compass, also two of the Yahnke apple trees. This seedling, to my mind ranks well up with the Wealthy in hardiness and productiveness and is a longer keeper. I think it a valuable acquisition to the Minnesota list of apples. I also planted six of the McIntosh Red, sent by ex-President L. G. Kellogg; six Sweet Fameuse and two each of Wisconsin

Snow and Briar Sweet, propagated and sent by President T. E. Loope. All the foregoing have started to grow.

As I stated in my report last spring, we have some fine object lessons in top worked trees—they will pay well for our young men to study. Another plan I have thought of to acquaint the people of northern Wisconsin about this orchard and prevent them from being swindled by trees unsuited to our climate, would be to have a man acquainted with the orchard attend as many of the northern Wisconsin institutes as possible the coming winter, not to advise them to plant large orchards, but to earnestly advise farmers to plant a few suitable kinds for family use. The boys and girls will be benefited by this.

Mr. Wright, the able secretary of the Marathon County Fair, has promised me that if I take charge of the orchard next season that I shall have all the space I need for an exhibit at their fair, and I can have suitable time each day to talk to their farmers on the value to them of this orchard so they may know more of it, and if the executive board of our Society thinks it best I can do the same at a number of the northern Wisconsin county fairs next fall, as I think it will do our taxpayers in that part of the state more good than any exhibition of fruit we can make outside of our own state. This report is somewhat lengthy but it is the first lengthy one we have had for three years. I feel justified in taking your time. I am glad we have an increased appropriation which will enable us to do better work for our trial orchards to benefit the men who pay the taxes from which that appropriation is made, and I wish Mr. McKerrow would publish the same in his annual bulletin which goes into so many farmers' homes.

REPORT OF SECRETARY.

J. L. HERBST.

Again we have met in session to discuss the subject and learn from each other new ideas which will help us to carry on the work which we have chosen. In making up our program I have tried to choose those subjects that will be of interest to us all. By the suggestions of other members I have tried to suit all. I wish to thank all who have so kindly aided and offered suggestions in the making up of our program and trust the coming year will be one of joy and prosperity to each and every member of the Society.

The past season has been another one that kept us all guessing and most of us lived in hope throughout the season. While this was called the off season for fruit in our state, especially tree fruits, we hear very good reports from different sections.

While the season was unfavorable for the best results still we find a good many who seem to be satisfied.

This being the off year for our tree fruits, no very great amount of profits gained can be told by those in this profession. Late frosts, wet season being unfavorable for good pollenization of the blossoms, and the excessive overbearing the year previous were all causes for the light crops of tree fruits. Nevertheless the Society was able to secure over 600 boxes of fruit to put in cold storage for the Louisiana Purchase Exposition and these at last accounts were keeping well with the exception of a few.

There are still a good many southern grown trees being planted especially in the northern part of our state. In one town alone over $1,700 worth of apple trees were disposed of by an Ohio nursery. The plum crop was about an average along the lake shore and eastern part of the state while in most other sections it was below the average.

Small fruits did exceptionally well in some localities while in others the frost and wet weather damaged the crop considerable. The southern crop came in on our Wisconsin crop and the market varied considerable. The late varieties brought a much better price.

From conversations with the leading nurserymen of our state

I learn that an increase in their sales of stock leads me to think that more interest is being taken in horticultural lines of our state. Having attended several of the Farmers' Institutes being held in the state this winter will say that a good deal of interest is taken in the subject of fruits and many questions are asked in regard to varieties, culture, etc., by those in attendance. Will say that Supt. McKerrow has three workers on his forces who talk on the subject of fruit growing for the farmer's use.

Our executive committee have held several sessions during the past year with the following results:

A year ago February 4th at the session held a committee was appointed which consisted of Wm. Toole, J. J. Menn and L. G. Kellogg, to take up the matter of organizing a northwestern auxiliary to our State Society. Motion was carried whereby the Vice President was to become a member of the executive board.

Motion was carried that a committee of five with the President as chairman be appointed and to be called the emergency committee who should be called to act on matters that needed immediate attention which would be done without calling all the executive board together. The committee appointed were: President Loope, L. G. Kellogg, S. H. Marshall, D. E. Riordan and your Secretary.

The question of salary to the Secretary was left to the executive board.

The name of Mr. Williams was selected instead of Mr. Cooper and L. A. Carpenter and W. P. Bussey were added to complete the executive board for the ensuing year. And the executive board for the past year has been the president, vice president, secretary, treasurer, S. H. Marshall, W. J. Moyle, appointed to fill the vacancy of Henry Tarrant, Wm. Toole, Daniel Williams, Geo. J. Jeffrey, W. P. Bussey, J. J. Menn, C. A. Abbott, A. L. Kreutzer, D. E. Riordan and L. A. Carpenter.

At the summer meeting held at Omro the executive board in session passed the following resolutions:

That at the present session no distinction be made between amateurs and professionals in exhibiting fruit.

That separate premiums be offered to amateurs and professionals in collections of fruit.

S. H. Marshall was appointed as superintendent in collecting fruit for the Louisiana Purchase Exposition.

That the committee appointed to locate the new trial orchard use their best efforts to organize a local society in that section.

That a committee of two be appointed to confer with S. H. Marshall in selecting varieties of fruit to be used for the cold storage fruit which was to be used at the Louisiana Purchase Exposition.

The trial orchard committee met in session March 19, composed of President, Secretary, Henry Tarrant, S. H. Marshall and A. J. Philips, and passed the following resolutions: That the following trees be planted at the experimental stations:

At Wausau—5 Fameuse, 6 Lyman, 2 Yahnke and 5 McIntosh, and 4 Hammer and 2 Brittlewood plums, and that the orchard be seeded with clover if found necessary.

At the Eagle River station it was decided to plant 200 more trees and included the following: 10 Lyman, 30 Wealthy, 30 Longfield, 20 Utter, 10 P. Cider, 10 Walbridge, 10 Windsor, 5 Lubsk Queen. In plums—10 Hammer, 10 Brittlewood, 10 Rockford, 10 Aitken, 10 Rolling Stone, 10 Quaker, 5 Surprise, 5 Terry, 5 Compass.

The Medford orchard was to be duplicated.

The motion was carried that A. J. Philips be superintendent of the Wausau orchard, T. E. Loope of Eagle River orchard, and H. Tarrant of the Medford station, and that they be allowed $3.00 per day and expenses for time actually put in.

Motion also carried that if Mr. Philips thought necessary that a spray pump be purchased for the Wausau orchard by the Secretary at the direction of Mr. Philips.

The emergency committee met at Milwaukee June 19. Those present were T. E. Loope, S. H. Marshall, D. E. Riordan and J. L. Herbst, and the following resolutions were adopted:

That the president appoint a committee of three with full power to rent or buy as they see fit a site of 5 to 20 acres for a trial orchard in the northwestern part of the state. The committee appointed were T. E. Loope, S. H. Marshall and D. E. Riordan. The site has since been chosen and is at Poplar, twenty miles from Superior, and the committee no doubt will give the description of the site in their report.

The Secretary was instructed to buy such fence for the Wausau station as would be agreeable to the owner of land.

The Secretary was also instructed to have signs made for the stations at Wausau, Medford and Eagle River. Signs to

be 2x12 ft. and to bear the following matter: Wisconsin State Horticultural Society Experimental Station.

By the death of our member Henry Tarrant a vacancy was left on the executive committee and on the trial orchard committee. President Loope appointed W. J. Moyle to fill the vacancy on the executive board and L. G. Kellogg to fill the vacancy on the trial orchard committee.

As near as I can figure it has cost for the maintenancy of the several stations as follows the past year:

Wausau station, including new trees set, fence, sign board lease of land, work, and salary of the superintendent, $286.30.

Eagle River station, new trees, sign, lease of land, labor and salary of superintendent, $236.21.

Medford station, I am unable to say as no bill has as yet been presented.

Poplar station, locating alone $141.96, rent one year $75.00, total $216.96, very nearly what the Eagle River station cost.

Our superintendents will no doubt give us good reports of the different stations.

Our library is now located in room 124 of capitol building and contains over 500 volumes of horticultural and agricultural reports for various states in the Union. There is a complete set of our reports from 1871 to the present time with the exception of 1873–4–5 and 1896, a complete set of Illinois from 1861 to present time which was presented to the Society by Jonathan Periam of Rogers Park.

A majority of the Minnesota reports and scattering volumes of Indiana, Iowa, Michigan, Kansas, Nebraska, Missouri, Oregon, California, Colorado, Maine, Vermont and New Jersey. A number of volumes from the department at Washington, D. C.

We again mourn the loss of five of our members the past year. Henry Tarrant, A. Clark Tuttle, Z. K. Jewett, D. G. Rogers, and am just informed of the death of Asa Seymour. They have done there life work and passed to the great beyond. May their pleasant faces and examples of their life work always remain with us.

FINANCIAL REPORT.

Postage	$40.50
Freight and express	41.66
Stationery and printing	30.65
Miscellaneous	139.91
Salary	500.00
	$752.72
Received for expenses	$252.72
Received on salary	500.00
	$752.72

Respectfully submitted,

J. L. HERBST,
Secretary.

TREASURER'S REPORT.

L. G. KELLOGG, TREASURER, IN ACCOUNT WITH THE WISCONSIN STATE HORTICULTURAL SOCIETY.

1903.	*Receipts.*		
Feb. 5..	To cash received from state treasurer		$1,125 00
Feb. 5..	To cash, subscriptions and advertising		69 36
Feb. 5..	To cash, memberships		105 00
Aug. 21..	To cash received from state treasurer		2,000 00
			$3,299 36
1904.	*Disbursements.*		
	By cash paid out on orders	$2,997 61	
Feb. 4..	By balance in treasury	301 75	
		$3,299 36	

1903.	Order No.	Disbursements.	
Feb. 5..	.....	By amount due treasurer	$277 93
3..	1	A. J. Payton, delegate to winter meeting	4 15
4..	2	S. H. Marshall, delegate to Iowa state..	22 60
4..	3	Wm Toole, expense account, winter meeting	1 50
4..	4	A. C. Tuttle, expense account, winter meeting	1 48
4..	5	Irving Smith, expense account, winter meeting	6 15
4..	6	T. E. Loope, expense account, Madison and Minnesota state meeting	36 51
4..	7	Geo. T. Tippin, expense account, winter meeting	40 70
4..	8	Mrs. S. G. Floyd, expense account, winter meeting	5 00
4..	9	Mrs. Mae Bradt, expense account, winter meeting	5 00
4..	10	A. D. Barnes, expense account, winter meeting	12 56
4..	11	W. J. Moyle, delegate to N. E. Iowa	23 77
4..	12	A. B. Frees, expense account, winter meeting	4 00
4..	13	W. P. Bussey, expense account, winter meeting	4 00
4..	14	Elw. Nye, premiums at winter meeting	1 20
4..	15	Parsons & Loope, premiums at winter meeting	14 30
4..	16	A. J. Philips, premiums at winter meeting	5 10
4.	17	F. F. Chappel, premiums at winter meeting	8 50
4..	18	A. G. Tuttle, premiums at winter meeting	5 05

1903.	Order No.	Disbursements.	
Feb. 4..	19	By A. D. Barnes, premiums at winter meeting	$9 55
4..	20	Geo. J. Kellogg, premiums, winter meeting	3 05
4..	21	F. C. Edwards, expense account, winter meeting	2 28
4..	22	Mrs. L. W. Barnes, delegate to winter meeting	12 56
4..	23	C. A. Abbott, expense account, winter meeting	4 80
4..	24	G. L. Finkle, expense account, delegate to winter meeting	4 80
4..	25	J. J. Menn, expense account, executive committee	3 80
4..	26	J. Buehler, expense account, winter meeting	2 15
4..	27	John Van Loon, expense account, winter meeting	5 35
4..	28	T. E. Loope, three barrels apples	12 00
4..	29	T. E. Loope, incidental expenses as president	25 09
4..	30	Geo. J. Kellogg, expense account, winter meeting	1 40
4..	31	Mrs. Fannie Earl, expense account, winter meeting	2 00
4..	32	J. A. Gaynor, expense account, winter meeting	4 88
4..	33	W. H. Huppler, hotel accommodations	167 80
10..	34	J. W. Livingston, address and expense account	30 44
13..	35	A. J. Philips, expense account, winter meeting	4 88
Mch. 6..	36	McBride Bros., printing magazine	78 00
9..	37	J. L. Herbst, part salary	75 00
12..	38	Emma Jacobson, reporting winter meeting	59 40
April 2..	39	H. Tarrant, expense account, orchard com	3 38
May 9..	40	A. L. Kreutzer, rent as per contract	50 00
14..	41	Coe, Converse Edwards Co., trees for trial orchard	14 40
20..	42	C. L. Watrous, trees for Eagle River orchard	11 75
June 1..	43	J. L. Herbst, expense secretary's office	36 50
1..	44	A. B. Lyman, trees for Eagle River station	3 00
13..	45	S. F. Harris, freight on trees	2 80
July 6..	46	T. E. Loope, expense account	25 50
6..	47	T. E. Loope, expense account, Medford trial orchard	38 76
6..	48	T. E. Loope, expense account, St. Louis exposition	8 50
24..	49	S. H. Marshall, expense account corresponding secretary	22 64

1903.	Order No.	Disbusements.	
Aug. 3..	50	By J. L. Herbst, three signs for trial orchard	$24 00
3..	51	J. L. Herbst, expense secretary's office..	38 50
8.	52	A. L. Kreutzer, work on Wausau orchard	97 50
8..	53	T. E. Loope, expense account, locating Poplar orchard	36 10
8..	54	S. H. Marshall, expense account, locating Poplar orchard	63 36
27..	55	E. B. Skewes, expense account, summer meeting	7 29
27..	56	T. E. Loope, expense account, summer meeting	8 50
27..	57	R. R. Remington, expense account, summer meeting	10 00
27..	58	Wm. Toole, expense account, summer meeting	11 00
27..	59	J. J. Menn, expense account, summer meeting	10 30
27.	60	Miss Ella Menn, expense account, summer meeting	10 30
27..	61	W. J. Moyle, expense account, summer meeting	7 10
27..	62	C. A. Abbott, expense account, summer meeting	90
27..	62	F. C. Edwards, expense account, summer meeting	5 80
27..	64	Irving Smith, expense account, summer meeting	2 70
28..	65	A. Larrabee, hotel bill, summer meeting	20 00
29..	66	J. L Herbst, printing and stationery....	33 50
29..	67	D. Utter, expense account, summer meeting	6 02
29..	68	E. T. Sheldon, premiums, summer meeting	5 00
29..	69	Mrs J. Treleven, premiums, summer meeting	10 00
29 .	70	A. D. Barnes, premiums, summer meeting	10 50
29..	71	J. B. Noyes, premiums, summer meeting	3 00
29..	72	C. A. Abbott, premiums, summer meeting	1 00
29..	73	W. P. Bussey, premiums, summer meeting	1 00
29..	74	Mrs. T. C. Cook, premiums, summer meeting	6 00
29..	75	Wm. Toole, premiums, summer meeting	6 50
29..	76	W. M. Hall, premiums, summer meeting	1 00
29..	77	M. V. Sperbeck, premiums, summer meeting	11 50
29..	78	A. B. Frees, premiums, summer meeting	2 00
29..	79	Q. G. Floyd, premiums, summer meeting	10 50
29..	80	R T. Darrow, premiums, summermeeting	4 00
29..	81	J. P. Roe, premiums, summer meeting .	6 00
29..	82	T. E. Loope, premiums, summer meeting	6 00
29..	83	Mrs. E. Stead, premiums, summer meeting	4 50

1903.	Order No.	Disbursements.	
Aug. 29..	84	By Miss M. Howlett, premiums, summer meeting	$4 00
29..	85	Mrs. W. E. Thrall, premiums, summer meeting	6 50
29..	86	Mrs. L. W. Barnes, premiums, summer meeting	9 50
29..	87	Mrs. Geo Buck, premiums, summer meeting	8 00
29..	88	C. Philipson, premiums, summer meeting	2 00
29..	89	Sarah Tieman, premiums, summer meeting	1 00
29..	90	H. C Christenson, premiums, summer meeting	50
Sept. 14..	91	S. H. Marshall, expense account, summer meeting	11 09
14.	92	Emma Jacobson, reporting summer meeting	30 00
14..	94	Mrs. J. Treleven, board, summer meeting	12 30
Oct. 3..	95	P. A. Peterson, rent, Poplar orchard	75 00
3..	96	E. B. Banks, survey and plat of Poplar orchard	25 00
10..	97	A. L. Kreutzer, fence and expense account	66 61
29..	98	L G. Kellogg, expense account and trees for stations	71 69
29..	99	A. D. Barnes, premiums at state fair	6 50
29..	100	Mrs. Robt. Ramsay, premiums at state fair	7 00
29..	101	W. F. Steele, premiums at state fair	6 50
29..	102	Pioneer Fruit Farms, premiums at state fair	5 50
29..	103	Kelly Bros , premiums at state fair	5 50
29..	104	Geo. J. Jeffrey, premiums at state fair	5 50
29..	105	Wm. Fox, premiums at state fair	5 00
29..	106	Wm. Ablard, premiums at state fair	4 50
29..	107	E. W. Palmer, premiums at state fair	4 00
Nov. 16..	108	J. L. Herbst, part salary	75 00
28..	109	D. E. Riordan, locating Poplar orchard	42 50
28..	110	D. E. Riordan, labor, etc., Eagle River trial orchard	105 55
Dec. 1..	111	A. J. Philips, salary and expense account	59 44
1..	112	A. J. Philips, trial orchard com	9 07
22..	113	T. E. Loope, delegate to Missouri state meeting	50 95
22..	114	E. P. Sandsten, delegate to Iowa state meeting	30 07
22..	115	J. J. Menn, delegate to North Illinois state meeting	11 20
27..	116	Wm. Toole, delegate to Northeastern Iowa state meeting	14 56
1904.			
Feb. 4..	117	L. G. Kellogg, expense account	21 92
4..	118	J. L. Herbst, balance salary	350 00
4..	119	T. E. Loope, expense as president	25 00
4..	120	A. D. Barnes delegate to Minnesota	21 70
4..	121	J. L. Herbst, expense account, secretary's office	120 22
			$2,997 61

REPORT OF FINANCE COMMITTEE.

Madison, February 4, 1904.

To the President and Members of the Wisconsin State Horticulturist Society:

The undersigned, your committee on Finance, have this day examined the books, vouchers and accounts of your Secretary and Treasurer and find the account of Treasurer corresponds to the bills filed with your Secretary.

We would respectfully recommend that the reports of your Secretary and Treasurer be accepted and adopted as read.

Respectfully submitted,

W. P. Bussey,
Irving C. Smith.

REPORT OF COMMITTEE ON FRUIT DISPLAY.

To the President and Members of the Wisconsin Horticultural Society:

Gentlemen: Your committee, appointed to make the awards on fruit exhibited at this meeting, beg leave to report that we have carefully examined the exhibits and awarded the following premiums:

C. L. Watrous,
L. G. Kellogg.

Apples, Largest and Best Display.

1st, T. E. Loope; 2nd, A. D. Barnes; 3d, Geo. Jeffrey; 4th, A. N. Kelley.

Display Seedlings.

1st, A. D. Barnes; 2nd, T. E. Loope; 3d, Geo. Jeffrey; 4th, Louis Grieling.

**Four Varieties, Quality, Hardiness and Productiveness.*

1st, A. D. Barnes; 2nd, T. E. Loope.

†Three Varieties, Long Keepers.

1st, A. D. Barnes; 2nd, T. E. Loope.

Three Varieties, Russian.

1st, Geo. Jeffrey.

Three Crab Apples.

1st, W. A. Toole, on native crab seedlings.

Single Seedling.

1st, A. D. Barnes; 2nd, T. E. Loope.

Single Plates.

Wealthy: 1st, T. E. Loope; 2nd, A. D. Barnes.
Northwestern Greening: 1st, L. G. Kellogg; 2nd, T. E. Loope.
Pewaukee: 1st, Mrs. C. A. Alexander; 2nd, A. D. Barnes.
Wolf River: 1st, A. D. Barnes; 2nd, T. E. Loope.
Fall Orange: 1st, T. E. Loope; 2nd, Geo. Jeffrey.
Fameuse: 1st, T. E. Loope; 2nd, Geo. Jeffrey.
Repka: 1st, T. E. Loope.
Ben Davis: 1st, A. D. Barnes; 2nd, T. E. Loope.
Golden Russet: 1st, T. E. Loope; 2nd, A. N. Kelley.
Goldenburg: 1st, A. N. Kelley.
Tolman: 1st, T. E. Loope; 2nd, A. N. Kelley.
Malinda: 1st, A. N. Kelley.
Newell: 1st, A. D. Barnes; 2nd, A. N. Kelley.
McMahan: 1st, A. D. Barnes; 2nd, T. E. Loope.

---

*Mr. Barnes won on Wealthy, Wolf River, Pewaukee and Northwestern Greening.
†Northwestern Greening, Golden Russett, Ben Davis.

Walbridge: 1st, T. E. Loope; 2nd, L. Grieling.
Scott Winter: 1st, T. E. Loope; 2nd, A. D. Barnes.
Plumb Cider: 1st, T. E. Loope; 2nd, Geo. Jeffrey.
Evelyn: 1st, A. D. Barnes.
Price Sweet: 1st, A. D. Barnes.
North Star: 1st, A. D. Barnes.
Seek-No-Further: 1st, L. G. Kellogg; 2nd, Mrs. Alexander.
Golden Russet: 1st, A. D. Barnes; 2nd, Geo. Jeffrey.
Patten: 1st, A. D. Barnes.
Perry Russet: 1st, T. E. Loope; 2nd, A. D. Barnes.
Gano: 1st, L. G. Kellogg; 2nd, T. E. Loope.
Northern Spy: 1st, T. E. Loope.
Grimes Golden: 1st, A. D. Barnes; 2nd, T. E. Loope.
Anisim: 1st, Geo. Jeffrey.
Sutton: 1st, Geo. Jeffrey.
Twenty Ounce: 1st, Geo. Jeffrey; 2nd, T. E. Loope.
Mann: 1st, Geo. Jeffrey; 2nd, Geo. J. Kellogg.
Wythe: 1st, Geo. Jeffrey.
Jonathan: 1st, Geo. Jeffrey.
Bottle Greening: 1st, Geo. Jeffrey.
Wagner: 1st, Geo. Jeffrey.
Fuldenwalder: 1st, Geo. Jeffrey.
Milwaukee: 1st, Geo. Jeffrey.
Gilliflower: 1st, Geo. Jeffrey; 2nd, T. E. Loope.
Limbertwig: 1st, A. D. Barnes.
Northern Sweet: 1st, T. E. Loope.
Bailey: 1st, T. E. Loope.
Longfield: 1st, T. E. Loope.
Gideon: 1st, T. E. Loope.
Greening (Rhode Island): 1st, T. E. Loope.
Willow Twig: 1st, T. E. Loope.
Peerless: 1st, T. E. Loope.
Pearmain: 1st, T. E. Loope.
Antonovka: 1st, T. E. Loope.
Fameuse Sweet: 1st, T. E. Loope.

On motion of Mr. S. H. Marshall, the visiting members from adjoining states, Messrs. Patton, Marshall and Watrous, were made annual honorary members of the Society.

The next order of business being election of officers, the Presi-

dent appointed as tellers, Mr. W. A. Toole and Mr. A. D. Barnes.

It was moved by Mr. Philips that the Secretary be instructed to cast the ballot of the Society for the present president, Dr. T. E. Loope, to succeed himself. Motion was put by Vice President Edwards and carried, and the Secretary cast the ballot accordingly.

Mr. Phillips placed in nomination for vice president Mr. Geo. J. Kellogg, of Lake Mills, and on motion of Mr. Irving Smith, the Secretary was instructed to cast the ballot of the Society for Mr. Kellogg.

The informal ballot for secretary resulted as follows:

Total number of votes cast, 86; necessary to a choice, 44, of which Mr. Philips received 11; Mr. Herbst, 12; Mr. Cranefield, 59; scattering, 4.

Mr. Herbst having withdrawn his name, Mr. Philips withdrew his also, and moved that the informal ballot be declared formal, and Mr. Cranefield be unanimously elected, which motion was seconded by Mr. Herbst and carried.

On motion of Mr. Philips, the Secretary was instructed to cast the ballot of the Society for Mr. L. G. Kellogg as treasurer.

Mr. Marshall stated that he would not again accept nomination or election for the office of corresponding secretary, and placed in nomination Mr. Wm. A. Toole of Baraboo.

On motion of Mr. Phillips, the Secretary was instructed to cast the ballot of the Society for Mr. Toole.

As a member of the trial orchard committee, to succeed Mr. Tarrant, deceased, Mr. Marshall placed in nomination Mr. L. G. Kellogg, and on motion of Mr. Toole, the Secretary was instructed to cast the ballot for Mr. Kellogg.

A motion was made by Mr. L. G. Kellogg, and carried, that a committee of three be appointed to place in nomination members of the executive board of the several districts of the state.

The President announced the following nominating committee: Messrs. Wm. Toole, D. C. Converse and L. G. Kellogg.

The nominating committee reported as follows: For member of executive committee for—

1st District.—W. J. Moyle.
2d District.—S. H. Marshall.
3d District.—Wm. Toole.
4th District.—Arthur Wright.
5th District.—F. W. Harland.
6th District.—Geo. C. Hill.
7th District.—J. J. Menn.
8th District.—W. P. Bussey.
9th District.—Irving Smith.
10th District.—A. L. Kreutzer.
11th District.—C. L. Richardson.

On motion the report was adopted.

PART II.

REPORTS OF DELEGATES FROM LOCAL AND OTHER STATE SOCIETIES.

Report of Sauk County Horticultural Society.
F. Johnson, Delegate.

Any report of horticulture from Sauk county must of necessity be largely an account of individual effort, not that the spirit of fraternity is lacking among us but we have not yet reached the co-operative point. Of course there are reasons why other places in this state have outstripped us in this direction. It may not be easy to say just what they are. Perhaps others can see better than we can see for ourselves.

The gathering of fruits for the St. Louis exposition was left in the hands of our President, Wm. Toole, and it is to his efforts that Sauk county will be represented along with the rest of the state. Apples in Sauk county were a failure last year. Only those who made a determined fight had any fruit at all. Conspicuous among those who fought and won is L. H. Palmer, who is here and he can tell you how it was done.

Strawberries and blackberries were a fine crop and brought very good prices. Our area devoted to small fruits is not as large as in former years. Wm. Rounds is our leading berry grower. He raises strawberries the year around. I haven't noticed whether he has been marketing fresh strawberries this winter or not. I interviewed him last November while he was marketing magnificent berries and he said that up to that time he had received about a hundred dollars for his second crop. This made no account of the berries which he gave away which

must have been considerable if he was as lavish with all of his neighbors as he was with me.

Among our nurseries the Great Northern seems to be flourishing. Mr. Foley can tell you about that. Mr. Chas. Hirschinger has retired and is succeeded in the nursery business by one who was for many years one of his employes, Charles Frederick Schellenberger. Mr. Schellenberger has some very fine apple trees of his own raising. He confines himself mainly to the old and well tested varieties that Mr. Hirschinger and others have found peculiarly adapted to Sauk county.

One of our members, A. Clark Tuttle, passed away during the year. He was the first Recording Secretary of our local Society and while living in Baraboo has always been identified with us.

Report of Grand Chute Horticultural Society, 1904.

Being elected to the office of Secretary, at the annual meeting, held in Appleton on January 28, our people conceived of the idea from some cause or other, that I must attend this meeting, consequently was elected a delegate to represent the Society. I most respectfully submit the following report. Very recently there was a revision in the list of membership reducing the number to some 40 members. This was considered advisable from the fact that it was more profitable to carry along one good independent worker, than to carry a poor one by the side and not either one doing any work. There is much enthusiasm expressed among the members of the Society. A resolution of this character was presented at the annual meeting: Resolved, That all members of the Society be considered as a committee for the purpose of enlarging membership. By careful observation it has been decided that our Society was never in a more prosperous condition, than at the present time. A visit from any of the state officials would be very much appreciated, as it would have a tendency to create more interest and strengthen the weak in the way of horticulture.

Respectfully submitted,

W. M. Roblee,

Secretary.

Report of the Lake Mills Horticultural Society for February 4th, 1904.

This Society has held four meetings at the City Hall during the past year:

The first was March 13th. Devoted to discussions on planting and care of shade trees, orchards of pear and apple trees, instances of success; care and cultivation of orchards; treatment of strawberry beds; care and cultivation of grape vines, etc.

The second March 28th. At which there was an exhibition of apples and Mr. Kellogg gave the process of root grafting and distributed root grafts, giving the treatment necessary for success.

The third May 7th. The annual election of officers: Geo. J. Kellogg, president; C. T. Fargo, vice-president; Lewis Wickham, secretary and Robert Fargo, treasurer. Mr. Robert Fargo having just returned from eighteen months in California gave a very interesting report of California fruit interests. The orange industry from start to finish, planting, growing, picking, sorting and packing. The grape industry and the tens of thousands of acres in prunes and English walnuts, upon which questions and general discussion was had.

Fourth meeting June 23. An exhibition of strawberries, roses and a general display of other flowers in their season; about twenty premiums were offered for fruits and flowers. There were twenty-five varieties of strawberries on exhibition, many bouquets of roses came from three and a half miles away and won some of the prizes. After the awards of prizes, a general discussion was held on strawberries, roses etc.

Reports of the Horticultural Society distributed at each meeting.

Mrs J. W. Hassano Kellogg was duly apointed delegate to attend the February meeting for 1904 at Madison.

Lewis Wickham,
Secretary,
Geo. J. Kellogg,
President.

Report of Omro Horticultural Society.

The past year has been a very successful and we trust helpful one. Our society had the pleasure of having the farmers' institute at Omro, the summer state horticultural meeting and also held our ninth annual chrysanthemum fair, all a success. We now number 100 members not counting the young people of which there is a large attendance at every meeting, and are always glad to have the young meet with us and they feel free to come and are a great help in making our meetings more interesting. We meet the second Friday evening of each month, and besides our regular meetings we have had an anniversary and two socials during the small fruit season. We still continue to meet at the homes of our members and all feel quite at home at our meetings. Our annual meeting was January 8, 1904. The following officers were elected:

President—W. J. Jenkins.
Vice President—John Moran.
Secretary—Mrs. Jos. D. Treleven.
Treasurer—Mrs. Ella Oak.
Delegate to state meeting—W. J. Jenkins.

Our society would be pleased to have the privilege to entertain any of the state members who care to visit us. Our aim is for improvement and we are ready to receive suggestions from those that are wiser.

Mrs. Jos. D. Treleven,
Secretary.

Report of Rushford Society.

Mr. President, Ladies and Gentlemen: As I am here this forenoon as a delegate to represent the Rushford Horticulture and Improvement Society of Eureka, Wisconsin, the home of your honored President, it is not only a privilige but an honor to be with you here this forenoon in the name of the State Horticultural Society in which you are doing so much to advance in wealth and power, which I in common with all of you feel in this important work, and I am here with a quickened thought to grasp the opportunities that are now afforded us in the way of horticulture.

It is always a pleasure to report the condition and doings of

this auxiliary of the State Society. If there is anything in prepotency we must possess it in a generous degree.

Some ten years ago a few choice spirits here took hold of a few lines of work under a rather indefinite term of horticulture and through the first efforts toward an organization were confronted by very deterent circumstances, yet the faithful few, in the words of the illustrious Grant, kept pegging away until results of a most gratifying nature were developed.

At the inception of our Society the men held entire sway. Consequently our efforts were circumscribed to fruits and farm products in general, far too narrow a range we found to embrace certain social elements so essential for the existence of modern institutions and their beneficent efforts. In a few months the ladies being desirous to know what was being done, and being urgently invited to attend the meeting, they consented to join with us in this grand work which resulted in the adoption of a broader system of floriculture now firmly incorporated as a component part of our functions which we are assured has had a refining influence in our community. Many window gardens have been established in scores of homes well advanced with improved and up to date varieties of flowers, landscape gardening to through well kept lawns interspersed with flowers, shrubbery, and ornamental trees have displaced unkept surroundings. These charming improvements over the recent pioneer days with their wild environment leads us to believe greater achievements of a sunshine nature through persistent efforts are awaiting us.

Our local name is The Rushford Horticultural and Improvement Society. Our patrons are from the surrounding towns to some extent. Place of meeting is in the village of Eureka on the first Saturday of each month. Number of members, 70. Among them are Dr. T. E. Loope President of the State Horticultural Society and Henry Floyd of Eureka. The assistance of those two enthusiastic and untiring workers have proved of essential benefit to us. We have held two special and twelve regular meetings. At our meetings we have an entertainment program and certain topics are discussed, their scope is sufficiently broad to embrace all things lovely.

In January, 1903, we took a new departure and elected a lady gave a very interesting and comprehensive report of the proceedings, Mrs. S. G. Floyd accompanied her and gave an excellent paper on the same occasion.

At the state summer meeting Mrs. S. Timon was our delegate and Mrs. Jennie Chapelle presented a most commendable paper. During the past summer we have had two shows, the first in June, in which strawberries, cherries, and flowers were shown in their amplitude and beauty, later on we had one of the most attractive and brilliant aster shows ever given by our ladies and on many occasions they have given us the pleasure of most superb ones. This exhibit covered scores of flowers of the season and many varieties of plums and apples. We take pains to procure a supply of the Farmers' Bulletins each year for distribution which we find are a most valuable treatise on a multitude of subjects.

Our Officers for the ensuing year: President, J. F. Diley; 1st Vice President, Mrs. Carrie Loope; 2d Vice President, W. M. Hall; Secretary, H. H. G. Bradt; Assistant Secretary, Mrs. Mae L. Bradt; Treasurer, Mrs. M. E. Penniman.

Delegates to the winter state meeting, Mrs. Mae L. Bradt; summer meeting, Mrs. S. Timon, Mrs. S. G. Floyd and Mrs. Jennie Chapelle represented the Society with papers, which closes the report of our Society.

H. H. G. Bradt,
Secretary.

Algoma Horticultural Society.

Algoma Horticultural Society has 96 members and has held its regular meetings on the first Tuesday in each month, also four special meetings.

At each regular meeting there was a fine program of essays on horticultural subjects, questions asked, answered and discussed, recitations and music, both vocal and instrumental. The young people were encouraged to take part in the program. The meetings were held at Grange Hall and were open to the public. Refreshments were served each meeting.

The Society held a flower and fruit show in connection with a social in June. There was a very fine show of strawberries and cherries. There was a large display of roses besides pansies, columbines, and other flowers of the season.

In November a chrysanthemum fair was held at the City Hall

in Oshkosh. There was a large and fine showing of chrysanthemums besides vegetables, grain, fruit and fancy work.

The following officers were elected for the year 1904:

President—Lester J. Athearn.

Vice President—Mrs. Emma Payton.

Secretary—Mrs. Alice Howlett.

Treasurer—Herman Christensen.

The Society has a balance in the treasury of $24.81.

MRS. MARCIA H. HOWLETT,
(Sec. Algoma Hort. Society for 1903.)

Rural Route No. 5, Oshkosh, Wisconsin.

REPORT OF DELEGATE OF BROWN COUNTY HORTICULTURAL AND AGRICULTURAL SOCIETY.

While the Society is not wholly a horticultural one, much of the interest manifest is for such topics.

Held eleven meetings last year, some of which were picnic meetings for members and families.

Have 47 members—an increase of 21 in 1903.

Have $450.00 in the treasury against $14.00 last year.

Held a fair the last week of August at which there were 1,631 entries, about 100 more than previous year.

Paid premiums amounting to $3,082.35.

At the annual meeting held in January Isaac Dickey was elected president, Frank Desnoyers, secretary, and Andrew Ries, treasurer.

While we have apparently not accomplished much for horticulture we feel that something is gained.

At our fair was as fine a display of fruit and flowers as could be wished.

I think from conversation I have had with several of the members that a little help from the members of the State Society would be conducive of much good and would be appreciated accordingly.

W. S. HAGER,
Delegate.

For the Waupaca County Society Mr. Ham made the following report:

Mr. Ham: I have not prepared any written report of our Society, but will say that we have a Society of about 60 members. We let the whole family come to our Society if they so desire; we meet perhaps five or six times a year and have very good turnouts, sometimes as high as 100 at a meeting, and we discuss different topics of horticulture and agriculture and have a very good time, and am glad to say that I think the Society is doing a great deal of good in the community. You all know that when you call for Waupaca county you call for a county that grows fruit in the ground instead of on top, and our county is more noted for the potato industry than any other, and it is hard work to get them away from that and get them into horticulture, but the Society has done a great amount of good and I think will still continue. Through the hard work of Mr. Barnes in that community we have got some very good orchards, and I think the good work will keep on.

REPORTS OF DELEGATES TO MINNESOTA, N. E. IOWA, NORTHERN ILLINOIS, MICHIGAN AND MISSOURI.

REPORT OF DELEGATE TO MINNESOTA STATE CONVENTION.

A. D. Barnes.

The meeting was called to order promptly at 9 a. m. by the President, Clarence Wedge, with about one hundred members and several outside delegates in attendance. After prayer the different delegates were called to the rostrum and introduced to the audience. The program was then closely and carefully followed with few digressions.

One grand and remarkable feature about the Minnesota Society is the preciseness and promptness they observe in calling to order and calling on papers and discussions, not losing twenty minutes' time in the whole session. It is your dele-

gate's opinion, however, that they have almost too many topics and devote to little time to the discussion of some of them.

Cordiality, co-operation, and an unbiased endeavor to make the meeting a success prevailed. Hospitality and generosity prevailed everywhere. Timely and practical discussions followed each subject, but not one word or even a suggestion of discord entered this meeting. May it be said with credit to their Society that they act as a unit in making their meetings a success, for which our Society might well pattern.

The fruit exhibit was simply wonderful, owing in a measure to the generous premiums they offer and individual aid—their desire or rather determination to make Minnesota apples the cap sheaf of western horticulture. They had the best arranged and most conveniently situated audience room and exhibition rooms that it has ever been my pleasure to visit.

Their exhibit consisted of about 2,000 plates of apples and crab apples, including the grand exhibit of 109 plates or varieties of seedling apples from the famous Perkins orchard of Red Wing. This table had on it large placards containing this information: "Seeds planted by Mrs. T. E. Perkins in spring of 1893. First fruit in 1901. First exhibit, 1902. This exhibit, 109 varieties. This exhibit won the Wilder medal at Boston this fall. Forty trees not yet fruited." To these placards I wanted to add, in large letters: SEE WHAT A WOMAN HAS DONE. No wonder Minnesota is famous for apples with such women to follow Peter Gideon's examples: Go thou and do likewise.

This orchard was all grown from the seeds of the Malinda, which had been fertilized with pollen from Wealthy, Duchess, Haas, and Perry Russet. Winter sorts prevailed in this collection and the Malinda characteristic showed to a marked degree in many of these sorts. To me the greatest achievement along the seedling line was an exhibit of 57 varieties of remarkably fine apples and crabs grown by A. M. Hazleton at Cullen, Minn., 150 miles north of Minneapolis and 75 miles west of Duluth. Surely Minnesota's seedlings will be world famed and this shall be her keynote to apple-heaven. Miss Gertrude Cairns of Pierce county, Wisconsin, showed a very fine collection of seedling apples some of which scored very high. This, too, shows what a woman can do.

Many other smaller but fine exhibits of seedlings were in line, all claiming more or less merit, but as yet no one has been awarded the $1,000 on a seedling apple. But it is my opinion that this liberal offer has already proved a grand stimulus and has wrought great benefits and grand achievements along this worthy and to be renowned vocation and apple-climax.

Cold-storage and cellar-stored apples were kept separate and classed as such and were not allowed to compete for the same prizes. As usual the plates of the N. W. Greenings attracted more attention and admiration than any of the other named sorts. The Jewell Nursery company of Lake City showed barrels of fine apples for the purpose of advertising the goods, and our A. J. Phillips showed a large top-worked Virginia crab tree as an object lesson.

Prof. N. E. Hansen of South Dakota presented an eloquent plea for the Pyrus Baccata on seedling crabs as the best seedling stalk on which to graft apple scions and urged that they be put on just above the crown or surface of the earth. To which argument C. G. Patten of Iowa took exceptions and he claimed the seeds from the hybrid sorts, such as Whitney, Martha Orange Crab, Sweet Briar and such sorts, were the best root stocks for the apple as they were hardy and closer akin to the apple. Professor Hansen said the curse of American horticulture was our very cheap way of producing and selling apple trees and that the prices should be equal with that secured for pears, peaches and cherries. A. J. Philips said that he grafted 12 apples on crab trees and 100 on apple seedlings twenty years ago and planted them in his orchard and the 12 are all alive and fine trees yet while the 100 apple seedlings are all dead—a good object lesson surely.

The Beda grape was called the most hardy of all grapes but poor in quality. Dunlap, Damon and the Midnight the best strawberries; Oom Paul, Commander and Velvet the three largest bearers.

The women's auxiliary (one half-day session) was inspiring and surely worthy of our devotion. The Audubon society had done much to protect innocent birds and to discourage the fiendish style of society ladies parading poor dead birds on their hats.

The memorial services for their departed—Pendergast, Darrt,

and Grimes—were very solemn and impressive, ever mindful that we too must sooner or later pass over to the beyond.

The annual banquet given by E. A. Webb, editor of *The Farmer,* was a fine social affair and a most enjoyable occasion.

The sad information of the sudden death of his esteemed wife was conveyed to President Wedge during the noon recess of the second day, which cast a gloom of sadness over all present and required his immediate departure. Prof. S. B. Gerner occupied his chair during the balance of the session and be it said that no better executives ever accepted a chair than these two men are. This society has a membership for 1903 of 1,430 members. They pay their Secretary a salary of $1,000 and all expenses.

Your delegate indulged in a one-day's visit to the State Agricultural college and one day at the Owatonna seedling trial orchard of some four acres, containing hundreds of choice seedling apple trees of which a careful record is kept. This orchard is owned by the state, was founded by the Hon. E. S. H. Darrt, now deceased, and at present is under the control and supervision of one of the best and most practical nurserymen in Minnesota, for which he receives the sum of $400 annually, which is, in my opinion, a guarantee that this orchard will be well cared for and of a benefit to the members of their society and country at large. And my greatest regrets are that time and space will not let me enter into more detail about this orchard.

FINALE AND SUGGESTIONS.

Your delegate begs to suggest that we adopt the Minnesota system of placing more numbers on our programs in the future, and that we pay hotel bills only for the officers and those appearing on the program; that our society should elect an organizer, whose duty it shall be to organize local auxiliary societies, and that we appropriate the sum of $100 for this purpose; that we extend a cordial invitation to the ladies of Wisconsin to organize an auxiliary society that may work in conjunction with us and that they have charge and control at least one half-day's session at both our annual meetings, and that the said organization be perfected at our coming summer meeting; that the study of our native birds and their benefits be more extensively

discussed; that more attention be paid to the subject of blight: its prevention and destruction; that more time be spent on the kindred subjects of good road making, forest reserves, and water supplies; that we adopt a uniform size and style of fruit packages, crates, and barrels; that co-operative marketing be more fully considered; that this society should locate and maintain a seedling trial station for the purpose of originating, propagating, testing, and disseminating new seedling fruits; that our executive board be authorized to procure a suitable site and secure a competent person to have charge of this station, believing that the originating of and disseminating of new, hardy, adapted, and acclimated seedling fruits should be our aim, ambition, and determination for our great welfare and success.

All of which is respectfully submitted by your delegate,

A. D. BARNES of Waupaca.

REPORT OF DELEGATE TO MEETING OF N. E. IOWA HORTICULTURAL SOCIETY.

Your delegate to the sister society across the Mississippi, with thoughts of pleasant acquaintance formed with former delegates from the Northern Iowa society, was pleased to carry the greetings of our society to the Decorah meeting, expecting a hearty welcome which was fully realized. Guilford, Patten, Ferris, Bents, and others who have met with us were there and still others whom we hope may be spared to attend future meetings of our Wisconsin State Horticultural society.

It was noticeable how many active gray headed men there were in the society, and the thought would come that horticulture more than any other pursuit keeps perennial the youthful spirit when other men are ready to feel that their days of usefulness are over. And the young men, too, were here, among them a couple of bank clerks from a neighboring city who said that to them horticulture as a recreation is preferable to the more popular so called athletics.

Iowa is surely a great state and its soil is probably all right for fruit growing; but looking for orchard sites from a Sauk

county view point, altitude and the ideal exposure were too often missing. They seem to be as eager for better fruit and more of it as we are, and consideration of varieties received more attention than any other subject. · Patten's Greening was very highly spoken of and also favorable mention was made by several of two of his other seedlings, a Fameuse and a Duchess seedling, each of which has been tried for a number of years. The coming winter apples are being sought for among the seedlings and several promising ones were shown. Scab and the fly speck fungus have disfigured their apples even more than ours the past season, and one feature accompanying their worst cases of scab was a spongy, corky growth which was decided to have been caused by pail bruising.

There was one paper by a lady, Mrs. E. W. Holway, about ornamental vines, which was very good, but the general scarcity of ladies during the meetings was quite noticeable. In discussing varieties of small fruits for farmers the recommendations were very conservative, being confined to the following: Strawberries, Crescent, Beder Wood, Enhance, Warfield, Dunlap, the Haverland; Red Raspberries, Marlboro and Cuthbert; Black Raspberries, Ohio, Older, and Nemaha; Blackberries open to question; Currants, Victoria and White Grape; Gooseberries, Chas. Downing and Pearl.

In the absence of Dr. Storms, President of the State Agricultural college, his place was ably filled by the professor of rhetoric in that college. His address was very inspiriting and carried the audience to a high degree of enthusiasm for the higher education which the state is providing in mechanics and agriculture. I judge that the people of Iowa felt as we would to have Professor Henry give us an address on what has been and is being done in our own state institution. The serious talk of the professor of rhetoric was followed by some of his humorous impersonations which were greatly appreciated by the audience.

Our A. J. Philips was then called on to give some of his humorous talks, which were greatly applauded each time when he reached the point where the joke comes in. With A. J. Philips to take part in the discussions I felt that Wisconsin was well represented at this meeting.

Unfortunately some who should have presented some very interesting papers were unable to be present and the local peo-

ple for some reason gave but scant attendance, but the attendance from outside was good. Papers were interesting and discussions full and animated. Two discussions out of the common line were very interesting—one by a resident of Decorah who seemed to think that nearly all of the mushrooms, toadstools, and puff balls are good to eat; the other was about horticulture in the orient, by C. A. Marshall, whom we expect to have with us at this meeting.

As with us in Wisconsin they have found it difficult to secure as many choice apples as they wished for show at the St. Louis exposition, and like Wisconsin Iowa will make extra efforts to show what their state can do in raising apples.

I should judge that the average of Wisconsin is as favorably situated for fruit growing as is northeastern Iowa.

WM. TOOLE.

REPORT OF DELEGATE TO NORTHERN ILLINOIS HORTICULTURAL SOCIETY.

(Held at Rockford, Ill.; December 9 and 10, 1903.)

Your delegate begs to report as follows: Left home on morning of December 8th; arrived at Rockford, a beautiful city of about 40,000 inhabitants, at 8 o'clock p. m. A fierce snowstorm raged all day so your delegate was not permitted to see any of the farms and orchards along the line of travel.

The meetings were held at Memorial Hall, and the first session was called to order at 11 o'clock, December 9, by President Thomson. About thirty fruit growers were present. After the reading of the Secretary's report by Jacob Friend, and the Treasurer's report by S. G. Soverhill, the President's address followed. It was a well prepared paper and made a favorable impression. He said we have 5,000 fruit growers in the northern district and about 60 nurserymen, but I am sorry to say that the younger people of our district are not interested in our work as they should be. I could not help but think how true this same state of affairs exists at home in our own state meetings. While Rockford is a busy city and well calculated to draw and entertain a large crowd, there was a noticeable lack

of farmers to whom the ably prepared papers should appeal and benefit.

But it was apparent that the enthusiasm of fruit growers present was in no sense abated. They were all up-to-date horticulturists and wide awake to this interest as shown by their enthusiasm throughout their meeting.

The fruit exhibit was not very large, consisting of 70 plates of apples, but very fine. I was surprised at their fine showing, they claiming a very poor crop of apples for this district. President Thomson exhibited some very fine canned plums and also one-half dozen varieties of vegetables. The varieties of apples exhibited are in line with our Wisconsin varieties (with few exceptions), although the Minkler apple seems to be popular with them. Cultivation was held to be one of the first requirements of successful apple growing. Persistent spraying is also one of the prime essentials to successful fruit growing.

Reports from the district showed a good crop of strawberries and bush berries. All the papers read had been carefully prepared and brought out lively discussions. What Fruit Can a Farmer Grow, by G. J. Foster. In part, he says, grow more currants and gooseberries. More grapes are grown in the northern districts than in the rest of the state. The early Richmond cherries are very profitable to grow. Graft on Moralo stock.

R. J. Coe's subject, "Hash," was ably handled by him, telling how he became a horticulturist when a boy. The growing of strawberries, bushberries, and grapes was also fully discussed. He recommends the cutting out of old strawberry plants the first fall after planting or as soon as enough of new plants are nicely rooted or are sufficiently thick for another season's crop. This statement of his brought many questions. One prominent member stated, "to learn this more than pays my trip to this meeting." Further, he says, Raspberries for success; humus and cultivation; apply manure; work thoroughly.

Question: How to get rid of mice? Answer: Poison them.

Question: Is it advisable to mulch apple trees? Answer: No.

The first evening session was well attended. The first on the program was Horticulture and High Life, by Mrs. Emma Hay, Dixon, Ill.; then the Bird Problem as Related to Horticulture

was presented by S. J. Cook of Galesburg, Ill. He says the tree sparrow in Iowa destroys in one minute 825 tons of weed seed; the chickadee in Michigan destroys in one year 9,000,000 insects. The worst enemy to birds are cats. Under the title of Preservation of Natural Flora, Blanche Goodall says our natural ferns and flowers are fast disappearing, also our forests. The most destructive enemies to our forests are, 1st, cattle; 2d, lumbering, 3d, fire.

Thursday, December 10. Cultivation of Grapes, by Mr. E. Riehl, North Alton Ill. Location, south to east; fertilizer, "barn yard manure;" distance, 6x8 feet; for a black rot spray every ten days with Bordeaux Mixture; "Early Wine" recommended as one of the best early varieties; color, black; size, medium; a very fast grower.

L. R. Bryant's report on Experiment Station, Princeton, Ill., fully described the season's work. Out of 125 varieties of strawberries tested, "Senator Dunlap" at head of list on two-year trial.

Spraying, by A. V. Schemerhorn, Kimmerly, Ill.: If you want fruit, spray often and thoroughly.

Bees and Blossoms, by Dr. C. C. Miller, Marengo, Ill.: Many questions were asked, among them a remedy for bee stings. Answer: Bathe with cold water.

The last on the program was the reorganization of meeting into a school with J. L. Hartwell, teacher. All members present are scholars. This was very amusing and interesting. The question, In a family orchard of 100 trees what varieties to plant, was not fully decided when your delegate had to leave. The varieties recommended were Wealthy, Duchess, McMahan, N. W. Greening, Salome, Jonathan, Fameuse, Transparent, Red Astrachan, Longfield, Rombo Sweet, Minkler.

Am pleased to say your delegate was royally entertained, and found everyone very cordial.

Respectfully submitted,

J. J. MENN.

REPORT OF DELEGATE TO THE MICHIGAN STATE HORTICULTURAL SOCIETY.

Held at Traverse City, January 5, 6, and 7, 1904.

The meeting opened on Tuesday morning in a commodious opera house, with C. F. Hale, President, in the chair. The ever active and wide awake Secretary, Mr. C. E. Bassett, was ready to impart information to all present. One of the attractive features of the meeting, not only to fruit growers but to every visitor, was the very fine display of apples. I have seen larger displays but never finer specimens of the very best winter apples, such as Kings, Tolmans, Wagners, Baldwins, Rhode Island Greenings, and Northern Spys.

To single out and speak of all the excellent papers would take too much space, but it is not too much to say that all were of a high order. The state college was ably represented by Professors Taft, Hedrick, and Gunson. Professor Blair of Illinois was absent but Mr. Schemerhorn, a very large fruit grower of Kidmundy, in his state, gave an excellent talk on general fruit growing. Peach growing is the principal industry of western Michigan. One man reported 50,000 bushels marketed one day last fall at Grand Rapids. It is easy for a Wisconsin man to realize that Michigan can grow peaches, when he is transferred from the west side of the lake with the thermometer registering 22 to 26 degrees below zero to the east side and 300 miles north where the mercury had not gone down to zero up to the time of the meeting, and the change made in the short space of an hour. Peach trees and trellises covered with grape vines were in constant view all day long. In common with us in Wisconsin they discuss fertilization, cultivation, and spraying. The Elberta peach and the Concord grape seemed to be the favorites. An excellent paper on apple growing was read by a young man named Palmer, a graduate of the Agricultural college. Strawberries were ably discussed by a Mr. Cook. The Marshall is his choice for a market berry.

Your delegate was cordially received and royally entertained. Was furnished a room to sleep in where the carpet was woven full of beautiful roses in addition to other flowers, which would have made Brother Kellogg think he was in his

Janesville rose garden. The Secretary's report and President's address were encouraging and full of interest to fruit growers. Their old Treasurer, Mr. Slayton, was re-elected for the twenty-first time, and harmony seemed to prevail among the members.

A. J. PHILIPS.

REPORT OF DELEGATE TO MISSOURI—DR. T. E. LOOPE.

President Loope: I was privileged to go to Missouri. I have no report, but wish to say that I went to Columbia, the place of their meeting, and found quite a large assembly of fruit growers and in Missouri that means something; it means that probably there are 25,000,000 trees represented in that meeting. The members were mostly past middle age, they were all talking about Ben Davis, you could not talk long about anything else. They had a small display of apples, excellent as far as they went. We were favored there by having Mr. Hale of Connecticut, the peach man, and Mr. Craig. In the discussions on orchard care and cultivation, the majority of the opinions there was that orchards should not be pruned and that they should be in blue grass sod. After a while Mr. Hale got up and jumped on them and stamped on them after he got them down and it was a very amusing thing and they could not help but find it so too and they laughed as hard as anybody; it was all so good natured and everything was all right. Prof. Craig also gave a talk in the line of cultivation, and they did not think it was possible that Mr. Hale with his millions of peach trees should be able to cultivate so that there would not a weed grow there, but he made them believe it before he got through. They are making great preparations for the World's Fair. The secretary made a statement that he wished and expected to have on more than one day and more than one week 100 bushels of apples on their tables in St. Louis. That is a good many apples, but they have got them. I found out that orchards down there ran all the way from 80 acres to 2,000 acres. That does not mean all apples, but in the Ozark region a great many are growing peaches.

Col. Evans was there representing 200 acres of peaches, and he told me his method of going to work in the Ozark region. I

think it is a company; they cut down all the trees on the land, put in a gang of men, and with six spans of mules on a plow, they plowed up all the stumps and everything else as they went. They put out 2,000 to 2,200 acres of peaches, and at the end of the fifth year they had a crop yielding $100 an acre, and now that they are seven years old they run from 150 to 300 an acre. You can figure for yourselves how much that crop would amount to. I had a good time, but I brought very little away from Missouri. We have nothing here but a few scrawny Ben Davis in common with Missouri on the table. They had nothing that we have got. I did not see a single Northwestern Greening there, but they had fine apples of Ben Davis, Gano and Waggoner, Ingraham and that class, a great many more than I can name now; highly colored and very large specimens of York Imperial, as big almost as our Northwestern Greenings. I have seen York Imperial here that were very small apples, and I would like to know if that happens in the northern states, whether the York Imperial grows small with us and large with them. All I have seen there were large, those that I have seen here were small.

On motion of Mr. Philips, Mr. Hale, President of Michigan Horticultural society, was made an honorary annual member of the society.

Mr. Patten: I wish to say a few words in reference to the report from the Minnesota meeting, and will say at the first that I consider it a very excellent report from that body, but it seems to me to be lacking in one or two things thatI think should have been noticed in reference to two or three exhibits of fruits that were made there, and one was that I heard no mention made of your Northwestern Greening in that report. It has attracted a great deal of attention in Minnesota and Northern Iowa, in fact, I think nearly all over Iowa, and many very fine specimens were on exhibition there. I also wish to refer to the Patten Greening, which I heard nothing of in this report, and I think I may speak of this apple freely now, as it is so generally before the public. There was no apple mentioned at that meeting that has come into prominence more rapidly in Minnesota than that apple has for a few years past.

WEDNESDAY AFTERNOON.

RECEPTION OF DELEGATES FROM OTHER STATES.

Mr. Marshall (Southeastern Iowa): Mr. President, Ladies and Gentlemen, I am very happy to be here this afternoon to bring to you greetings from the Switzerland of Iowa. We rather enjoy the name of Switzerland of Iowa, because of our beautiful scenery. It does not extend very far back, up the Iowa river about one hundred miles, but I live just near enough to that part of the country that is so rolling that whenever we get tired of the monotony of the prairie, after driving for half a mile or so we can enjoy some of the most beautiful scenery in this country.

There is a great and peculiar bond of sympathy between the horticultural societies of Iowa and your society here in Wisconsin. Our hopes, our aspirations, our aims and our struggles, our successes, our disappointments are one. There is an indissoluble bond of fellowship between us; we are working toward a grand and common aim. I want to say to you that you are working along those lines which the great Creator set before us, to improve this world; we are put into the garden to till it, and it is upon the line of this grand scheme that we are all to work.

Mr. Thompson (of Ill.): I did not come here as a delegate, I came here as an individual and did not expect to be called on to say anything. I always like to come to the meetings, I have lived in this state twenty-five years, so that I feel at home. We held our meeting down in northern Illinois last fall, and we had a delegate from this society down there and we were very much pleased with him indeed. I have nothing further to say excepting that I am very glad to meet you here and wish you success.

Prof. John W. Lloyd (Univ. of Ill.): This is the first time I have had the honor of being present at a session of the Wisconsin State Horticultural society, and I assure you that I esteem it an honor to be here with you. Our state is rather long, like your state, there is as much difference between the climate conditions in the northern part of our state as there is in the two extremes of your own state. The conditions

in northern Illinois are very much like the conditions in the southern part of your state, but way down in "Egypt" things are quite different; we are more like Missouri; we are in the land of the big red apple, like the Ben Davis, that are made to sell rather than to eat. The problems which confront the horticulturists in the southern part of the state are somewhat different than in the northern part of the state or in your state. A great deal of attention is given to the fungous diseases; we have bitter rot and root rot, as well as apple scab and codling moth, and the farther south you go, the worse the codling moth is, especially down in "Egypt," where, after a person has sprayed his apples three times, he will have a crop 98 per cent. of which are wormy, so there is a great deal to contend with. The orchard interests in the southern part of the state are quite large; it is not anything unusual for a man to have 200 acres of apples. We grow a few strawberries there too; I have seen twelve carloads of strawberries shipped from one shipping point in one day, and there are a number of shipping points of strawberries. Just at present there is a great deal of attention being given in our state to the question of cold storage for apples. The state experiment station is carrying on quite extensive investigations touching various phases of cold storage. At our state meeting this year I think there was more prominence given to the matter of grading and packing apples than has been true in previous years. The people are beginning to realize that any old apple will not do for the consuming public and an effort is being made to be more rigid in grading and to try to put on the market strictly first class goods. Those are the principal things that are receiving the attention of the commercial growers.

Mr. Hale (of Mich.): I came forward this forenoon and showed myself and made my bow; I think at this time I will not take the time to say anything.

PART III.

Papers and Discussions.

AN EXPERIENCE WITH STRAWBERRIES

C. L. Pearson, Baraboo.

A personal experience may necessitate the use of the pronoun "I" but we will turn the I's into strawberries as often as possible.

I was born with a strawberry in my mouth—please don't take that statement literally—I mean to say that I inherited a tender feeling for strawberries and have cultivated that notion until I'm called a "strawberry crank," but, you know a crank is what you turn things with.

I have also cultivated strawberries in July when mercury was trying to roost on the top of the thermometer and if I hadn't been in love with the dear things I would probably have sat in the shade and let the weeds grow.

One year after a hard struggle with weeds my strawberry field was lookng fine and a neighbor who was viewing the plantation remarked that I was lucky to get my strawberries on ground that wasn't weedy. I said nothing but kept up a hard thinking. I have found that the man who grows strawberries for market has this pasted in his every day hat.

"Do the right thing at the right time."

Strong plants of the best known varieties should be selected. Well fertilized ground should be thoroughly prepared as early in the spring as it is in proper condition to work, transplanting must not be long delayed, cultivation must be promptly and thoroughly done the blossoms picked at the right time, the run-

ners trained and trimmed, and the winter protection applied in season.

The right time to do all this work must be left to the judgment of the grower and no iron clad rules can be followed. When I had grown my first big crop of strawberries I thought I had the business down pat and proceeded to do the work the same way the next year but different weather conditions prevailed and the result was a partial failure of the crop, another result was that my bump of conceit was some what flattened and I didn't feel like telling people "How to grow strawberries."

When I was twelve years old father gave me permission to grow the family strawberry bed on shares—the family share to be all they wanted to eat, the balance I picked in tin pails and carried two miles to market selling seven dollars worth which seemed like such a large sum that I wondered what I would do with the surplus. I tried to get more berries to sell but the folks seemed to have an awful appetite for fruit that year.

Ever since that experience I have thought there is money in strawberries and am still digging for it.

A good family strawberry bed is a luxury that every farmer can afford and every member of the household will take delight in some phase of the work especially the work of adding the sugar and cream. There was a family disturbance in the first garden about apples but nothing is said in regard to trouble over strawberries so we will call them the peacemaker and the queen among fruits.

There are varieties galore, but, the well tested kinds are the ones to tie to. I would choose Bederwood, Warfield, Haverland and Sen. Dunlap for a quartette of hustlers either for home use or market.

A number of years ago I settled upon a "poor but stony farm" and after listening to the gospel of fruit growing as proclaimed by Messrs. Thayer, Johnson, Coe, Kellogg, Edwards, et al, I concluded that commercial horticulture was my only financial salvation and went into it with all the zeal and enthusiasm of a new convert, my neighbors got the fever too and we all had it bad.

The fruit growers hopes were soaring high
As on bud and blossom he cast his eye
His every nerve with joy did tingle
While thinking of dollars he soon w'd jingle.

Great castles in air were by him built
He'd buy carriage and harness trimmed in gilt
Houses and barns around him w'd grow
On a trip to Europe he surely w'd go.

And then as the boy said "every thing busted," prices for berries went below the cost of production and many growers quit in disgust but there are a few "what you turn things with" at Baraboo who are still in the ring and continue to do business at the old stand with no immediate prospect of going into the hands of a receiver.

In summing up the profits of commercial berry growing dollars should not be the only consideration—growing the fruit is a pleasant and healthful occupation—the business methods required to successfully manage a crew of berry pickers and place the crop on the market are conducive to mental discipline which is profitable to man, and then there are great possibilities in berry culture,. When we grow corn, potatoes, hay, etc., we know about how large a return we can figure on, not very large but generally sure—"slow but sure" does not satisfy average men, they prefer games of speculation—they will play poker, bet on a horse race, or place money on the soul-inspiring game of football, others will invest in mining stocks for one chance in a thousand of making a fortune,. I prefer to grow strawberries, it satisfies my longing as nothing else can do,—for games of chance.

Five hundred dollars have been taken for one acre of strawberries. It is easy to sit by the hearthstone on a cold winter eve and figure that forty acres at that rate would bring in $20,000 and the beautiful golden sometime, when there's neither frost nor drouth, no bad insects—ditto commission men, and the other fellows quit growing so many berries you and I will quietly plant one thousand acres and become millionaires.

DISCUSSION OF MR. PEARSONS' PAPER.

Mr. G. J. Kellogg: I would like to ask Mr. Pearsons what are the three most profitable varieties of strawberries which you have been growing?

Mr. Pearsons: The three most profitable varieties are the Bederwood, Warfield, and, it is a little hard to name a third one, there are several others that come in pretty close. I think perhaps in years past it might have been Crescent, but the last two or three years Crescent does not seem to do very well with me and I have discarded it.

Mr. Kellogg: Have you tried the Splendid?

Mr. Pearsons: I have tried the Splendid, but it does not yield near as much fruit as the Bederwood, with me.

Mr. Barnes: What is your soil?

Mr. Pearsons: My soil is quite a heavy clay loam.

Mr. Barnes: Do you not think that the different varieties make a great difference as to yield?

Mr. Pearsons: I think so.

Mr. Hartwell: Do you have to ship any berries?

Mr. Pearsons: I ship nearly all of them; sell very few in the home market.

Mr. Hartwell: Don't you have trouble with the Bederwood in shipping them?

Mr. Pearsons: Not where I do not have to ship very far; I ship to retail merchants, near markets.

Mr. Kellogg: Have you tried the Enhance?

Mr. Pearsons: I have tried the Enhance, but they do not seem to suit the consumer, so I am not growing many of them. One year I went to a fruit dealer in our city, and it was when the berry season was about two-thirds gone, and he said that people were tired of berries, did not seem to buy any more. I asked him what variety he was handling, he said he did not know, and I looked at them and saw that they were Enhance. That was the only variety he had on sale, and I concluded that was the reason that he did not get much demand for berries.

President Loope: What of the Dunlap?

Mr. Pearsons: I think considerable of the Dunlap; for two years I have fruited it, and I think it is going to come pretty close to the Bederwood as a fertilizer, and also as a producer.

Mr. Barnes: Do you know anything about the Rough Rider?

Mr. Pearsons: I have never tried the Rough Rider.

Mr. Hartwell: There are several new varieties I would like to ask you about that I have experimented with, for instance, the Nettie.

Mr. Pearsons: No, I have never had that.

Mr. Miller: Or the Miller, or the Klondike?

Mr. Miller: No. I will say I am not testing new varieties just at present. I used to do that a great deal more than at present, and I found I have sunk several hundred dollars in growing new varieties, where, if I had had Bederwood or Warfield in place of them, I would have been away ahead.

Mr. Hartwell: Have you tried the Clyde?

Mr. Pearsons: I have the Clyde.

Mr. Hartwell: What do you think of it?

Mr. Pearsons: It is a good yielder, but it is rather soft; it is not a firm berry for shipping, and it is not as good as the Bederwood.

Mr. Barnes: Isn't it as good a yielder as you ever saw?

Mr. Pearsons: It is a good yielder, but I think the Warfield and Bederwood will bear sooner.

Mr. Hanchett: Have you tried the Gandy?

Mr. Pearsons: I tried the Gandy for the first time last year, but last year it did not yield; there was not as much money in it as there was in some of these old varieties.

Mr. Barnes: You have named the Haverland for third place, for what reason?

Mr. Pearsons: Haverland is a great yielder and especially good for home use. For market I should not plant very extensively of Haverland.

Mr. Irving Smith: How soon would you begin to cultivate after the first crop, for the coming year?

Mr. Pearsons: After the first crop I formerly would plow through the rows, and of course burn over the ground, plow through the rows and drag down, but I found with me that that did not pay. All that I do now is to harrow the bed, just as soon as I get through picking. That is all I do until the next year when I have picked the crop. I do not even cover it the second year, as sufficient of the vines are on there to form a protection, and I get quite a profitable crop from that second year without much labor.

Mr. Smith: How does the second crop compare with the first?

Mr. Pearsons: Well, the berries are usually smaller in size, but sometimes I get a heavier yield.

Mr. Hartwell: Have you had the leaf roller?

Mr. Pearsons: Not to any extent.

Mr. Hartwell: You will do a lot of thinking about your methods when you get it.

Mr. Barnes: Would it pay you to take a third crop off?

Mr. Pearsons: Some years it might pay. One year I thought of plowing up a bed that I had picked two years, but concluded to leave it; it was an acre, and I took from that bed 160 cases, and I concluded it was very profitable that year.

Mr. Hartwell: What kind of tools do you use in cultivating your fields?

Mr. Pearsons: In cultivating the strawberries after they are set, I use Planet Junior, twelve-tooth.

Mr. Hartwell: Have you ever used a weeder?

Mr. Pearsons: I use the weeder sometimes when the ground is in proper condition; if it does not get too hard or beaten down with a heavy rain, after the plants are first set I go over the field with a weeder.

Mr. Barnes: What part of the season do you recommend planting?

Mr. Pearsons: I would plant as early in the spring as you can get the ground in good condition. I plant four feet between the rows and two feet in the row, usually; I vary that a little according as the varieties run more or less.

Mr. Hanchett: How do you avoid excessive plant setting?

Mr. Pearsons: Well, I am not always troubled with that, but this year there seemed to be a great many more plants than I had room for, so I made a rake of ten-cent butcher knives, put six knives about four inches apart, then I headed that rake down and when the runners began to climb over each other and make ropes an inch in diameter, as they tried to, I went across the rows with that rake and cut them and sliced them in that way.

Mr. Menn: Have you ever practiced digging out the parent plant, that is, the first fall after setting, so as not to have too many plants?

Mr. Pearsons: Yes, I have tried that, but the year I tried it I dug the plants out too soon and the weather became pretty dry and I did not get plants enough, so I thought I would better leave the parents there after this.

Mr. Hartwell: I would like to have an expression from Wisconsin as to that point. That was brought up at our north-

ern meeting by your Mr. Coe, and it struck me very favorable as a theory.

Mr. Silas Smith: I have been practicing that for several years. As soon as the berries were off from the first crop we mowed the vines off, then go through and cut out about one foot, take out the parent plants entirely, not only do that, but take an entire foot out clean out of this space, which, of course, would take some of the plants of that year, leaving only a strip on each side. Sometimes the strip would be only about four inches wide, and perhaps be a foot in other places. Then after I get the bed thoroughly clean, keep on working as long as there is space, let the plants run again. I have followed that for three or four seasons and unless I have very different results from what I have had in the past, I shall probably keep on. I have not failed so far to get a very satisfactory crop the second year.

Mr. Hartwell: Your case does not apply to the discussion, which is in regard to taking out the parent plant after there is a reasonable amount of setting the first fall.

Mr. Smith: I have not done that.

Mr. Hanchett: The system that we are using for keeping down the excessive plant growth might be of interest. I do not doubt but some of our growers will pronounce it a shiftless plan, in fact, I learned it from a shiftless neighbor. When we get a row with sufficient plants in, we simply go in with a double shovel cultivator, or a cultivator that will throw dirt very profusely, and we let the dirt fly over them, bury them. Enough of them will come through to leave a good row, and we found by doing that we would get about double the fruit and a good deal nicer berries.

President Loope: The first year, do you mean?

Mr. Hanchett: The first year when they are running. Now that looks a little bit shiftless; we used to rake the ground very carefully, but now we use a wheel cultivator, and if it buries the weeds it is all right, if it buries the runners, it is all right. I learned this from a man whose back was a little too tender to reach over and pull out the weeds. I bought the field that he was cultivating in that way in the fall, and last season from one acre that he treated in that manner we picked 600 cases of strawberries.

Mr. Hartwell: Your method would produce exactly oppo-

site results in some instances. Oftentimes we have plants without any roots, and you will get roots by doing that very thing.

Mr. Hager: I have not been very successful when I undertook to cover them, I would have a meadow next year instead of a strawberry field. If I undertook to get rid of the clover and grass, it cost me more in labor than to raise a new bed. As a rule, my experience has been in favor of plowing up a bed when I get one crop, and I would like to ask how to get rid of those weeds, or the grass.

Mr. Kellogg: I think the trouble with clover is, the seed is in the ground, you have not had that ground cultivated years enough to get out the clover, or else you are mulching with clover straw.

Mr. Hager: Mulching with clover straw and manure.

Mr. Kellogg: You cannot grow grass and strawberries down our way.

STRAWBERRY NOTES FOR 1903.

GEO. J. KELLOGG, LAKE MILLS, WIS.

Mr. President, Ladies and Gents:

The more I study the strawberry, the greater the field of exploration. I am very favorably impressed with R. M. Kellogg's "pedigree" plans. Some years ago I remarked to J. M. Stickney, who was visiting my grounds and tracing the Bubach plants that were barren and productive, that there should be a stake stuck here and there, selecting those that were the most fruitful for propagation.

My first plants of Van Deman, received from Sparta, had been so badly run in propagating that they did not show a blossom the first year, and never did amount to anything anyway. My first thousand of Michel were no doubt the outside tips in the propagating bed and never bore berries enough to pay, and even Michel bought of R. M. Kellogg never paid for cost of labor. I never can get a crop of Michel.

All varieties that are abundant plant makers will run out, unless restricted. Crescent is the oldest variety that is now generally disseminated, and that needs regenerating by Kellogg's plan of selection. Warfield is in the same boat and needs the same treatment.

The old Wilson went by the board because of this same careless propagation.

Dunlap will be very short lived unless restricted; it will form a matted row ten (10) feet wide in one season.

To make strawberry growing a success we must restrict the heavy plant makers to rows not wider than twenty inches, and the plants at least four inches apart. I have seen matted rows six feet wide and the plants less than an inch apart; in my first growing of Crescents I dug forty plants to one six-tined fork full, but that was in its first introduction and those plants yielded the best of any I ever planted of that variety.

I am fully in accord with "R. M. Kellogg's hedge row" plan for raising fancy fruit, that is, planting one continuous line with plans and runners eight inches apart, allowing no outside runners to form.

In this paper I wish to present a classified list of old and new varieties largely from my own experience. In selecting varieties it is much like selecting a wife,—you may be successful and you may not, but there is no restrictions in selecting varieties. You can try as many as you choose. Some will like your soil; some will kick on your treatment; some varieties seem to do well on any good soil and even with neglect. Those varieties that have a record of six berries to the quart of eighteen ounces, were no deoubt petted and pruned and pampered. The best I ever did in field culture, matted rows, was twelve to the quart.

I have arranged these lists alphabetically so there will appear no partiality.

Best Early (and none of them are satisfactory).—August Luther, Cammeron, Excelsior (on sand), Hathaway, Johnson, Michel (on sand), and Texas (on clay).

Best Medium Early.—Crescent (P), Dunlap (restricted), Enormous (P), Glen Mary, Haverland (P), Klondike, Lady Thompson (this has the best record in the south of any on the list), Lovett, Parson's Beauty, Splendid, Wood and Warfield (P).

Best Late.—Aroma, Big Late, Bismark, a mate for Bubach (P), Dornan, Enhance, Gandy (on clay), Lester Lovett (very much like Gandy), Michigan, Marshall, Midnight (on clay), Oregon (this blooms so late it is called frost proof), Olympia, Sample (P) (on clay).

Most Productive.—Aroma, Crescent (P), Clyde (needs rich soil), Dunlap (restricted), Enormous (P), Haverland (P), Klondike, Lovett, Parker Earle (if on very rich clay loam), Splendid, Wood, Warfield (P), and Wild Wonder.

Of Best Quality.—Aroma, Brunett, Cumberland, Dunlap, Jessie (on clay), Maximus (on clay), Marshall, President, Sample (P), and Warfield (P).

Of Largest Size.—Bubach (P), Bismark, Commander (six to the quart), Duncan (with a record of seven to the quart, and $1,400.00 net to the acre), Glen Mary, Jessie, Maximus, Oom Paul (with an undisputed record of six to the quart, weighing eight ounces; this and Commander are very much alike), and Wm. Belt with a record of twelve to the quart, in matted rows.

Best for Field Culture.—Bubach, Ben Davis, Commander, Excelsior, Gladstone, General de Wet. Jessie, Maximus, Oom Paul, President and Parker Earle.

For Hedge Row Only.—Challenge, Hero, Kansas, Lyon (P), Monitor, Nick Ohmer (on clay), Rough Rider (on clay), Ruby, Seaford (on clay), Sutherland, Uncle Sam, Velvet, and Wolverton.

For Fall Bearing.—Arizona and Enhance.

Of the sixty-two (62) kinds I have named only nine are pistillates; these are marked (P); the rest are all perfect in the blossom. This shows a marked change in the sex. During the past ten years, as formerly, it was difficult to find perfects to pollenize the pistillates. One of this list cannot be had for love or money this year. One other is sold at one dollar a plant. I have also three kinds of Reasoners on trial that are not yet on the market; also a chance seedling of my own. J. L. Schultz has quite a number of promising seedlings.

Of this whole list, if I could have but one variety, it would be Dunlap (*restricted*), next I would add Aroma, and for two best pistillates, Sample and Warfield. If I must have ten for family use, add Midnight, Oregon, Dornan, Splendid, Duncan and Oom Paul.

I could give you quite an additional list that during the past

season has proven a failure. I dare not say which it is the fault of,—the varieties, the soil, the weather or myself.

The past season was too cold, wet and cloudy. It is not safe to throw out any well recommended variety from your grounds till you have tried it four seasons, and that is why our "State Experiment Station" should again take up the strawberry question.

DISCUSSION ON MR. KELLOGG'S PAPER.

Mr. L. G. Kellogg: I understood Mr. Kellogg to advocate two systems of planting strawberries, that is, the matted row and the hedge row. Now, would you recommend the hedge row for the commercial grower, or just for the amateur in a small way?

Mr. G. J. Kellogg: I hardly think I would recommend the hedge row for the market, excepting for fancy fruit. I would restrict them to 18 or 20 inches, I think you get the same amount of fruit. It is a little more trouble to keep off the runners, but you will get better fruit and better growth.

Mr. Hanchett: I would like to emphasize the idea of those pedigree plants. We have all poked more or less fun at Mr. Kellogg in regard to that wonderful theory of selection, and I confess that I never have been one of his disciples, but I have some friends who have been, and they have been following out the idea advanced by Mr. Kellogg. I have visited them this summer and I found that they have got a Warfield that will stand out in the hot sun and not have the leaves curl up. That is more than the Warfield I know of will do, the leaf will curl up and look as though it were dead. By selection they got an Enhance that was almost free from rottenness which makes the Enhance so undesirable. Now they have got an Enhance that is so smooth and perfect that it is one of their most desirable market berries. I think there are great possibilities in the line of selection.

Mr. Moyle: In regard to the Senator Dunlap, that is a new strawberry. I have had some experience with it, and while it is a nice strawberry, I would not advise anybody to go into the Senator Dunlap too heavily. It is quite successful this year,

while it has been a wet season, probably a dry season it might be different. The first speaker here stated that it would do to fertilize early varieties. Now I think he is mistaken; if he classes it with the Bederwood he will get left, as it does not come into bloom until ten days or two weeks after the Bederwood. Furthermore, I notice the Dunlap will not fertilize itself; it will not set the berries that some other varieties will, and the past season with me it has rusted terribly, as bad as the Bederwood, and in a wet season it grows as rank, but in a dry season it might be different. It might be a valuable berry in a dry season, but the color is off with me, it is a little too light in color.

Mr. Hartwell: I very much doubt if you have got it.

Mr. Kellogg: I doubt it. Take a nice Warfield and a Dunlap, you cannot tell them apart, unless you know where they come from.

Mr. Hartwell: I want to confirm every word that Mr. Kellogg has said about the Dunlap. I have had some experience that is worth something. I grow from six to eight acres of strawberries every year, and this year I had a phenomenal crop, and while I am fruiting it quite extensively, I only had one commercial row 40 rods long, one beside another, 70 or 80 rows of Warfields and others, and it was simply difficult to keep pickers from sneaking over to that row to pick, because they were so large and so easy to fill the boxes with. Now, in confirmation of the other point, I had about the same thing, and I did not have scarcely any berries on that row one year, because they were so massed in the row that it was impossible for the berries to set.

Mr. Hanchett: I would like to ask Mr. Kellogg about his experience with the Aroma; how many years have you fruited it?

Mr. Kellogg: I have not had much experience with it; it is a late berry; fine quality; good berry; healthy vine.

Mr. Hanchett: What is the color?

Mr. Kellogg: It is a dark berry.

Mr. Hanchett: More productive than the Gandy?

Mr. Kellogg: Oh, yes, twice. The quality is better, the Gandy does not compare with it.

GROWING AND MARKETING SMALL FRUIT.

By Byron Hillier.

The first thing in growing small fruit is to get a good start, buy strong hardy plants; buy them from a reliable nursery. Do not buy some new variety that the agent says will choke out quack grass and all other obnoxious weeds. If you can get the plants in your own patch, so much the better.

As to vareties to plant, you must decide for yourself, locality and market perhaps would need to be considered.

The time to set out small fruit has been decided by most fruit growers, to be in the spring. The ground should be plowed very deep in the spring, then harrowed and planked until fine. The plants may be set out by a line or by a mark.

Setting out strawberries:—The spade method is the most practical, each man take a spade and a basket of plants and sets his row. The rows may be four feet apart, and plants 16 to 18 inches in the row, varying with different varieties.

Setting out raspberries:—The plants should be set three or four feet apart in row and rows seven or eight feet apart.

Currants and gooseberries:—Are set out in the same manner, except setting them in rows both ways, five feet each way.

Care of strawberries:—The first year they should be hoed and cultivated every week all summer; take pains to heel in all the first runners; do not let the ground get hard around the plants. Just before the ground freezes in the fall the plants should have a thin covering of marsh-hay, then covered with manure. This mulching is put on the berry row. When this work is completed the fruit-grower can feel safe that his strawberries will be allright in the spring.

After the danger of frost is past in the spring this mulching should be taken off and put between the rows, making a path of 1½ feet wide. This will keep down all weeds between the rows. Soon after the mulching has been taken off, the weeds will start; these weeds should all be weeded out before the green berries get too large. The berries will not need any more care until berry picking.

After the fruit season is over the patch should be mowed,

then raked with horse rake and with a hand rake, raking out all dead leaves and mulching. When this work is completed the path should be cultivated, going through three or four times, then rake down smooth with a hand rake. About the middle of August the berry row should be weeded again. This completes the work until mulching in the fall the same as in the first year.

Strawberries can be cropped three or four years by this method. The fourth crop may be larger than the first and taking less work.

Care of raspberries:—They should be cultivated and hoed the first year. The second year they may be pruned, cutting out all dead wood. The Blackcaps may be tied up to a wire or snapped when young and not tied at all. Most growers do not tie red raspberries to wires but keep them low. It is a good plan in some cases to have two wires about sixteen inches apart, have a stick on top of the post putting the wire in each end of the stick, and have the canes between them.

Raspberries, gooseberries and currants should be cultivated until the time of picking fruit, a cover crop may be sown at this time, or they may be cultivated after the fruit season is over.

Winter protection for raspberries:—In some localities they do not need any protection, in other places they do. It is a good plan to tip them down and put some earth on the tops to hold them. This is sufficient in most places.

Marketing small fruit:—All fruit should be marketed in clean new boxes. Black and red raspberries should be marketed in pint boxes. The fruit should be hauled in a light spring wagon, which should be covered so as to keep the berries cool.

Home market is preferable if it can be had, but if necessary to ship the fruit, it should be picked a little green. Be careful and not put in any soft berries.

There may be better methods of growing small fruit, but it does not make so much difference which method you practice as long as you succeed.

DISCUSSION OF MR. HILLIER'S PAPER.

Mr. Hager: I watched for something in that paper in regard to blackberries. I have been trying to grow blackberries and was told that the Ancient Briton was the only thing, but my soil is such that I cannot successfully cover them. About half of the time they are either winter-killed or caught in the frost. I nip the branch low. One of my neighbors is growing what he says is Snyder, or, in other words, it is growing itself, without any cultivation for years. He has from a quarter to half an acre growing wild; the canes grow from 8 to 10 feet high and loaded with the nicest lot of berries that can be grown anywhere. Now if they are Snyder, and if berries can be grown generally that way, that is the thing for me to grow. All the care that he gives them at all is simply the thinning out of the old wood and some staking up of very tall canes which the fruit would break down of there were not something for them to lean upon. He got 14 cents a quart from storekeepers last year. There is a lack of cultivation; once in a while he throws sawdust or something through them; it has brush, grass and weeds all through. I would like to know if some one had anything similar, or if the Snyder will do that, or any other variety will do that? It is heavy clay soil he is doing it on.

President Loope: We have a paper upon this subject, and I think we will get the discussion fully brought out then.

Mr. Pearsons: I would like to ask what varieties Mr. Hillier would recommend for the market.

Mr. Hillier: Warfield and Splendid are among the best. Of course there are others that probably will do as well as those.

Mr. Pearsons: I would like to ask Mr. Kellogg what he thinks of the Bismarck as compared with other varieties for profit as a market berry?

Mr. Kellogg: As far as I have picked and marketed it it is profitable, but I would try it on my own grounds, or you on yours, in a limited way before I branched out very heavily on it, and just the same on ony other new varieties.

Mr. Irving Smith: I would like to ask the gentleman that had the last paper what he considers a good crop. He speaks of getting three or four crops from the same field without resetting, that perhaps the fourth crop may be better than the first; what is considered a good crop per acre, how many cases?

Mr. Hillier: About 1,400 an acre.

Mr. Cole: I would like to ask one question. The gentleman wishes to avoid putting in any soft berries. I have more difficulties along this line than anything else. I have children from the neighborhood around who do the picking, but I cannot keep those children from putting in inferior berries. I aim to grade my berries in regard to size, and I would like to know how a man is going to regulate that, to put the best berries on the market. I am the one that gets the blame for it.

Mr. Hartwell: How many pickers do you have?

Mr. Cole: From 30 to 35.

Mr. Hartwell: Number them all and make them number their boxes as they pass them in, and scorch him if he does not do the right thing.

Mr. Cole: I cannot get any more pickers than I want.

Mr. Wilkins: Then scorching does not pay.

Mr. Kellogg: I find sometimes it is necessary to take a picker by the nape of the neck and throw him over the fence, but if you cannot get pickers you cannot do that, but if you can hire women you will find the best pickers are those anywhere from 16 to 20 years of age. If you cannot get those, why, do the best you can. I have been bothered with that soft berry business.

Mr. Pearsons: I have found it impossible to get pickers to do my grading. I have tried it, but the only way I can do is to have them pick the good berries and leave the others in the field. That is, I cannot have two sizes of berries to put on the market. I only have the best, the others I have to leave in the field; that is the only way I can get the pickers to do the work.

Mr. Hartwell: I want to take back my harsh statement and give you a remedy that I heard at this convention four or five years ago from Mr. Johnson, of Baraboo. His remedy was kindness, and to get the children to appreciate whom they were working for and what they were doing, and he made them feel that what he was doing was their business and that they were carrying out his interests and they loved to do it, and in his personal contact with them, he gave them a box of berries to take home to their mother, something extra, and that little touch with them personally inspired them to doing something for him, and I do not know of any better remedy than that.

Mr. Kellogg: You are dealing with all kind of human nature. Some pickers are all right.

Mr. Irving Smith: I think our friend here has evidenced a little fear of his pickers. He does not seem to be able to tell them just what he wants, he is afraid to tell them exactly what he wants for fear they will quit, and perhaps if you add to what our friend from Illinois has just said about kindness, and remember that those whom we make mind, whom we impress with our own dignity and power over them, will think a great deal more of us, just as a child which you make obey will love you a great deal more than one whom you let alone, and if, with the men and women and children that you have working for you, you are kind and still firm and insist on the right with them and be sure that you are in the right yourself, you will find that it will help a great deal. It will not remedy all difficulties, but it will help a great deal. I have been at it for about twenty-five years.

Mr. Pearsons: The way we have to induce our pickers to do good work is to pay them a cent and a half a quart if they do good work and pick all season through, and if it is necessary to have them quit before, or if they quit of their own accord, they get but one cent a quart.

THE STRAWBERRY SEASON.

C. L. Richardson, Chippewa Falls.

The first requirement of the commercial strawberry grower is a suitable location. That is, he must be within reasonable distance of a local market and he should have good shipping facilities; for any man who is in the strawberry business to stay needs both local and export markets.

Strawberries do not require any particular type of land. Any good corn land sloping enough to drain, but not enough to wash, will do. Locations removed from woods and open to the west are less liable to late frosts. The strawberry is a rather cold-blooded plant, therefore the danger of planting on cold ground lies, not in the aversion of the plant for this, but in the

danger of frosts. Old sod is apt to harbor too many white grubs and cut-worms while corn ground is often infected with ants. A young clover sod heavily manured, plowed under and planted to potatoes and again heavily manured makes a good sight.

At the present time the labor and expense involved in setting by hand a large field of strawberry plants renders it a serious problem and any device tending to shorten the time and lighten the labor of transplanting is of distinct advantage. Hence a "setter" or "transplanter" is becoming a necessary part of the practical grower's equipment. We use a barrel transplanter manufactured in this city (Madison) and find that under average conditions and with proper care its work is at least as satisfactory as ordinary hand setting. The machine, which is operated by three men and a team, will set from twelve to eighteen thousand plants per day. It is well to have a boy follow to straighten and tramp in the plants. Avoid a hot, windy day when the dust blows; hot sunshine is not nearly so bad as a drying wind. We have had the best success setting in the afternoon thus allowing the plants over night to recuperate. Ordinarily ninety per cent. of them ought to live. Insecticides, fungicides or commercial fertilizers may be applied in the form of a solution placed in the barrel of the machine.

In purchasing plants it is well to remember that there may be upon the market two or more strains of a variety differing slightly in vigor and productiveness, and that a strain obtained from a house where it is highly recommended is sometimes superior to a strain from grounds where it is not a success. In transplanting on the home grounds take plants from rows which are not too thick, where they have had plenty of sunlight and room to develop, and choose only the vigorous, well-rooted stock. Tip plants are perhaps the greatest runners but produce less fruit than those at the first and second nodes.

It is well to renew the stock from time to time in case it shows any sign of degeneration. This may be done in two ways: either by the purchase of plants from some specialist who makes a business of improving old varieties, or by the substitution of better and more recent introductions.

Carry a large number of varieties. This reduces to a minimum the danger of loss by frost or the failure of a single variety. It also keeps up the average size of the berries, distributes the

crop over a long season, and enables the grower to realize the greatest possible amount of his year's work. Perhaps it costs a little more, but the cost is amply repaid. The grower who has August Luther, Michel Early and Excelsior for extra early, Bederwood, Senator Dunlap, Warfield, Crescent and Haverland for early and medium, Marshall, Bubach, Clyde, Brandywine, Marie, Aroma, Sample and Glen Mary for medium and late, and Gandy, Ridgeway, Hunn and Rough Rider for extra late, is prepared for a long and remunerative season.

Keep experimenting. Order a few dozen plants each year: many will fail but occasionally one of great value will be found. Write for a few catalogues, read them carefully, subscribe for a periodical devoted to small fruits. Correspond with introducers and nurseries of your state and section and keep up with the times. If a practical working knowledge of the profession is a good thing, surely the addition of a theoretical and academic knowledge of it is better.

Where fruit is grown on a large scale it is necessary to mark each row, and to be doubly certain, it is well to plat the field besides. A four-inch board, planed, painted and cut into sixteen-inch lengths, makes a good marker. A tin tag about two inches by four inches, stamped with a cold chisel, and hung on a piece of number eight guy-wire about eighteen inches long is superior in some respects to a wooden marker.

As soon as possible after setting go over the field with a fine-tooth cultivator and follow with the hoe. I think many of us are inclined at this busy season to shut our eyes to the vital importance of this first hoeing. It is necessary to get the plants started right and never let them stop growing long enough to "talk it over" or they are likely to go on a strike in picking season. It is necessary to remove the blossoms on the newly set plants but in our northern latitude, subject to summer drouth and other back-sets, I do not believe it is advisable to remove the early runners, as advocated by many. The average grower is likely to be injured by too few, rather than by too many plants. What is needed is to get the young plants started early so that the roots may be hardened and fruit buds developed before winter sets in. The amount of cultivation required by a field depends on so many considerations that it cannot be accurately foreseen. In general, however, the returns are roughly proportional to the labor expended. Cultvate two to

four times per month and hoe four to eight times during the season is an approximation.

When the crop begins to ripen hire a regular crew and keep them for the season, and retain the good ones year after year. Cultivate a spirit of neatness, dispatch and efficiency. Upon the *personnel* of the crew and the care of the crating force more than upon all other factors depends the ability to put on the market a first-class article. Pick all fruit as soon as ripe. This costs more, but a single storm may ruin enough to repay many times the extra cost.

Then there is the question of crates and boxes. Perhaps the sixteen-quart, one-piece-top, one-piece-side, middle-partition, hardwood case is as convenient as any. This costs more in the flat than an inferior slat case, but is cheaper to make up, will last as long as it can be got back, does not warp, or pull out of shape when raised by the corners, stands more hard usage in transportation and looks better than a cheaper, poorer case. The many shapes and sizes of boxes may be classified as full- and scant-quart: which to use depends on both moral and business considerations. The scant-quart case weighs less, saves over a quart of fruit per case, and will probably sell to the export trade for the same price, but the home customer and local grocer are quick to detect and appreciate the full-quart box, and are usually willing to pay more for it.

It is well to supply local customers with some of your best berries, but do not forget that your grocer is your best and staunchest customer. If you export the best berries and give him the remains be sure he will find it out; while he will be just as certain to appreciate a fancy article, and his favor is a valuable asset in the small fruit industry. Don't try to force him to pay the same price as private customers; he must make a profit as well as you. Grow the largest, brightest, best-flavored berries in your community, pick them at the right time, pack in good cases and market twice a day and you can supply the best grocery and the best customers at the best cash prices—and your business will grow from year to year.

When your grocer is overloaded do not attempt to force more berries upon him to spoil, but climb on your neat delivery-wagon and get out and hustle. Form a Fruit Grower's Association and save freight on boxes and express on berries. Fix a minimum price in the local market and ship out what cannot reasonably be

sold, to the Association agents and commission houses. Combine and organize as other industries are doing. This plan has been tried with success at Eau Claire and Long Lake, Minn.

Careful, abundant cultivation is of considerable importance in checking insect pests and plant disease, but it alone is not sufficient. Spray the field with Bordeaux mixture for blight or rust, and spray with Paris green, disparene or some similar arsenical poison for leaf roller, strawberry slug and all leaf-eating pests. Mow, burn, renovate and spray old beds; get clean plants on clean ground to escape root-lice and underground or interior parasites.

There is little danger of plants winter-killing if they go into winter quarters in a fairly dry condition. They may be mulched any time after the ground freezes. If protected by a considerable depth of snow they are safe until spring, otherwise mulch before extreme cold weather. It is not a winter protection but to prevent freezing and thawing in spring, and to keep the fruit clean and conserve moisture in summer, that the mulch is chiefly valuable.

To summarize: Choose good land safe from frosts, manure heavily, work it thoroughly before and after planting, set by machine, carry several varieties, early medium and late, spray, cut blossoms, cultivate incessantly, pick with care and market immediately. Keep the plants growing as long as the frost is out of the ground and do not rest satisfied until you realize two hundred dollars per acre; then try to make it three hundred.

DISCUSSION OF MR. RICHARDSON'S PAPER.

Mr. Patten: I would like to ask the young gentlemen if he has never had any experience in the fall of the year, when it was dry, and freezing nights continually for quite a length of time, that it became necessary to mulch before the ground froze up, in freezing and thawing days in the fall as well as in the spring, as he speaks of? In my own experience I have had one or two years when I practically lost my crop by not mulching early in the fall, a slight mulch over the plants would have saved them quite perfectly, whereas, leaving them to freeze and

thaw during the very dry season that we had, as I said, the crop was practically ruined.

Mr. Richardson: I think perhaps the reason that we have not been troubled with that is due to our soil. We have a soil in our locality that will produce few runners, comparatively; it is a soil that dries out very quickly, we can be out and cultivate in the afternoon, after a heavy rain in the morning. I think this makes a radical difference from that of a heavy clay soil.

Mr. Hartwell: You ought to mulch earlier because of that drying out and weakening of your plants. I practice mulching every year before heavy freezing.

Mr. Patten: The weakening process comes from the loss of the leaves, so that the plant is merely destroyed from that cause.

President Loope: I think that under conditions when the plants go into winter quarters green, that it is advisable to mulch early, because if the plants are well ripened up, it makes very little difference whether they are mulched early or late, or any time before the first of March.

Mr. Smith: I think this matter of fall freezing and thawing is very largely one of climatic conditions. In central and northern Wisconsin we have very little of it in the fall; it is nothing unusual at all to have a fall where the ground is scarcely frozen at all until it freezes up and stays frozen, while in the southern part of the state and in Illinois the conditions may vary a great deal from that.

Mr. Richardson: Has any one here tried the sugar beet weeder? I had an idea that under certain conditions that could be used advantageously in the strawberry row.

Mr. Hartwell: Any weeder is all right.

Mr. Kellogg: I have found it very beneficial, immediately after the planting, to go through the strawberry patch with a weeder and keep that weeder running as long as the runners do not interfere; in fact, I have followed the pickers so close that they have had to get out of the way in order to let me go by with the weeder.

Mr. Hanchett: I think the gentleman would have some trouble with the weeder in transplanting, in pulling the plant up. That has been our experience.

Mr. Kellogg: I do not think the weeder should follow the machine planter. We practiced that until we gave it up. The

planters do not firm the ground enough; it wants a man with his heels on every plant to follow that planter to firm the ground.

Mr. Hanchett: Not so with us. I think if we had to have hand planting I would quit raising strawberries. We plant from five to ten acres every year, and when we buy those two dollars a dozen varieties, we even put them in with the planter. It needs careful men and careful work.

Mr. Hartwell: I want to give a little personal experience resulting from my relation to this society. A Mr. Scofield, who is now dead, I think he lived at Marengo, gave me a point in regard to setting strawberry plants that has relieved me of all this trouble, and I would not give you any money for your machine, and I set from three to five acres per day. I can set 5,000 plants per day with a little boy with me who carries the pail, and I carry the machine. The machine is one that Mr. Scofield told me how to make. It is a trowel-shaped affair, with handles at right angles with the blade. I stick it in the ground and turn it around to one side with a twist and raise it; I put the plant in behind it and go on my knees and fingers and press the dirt and we rush on. I can set easily 5,000 a day, and I do not think the machine will do much better, and I know the plant is in the proper place and I know the weeder will not pull it up. The spade suggested by the first gentleman is all right, but it is slow. I have hired men who think it is a big job to put in 5000 plants a day.

Mr. Menn: Mr. Hartwell, do you find it advisable to wilt your plants before you set them?

Mr. Hartwell: I do not believe in wilting anything that I want to grow. I have heard it advocated, but I do not practice it.

Mr. Toole: The more wilting any plants have, the worse off they are; positively avoid the wilting if you can.

TUESDAY AFTEROON.

THE BEST THINGS TO DO IN FRUIT CULTURE.

By A. L. Hatch, Sturgeon Bay.

The best we can do in fruit culture is to *keep the growing conditions always favorable* for every tree and plant we expect to bear fruit. Can we do this? Are we not at the mercy of the seasons and changing freaks of the weather? Can we overcome the ill effects of drought or excessive rainfall, of untimely frost or great heat of the growing season? If we pass the summer season without loss from insect or fungus foes are we not still likely to meet defeat from the fearful cold of winter? To put the question in another form: Can we, by correct management, grow satisfactory crops of fruit profitably each year?

Assuming that a reasonably good site is used and varieties adapted to our climate are planted, my own experience answers this question in the affirmative. Where to plant and what to plant are not questions I care now to discuss, but rather what we can and should *do* to *keep the growing condition always* favorable. When all these conditions are made as favorable as the ordinary fruit grower should make them, then profitable crops are assured and the business is no more at the mercy of the seasons or so-called luck than the best agricultural crops are, such as hay or wheat, corn or potatoes.

The successful fruiting of trees or plants can be effected only when our management includes: First, training; second, feeding; third, protection. Training is something I do not wish to treat of in this paper, but I will say that pruning, which is a very important matter, especially with fruit trees and grape vines and is almost indispensible to control the vigor and fruiting of the trees or vines. Presuming this to have been properly attended to, the next great problem is that of the nutrition of the tree or plant,—its feeding and watering through the soil. Assuring that there is in the soil within reach of the tree or

plant roots plenty of the three essential plant foods, viz., nitrogen, phosphoric acid and potash, and that these are in correct proportion, then our problem becomes this: How can we make this plant food continuously available?

At the beginning of the season when trees and plants are awakening from their winter rest our operations should begin. As new leaves and branches grow, as the flowers change into fruit, and the whole tree puts on a new layer of growth under its old bark, it becomes essentially a new creation, and our efforts in its behalf should be in full play at this season. Although the formation of new leaves and branches may cease by the first of July, there is still growth to be ripened and matured, so the growing conditions should be favorable for these operations to go on. Not only is it desirable to maintain these conditions for the positive good that results but also that failures be avoided. I can see no reason why good growing conditions should not be given a fruit tree as well as corn or potatoes. Should any farmer cultivate his corn or potatoes in June only, he surely would fail of a crop in this climate. The principle of culture seems to be to cultivate until the crop has been assured by the direct effect of that cultivation.

It is now well known that the food supply of the plant is made available by cultivation, and this is effected not only by the tilth and aeration of the soil in common cultivation, but it is also affected by the conservation of the moisture in the soil that is necessary to dissolve plant food, as that is the only form in which it can be used by trees or plants.

In orchard cultivation it is a problem to know what to do to secure good tilth and cultivate properly without injury to the trees. Two years ago I obtained an extension disc harrow with cut-away and reversible discs. This is designed to work under trees and throw the soil either toward or away from the trees. Last season I used this quite considerably, and I am somewhat disappointed with it,—not so much because it failed to do the work as because I have a better plan. I would say, however, that where sod has to be subdued that can not well be plowed, then the cut-away disc will work into and break up the sod that a solid disc will ride over. When, however, the surface has been broken sufficiently to allow a spring tooth harrow to work without clogging, I used that entirely. The

spring harrow I use has an iron frame work and a lever to each section that permits setting the teeth at any depth up to six or eight inches. It was the method of using it, however, that gave the results I sought. This method I term the zig-zag method, for want of a better word. In use the team hauling the harrow passes to the right of one tree, then to the left of the next tree in the row, and so on to the end of the row, returning on the opposite side of each tree when coming back across the orchard. This zig-zag method draws the harrow under the tree as the team swings around it to the next one, so that when the rows are harrowed both ways and crosswise there is very little surface left uncultivated under each tree. Of course, this zig-zag method can be used with the disc or any other harrow, and is in my opinion much preferable to wide, expanded or extension harrows. Of course tap-rooted weeds were not all killed with the spring tooth harrow. To kill them I had two long steel knives made by the blacksmith and clipped by iron posts to the spring harrow frame in such a way that they slanted across each section with the bars coming together in a v-shaped point in the center. This was drawn through the orchard where necessary, either in zig-zag or direct, as desired.

This method and these tools seemed to solve the problem of cultivation in my cherry and plum orchards, at least, and have demonstrated how I can do my work by horse-power instead of hand work.

Insect and fungus foes are always with us. There is no such thing as complete exemption from their ravages. There is certainty of serious injury and great probability of complete failure unless their bad work is held in check. No matter how carefully we cultivate or manage if we neglect to save the leaves of our trees and plants and carry them to maturity in reasonable health and vigor we cannot expect success. At this time we know of no preventive or remedy equal to that of spraying. For efficiency this should cover the entire period of leaf-production. When a tree or plant ceases to produce new branches and leaves then spraying may rest, except that it is now generally conceded that at least one good spraying shall be given when there are no leaves upon the tree, that spores of fungi there resting may be destroyed.

For this winter spraying, as it is called, a solution of copper

sulphate (blue vitroil) alone is used, then two sprayings with Bordeaux mixture and some insect poison after bloom and before the fruit is large enough to be spotted with the spray; then following this either diluted Bordeaux mixture and no insecticide or else Bordeaux mixture made with sucrate of lime.

When the plan of management I have outlined has been followed, good foliage results and it is carried to maturity so that good sound wood and plump healthy buds result,—the wood is hardy and does not winter kill or sun scald; the bloom is strong and abundant and the fruit ample and good. That good growing conditions always maintained make our fruit trees and plants hardy enough to endure our coldest winters perfectly on good sites is shown by the fact that no winter that we ever had has killed all of the trees of almost any of our popular kinds. Even though some were lost, we've had good trees left of the same kinds, such as Fameuse, Tollman Sweet, Golden Russet, Wealthy and Newell in apples, and those also that did not suffer with the so-called sun scald of winter. Always the best were those that were in the best condition as a result of a better growth and better preservation of foliage and arising from conditions that were produced by the cultivator himself. Winter killing, sun-scald and failure to fruit is neglect,—and neglect only. Having experienced these things I feel sure the best thing to do in fruit culture is to keep the growing conditions always and continuously favorable.

DISCUSSION OF MR. HATCH'S PAPER.

Mr. Marshall: I would like to say that I saw Mr. Hatch's harrow, and I am perfectly satisfied that it is a great tool for his soil, but I do not think six horses could pull it through my orchard.

Mr. Watrous: Is his soil sandy?

Mr. Marshall: Light soil, yes.

President Loope: It is a stony soil, rather light.

Mr. Watrous: Not tenacious?

President Loope: No.

Mr. Smith: Don't you find a spring tooth harrow very good to use in the orchard for cultivating?

Mr. Marshall: Yes, I think the spring tooth harrow is very good for the orchard. I refer to this knife underneath; to pull that through a clay soil will take a great deal of power.

Mr. Smith: We have used it very successfully the last few years for cutting weeds where they get quite a size, the Planet, Jr., 5-tooth cultivator, with what they call a sweep. The teeth, which are made broad and flat and up to 12 or 14 inches wide, probably from 4 inches up, you can get them any width you want. We have a set 2–6 and 2–8 and one 10. That will cut off anything in the way, and after going over ground that is quite weedy with a spring tooth harrow and loosening it up, if it is heavy ground, you can go over it then with this cultivator with one horse and there will not be a weed left.

Mr. Watrous: I have used a tool that, for want of a better name, we call a razor, and I have different sizes. Take a stock that can be bought that will take almost any kind of a shovel and then make some knives in this shape (indicating) and the cutting edge is outward and the brace that fastens this tool on to the stock is in the middle of the angle of the knives. By that you have a tool maybe 20 to 24 inches broad, and that goes with the sharp point forward; you can run that through any kind of tenacious soil, unless it should be terribly wet and baked, and by keeping the edges sharp you can run up within an inch or two of the nursery stock or plants, no matter how small, and you kill every weed that is there, and it can be used late, because you do not cultivate the ground more than an inch or two deep. It is the best tool I have ever had any experience with.

President Loope: We all know Mr. Hatch, and Mr. Marshall and I were up there the latter part of the summer and looked his orchard over, and he has been very successful, particularly in cherries and plums. He raises the Japanese varieties easily way up north there at Sturgeon Bay, and he raises another product there which is not very profitable, and that is Canada thistles.

Mr. Rieck: I was going to inquire in regard to the best method of running a harrow in a zig-zag manner between the trees. I think you have struck the keynote there of success, but how do you manage when you go to the right of one tree and to the left of the other when your team gets up to the tree,

to prevent the harrow from coming up so close as to bark the tree that you are passing. That is the only difficulty in that kind of cultivator, getting the team past the tree, and then, as you turn to the right, it draws the harrow up to the tree you have passed, while the team with the whiffle trees, you have got to watch the team one way and as you are turning around you are drawing your harrow against the other.

Mr. Watrous: I should say you must have a driver with good eye-sight and he must be strictly sober.

Mr. Rieck: I know a driver that has those qualifications and I cannot trust him to drive past four trees but he will bark two of them.

Mr. Hartwell: What does he bark them with?

Mr. Rieck: Sometimes the whiffle tree and sometimes the tool. It is a pretty difficult job. Suppose your trees are 12 feet apart, by the time you have passed one tree you are drawing your cultivator onto the preceding one.

President Loope: You will stick them on that proposition,—12 feet apart.

Mr. Kellogg: I practiced that twelve years, and I set my trees further apart.

Mr. Rieck: That is the idea, and the farther apart you have them, the less trouble you will have, but it won't do on high-priced land.

Mr. Hartwell: I have an orchard planted on land that is worth $100 an acre where the trees are 16 feet apart, and I would give $100 in cash if I could make them 18 feet apart.

PREMIUMS ON FRUIT AND VEGETABLES AT ANNUAL COUNTY FAIRS.

By J. J. Menn, Norwalk.

Mr. President, Ladies and Gentlemen:

In looking over the constitution and by-laws of some of our county fair associations, we find them stating that their object shall be for the improvement and development of the "light

harness horse," promotion of agriculture and improvement of the Association track and grounds.

The purpose of a county fair is to show the people who attend these fairs the resources of the county. The fair should be a practical school, the exhibitors to become teachers, the exhibits our lessons and every one attending, a pupil.

Let us enter this school for a few hours. The first we observe is a fairly good exhibit in the various departments. Many of the exhibitors are strangers to us. We soon learn they are from other counties. We look through the buildings where the products of the farm, orchard and garden, etc., are to be found. Very few of the exhibitors are kept busy teaching where everybody seems to be in a hurry to get away. We follow the crowd which moves on toward the "grand stand." We pause for a moment. "What means all of this?" We see a village of tents and booths with flying banners, and hear ear-deafening noise, an immense crowd of people all seemingly to be enjoying themselves, pushing and crowding. One thought now enters our mind, "Hang onto your pocket book." We finally get through safely. We look back. What have we seen? What shall we call it? Is there a name for it? You say, "Yes, it is the fair." But I suggest, please add the word fakir first.

We look over the live stock exhibits. Very few interested scholars to be seen; we return home. We are asked, "What have you seen?" We answer; "The monkey, the horse racing and the balloon." What have you learned? Yes, brother horticulturist, what have we learned?

But I am getting away from my subject. I am to tell something on premiums. Yes, the Association offers such as an inducement to draw the people, they to bring with them the best they have on the farm to be entered in the various departments. Without the people we cannot have a fair, and without inducements and amusements the people will not come, so we must have both.

Now, how about premiums on fruit and vegetables? We assembled here at this state meeting are all interested in this question. Let us look over a few premium lists. Here is No. 1: Total premiums on fruit, $9.00; vegetables, $12.75. No. 2: Home county fruit, $25.00; vegetables, $18.00. Now we

could go through every county in the state and as a rule you find the premiums low on our products. Can you show me any inducements in these offers as read?

In my own county the highest premium is $3.00 on the best six varieties of apples correctly named and labeled; $1.50, second; then single plate premiums from 50c to $1.00 are offered, but no distinction being made between the professional and amateur exhibitor, the farmers' fruit coming in competition with the professionals. And right here a great mistake is too often made. The fruit is all placed on the same tables and we are at a loss to find the fruit we look for, and the farmer who has probably one-half dozen choice varieties fears to bring them because he has not as large a collection.

Why not have a separation, with a large sign in plain letters reading thus: The Professional or Nurseryman Exhibit, The Amateur or Farmers' Exhibit.

The premiums on the professional should not be any higher than the farmer's, even if he has a large assortment, for this is very discouraging to the amateur. We want the professional's fruit at our fairs; we cannot get along without it. If he has some new and promising varieties we want to see them. At the same time, if neighbor Jones, who may live some distance, has only a few very choice varieties, we want him to bring them and not fear competition.

I will give a few reasons why more farmers do not attend and make exhibits. One of the reasons why we do not get better exhibits at our county fairs is due to the small amount realized in premiums. If more attention was given by the management of our county fairs in the way of sufficient compensation, our exhibits in the various departments would be more satisfactory, and it would be more of an inducement to farmers and others to make exhibits.

Again, all exhibitors at our county fairs should, as far as possible, be products actually raised in the county in which the fair is held, so the people in the county could see what the county produces, and learn what their neighbors are producing. But we find very few local exhibitors at these fairs in proportion to the population of the county in which the fair is held.

Another reason for so few local exhibitors is due largely to the professional exhibitor who makes it a business to exhibit

from fair to fair, exhibiting the same products, and very often the products thus exhibited are not of his own production, but bought up and exhibited in their own names. I find that this state of affairs not only exists in the horticultural departments, but in every other department.

I have in mind one particular case: Mr. Brandt who introduced the White Plymouth Rocks in our community and who has spared no time or money in breeding these birds to the standard, has produced some of the finest and some of the best layers that I ever saw, some of his birds laying as high as 266 eggs in one year. Mr. Brandt, however, could not be induced to show any of these birds at our county fairs, for the reason that the premiums offered are entirely inadequate for the trouble incurred in making the exhibit, and on account of the professional exhibitor who has no interest whatever in the county, but simply taking his stock in order to get a premium for advertising purposes.

But I hear some one say: "It is not for the premium only. There is some honor in securing a prize." True there is. Supposing the Society offers the blue ribbon only, how many would exhibit? But few, if any. It takes that which tinkles in our pockets; that which is bankable, to go with the ribbons. The more of this in sight of winning, the larger the exhibits.

You ask me how high a premium would you offer on fruits and vegetables? This is a question we are to decide, but I would suggest to have them high enough to bring out the very best there is grown in the county. I am more than ever convinced since gathering fruit for the St. Louis exhibition last fall that the finest fruit and vegetables are not shown at all at our fairs. I called at more than one hundred farmers that raise fruit and found two that had at one time exhibited fruit. Undoubtedly all of you who have been engaged in this work can say the same.

A friend of mine, an experienced fruit grower, returning from our State Fair last fall, stopped thirty miles west of Milwaukee to visit a relative. This man grows fruit for home use; he has a seedling winter apple tree that bears annually large handsome apples that keep until May. The seed of this tree was planted in 1857." This shows that we have men growing fine products in our own counties and we are not aware of it,

These growers of fruits and vegetables are interested in every other branch of farming, such as poultry, live stock, etc. My friend says, "I have never before seen such large handsome Wealthy apples as grew here; nothing at the State Fair to equal them. Not this alone, Association should offer such liberal inducements in premiums as to bring them to our fairs. Some say we will not have room to place all exhibits. The larger the exhibits, the larger the attendance. This means larger gate receipts and ample funds for additional room, but I hear someone say the competition will be too close. Yes, it may. My own exhibit may be very fine, my neighbors still finer. He wins the prize and receives the blue ribbons. I receive the red ribbon. I stand for a moment. My features show a happy combination with the ribbons on my fruit, or your brother horticulturist may feel as blue as the blue ribbons that adorn your rival's exhibit. What of it? We have one consolation,—old mother earth will revolve and we will be here again and then see.

Supposing it rains during fair week? What then? We had an example of this last fall. The Association had not sufficient funds to pay premiums. This can be overcome by having a better understanding between the managers and exhibitors, by receiving a certain per cent. of the premiums awarded.

Could not our nurserymen offer a special premium to the farmers in their home county on such varieties of fruit as they can recommend? Would it not be advisable for our State Society to offer a premium in the northern counties to the fruit and vegetable growers where a fair may be held and at the same time make an exhibit of our fruit grown?

At the Wausau trial orchard let a representative of our Society have charge of this, he to be supplied with our annual reports, and he could do missionary work for our Society.

I do not wish to criticise our county fair managers, but let us offer suggestions so they may be better able to give us better fairs, socially and morally. Every tiller of the soil should, with his family, attend his county fair at least a couple of days. We owe it to our wives, sons and daughters. If there is one thing that drives our boys and girls from the farm it is not letting them go to a fair, after they had a promise all summer and worked faithfully.

Our state is interested in premiums offered by county fair associations, they paying annually liberal sums to the Association. Should not the purse on horse racing be reduced, and this money used for premium purposes, to a better advantage, until some of the abuses, as I have tried to show you, are corrected, our county fairs will not be in the true sense of the word what they represent. Let us awake to our interests, and have higher premiums for our products exhibited at our county fairs.

DISCUSSION OF MR. MENN'S PAPER.

Mr. Toole: I think the paper just read touches on a point of very much interest in the line of horticulture. In regard to the offerings, they certainly are inadequate, so much so that people do not realize the importance of it. I was attending a fair in the northwestern part of the state, held at Chippewa Falls, and I was very much surprised, in looking upon the premium list, to see how poorly the offerings were fitted to the occasion. I was judging horticulture in some other line, and there was quite a little stirring around to find where the flowers were, there did not seem to be any provisions made as to where the entries should go, and there were some few offerings made for flowers, I think some two or three dollars for first premium on plants, nothing offered for showing cut flowers, nothing for asters, no offering for bouquets, or designs, or anything of that sort, but a few offerings in such an absurd way, as, for ten lefkojes, etc. Then, when it came to offering for fruit, I think they must have made a special offer for every kind of crab-apple I ever heard of; yet there was a fine showing of some of our leading varieties for which no premium was offered, and it seems to me there is great need there that the Horticultural Society find out what people have, find out what they can do. In the northwestern part of the state there are a great many fine apples grown, but they do not seem to get together to know what they have or what they can do. There is a great need that somebody that knows something about horticulture go over the premium list and revise it.

Mr. Barnes: I am one of the directors in one of the northern central state fairs and it will be our effort to pay more attention and offer more premiums on the exhibit of fruits and garden vegetables. We will also create two classes, professional and amateur, and I believe, as Brother Menn states, that ought to prevail in every county society in the state, and I think it ought to prevail in this society, and I think that for the winter exhibits especially in this society, if I may be permitted to touch on that now, there ought to be a discrimination as between cold storage fruit and fruit kept in ordinary cellars, but that would not apply to county fairs, which we are discussing.

Mr. Hager: In regard to offering premiums at horticultural fairs, I think I can apologize to a certain extent for the management of fairs. I have found that it has oftentimes been a matter of ignorance or not understanding what varieties to put premiums upon. In fact, the case is that in nine cases out of ten the management of the fairs is not interested in horticulture, the main attraction of the fair is the horse race, and the men who are interested in the horse races are the ones that run it, and to remedy this, we as horticulturists must take hold ourselves, crowd ourselves in and let them hear our voices and demand that these things be put on the premium list and attract people's attention toward horticulture.

Mr. Philips: I have had a little experience in running county fairs. The great trouble with county fairs is that the premium list is not right, there is too much offered on horse racing and not enough in the ladies' department and not enough for fruits and flowers. People never think of a county fair for eleven months and a half, they never think of attending the meetings and arranging the premium list, and then get mad because they do not get premiums.

Mr. Johnson: I thought there were some very good points brought out in the paper. There is one idea that I do not know as it was stated, though it was implied, and that was that an increase in the amount of premium would correspondingly increase the exhibit. I suppose that is true to a certain extent, and yet I do think there is something else in that, a little more than mere money, and that is, have a little more of it put into brains. Brains tell on a premium list just as much as anywhere else and I will give you a little illustration. Our secretary went around to a horticulturist and asked him what he would

give for a special premium, and they picked a barrel of apples and offered it as a premium for the best peck of onions, and there were two pecks of onions. Next year they asked him what he would give. He said, "I will give a barrel of apples for special premium, but I want something besides two pecks of onions to show for it. I would like to offer it for the best display of tomatoes." Well, it was offered for the best display of tomatoes, and he took a little pains to interest a few in that, and I think all who saw it will say that that display of tomatoes was one of the most beautiful, instructive and interesting in this line that we ever had at that fair.

Mr. Toole: I am glad to see that we have been moved to consider the importance of this subject, and the next thought that occurs is, What are we going to do? We want to do missionary work through the state and want to meet the people to whom the fruit belongs. It will be pretty long before our horticultural report gets out, and somebody has suggested that we might issue bulletins from this Society, and then perhaps later revise the premium list in the Horticultural Society. I believe that a motion was passed last year that some special attention should be given to seedlings, asking for a committee to be appointed, and if we have one, we ought to begin at home and give very much closer attention to our own premium list.

President Loope: It was suggested to me that the Society through a committee send out a premium list for county fairs on horticultural products. It might possibly be the means of enlightening some if a suitable list were made and explained, because they do not know anything about it as a rule, and perhaps at the same time that might be brought up.

Mr. Barnes: I can perhaps say for the benefit of some of these members that some of the central and northern associations have adopted a plan of paying a sort of professional man for two days' service. He is to be in attendance the first days of the fair to correctly name the different varieties of fruits as they are brought in. They are inclined and do generally make the premium list read, so much for any single plate correctly named, meritorious variety of fruit. The second day this man judges the fruit. I think that is a good way, and the northern counties can set good examples to many of the southern counties of the state along that line. It is hardly fair to offer a premium on just certain named varieties, because it is a fact that some of

our most worthy varieties are practically new and unknown in a good many parts of the country; therefore I think the system of offering a premium on any meritorious sort is the proper way to offer premiums at the present time.

Mr. Menn: I would suggest that the Chair appoint a committee of at least three fruit growers and a few vegetable growers to revise the premium list, that is, for the state at large, and send a copy of this to the secretary of every fair association. Then if they have a basis to go by they could, if they thought it was too high, lower it, or if not high enough, they could raise it a little. What they want and what they need is a basis to go by. I spoke to the secretary of our home society and asked him about this same question; he said, "Well, we realize we are not paying enough, we could afford to pay more, but you people come and tell us what you want and we are willing to abide by it." Now, there is just the point.

Mr. Patten: May I ask if your Horticultural Society has a horticultural worker at your Farmers' Institutes in this state?

President Loope: There is some work of this kind done, but I think it is not always done, and it is not a permanent thing, that is, with every institute.

Secretary Herbs: I have been out four weeks this winter, and I understand there is another man, and Mr. Coe has charge of one of the corps and he also has been doing work in the horticultural line at institutes and there is quite a little being done throughout the state at the Farmers' Institutes and a great deal of interest is being shown by the farmers in the work.

Mr. Patten: In asking the question, I thought that if you had such a man in the field, that your Society, by resolution or instructions, might get this matter directly before the people of your state in various localities where those institutes are held, and so not postponing the matter almost for the year to come. This, in connection with the thought expressed by Mr. Menn, it seems to me might be of use in getting the work done.

THE RELATION OF EXPERIMENT STATIONS TO HORTICULURE.

By J. L. Hartwell, Dixon, Ill.

The question of constitutional peculiarities of varieties, their adaptability to local conditions, including soil and climate, is fascinating to the student of biology.

That each locality whose physical and climatic conditions are not identical with those of other localities, should attain unto itself a flora adapted to that particular area, will be of supreme importance so long as vegetable organisms play so important a part in the maintenance of human existence and its activities.

That nature, unaided, will not do this for at least a large part of the habitable world, needs no debate; but to the student of horticulture, she opens up a field of work radiant with fascinating possibilities. To secure an adapted list of fruits for this territory, is the absorbing theme of our conventions.

The problem is comparatively a modern one. We have been at it considerably less than fifty years. It is one that demands patience as well as persistence. The laws, by the application of which it may be solved, are the laws of evolution. Comparatively crude notions prevailed back of the generation now living regarding variation in plant life. Scientific plant-breeding is still a sealed book to most people. Secretary Wilson said recently, in discussing the application of science to agriculture: "If we want a man to conduct a scientific investigation in some department of husbandry, he is not to be had. We have to make him."

The plant-breeder confronts a much more difficult problem than does the breeder of swine or cattle or fowls. The pedigree of well-bred animals is easily traceable through many generations. It is rare that we can affirm with any degree of certainty as to the first parents of any variety of fruit. Absolutely nothing positive is known back of the first generation.

He who plants one thousand apple-seeds can predict with no absolute certainty as to the characteristics of the fruit borne by the trees of which these seeds are germs. The apples may be sour or sweet, small or large, of any color, ripening in any season, in all manner of shapes. The trees may be tender or hardy,

although the process of fertilizing these germs is under the strictest scientific supervision. There has been practically no scientific plant-breeding done and this fact we must face when considering the subject of varieties.

Practically all our new varieties are accidents. Their characteristics cannot be predicted; they must be tested. There are few growers of extended experience who have not found at some time a stranger among their plants which boded something good, possibly better, and maybe the best thing known of its kind, and how many ruined air-castles are strewn all along the line. This quest for something new, something better, for the unattained, is primarily a virtue; but when uncontroled, approximates a vice.

A vast amount of harm has come to the pursuit of horticulture from this reaching out after the new and untried. Probably not more than one in five hundred of the new things that are constantly knocking for admission to public favor and patronage, prove, in the end, to be *good* things. Is it any wonder that the road is strewn with blasted hopes and that so many, many toilers faint by the wayside?

To avoid this terrible waste, a large number of us have given up trying to find out for ourselves the merits of every new variety which the over-wrought imagination of its originator thinks it possesses and have delegated the task to one person whose place of work we call an experiment or trial station. The soil, climate, etc., of his field is supposed to be identical with that of those for whom the trial is conducted. If one man can conduct an experiment which will relieve ten thousand from doing the same thing, it certainly is an economical transaction, and it takes very little figuring to prove it. The same argument applies to all classes of experiments in all classes of industries. *The experiment station is, itself, not an experiment:* its value is self evident to the thoughtful husbandman.

The Illinois State Legislature appropriates annually $1,000 for experimental work under the direction of the State Horticultural Board. With this eight or ten experimental stations are maintained in different parts of the state. The work of these stations is limited to testing varieties. Each station is conducted by a practical fruit-grower, and the ground upon which it is planted is private property.

This system has been far from satisfactory. The death

or removal of the one in charge of a station usually means the end of the station as far as its usefulness to the state is concerned, and this frequently happens at the most important period in the development of the station. Of course, in common with other states, we have an experiment station in charge of our State Agricultural College as provided by the Morrill Act, whose field of work is much broader. There every problem which comes before the fruit-grower for solution is handled by a scientific expert. Much of the work which has been done at these stations is very preliminary, the value of which can only be tested by time. Like the pioneer settler, little more than to lay the foundation and blaze the way, has been accomplished.

Those of us who are familiar with the workings of these stations, look with much interest for the bulletins issued and the reports of experiments conducted. The average fruit-grower knows very little of what the stations are doing and cares less. What proportion of the fruit-growers in your state or my state, think you, consult the bulletins and reports from our stations to determine the comparative merits of dust or liquid spray, deep or shallow cultivation, barnyard manure or commercial fertilizer, or the real merits of a new variety of fruit? To illustrate a thought which appeals to me with much force, let us consider the question of new varieties of fruit and their relation to our experiment and trial station. Every spring there are sixteen-to-one candidates for public favor among the new fruits than the state of Illinois has aspirants for the governorship. My Wisconsin friends are probably not fully aware how strong an illustration this is. One propagator of plants for the trade announces twenty-five new varieties of strawberries; another thirteen; another eleven; another seven. In the selection of names every possible prejudice is appealed to. You have your choice between "McKinley" and "William Jennings Bryan." If you don't like "Teddy," "Mark Hanna" is on the list. Military heroes are in evidence from "Oom Paul" to "Admiral Dewey." Practically every state is represented, from "New York" to "Texas." As to descriptions: is it not a little remarkable how many "largest," "the most productive," "finest flavored," "strongest plant setters," "entirely free from rust" and such terms, there are?

I have a theory that one of the sublime virtues is a firm belief in the integrity of one's fellowman; but the last few years' ex-

perience in testing over one hunderd varieties of strawberries, has made more of a skeptic of me than I like to admit. Many of these conflicting experiences with different varieties are due to varying conditions of soil, climate, etc.; but I wish that I could feel that *all* the disappointments could be accounted for in this way.

There are some phases of this "new variety problem" which should not be passed lightly by, and I am not sure should not be placed under legal restrictions. There are in the neighborhood of fifty new varieties of strawberries which have come to my notice and which are offered to the spring trade at $1.00 or more per dozen. They will be planted in most, if not all of the experiment stations as they ought to be. A large number of amateurs will buy them at these figures. In five years from now not one in ten of these may be on our fruit-lists. History would only repeat itself if they all disappointed in ten years. I wish it had been possible for Peter Gideon to realize $50,000 for the Wealthy apple, and Mr. Warfield a similar amount for his admirable strawberry. Neither of these varieties of fruit were placed on the market by their originator until they had been thoroughly tested. *I believe it is eminently practicable and entirely proper to regulate the introduction of new fruits by law.*

The originator of a new variety of fruit of real merit should receive government protection in it as a piece of property as much as the patentee of a mechanical device, and to secure this protection, his variety should be subjected to tests by those legally authorized to make such tests. If the originator believes that he has a variety of real merit which will stand investigation, let him be required by law, before it may be offered to the public, to furnish specimens free of cost to the experiment stations where it shall be tested and reported upon, which report he must publish along with such other matter as he may send out describing the variety.

This would bring our experiment stations more prominently before the public and lead to a more general recognition of their function and usefulness. It might work a hardship to certain plant-venders; but the originators and disseminators of varieties that are valuable, would hail such restrictive legislation with delight.

It is no hardship to require every man to render value re-

ceived for whatever he has to offer to the public in trade, whether it be his brain, his muscle or an article of merchandise.

There are many tillers of the soil who do not know that there are such things as experiment stations; or if they do know of them, their ideas of what they are trying to accomplish are very vague. That the stations are pursuing a line of work in which they are personally interested, has never occurred to them.

The nursery man who is advertising his stock under the conditions for which I am contending, would doubtless make prominent what the experiment stations had to say about it. Every tree-peddler would appoint himself a committee of one to inform every farmer and every owner of a garden-plat, about the nice things the experiment stations were saying concerning the trees and plants pictured in his plate-book.

This great northwest territory is not wanting in fertile acres or strong, robust, intelligent citizens. It has many hard problems to solve, prominent among which is the securing of a list of plants and trees adapted to its soil and climate. It is very plain that the experiment stations will take a prominent part in the solution of this problem.

DISCUSSION OF MR. HARTWELL'S PAPER.

Mr. Phillips: Along the line of experimenting I would like to ask ex-Governor Hoard to give us a little account of the experiment station he started.

Mr. Hoard: You can search me from top to toe, you will not find any experiment station on me. I have not such a thing concealed about my person. I do not know what Mr. Phillips is alluding to. He is a romancer. I dropped in here to listen. Mr. President, I have not any words of wisdom to impart in this matter. I have been very much interested and shall prefer not to waste your time, if you please, in talking.

Mr. Marshall (of Iowa): I think this subject hinges on the last one discussed, namely, the interest the people would take in our county and state fairs. A man on the floor said he was a crank on a certain point; I like to hear it, because you never saw a crank but what you saw an enthusiast, and this world has moved forward on the wheels of enthusiasm, and what we

need to present our horticultural interests before the public is more enthusiasm among the growers and we want to cultivate that spirit, not only among ourselves but among our neighbors. Now, here is the matter of experiment stations. Why have we not had it before? We all know how valuable it will be. There is a certain pathetic touch in the thought that men get to a certain mature point in the experiment station and then death sweeps them away, and I want you to remember what was said by old John Wesley, "God buries the workers but he carries on the work," and I am glad to see so many young men here today. What we want is young men to catch up the falling standard that is droping from the hands of those who came to this country years ago, and carry it forward to successful prosecution. I believe there is a great deal of work for horticulturists and fruit growers in northwestern America. When I went to Iowa forty-seven years ago, people met me with rather sad faces. They said, "Yes, you can grow crab apples of every grade; there are wild plums on the river, but you never can raise any fruit." And they told us about clover, and the finest field of clover I have seen in this world (I have traveled around it twice), was in Iowa, and I believe, as I look upon the specimens of Nature's handiwork that are before us today, that the day is coming when not only Iowa, but Wisconsin and the whole Northwest will be one great garden in apple raising. Let us have more enthusiasm, more devotion in our work.

Mr. Barnes: I am sorry to know that Illinois is in half as deplorable condition with its trial orchards as are we. Friends, it is a fact that we have four trial orchards in central and northern Wisconsin, or northwestern Wisconsin. These orchards are on leased ground; these orchards are under our care, or to be cultivated, at least, and should be reported on by four different individuals. I have attended every state meeting that has occurred since these orchards were planted, or nearly every one, and I have never had the pleasure of meeting three of these carers of those orchards in these conventions; I have never known of a single report made by any one of those three.

President Loope: Are you discussing the matter Mr. Hartwell brought up in his paper?

Mr. Barnes: Mr. Hartwell's subject is along that line.

Mr. Phillips: I have a paper that covers that.

Mr. Watrous: Because at one time in my life for several years I pursued the study of law, and because I am interested in experiment stations in my own state, may I talk about a minute in relation to what Mr. Hartwell said about the subject of preserving the right of the Horticultural Society to the use of the land. I think there may be a point in it. It would be, I think, good law, and I do not see why it would not be practical if the Society of Horticulture, before sending out stock to the experiment stations—we do it in Iowa and in many of the states—might not take from the owner of the land in legal form a lease of an acre, or half an acre, or more land, whatever they choose, conditioned that, upon the annual payment of one dollar (as good as a thousand) they might have the right to renew that lease from year to year for as long time as they choose, say ten or fifteen years, that will be long enough, or twenty years, for any kind of fruit to show what it is going to be, just as much as if it stayed there fifty years. That is one point. I do not see why that would not be a good, legal way to go about it.

Then there is another thing. In regard to having a law that shall in some manner prevent a man from selling a humbug to a foolish man that is willing to buy that humbug and pay his money for it. As long ago as Bible times it was said sadly and truly that "The fool and his money are soon parted." We tried in this country and in other civilized countries various ways to prevent frauds, we punish fraud, but to undertake to frame and enforce a statute that would prevent a man from selling a new fruit that he would advertise with fine posters and flaming colors for cash that would be paid in advance, if you please, I do not believe that such a law would be in the least degree practicable. Perhaps there are other men here that know more about law than I do, but I do not believe that the point that Mr. Hartwell makes of attempting to get at it by law would do very much good. The trouble that makes it so easy for a designing man to get money out of the public in regard to horticulture is, that of all subjects which interest the daily life of every man and his family, I think there is no other one upon which the average, well-educated man is in such dense ignorance. You may go into any town you please and go among the professional men, and when you come to the knowledge of plant life, to say nothing about plant breeding, when you wish to talk about the

ordinary matters of horticulture, they are helpless as can be, and if a man comes along with a glib tongue and a smooth face, he can make them believe what, if they had a little bit of horticultural education, they would know to be absolutely impossible, because it would prove that the things which he already knew were untrue; in other words, he would have checks and stop guards that would prevent him from going wrong.

Mr. Hartwell: There is one phase of that, I think, I saw in what Colonel Watrous has said before he said it. I see the same difficulties in the proposition. I do not expect to hedge up all fraud by this. I do not know that it is practical, but here is a phase that I believe is possible to get at. I, as an amateur grower, am presented with a price list of a plant disseminator in which he advertises a large number of testimonials regarding variety. Now, he makes it appear in that that he has something extraordinarily fine, as far as I can see; there is nothing authoritative about it, nothing that is endorsed by any authority whatever. I simply am taking it on trust, as most of those things have to be taken on trust. Now I, in common with every other fruit grower, would like to get hold of the best thing, on the first floor; that is the common feeling. I would like to get at the beginning of things, start with this new, fine thing; that feeling is prevalent everywhere with all the fruit growers; we are all that way and we are not fools either. Now, if I had this thing to refer to, down so many miles from me there is a man that I know, who is an expert that has tried this thing that this man advertises and he gives me the result of his trial. I will feel more confident that I am getting what I want from that result. Now, I may or may not buy it, that is not the question, but without that I am left helpless, and it will help out the intelligent fruit grower if it don't the fool; the fool will be caught by some kind of dodge, whatever the law, and it will advertise the question of legitimate tests along with the law.

Mr. Toole: I think this question of state investigation might work all right in regard to strawberries, but I doubt if we would feel satisfied to have it applied to the testing of new varieties. In the first place I do not believe any one gets very much swindled by the slow process of new variety apples becoming tested and coming before the public. Swindles in apples come in other ways, and I do not think we can say that any

one has lost anything, because we have been gradually, in different tests, finding out the apples that have come before the public, and I doubt if any one of us would be satisfied if we would be expected to accept the state test and that only. We would feel, scattered here and there among the growers, tests would be of far more value than tests at a few stations. What we want is more encouragement for people to take hold of these new varieties and give them a test.

Mr. Pearsons: You told us about a variety of strawberries that would yield $1,400 an acre, and I remember about ten years ago hearing of a variety, I would not have rested satisfied without getting that variety if I had had to give about $5 apiece for those plants. But the experience I have had with new varieties, some that I planted, I expected to get several thousand dollars an acre from, but when I came to the crops, some of these old standard varieties had nearly four times as much, and cost only about one-tenth as much for the plants. I have settled down so that I shall not test new varieties very much, and as far as I am concerned, I would be glad if these people would test some of these varieties of strawberries; I think perhaps there may be some variety that is better than the standard varieties, but when it comes to a grower that has not a very large bank account, attempting to find the best variety out of the thousands that are offered, it is a pretty expensive process.

Mr. Kellogg: I am satisfied that the testing of strawberry varieties thrown upon the market would be worth a great many thousand dollars to the strawberry growers of the state, more than any other experimental work that they can do. How many varieties are you trying?

Mr. Hartwell: About 125 varieties.

Mr. Kellogg: I have 80 kinds growing in my garden, and I am doing that for my own amusement, but I take a great deal of stock in what the advertising lists say, until I have proof to the contrary. But if our state experiment station would take up the strawberry question again, I think it would be $10,000 advantage to the growers of the state every year.

President Loope: This is a very interesting subject, and the State Horticultural Society, I believe, has got to face this matter in a more thorough way than we have ever done before. I believe that as long as the state of Wisconsin gives this money to do it with, that we must use that money for their benefit.

INDIVIDUAL PREPOTENCY IN PLANT BREEDING.

By William Toole, Baraboo, Wis.

In a recent notice of the organization of the American Breeders' Association, mention is made of a book on Breeding by a German author, in which special attention is given to teaching the subject of plant breeding in colleges, using illustrations from animal breeding. Any one who has given attention to the building up of the various breeds of animals must have noticed the value of this principle of individual prepotency in animal breeding, and we note that great value is placed on the progeny of some particular animal for breeding, not alone because of the product, or performance of the dam or sire, but more because their impress of individual prepotency has been shown through like qualities in so many of their descendants.

Given two cows equally well bred, and each yielding the same amount of cream, we would certainly prefer to build up a herd from the one which has shown the greater impress of good qualities in her progeny.

It may be fortunate that we have the chance to judge from analogy of animal breeding, what to expect in like work in plants, and yet it seems unfortunate that there has not been a greater number of experimenters in plant breeding, who have kept a careful record of their work and are able to throw light on obscure problems which may confront us in plant breeding.

And yet a close observer may find many examples of individual prepotency in plants.

My attention was particularly drawn to this feature as shown in some experiments in corn breeding conducted by my son the past season. The corn was planted in rows, each row from a separate ear,—and although all were of the same variety, there was marked difference in the manner of growth of some rows, even to the extent of one row not standing up so well as the others when the crop was matured. The husking results showed the impress of this individuality in some, not only in greater yield, but also in uniformity of product, and greater number of symmetrical ears.

In our pansy breeding this individuality of plants has been shown in a marked degree. In trying to breed a fringed variety, the results from one particular plant of white have given much greater success than from any other.

The impress of color, markings and form of flower from this particular plant has been quite remarkable. So, too, it has been with one particular plant out of several rose-colored of the Trimardeau class. We have found the same principle illustrated by experiments in improving other colors. So in the future in our work, special attention will be given to this feature of plant breeding. From some observations in the past in trying to breed double flowers from selection, I am inclined to think that the impress of individual prepotency may be shown, resulting from particular flowers or fruits on the same plant. In trying to breed up a line of pansies with a tendency to produce double flowers, but little progress has been made, because the flowers showing tendency to doubleness do not produce seed as the single ones on the same plant do.

It will be understood, of course, that this question of plant breeding is being considered only in the line of selection, without reference to artificial pollenization. In making practical application of this principle of plant individuality, we might, if this was a Farmers' Institute, consider the question from a corn breeder's standpoint, but as we are assembled here as horticulturists, I will only say on that point that the corn breeder's foundation stock should always, and continuously, be built up from repeated plantings of separate ears, the products of which may be merged into a common stock from general planting. With plants which are continuously reproduced from seed we can more readily carry out this or any other line of plant breeding experiments which are done through selection.

There are many kinds of plants which may be still further improved, and we may sooner see results from our efforts if we work with those which have been already improved rather than with those which have been but little changed from the original form.

Our perennial larkspurs give some beautiful subjects for fixing improved form or shades of color. The Zinnia gives great variety and not enough of the best, and the perennial Gailardia offers a grand flower for the plant breeder. For our example

let us consider the Verbena. Perhaps you are partial to some of the lovely shades of pink, and have a plant with flowers more beautiful to you than any of its kind you have ever seen. You may save the seeds and plant separately from those of any other, and probably you will be glad of the result of your care. Many of the seedlings will seem good enough to continue, and you would fain gather the seeds and sow again another year, but first study your plants carefully, for shade of color, or markings, size and substance of flower, freedom of growth and blooming. You may have several plants too good to be discarded, then save the seeds of each plant separately, making careful note of the distinct features of each plant. Another year you will find the product of each plant differs from the others, and if you are a careful observer you will find reasons for preferring those from some particular plant, which you would not have known of if you had not carried out this saving and sowing from separate plants.

With such perennials as strawberries, which are soon reproduced from seed, it is probable if we grew from varieties separately, that we would find a prepotency of varieties, and in the course of time establish breeding strains from which there would be more than an ordinary certainty of continuing to secure choice kinds.

It is a cause for thankfulness that there is such a general awakening of interest in the subject of plant breeding, that from now on probably more than ever will be done in raising apple seedlings. The succession of results in producing new kinds of apples, is not frequent enough for a close study of this principle of individual prepotency, but much careful experimenting might be done in the line of seedlings from separate varities, and this continued for some time would give our state a foundation for future improvement in apple breeding.

It may be noticed that even where reproduction is from budding, or grafting, that there is often a marked individuality in the fruiting of some trees which give better fruit of the same kind than do others in the same orchard of like variety. Here, then, is a chance to experiment, with the possibility that some trees might give better results than others. We look forward hopefully to new seedling apples, for direct results in securing varieties of certain classes, which we now need, but more than

that we need more seedlings, and seedlings of seedlings, that progress which has been all too slow may be quickened and that those who live in the future may be supplied with the kinds which we now need.

It would be slow progress, perhaps, to establish pedigree breeding strains of apples, but we would bless our ancestors if they had done for us what we might do for posterity.

DISCUSSION OF MR. TOOLE'S PAPER.

Mr. Hoard: I am a student of prepotency with animals. I know nothing of it, practically, with plants, except maybe in a very remote manner. Prepotency in animals has been very well defined to be that quality which lasts the longest in posterity. An animal, for instance, like Victor Hugo among Jersey cattle, or like the Clay among trotting horses, or like many other animals which have made a profound impress upon all subsequent posterity, they have had the quality of lasting long. It is noticed in breeding that bad qualities, as a rule, are more preponent than good qualities. I presume the same law applies to plants, but the great question with us is, how may we know a preponent animal by any external signs, and I would like to ask you, in the treatment of this question, how may we know a preponent plant by looking at it?

Mr. Toole: I think you may know a preponent plant by its results, just as you know the preponent animal by its results, and I do not think you are readily going to learn how to judge what animal is going to be more preponent than others; still, with your careful breeding you take care of what you get, while the plant breeders have failed to do that. I think the plant breeders have given but very little attention to it. We have very little specified in plant breeding; these results get very much merged together; in fact, our plant breeding is very much like a man who might establish a large herd on the plains, and while we might be satisfied that he has a well-defined breed, and starts all right, he is taking too many chances. We throw our seed together and take too many chances, and in that way we lose the value of the prepotency which might be selected.

Mr. Hoard: We have entered upon a study of prepotency from external evidences. For instance, the new scale of points in Guernsey cattle for the first time in the history of animal breeding includes that one point, the prepotency of a bull. For instance, we pay large money for a very valuable animal, supposedly so; he proves to be worthless, has no power of impress, and this question has been included in the new scale of Jersey points, and we have commenced correlating slowly some of the external signs of prepotent power. Is there any possible way of doing that with plants?

Mr. Toole: Now and for some to come, I fear, we plant breeders will have to look to you animal breeders to point to anything in that way. We are behind in the line, but I am glad to say that we are waking up, and I think in this line of analogy we will have to exchange experiences and you animal breeders will learn something from us, but at present I say, in answer to your question, there is no way that we can determine ahead.

Mr. Hartwell: I do not know that I can answer Governor Hoard at all. I will point out a fact that may have some bearing on it. We are facing a different problem from what the animal breeder is, the fact that the animal will reproduce the form in its progeny, within certain limitations. But we are investigating a plant first, that is not the finished thing we are after; we are after the terminal form of it in the shape of fruit, and when it has fruited it may give us some evidence through the fruit itself of what it may reproduce under certain conditions. As an illustration of the thought that I had in mind, take the one prominent class of fruits that we have been discussing this afternoon, the strawberry. I do not know of any variety of strawberry plant that is so weak in plant structure as the Warfield. It is a spindling thing, it is lacking in rootage; for instance, its upper structure is small compared with almost any other variety, and it is out of all proportion practically more productive than any other plant we have. It gives the life to the idea that the vigorous plant is the one that we are hunting for. Now, take the Bubach, a variety that originated near my home; it is a monstrous plant, a plant with a mass of roots; they are perfectly compact sometimes and would make more rootage than twenty-five Warfields, and at times it is almost barren,

Mr. Hoard: Then it is prepotent in other lines, it is prepotent in producing plants. Now, what are the indications of prepotency? For instance, in animals, what are the indications, if there are any, in plants, for the thing you want? For instance, with dairy cattle, we have the line of prepotency for the production of milk, but that is not the line of prepotency for the production of beef, nor the line of prepotency for the production of speed is not the line of prepotency for the production of draft power in horses.

Mr. Watrous: This matter of judging beforehand what manner of fruit a plant may be expected to produce has been taken up by some of our best experimenters in the east. Professor Beach, of the New York Horticultural Experiment Station at Geneva, New York, has read at least one, and possibly two, papers before the sessions of the American Pomological Society; and as I remember now, he says that if, for instance, you have a lot of seedling grapes and some of them show large leaves and others very small leaves, the large-leaved plants are much more likely to produce large fruit; if they show leaves with red mid-veins the fruit is more likely to be red, and if a plant have large blossoms and different colored blossoms, he has found by a number of years' trial that it gives you some idea about what the fruit is likely to be. I take it that that would be the beginning of the study in the line that we are discussing.

Now, there is one reason why in horticulture we are likely to lag behind the breeders of animals, for this reason, and that reason will never disappear. If a man work ten years to produce a strawberry, just what he wants, he does not thereafter have to breed that until he fixes the strain, as animal breeders do. He takes that and reproduces it by budding. The same thing runs all through horticulture. A man, or an experiment station, may spend fifty years in producing a fine apple, or may get it in five years, or one year. Having produced what he wants, he proceeds to work. He has but to put a bud somewhere where it will grow and he has got practically the same thing, whereas the animal breeder must cudgel his brain to produce a strain that will breed true, or to type, and the horticulturist, not being compelled to do that, and man being naturally a lazy beast, he is not likely to get up to it as fast as the other.

Mr. Hartwell: An illustration has occurred to me since

Colonel Watrous spoke. I was wandering through Mr. Loudon's grounds at Janesville four or five years ago, and he was inspecting several hundred seedling grapes, and he would say, "There is a plant that is very promising." Now it was just from a seedling, never fruited; it was one that I should dig up and throw away. He evidently knew types of growth that had something more than ordinary in them.

Mr. Hoard: They were indicative.

Mr. Hartwell: Now, the types are not fixed, because of this doubtful parentage.

Mr. Hoard: Is there such a thing as prepotency?

Mr. Hartwell: Well, prepotency may be made in this way: when we do not control both parents, we can one, and we may keep on breeding along certain lines, without this scientific pollination which may be done, and get a type which will run up to a certain standard.

Mr. Hoard: Scientific pollination means simply subsequent reinforcement.

Mr. Patten: I would like to offer a few thoughts on this question, and I premise by saying that Mr. Hartwell's paper opens a very wide field of investigation in plant breeding, as well as Mr. Toole's, and it is not confined alone to the fruits, as I regard it. This to mankind is a wonderful field; it is going to broaden out and embrace the grains and grasses, not only the tame grass with which we have to deal now, but the grasses of our plains, the native grasses in the regions where they need better grass so much. The thought occurs to me that it is practical to develop from the timothy grass that we have, a grass that is twenty-five per cent. more valuable than the timothy in this country by selection, and I say in partial answer to Governor Hoard's question, that every animal breeder I believe recognizes the fact that prepotency is determined by the progeny of the animal, and so it is with the progeny of the plant. If we plant here a dozen plants, or a dozen seedling strawberries, or a dozen seedling apples, and we say that one of them has characteristics that are true to the model that we have before us, that is superior to the others, why, that is the plant that we would work with, just the same as Governor Hoard would work with any animal in his herd that was typical of everything that he wished and this is carried into the smallest minutiae.

I have been experimenting for a great many years with seedling fruits, and especially with seedling apples, and I have discovered that one variety will produce seedlings that are so far superior to the seedlings of another variety, that practically sets that one variety aside and places the other in front. I would say in the effort of breeding an apple, that I first began with the selections. I never had any patience with this haphazard method that has been carried on for so many generations, of simply gathering up a lot of seeds of this thing and that thing and bundling them together and planting them promiscuously. I never did that. In all my plantings, unless I made a mistake and forgot the seeds of the variety, I kept a record of the parent plant on the one side. I knew so much to start with, that if I got strong, vigorous, promising plants from the one, and got weaklings from the other, I knew that I would not want to deal with weaklings. And here in your own state quite a number of years ago, just north of Baraboo, Mr. Brier, having the Bailey Sweet that is now on your table here, and perhaps the Brier Sweet also, made the Bailey Sweet stand by the side of what was then called thelarge red Siberian, about three-quarters of an inch through, perhaps nearly an inch in length. He took the seed of this Siberian and planted it and the result is Brier's Sweet, and those who have made any observations at all can see very readily the characteristic of the Brier's Sweet, not only in the tree but in the fruit, just as plainly in the fruit as Mr. Hoard or any other breeder of animals can see in his animals the impress of this or that animal. Then about twelve years ago at my station—and perhaps at Captain Watrous' also—Iowa began this experimental work of stations twenty-one years ago this coming spring, and I say it with modifications, that I am not very much further advanced than what we were. Circumstances happened in our state that seemed to have retarded the work very much; but about twelve years ago we began this more scientific work of cross-fertilizing from known parentage, and this one that we took, knowing practically, and I might say positively, we knew that no such thing could come from the little Siberian as Brier's Sweet, unless it had been crossed with such an apple as Bailey's Sweet, and we have there the sweetness of the Bailey Sweet, we have the size of the Bailey Sweet, and we have the carmine coloring of the

Bailey Sweet in this new production. So in this work, in connection with a pomologist who lived further south and who brought the pollen of the old Tollman Sweet, we cross-fertilized this Bailey Sweet with the old Tollman Sweet. The result was that six out of the eleven seedlings have fruited, and every one of those six seedlings that have fruited are sweet apples. Well, now, that is a remarkable result to have obtained from the mixture of progeny such as we had on both sides to start with, of the Bailey Sweet and of the crab-apple. The crab-apple of course had the prepotency back of it; it had been a crab-apple from time immemorial, and had only received the infusion of a cross of our native apples to enlarge it as it was when Mr. Brier began that planting. So then the seedlings, the six, one of them has something of the coloring of Brier's Sweet, one of them that has only fruited once and that I expect to be larger than the others when it shall fruit again, because it has the large leaves of the apple and has the clear wood of the apple, and the indications are, in its first fruitage, that it will be still larger when it fruits again; the other ones are not much larger than the Brier's Sweet.

But there was another thing that cropped out in this process, and that was, that the color of the fruit produced (and I presume florists have learned this same thing) was the color of the pollenizing fruit, that impressed itself in a large degree in the cross.

Mr. Hoard: That was the Pound Sweet?

Mr. Patten: That was the Pound Sweet, and it does in other things, so that if you pollenize with the pollen of a distinctively marked red apple, or a distinctly yellow apple, then you may look for the color to follow largely in the seedlings that you produce the model parent in the cross.

Mr. Hoard: Let me ask you, Mr. Patten—it was an old distinguishing marks of the Tollman Sweet to be water-cored—does it show in the subsequent seedlings?

Mr. Patten: One of the five, yes, is distinctly water-cored; the larger one that has some coloring is distinctly water-cored, but in this case you will see that, notwithstanding the cross of these two larger apples, the prepotency is, in fact, to the small apple. The Siberian strength of prepotency overmatches the mixed variety of this and holds it down, that governs the size.

Now then, another spring I want to carry this experiment further, and for the purpose of not only enlarging the apple, but fixing positively, absolutely, that fixed type, that fixed characteristic of sweetness. I am going to use, if I live, the pollen of the Bailey Sweet back on these seedlings, on the best of them, not only, as I said, to enlarge the apple, but to fix the type; it is already fixed, but I want to fix it firmer, and I have not the slightest doubt, from what I have already accomplished, that I can fix it so permanently that if I plant the seeds of those sweet apples, that I will produce sweet apples.

Mr. Hoard: You breed back to one of the original types?

Mr. Patten: Yes, the first crabs. Now I want to call your attention to the basin at the calyx of this apple. You see this basin is large, and where you examine it you will say that the calyx is very large, it is very much more so than common. I wish to call attention to this one fact in the breeding process, and it comes from observation, too, that if you couple two apples with this characteristic, you may be almost certain that that characteristic will develop to a prominence that you will not wish, and make it possibly very susceptible to the attacks of the codling moth. It has been demonstrated to my fullest satisfaction that every single feature of the plant, if we wish to make an advance, has to be considered just as critically, just as scientifically, as the most expert breeder of animals would in his work, and as I said before, we are merely upon the threshold of the great work that is before us in the production of new fruits and new grains and new everything that the earth produces for the benefit of the human race.

Mr. Hartwell: I have overlooked one point in my paper that is probably the most important one, that the value of our experiment stations, conducted by the state, liberally paid for, in charge of a man like Mr. Patten, for forty years, can hardly be overestimated, in doing just this line of work, and we might look for something positive in the hands of such a man in experimental work, in the matter of scientific, careful, methodical breeding of varieties, so that we might get the results quicker which we want, in getting something which is fitted for our needs, that will be adapted for our use, that will be positive in its results, that will help characteristics brought out by the methodical use of the material at hand.

Mr. Periam: I do not like to disagree on a question of science with the gentleman, but I must be allowed to state that this question of the improvement of fruits and grains and vegetables has really been going on for over sixty years; we are just on the threshold, however. I am willing to admit of results greater within the next ten years than all that has preceded.

TUESDAY EVENING, 7:30 P. M.

Prof. Henry: Ladies and Gentlemen, Members of the Horticultural Society, and members of the Horticultural Societies of the University: It is with great pleasure that I say a word to you this evening as an introduction to this meeting. In 1877 there came to Cornell university, at which place I was then a student, a young man from the city of Brooklyn, New York. We, his classmates, soon noticed an earnest, studious, helpful young man, a man who minded his own business strictly, and yet he was a good friend and a chum with all of us, and he early showed in his work as a student a great love for plants. It was my pleasure to roam over the great hills surrounding the college with this young man, to associate with him in the class room and to enjoy his companionship. I saw there that which was the forerunner of what is now, and thought so much even then of this young man in his botanical work, that when I was appointed to this university and had to choose between the two lines of botany and agriculture, I said to the regents, "Here is a young man that can come and serve the university to advantage." I want to speak to the young men tonight on this one point. This student was largely working his way through Cornell university, he was willing to dust, to sweep, to do laborious work for 12½ cents an hour. When the regents asked him to come to this university, nothing was said about compensation; he did not seem to care for that side of the matter. It was an opportunity to work, and that has been the characteristic that is evident all through his work, doing something, accomplishing something, getting somewhere, and going from the university to the Shaw Botanical Gardens, now the Missouri Botanical Gardens. He has there built up a name which

reaches all over this country, and his botanical researches are gathered into volumes which go everywhere where the works of man are valued. Now, he was once Secretary of the Wisconsin Horticultural Society, always ready to work and trying to do something; he tried to help this organization while in Wisconsin, and I know that tonight he will receive a splendid welcome from his old friends from Madison and the university, and from those newer friends that tonight for the first time hear him speak. It gives me great pleasure, ladies and gentlemen, to introduce to you Prof. Wm. Trelease, director of the Missouri Botanical Gardens, better known as the "Shaw Gardens."

Prof. Trelease: I notice from the program that I have been announced to speak to you tonight on landscape gardening. It is a matter very well known, I am sure, to each one of you, that you may lead a horse to water, but you cannot make him drink. Your Secretary, I fear, is doomed to the disappointment that I, as Secretary, have many times experienced, of announcing a speaker and getting him before an audience, and not being able to compel him to do that which he was expected to do; for I am not going to talk to you tonight about landscape gardening. What I do want to do, however, is to carry out a promise that I made to Mr. Toole (one of my old associates in the society many years ago) a year ago when he asked me if I could not come back to one of your meetings to meet the newer men and talk to you on some subject, and the subject that we agreed on was that of the beautification of our homes and our surroundings by the use of plants—not quite the subject as announced, but with some of the same elements in it.

I have been touched by Professor Henry's introduction, in that he said the thing I was looking for when I came to Wisconsin was an opportunity to work, and if there is any moral in what I say tonight—because I think that there may be one picked out between the words—it is that by good earnest work you may accomplish that which I have proposed to speak of tonight.

I should like to preface what I have to say by asking a question, a serious and sober question, one that I ask myself many times. The question is, what do we live for? Do you horticulturists live in order that you may raise as much fruit as possible? De we teachers live in order that we may handle as

large classes as possible? Do we who are investigators live in order that we may do the greatest amount of productive work possible? I dare say each one of you would say yes to each one of those questions. Is that what we live for? Some of us live for the mere fun of living; the mere animal pleasure of being alive justifies existence to a great many of us. It does not to a great many others, and the accumulation of wealth, the winning of a name, go a very small way in my judgment toward justifying going through a long life, and I am inclined to think, the oftener that I come back to it, that those of us who live to a purpose, live in order that we may be of some use. Somebody has said that the ultimate, legitimate end of human endeavor is human happiness, and I am inclined to think that the purpose of life has never been more wisely stated than it is in those few words, for, whatever it is that we do that is worth doing, does ultimately come back to that, contributing to the happiness of our kind. We do it for something else; we do it for the sake of making a living; we do it for the mere pleasure of doing it; we do it because we feel it is useful; but after all, all its utility and its value comes down ultimately and finally to that.

What I want to analyze with you tonight is, some of the relations of our lives. This is a very complex life that we lead. It is not every individual for himself, by a great deal; some of us may possibly feel that we can stand alone; we all lean against each other, depending upon each other, and the further along in life we get, I think the more we are brought to see that it is the elbow contact between people that constitutes really the greatest factor in accomplishing the things that we are in the world for. This complexity makes it almost an impossibility for us to do all of the things that we would like to do. You remember only a few years ago the Dutchmen went down into a remote part of the interior of Africa, or up, if you like, in order that they might get to a part of the earth that nobody else wanted, so that they might do just as they wanted to do. Gold was found there, the world wanted their land, and they could not stand against what the world at large wanted. Neither can we as individuals, or communities, or nations, keep to ourselves exclusively what the world wants. We are here in the capitol of one of the great states of the northwest. The city of Madison was at one time nothing but a bit of lonely prairie,

FIG. 1. Barrenness of surroundings begets barrenness of life.

with oak openings, and the home of the red man. The settlers came and got their farms, and gradually a community was built up, and there came the various steps in the development of the city; and in the next few years some of you gentlemen may find that you have farms in the suburbs lying right in the lines that they want to run the streets of the city through. Can you hold the land? No, you must give it up. There is practically nothing that we as individuals, or small bodies of men, or groups, can hold when the larger body of mankind wants the things that we hold. They usually, or commonly, will recompense, or reimburse us for what they take away; but we must give what they want.

Now, the bearing of this comes directly down to the consideration that I am going to bring before you tonight. If we live in the country we can have our surroundings exactly as we want them; and as we go further with what I am going to tell you and show you by the aid of slides tonight, I think you will see that there are little things that each person living in the country can do to make his own home and his own surroundings more attractive and pleasanter than they are. But the thing I more particularly want to speak about is, what those of us who live in villages, in towns, in cities, and particularly, perhaps, in larger cities, can do in the same direction; because it is there that the difficulties are the greatest. There we are confronted by the need of transportation. If you like, a railroad comes in; we have to tolerate the smoke, the dirt, the noise of the railroad; we have to tolerate an enormous amount of danger to our persons, to the lives of our children, through having grade crossings; and yet it is a very foolish community, when there is a chance offered of getting a railroad, that says, "We do not want you," and will not let the railroad come in. We have the opportunity of going from here to the other end of the city on a trolley car; the trolley car is almost indispensable in cities of any size. The same element of danger attends it, perhaps not to the same extent, but to a considerable extent, as attends the railroad; we have also to tolerate poles and wires, which are unsightly and attended with considerable danger. Everything that goes to build up one of the larger communities brings with it very much that is undesirable. You want a manufacturing plant. It brings dirt,it brings smoke, it brings bad odors, per-

haps it brings a very undesirable element into the population in a part of its employes; and yet a community wants it. While we get the benefit of these things, we can in some measure counteract the disadvantages. That is one of the things I want you to think about tonight. I want rather to suggest questions than to answer them. We have, of course, in counteraction, the tendency of our social organizations exclusively for the betterment of the community; our schools, our churches, libraries, art galleries, things which bring into the life of the community what can only be brought by concerted effort.

These are partial only in counteracting the other things; they go a long way toward assisting, but still there is very much that is undesirable. I have thrown on the screen, as the first picture, one that I brought with me from home. It is our range of plant houses in the Missouri Botanical Garden, and I have brought it, not to show the plant houses, but to show you that where we are trying to grow plants in a decorative way, solely to give pleasure to the public, we are brought face to face with clouds of smoke and cannot grow trees high enough to blot out the unsightly background, because of tanks and big manufacturing plants and things of that kind.

I want to show you here a picture of a block that I had photographed last year in the city where I live, as showing one of the maxims I would lay down, that bad taste begets bad taste; that barrenness is a breeder of barrenness. Look at this barren street, with nothing but poles to decorate it, and see the kind of homes that are put on it; and yet if I could show you a picture of this same row of houses that was taken a year later, I should show you that, bare as the surroundings of the houses are, they were benefited by the planting of vines along the fronts, so that that particular little block was made into a very desirable residence block, but it was made so only through the co-operative action of the people who lived there and who wanted to have certain things done. Now, in contrast with this picture, I am going to ask you to cast your eye tomorrow morning on the upper part of State street, as you go up towards the university, and see what that street with its overarching trees would be, if the sign of a bookstore and a stopping notice of the street cars were taken down from the middle of the street, where they have no business to be. You will find there one of the prettiest illus-

trations of what the use of trees can be made to produce; and compare that end of State street, if you will, with this end down toward the capitol, and you will see at once, I think, on one and the same street, as good an illustration as you want of the effects that may be produced by the simple use of trees.

I think that those of us who live in cities need more than anything else—excepting municipal honesty, which is a very hard thing to get in these days, perhaps always been, and I fancy always will be—but next to that I fancy that those of us who live in larger cities need more than anything else civic pride. We need to feel that we are living in a community that is worth being kept in fit condition to live in and to have our friends look at.

Very frequently, in the part of the country that I live in, as I travel about through the country, I am confronted by a thing which I rarely see in your state—I do not know as I have ever seen it in the state of Wisconsin, and it probably is not to be seen here—I find that when I have to go to a house in a village, I have to go up four or five steps on one side of the fence, and down on the other side of the fence four or five steps, using a stile to get into the yard, instead of having a gate that I could open and pass through. Why, it brings up one of the very first fundamental principles in making our homes and our surroundings better: the pig is given equal rights with the human being; and as long as cattle and pigs have the same right on the street and in the door yard that the citizens have, you may be sure that no progress will be made toward converting the citizens into anything very much better than Nature has made them in advance of the animals that they keep as associates. The moment you say that the pig has his place, and the man has his place, and that the home of the man is to be made different from the home of the pig, you can uplift the community, but you cannot till then. Now, as I have said, this is a common condition through much of the southwest, while it is uncommon in the north; yet I mention it as a thing which closely affects the conditions which I have commented on. After one has once tried to place himself in proper relation to his surroundings and to the animals that he brings about him, he begins to find that it is not merely having a nice door yard, having a few flowers, a few plants, growing a little fruit for his family, though his

business may not be that of fruit growing—it is not merely this little use of plants around him that appeals to him, but he grows out into larger and larger things. What he has done about his home he wants his neighbor to share in, he wants the whole of the community to participate in with him; and the result is that a single earnest man in a town which is not too large can do very much toward renovating that town, and out of the effects of one or two people to begin with, will come concerted effort that will give driveways such as you have here about Madison, parks such as you are getting here in Madison, the great parks which some of the larger cities are getting, and that which we here in the west are perhaps not doing much with, playgrounds, gymnasiums, bath houses, washing places for the poor, and a host of those things that the individual cannot provide for himself individually, but that the community, once started, is able to carry out and carries out thoroughly.

What I wish to do tonight is to ask you to consider a few of the things that can be done to make our homes and our surroundings pleasanter than they are, and I will show a photograph taken in St. Louis in one of the newer and "unimproved" streets. What inducement is there to make a home attractive when a street is like this? Begin at the bottom and make some kind of a foundation; a paved or macadamized street is an absolute necessity; the street that has been paved is transformed by the planting of trees; and the moment you have made a beginning, progress is very rapid, if you are in earnest.

Now I come to one of the principal nuisances that we have to contend with, and that in cities we owe it to ourselves and to our fellow citizens to abate. Here is another picture taken through our St. Louis garden from an elevated point, looking out over the lower portion of our garden, over the intervening blocks, and showing you the source of some of the smoke that I showed in the first picture—a tremendous two million dollar tobacco plant. We want that plant in St Louis, whether we use chewing tobacco or not; it is one of the things that go to make the prosperity of the city. We want great industries and we cannot get them without having their dirt, but it become the duty of every one of us, in every way possible to restrict this and other nuisances that they bring. Honest treatment taken up by people who are cautious and yet who are firm will almost in-

FIG. 2.

FIG. 3.

How poles deface good places.

variably bring about an abatement of the smoke nuisance, without going so far as to make open ruptures and resort to the courts, because as a rule the people who control great corporations which are doing business in larger and smaller cities, are people who are there for a double purpose: they are there not merely to make money and to do a large business, but they are there for the sake of standing well with the communities; they like to stand well, and every little thing that can be done in the way of quiet, friendly influence with them brings a great deal of reward, in not merely what they do individually, but in interesting them in carrying the work along with other people.

There are many other things than smoke which come to us in cities. The waste of our streets. I have already spoken of the difference between a good street and a bad street; but when you have a good street it has to be cleaned, it has to be taken care of. I am delighted to find on every street corner, or every alternate corner in many cities, a little box, not an obtrusive box, of wrought or galvanized iron, neatly painted, and bearing the legend, "For Waste Paper." It is surprising, after these little boxes have been installed, how quickly people get to putting things into them. It is surprising how quickly, after they are well installed, people begin to heed the warning of the policeman who asks them to be careful not to throw things on the street, while he picks up a piece of newspaper that he sees a man throw away and himself puts it in the box; and in a very short time ordinances can be passed, if necessary, which everyone will obey, or the litter can be cared for without the ordinance. There are many of these little things that go toward mitigating discomforts in the cities. They have merely to be thought of and then put into action by people who really mean to do something with it.

Here is another of the distracting things of our cities: a row of nice houses, good residences, a vacant lot, and a tremendous billboard, while everywhere we have great telegraph and trolley and electric light and telephone poles. Here is a little more of the same. Is there anything that is in worse taste in a community than to permit, as here, for nothing, or, as frequently happens, for a trifling consideration, the disfigurement of block after block of good houses? The worst use that a block of that kind can be put to is there (referring to illustration). This

chances to be one of the principal centers of electric activity in my own city.

Perhaps the contrast is greater here than in any of the other pictures, for here you have a beautiful building and beautiful grounds, and right across the street a telegraph pole cutting into everything; and wherever you stand in that immediate vicinity, this, or other poles of the same kind, will cut off the beauty that has been secured by tasty planting.

Now I am going to give you a view of the illustrations that some of you may be familiar with, illustrations of what the National Cash Register people did in Dayton, Ohio, for the employes of their great establishment. They built a lot of nice little cottages, and then they employed people of taste to advise in what way the surroundings of the homes could be bettered. Here was the condition which was found by the experts. Each one of these front door yards had a solid fence which fronted it, and flanked it on either side. The first thing they did was to cover the fences with morning glories, which was a considerable improvement on the bare fence, and it did very well the first year. Then they took the fence out and put in wire screens, and on these screens grew vines, and I am not at all sure—it is a case where doctors disagree—that if they had done what you have done so commonly in Madison, had taken out all these little fences and had nice lawns, they would have gotten along better yet. But if you take the back yard, that is a different thing. Here is the back of a cottage; it shows the effect that I want to get, that of having a few vines and shrubs, even when your back yard is nothing but a little paved court. Here is one of the Dayton back yards where they have the screen. Unlike the front, one likes to have a fence and the seclusion which it gives. Four or five years ago my wife and I were in the vicinity of London for a number of weeks, and as most of my work was at the Botanical Gardens at Kew, we ran down to Kew. After looking around we found we could get rooms at a little villa in the village of Kew, and after we were settled there we chanced to go out to the back of the house, and what we found was a revelation to both of us. The yard was not a very large yard; it was scarcely as large as this room, but it was one of the prettiest little things, and the beauty that it showed was just the kind shown in this picture, showing the

transformation of the yard by the use of plants. Down the fence was a little border of shrubbery, with perhaps a few bedding plants, a tree or two shading it, the whole thing neatly done in a way that gave you a nice open lawn, and practically blocked all outside disturbing sights. Here is another one of the Dayton back lots, with a nice little veranda, and plenty of vines along the veranda and along the fence in different places. I think the appropriate way of starting a thing of that kind must be perfectly evident to you. Here is a view taken from the upper part of the factory, looking down into these back yards, showing the way in which vines and bushes produce altogether a different effect than that which was viewed at first.

When you get this kind of planting around the borders of your little lot, you can have not merely the growth of shrubbery during the summer season, but you can get the colorings of the autumn, not only the foliage in the opening season, or bright changing of the autumn, and the bright fruits which the autumn gives, but you may have winter coloring in the twigs, almost as pretty, if not quite as pretty as the other.

I have here the simplest of all of our treatments, which is perhaps emphasized as strongly by the use of vines as anything else, a simple cottage porch, and here again you can have another of the fine effects of the fall. This is the common Japanese *Ampelopsis*, and this is our native Virginia Creeper. The plant, as you gentlemen know, produces good strong suckers to attach it, and if a bit of the poison ivy happens to creep in, it colors up as prettily as anything else does in the fall, so that you have in vines as well as shrubs a very pretty foliage effect, and if you choose to go out and get others of our wood vines—the *Smilax*, for instance— you may get the same kind of effects with them, not the same brilliant color in the *Smilax*, but very pretty tints in purple and bronze. Now, to take perhaps the most critical of all the places around the house, if you once block out the idea of a house corner—here is one of the simplest little ways of handling it; this is the end of the porch, where rose bushes can be placed and crimson climbers, and there is at once a very pretty setting for the corner of the house; and you do not need for the plants that you use expensive florists' forms, but you can go out and get a mullein if you want to. You cannot get a more imposing plant than a mullein, if

you put it in the place that it is designed to go in; and what the mullein does the poke weed will also do, and the poke weed in the fall will give you these further colorings. So in the little plantings of your yard you may use weeds, as long as you grow them for a specific purpose. You know the definition of a weed—any plant out of place—and if that definition holds, any plant that you commonly call a weed may be converted into a very desirable member of your plant family if it is put in place.

I have here a bit of a picture that I took from an advertisement in "Country Life in America." You will see that somebody had a place that he wanted to sell, and he took a picture of house and veranda, and showed what kind of veranda and lawn and surroundings he had, and I have not any doubt he sold his place for what he asked for it, because what can be more charming in mid-summer than to have a nice veranda around your house, with vines running around the pillars, with a few potted plants and vines along the front, and then a beautiful stretch of lawn, blocked off so you get nothing unsightly in the background. Where you have more ample space, of course you go into other kinds of things, and you may perhaps want formal flower beds. Here is a sunken parterre immediately flanking our pot house, and you will see it lies in geometrical beds, planted to a number of things; but where you get away from the buildings you do not want any such flummery as flower beds; what you want is just this, which is one of the views at the Royal Gardens at Kew:—a bit of winter—it looks natural enough to belong here in one of your Wisconsin marshes, with cat-tails and shrubbery and tall grasses. Or take this picture, which is a view taken in our own garden last year, where you have the same kind of thing—the end of a bit of water, a nice clump of cat-tails, and trees and shrubbery; but I want to call your attention to the fact that you can still see certain intrusive buildings, for while we have some old trees, we have here as yet mostly a blocking of the houses by young trees, which in time are going to grow up and cut out all of that extraneous matter. This picture is just as instructive as that which I showed you a while ago of the big building and the telegraph pole; it shows the incongruity of having this artificial thing where it obtrudes into natural effects.

FIG. 4. Vacant lot gardeners.

FIG. 5. A pleasantly set bridge.

Perhaps you have a bridge; here is a photograph of a little bridge in New Jersey that I photographed a number of years ago; here there is a clump of elders and that sort of thing, and sumach and other small shrubs block it off in a way to make it extremely pretty. When it comes to planting, you may do the same thing. If you must have a bridge, do not make it a bare, obtruding thing, but let the vines and shrubs come over it in the way that is shown here. There illustrations will give you a little idea of the way in which trees and shrubs may be used. If you use trees and shrubs in the way I have suggested, of course, when autumn comes, you may have the autumnal coloring; and here is one of our oaks which in our western climate are perhaps more satisfactory than any of the other things, not even excepting the maples. Now, it frequently happens that you want, for the sake of growing certain things—because you become very ambitious if you become a gardener—to grow plants in the water, and if you do that you must have ponds for them. For some things you must have cement ponds. If you need them, place and plant them so that they will show this effect.

It occasionally happens that we have buildings that we want to get out of sight. Here is another illustration of my own needs. I had here a little building which had stood for years on the place; to be perfectly candid, it was the smoke house of the founder of the garden in the days when the garden was his country home. We did not want to tear the smoke house down; we had use for it, so we planted a few vines and shrubs and things around it. Here was an old tool shed and at the end of the range of greenhouses we had occasion to put in a steam plant to heat a residence and other buildings, and the result was some very bare and uninviting buildings. This is what we did with it. We took some of the common things, Hercules Clubs, syringas, sumachs, magnolias, etc., and you see we made a totally different thing out of it in the course of about a year. Here is the corner of the building, you get the chimneys here, which are festooned with vines. On the whole it is a satisfactory treatment of a very unsatisfactory group of buildings. When it comes to grouping structures that you have to have in a garden, the same kind of thing may apply. Here is a little plant house; here is a little power house; here is a little shelter

house for the plants that will not stand the winter exposure, and you will see that they are so grouped in here between these masses of foliage that they do not obtrude in the summer season.

Here is another bit of the same sort of thing, the tomb of the founder of our garden, taken in the winter, and you will see that with its setting of evergreens and sassafras, it is a neatly placed building, though quite the contrary might be true. Here is a gate through the fence which surrounds the enclosure; there is the corresponding gate at the other end. This is simply foliage of sassafras, which has been allowed to grow up in the form of shrubs, and is then trimmed out in the way the picture shows; and when fall comes we have not only the pleasant form, but we have the very pretty coloring of the sassafras, with its curiously lobed mitten-shaped leaves.

What we may do for our houses, sheds and other structures that we have to have around our homes, can be done just as well for other kinds of buildings. What can be more unattractive than this little suburban railroad station, with all these poles. and the bareness of the thing; and compare with it, if you will, the next, also a railroad station, and I think you will see from mere comparison of these that a similar treatment of the other is perfectly possible.

There are some things that we want to avoid, and among the things that we want to avoid is this kind of thing—a bedding effect. This was gotten up for a Grand Army meeting, and there may have been a justification for it, just as there is for fantastic banners when you want to welcome great crowds of people. This is the kind of thing that park superintendents of average political wisdom delight to produce, because they know that it will bring them the newspaper applause of the city, which means a longer tenure of office as superintendent of the park, but of all hideous effects, plants and flowers worked up into human faces and that sort of thing are perhaps the worst.

Why not plant in our streets? I have shown you some bare streets. I have told you that right here in State street you have a good illustration of both the bare and planted street. Why not live on streets that are shaded? What can be prettier than an avenue of silver maples? And I need not say that in your latitude here you have a fairly good choice of trees. Everybody knows that the box elder is a good tree and grows well;

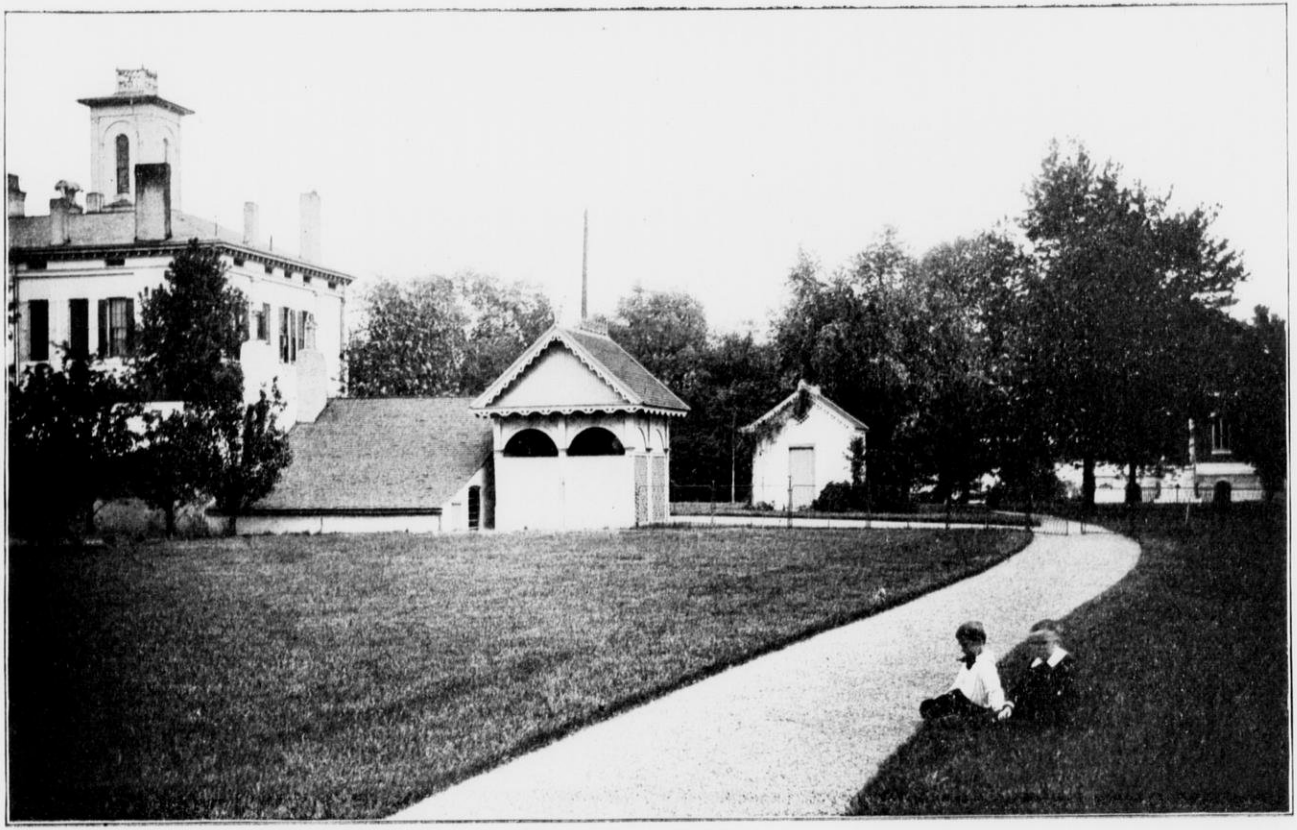


FIG. 6.

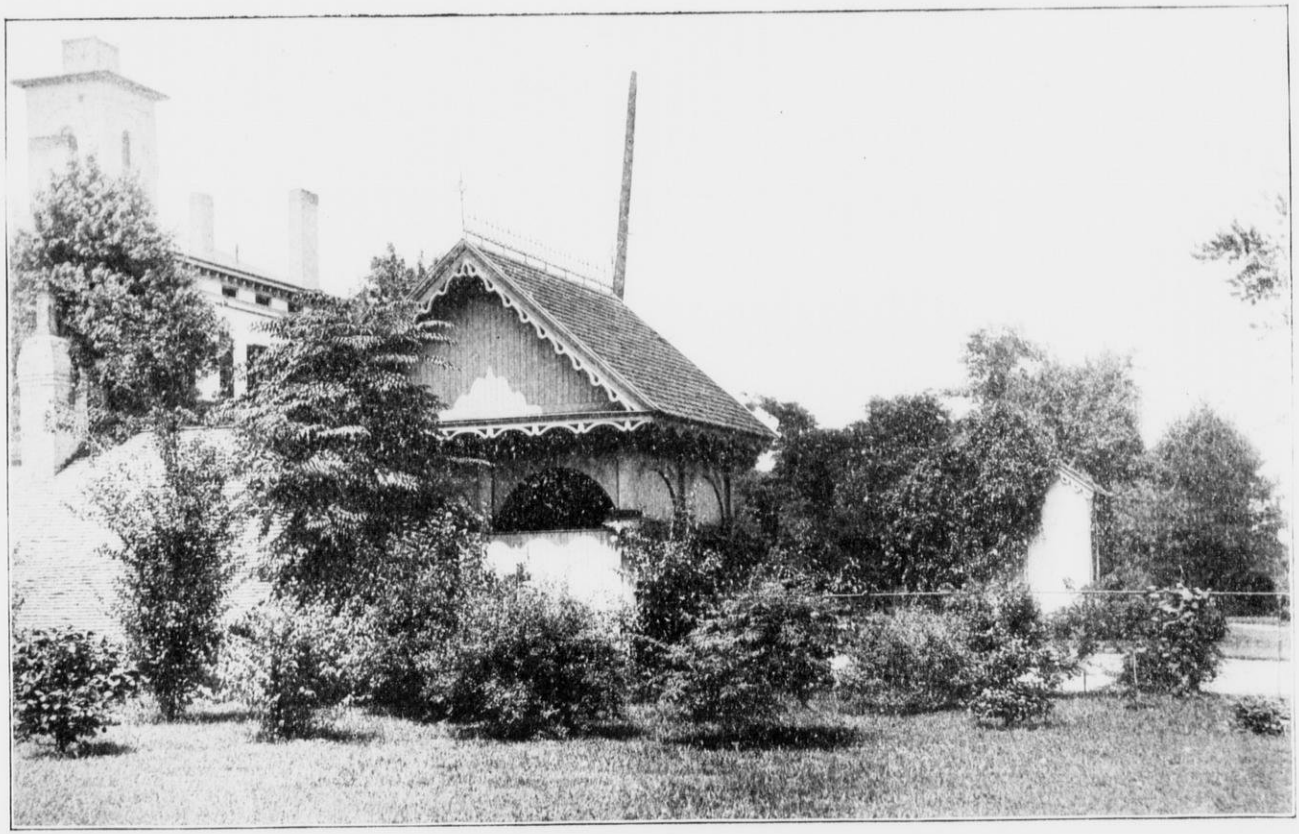


FIG. 7.

Before and after.

everybody knows that the silver maple is a good tree and will grow well; everybody knows that the hard maple does beautifully here, that the elm does well, and some of the ashes—so you have a considerable range of species which you can plant in this climate for street effect. But if you do go to planting street trees, do not make the mistake that is made by almost all beginners, if any of you should be beginners in this kind of work—do not make the mistake of putting your choice trees out between the sidewalk and the street and counting upon nature to take good care of them. Nature will do nothing of the kind; the butcher, and the neighbor's boy who wants a switch, and everybody who comes by that wants a piece of wood, or has a horse that he can tie up against them, will be sure to be in league against them. Do not set trees out in the street without staking them and protecting them. Here is a little simple design; all you need is a stake and a bit of netting—nail on a bit of chicken netting—and if there is danger of sun scald, a little wrapping or a couple of laths at the southwest side, and the thing is done, and it does not look particularly bad. This is part of our garden. We have lost a great many trees that we planted on the street, but we never lost one of these that we planted and put one of these guards on. In some cities there are ordinances which go a long way toward protecting trees; they make it a misdemeanor to fasten horses to trees, and they also make it impossible for you to plant trees without protection. Whenever a horse takes a bite out, a little wound is produced, and if your tree goes on growing, and some of you are good plant surgeons, you can handle that tree so that the wound will grow over, but I fear most of you would not. And the same kind of thing will happen if you have promiscuous pruning done. Pruning is essential, but you should not leave the wound exposed in this way to dry off and rot and produce that kind of after effect. This is a well pruned stub, cut in close, has healed over well; and here is another one that has remained open and furnishes a nidus for the growth of fungi which will rot out the wood in a very short time. Above all things, do not mutilate your trees,—I have seen it done in Madison and it is done in every city in the Union,—but plant trees that you are going to be willing to let grow up into good size, and then let them grow and do not cut them off. If you do remove a large

branch, you have got to tar or paint the wound over and keep the coating there. A wound the size of the thickness of your arm sounds the death knell of your tree if something is not done to head off decay.

Now, if you are out in the country, I know that this sight is familiar to you. It is familiar in New York state, or in any state that you may live in. What is much more barren than the country school? and it is not necessary that it be so. Here is a little suggestion of treating that same schoolhouse, and I think you will all agree with me that the improvement is very great

I once spoke to some gentlemen, after a banquet, of this matter of planting school grounds, and opened the subject for discussion, and one of them said, "why, there is no use in talking about it, you cannot have it done; you have got to begin at home, and let the parents make their homes attractive, and then their children may be gotten to take an interest in beautifying the schools." A few months after that, I happened to be in the town of Joliet,—I had been talking about this same subject that I have been speaking to you of tonight'—and after I got through, the president of the school board said to me, "I would like to have you get in my buggy for half an hour, I want to show you something." And he drove me over to one of their schools, and said, "What do you think of this?" As I looked at the grounds and saw that they had a little nursery on the school grounds at the back of the building, I said, "That is pretty good, but how do you keep the children from tearing these things down and making switches out of them?" He said, "Why, they are their trees." That is the secret of getting the children to do this sort of thing; let them do it as their own thing, and there is no trouble to be had from the children. We are trying, in St. Louis, to ge the children interested in what can be done. We cannot wait to have the parents do these things, and instill them into another generation, we want to have the children carry home from the school the beautification idea; and we have a little botanical club, named after one of our noted botanists, which got out these envelopes, and in them dealers sell a five-cent seed package for two cents. Here are the names of a few things, and an indication of what kind of plants they are; and here is the envelope a little girl who had paid her

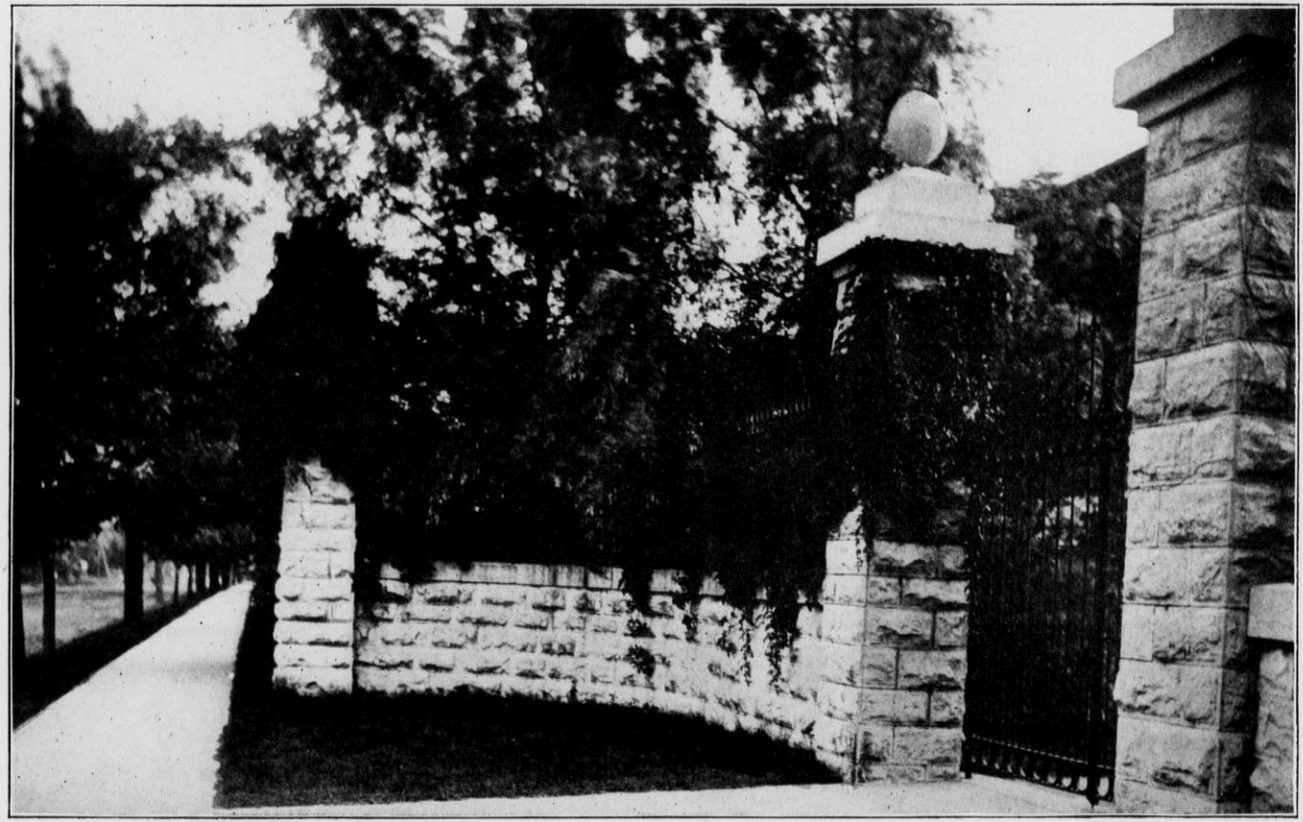


FIG. 8. A draped gateway.

money and marked these various kinds of seeds,—I have no doubt she raised a nice little flower garden. And to those who do good, efficient, energetic work in developing their home garden, the Engelman club presents certificates of this kind, and the president of the club and the mayor of the city sign them.

We got the newspapers of the city interested in the work, and an evening newspaper offered prizes for the best child's garden. Here is a vacant lot, a hideous place, as you can see, just as the graders left it when they graded the street, except that Nature had made a mess of it; and it is rather an inspiring sight to see half a dozen of these boys working away after school hours, growing their plants. Here is one of the gardens of the National Cash Register Co. that shows further what that company did in the way of bettering the homes of their employes.

Here we see one of the greatest transit lines of St. Louis. They came along here. You can see the kind of grading needed for the improving of this street. They made great banks here; but they offered prizes for the best gardening along their line, and the result of it was that all of these banks were nicely covered with brambles and climbers and things that naturally and gracefully grow in places of that kind, and where the situation was suitable for planting trees and shrubbery, that was done in many places.

I have gone considerably into details of a few things that have been done, but I have not gone, I think you will notice, into the details of many, many things that you could plant, because you will at once see that the one idea in this kind of planting is to use a plant that looks for all the world as if it belonged where placed. Don't get a miserable, weakly, sickly exotic that you have to nurse along, but get a native plant, or a hardy imported plant, that will stand your climate and do well.

And now in closing, may I say just a few words in regard to the way in which every one of you can do this kind of thing and do it effectively, each in his own community? There is only one thing that will do it, and that is organization. Organization may begin with the enthusiastic wish and earnestness of a single person but that person and those whom he associates with him have to keep unflagging interest in their purpose, or it will fail. It is of course a trite saying, but there is nothing that human effort accomplishes that does not require persever-

ance and continued effort in order that it may be pushed through. The simplest of all things, and the things that are nearest at home, are the best things to begin with, and the next step is to interest your neighbors and say, "I have begun here with my house, planting trees, planting shrubbery around here and keeping the grass in good condition, and now won't you do the same thing for yourself?" and just as soon as the people living on your block have a pretty and attractive front on one side, the people living across the street will admire it and they will not want that side of the street to be shaded while their own is bare, and they will put in trees, trying to get as near a match as possible;—and so it will go on from one block to another. This has been tried over and over again, and it has been proved that the sentiment spreads. To go back to Joliet, Judge Marshall, the gentleman whom I spoke of, showed how from the schoolhouse the block idea had worked out, for the neighbors who saw it was so pretty, had said, "We will better our places," and when the neighbors of the school commenced to do that, organization came later as an enviable thing.

There are one or two other things that perhaps should not be forgotten. First, the difficulty of having water where the poor who live in the cities can get at it. I was told a pathetic story could have cool, wholesome water to drink; but they could not ment of our city, about the wish of an association she was connected with to put an iron water fountain in the side of a building in one of the tenement districts so that the poor people there could have cool, wholesome water to drink; but theycould not get a place anywhere in that district to put it, for the simple reason that it was thought that people who could get this water to drink, would not drink beer,and the saloon people organized against them, and would not permit it. When you can give people of the tenement districts a chance to drink good, wholesome water, why don't you do it? And why do you restrict it to human beings? Horse fountains, dog fountains and bird fountains are just as legitimate as the other, and if you want to, you can follow this Brooklyn design for a bird fountain, where they have vines about it; but after all, almost any one of the standard types of drinking fountain will answer the purpose.

Now, if I have touched the subject that I have had in mind to touch tonight, I hope I have left you with the feeling that while

landscape gardening may be a grand art, something that these students of the agricultural college who are here will want to know something about, something that you gentlemen who grow decorative plants are interested in having people know about, yet I hope that I have left you with the thought that landscape gardening is really the tangible expression of the wish of people to utilize plants in such a way as to add to the beauty of our every day surroundings, and in that way add to the purity of our sentiment and to the happiness of our lives.

HOW I RAISE APPLES.

By H. L. Palmer, Baraboo.

I set in rows twenty-four feet apart each way, giving room for cultivation and a free circulation of air, which I deem very essential.

After the trees are set I aim to keep the soil in such a condition that it will produce a number one crop of corn or potatoes. No fear of getting too rich.

For the first eight or ten years I raise some cultivated crop, using a disc in place of plowing as much as possible, as it is hard to keep an orchard smooth by plowing.

Then I seed to clover, allowing the fall crop to decay on the ground, but never allowing my orchard to become sod-bound.

When the trees are set I prune to four or five feet high, according to varieties, aiming to obtain a uniform shape. During the growing season I go through my orchard every few days cutting away all unnecessary branches that may start. As the trees become larger I take a few days in the late part of winter to cut away any dead branches or water sprouts and so thin the center of the tree that the air and sun can get to the growing fruit.

One very essential part of raising apples with me is to spray. I use Bordeaux mixture just before the blossoms open. Waiting until the blossoms have fallen I add one-fourth pound Paris green to fifty gallons Bordeaux mixture and spray as before; re-

peating in about ten days, and shall in future repeat again in two weeks.

While I have not been as successful as I hope to be in the future, my apples last year were free from codling moth and with the exception of perhaps one-quarter of my Snow apples, were free from scab and other diseases. After the apples are raised I try to handle them so that they will sell for all they are worth by picking and sorting carefully, selling good and poor apples separately.

DISCUSSION OF MR. PALMER'S PAPER.

Mr. Philips: Mr. Palmer, what are your varieties that you raise for the market?

Mr. Palmer: I raise a great many Snow apples.

Mr. Philips: Many Walbridge?

Mr. Palmer: No, not any.

Mr. Philips: You depend mostly on fall apples?

Mr. Palmer: Well, I am selling some Northwestern Greenings, and I have a great many of the Newell's Winter; in fact, my first trees were half Snow apples and half Newell's Winter.

Mr. Marshall: I want to say that I saw Mr. Palmer's orchard last fall just as he was fruit picking, and I traveled around the state considerably last summer and I think that he had the best apples for the number of trees of any place I visited. I also wish to call attention to one thing that he stated in regard to feeding his trees. It is just what I have always understood to be the proper thing, and I wish to say that what he has stated was emphasized in my experience of last summer, that around Milwaukee, where I got the best apples, I think the market gardeners just have a few trees at the places I visited, but they put a wagon load of manure on every year, and they had fine apples last year and they said they had them every year.

Mr. Toole: Having had the good luck to have Mr. Palmer's orchard in my section of the country, while looking around for apples for the World's fair, I will say that the result of his spraying is a great encouragement to any one who has any

knowledge of his success. We all realize that it is an off year for apples, but all around where I have gone for apples, if their orchards had been as free from codling moths as Mr. Palmer's, it would have been fun to get apples the past season, but as it was you would see trees loaded heavily with fruit, but small apples, not worth taking, on account of codling moth. I do not know what Mr. Palmer thinks of his success in spraying for scab, for, while there was some slight scab, yet it seemed to me there was less in his orchard than any I have seen, in spite of the fact that his orchard is perhaps a little more sheltered than ncessary for the avoidance of scabs.

President Loope: I would like to ask a question, and that is, in the apples this year is not a great deal more of the poor quality due to the curculio than to the codling moth?

Mr. Palmer: I have one lot of Duchess in my orchard, and up to last year I never harvested many apples, the curculio had practically destroyed them, and last year, after spraying them three times, they were perfect apples all through.

Mr. Converse: The belief seems to prevail that thorough cultivation or high manuring produces a strong growth and causes blight; I will ask Mr. Palmer if his spraying with Bordeaux will prevent that?

Mr. Palmer: No, I do not think it prevents that, but I have no fear of that in regard to manuring trees. I have two Wealthy that blighted themselves to death last summer, that had less manure and poorer ground than any other trees in my orchard. I would not hesitate to manure on that account.

Mr. Hager: I would like to inquire in regard to this statement that Mr. Palmer made in regard to manuring; is it possible or is it impossible to manure too heavily? I have frequently heard it said, "Do not manure too heavily, it will make too much growth, the wood will be too soft."

Mr. Palmer: Many years ago my father had a horse that was a little balky; we started to unload manure in the orchard, and the horse balked at an old tree that we thought was half dead, and that manure was unloaded around that tree, and for the next five years that tree bore splendidly.

Mr. Patten: I think I can offer just a few words in reference to this scabbing of fruit that may be of interest to your members. It so happened that I planted in a row some Fameuse and

some seedlings, the trees are now about six or eight inches in diameter, and the Fameuse scabbed so badly that we did not gather from the trees a peck of merchantable apples, whereas from those seedlings in the same row we gathered some seven or eight barrels of very nice fruit.

Mr. Kellogg: Did you spray?

Mr. Patten: We did not spray this year, not at all, on account of the rains.

Mr. Barnes: In regard to this idea of over-fertilizing fruit trees, I have pretty clearly demonstrated to my own satisfaction that nursery trees and young orchard trees can be over-fertilized very easily, because if you put on too much manure they will grow too late in the fall and the sap will flow in the fall, but with old orchard trees there is no danger of over-fertilization; the growth of the pulp of the apple will take up the excess of fertility in the manure, and a good, large apple-tree with ten to twenty-five barrels of apples will eat up the whole load of manure and not affect the growth a particle.

THE WHOLE ROOT FAKIR.

By W. J. Moyle.

There is always a black sheep in the flock, a wormy apple on the plate, a thorn amidst the roses, a rogue among the worthy, and fakirs in every line of business, men who wilfully and gleefully take advantage of those who, being blinded by ignorance, see not.

In the nursery business we find no exception to the rule. In fact, we sometimes think, it is a little more so.

And the annual advent of the tree agent with his wonderful picture book and marvelous stories of productiveness and hardiness of everything he sells is proverbial.

The whole root fakir, one of the latest productions along this line, has been getting in considerable work throughout the country during the past few seasons.

He is the man who drives into your yard some day and announces that he is a tree agent representing one of the many prominent nursery firms and wants to sell you a bill of trees. In reply you tell him that you guess not, as for several years you have been buying trees and planting them with discouraging results always, most of the trees dying.

He then expresses a desire to go through your orchard and look at the trees, which you see no reason for refusing, so you lead the way. When you arrive at the first dead tree he pulls it up and looks at the decayed stumpy root, takes his knife, makes an incision and then, nodding his head and looking very wise remarks, "Just as I expected! A piece root graft! Absolutely worthless! Here is where all the trouble lies." Then with all the earnestness of a Free Methodist pracher, he proceeds, "My friend, if you would plant whole root trees you would never have occasion to look upon a dead and dying orchard, as you do here today. Those are the kind I sell, and the only kind to plant." And producing a series of charts he shows you illustrations of whole root and piece root two-year-old trees, the former having a root system that would fill a bushel basket, while the roots of the latter are so few and small that you can hardly find them with a magnifying glass.

What is the result? Simply that you are greatly impressed with the facts so clearly presented. You think "it stands to reason that a tree that has been grafted on a little short piece of root, say two inches long, could not have the vitality of one that is budded or grafted at the collar or crown of a whole root. Maybe that is why my trees die."

So you venture timidly to ask what would be the price of such trees. Whereupon you are informed that he will put them in at from five to eight dollars a dozen.

He is ready for you, when you exclaim at the high rates, and tells you that this is due to the extra expense incurred in digging. For on account of the large root system, they are compelled to use electrical machinery, the power of which is generated at Niagara Falls or some other falls that have been falling ever since the fall of Adam.

After slight hesitation on your part and considerable persuasion on his, you give an order for a dozen or two of the whole root,—never die,—live for ever trees.

Whereupon, acting upon the principle that "time is money," the agent lifts his hat, makes a polite bow and takes his departure, leaving you to sit down, scratch your head and speculate as to whether you have been buncoed.

The facts of the matter are these, as any conscientious nurseryman growing trees in Wisconsin will tell you: Whole root trees, whether apple, plum or cherry, are vastly inferior to trees that have been propagated by piece root grafting.

For this simple reason:

Fully 75% of all the fruit tree stocks used in this country are imported from the mild temperate climate of France, either as one-year seedlings or as seed as in the case of the French crab seed, which is imported by the ton by many prominent apple seedling growers.

They purchase this seed in France because it costs them less and this French crab makes a vigorous growth the first season, thus guaranteeing the grower an early salable article.

Now, apple trees, no matter what the variety, budded or grafted on these French crab seedlings at or near the crown or collar will be no more hardy than the root stock on which they are worked. And it has been proved again and again that the French crab is exceedingly tender and apt to winter kill in what we consider mild winters.

In the past it has been almost impossible at times to procure anything but these French seedlings on which to graft our apples. So the conscientious nurseryman has made a practice of using long scions with very short pieces of root, the function of the root piece being to act as a support merely until the scion becomes established on its own roots. If the season is favorable and the scion well down in the earth, with most varieties roots will be thrown out from the stock and the little tree will become well established the first summer on its own hardy roots. An apple tree thus grown will be equally hardy in root and branch and is to be preferred every time for Wisconsin planting. Such trees are now grown by the million by Wisconsin, Iowa and Minnesota nurserymen.

At present large quantities of apple seed is procured from Vermont, as it is claimed that Vermont seedlings are much hardier than the French crab. Be this as it may, the nurserymen of the northwest should be ever on the alert to secure hardy seedlings suitable for his trying conditions.

At present the Siberian crab, *Pyrus Baccata,* is being tried. Whether it will ever become extensively used remains to be seen.

What has been said regarding the tenderness of the French crab will apply also to the plum and cherry stocks that are imported from that country.

Thousands of plum trees of only a few years planting have died in Wisconsin, being budded on the Myrobolan plum, the tender stock of France, while German prune and Lombard trees that were growing on their own roots from sucker plants, have withstood the test and are still growing and occasionally bearing.

Though whole root trees may be all right for the south central and southern states, any man who tries to palm them off on the unsuspecting farmer or planter of Wisconsin is a fakir, for he knows better.

The average farmer knows little or nothing about the propagation of fruit trees and thus is easily hoodwinked into buying a bill of whole root trees paying twice their worth and getting what is undesirable at the most; and the salesman who sells him the trees is a fakir.

DISCUSSION OF MR. MOYLE'S PAPER.

A Member: I would like to ask Mr. Moyle how many pieces he makes of each root?

Mr. Moyle: That depends entirely on my stock. An ordinary seedling makes three grafts; make them as short as I can get them.

Mr. Hartwell: There have been some systematic experiments conducted on this question that are worth consideration. Now, the fact is, that the whole root grafters do not use whole roots at all; that is a fact; they simply use the upper section of the root, and that they call the whole root, making a union between a part of the root and the tree, and the testimony of those who have made these systematic experiments is that at the end of the first year what is called the whole root of the tree will be a little more vigorous than those that would be called piece roots; at the end of the third year the piece root is as large in

every material respect as the other; that is a fact, as learned by careful experience, so that really the piece root tree is the better tree, leaving out of the proposition the getting of the tree on its own roots.

Prof. Sandsten: Down south they generally graft higher on the collar than we do, and they use larger scions, while we use short scions and get it on its own roots, and that has proven, as Mr. Moyle has said, to be the best practice for Wisconsin. It is not of course the same in the south, the conditions are different. What we want is to get the tree on its own roots, and be able to plant it deep enough, and for that reason use short scions, you can use a piece root, and that practice is taking hold more and more in the south, and the large nurseries are beginning to use piece roots, and even those who a few years ago were using whole roots, do not do so now. It is probably as Mr. Moyle said, a catch that nursery agents use in disposing of their stock, more than from the fact that they are usually grafted on whole roots. The stand that we have taken at the Experiment Station is to use piece roots; we use scions that are from six to seven inches long, and a piece root from two to two and a half inches long, then stand them in the soil to the depth of four or five inches, then in two or three years the roots will come out of the scion and we have the tree, as has been said, on its own root, which makes the best trees for our climate. The union of the scion and the root probably takes place on the somewhat softer tissue further down on the root; I think we get a better union on the second piece than we do on the first, but I would like to state that it is not advisable to use too small a piece of root, nor use the extreme tip of the root. I think ordinarily about two pieces from a root is about a good average, especially this year, when the roots are very small.

I think I might say one word in regard to this stock, or seedling. We raise in America now probably more than half the seedlings; we used to import probably 90 per cent. of the seedlings, but the last few years the average nurseries, if I may use the term, handled this stuff in Iowa, Nebraska, and Kansas, and that supplied the large propagating nurseries with seedlings. This year more apples have been imported from France, because there was a scarcity of this year's supply of seedlings due to the peculiar weather conditions. The weather

was too wet and the seedlings did not grow, they drowned out; the report from Kansas stated that they had to cancel every contract.

Mr. Hartwell: Don't those nurserymen use French crab seed?

Prof. Sandsten: They use a large amount of French seed, but a great deal comes from Vermont; Vermont apple seed is probably used more than from France; pear seedlings are mostly imported.

Mr. Periam. The main point in this controversy has not been touched upon, and that is, that it is notorious that seedling apples upon the crown of which the trees are grafted are notoriously tender. There are plenty of instances where a tree has been killed at the root where the crown graft would not have been killed at the top. Now, you cannot tell in a lot of seedlings, whether they are tender or whether they are hardy; there is no possible way of telling; and to follow that up still further, the apple seeds that we get are not from the best and most perfect apples, they are the seeds from all kinds of culled apples. Now then, that is in favor of the piece root, because if the apple grows on its own root, if the variety itself is hardy, why then the whole tree will be hardy and as hardy in the root as in the stock.

IMPROVING THE NATIVE CRAB APPLE.

By W. A. Toole, Baraboo.

We often read of the opportunities which nature offers, to improve our native fruits, and if existing kinds have been developed from the original forms to the extent which writers tell us, and which seems possible from what is being done with the native plums, then surely there is a chance to improve our native crab-apple (*Pyrus Ioensis*) sufficiently to place it among our cultivated fruits.

This species presents such a wide range of variation in its native state that great results might be expected by following a long course of selection and breeding up to a certain standard.

The native crab-apple in its best varieties has qualities to commend it to the housewife for jelly, preserves, and improving the flavor of other fruits to such an extent that if the best of the present existing wild varieties were cultivated they would soon make a ready market for themselves on their merits.

Mentioning to friends an intention to improve the qualities of this fruit by long continued selection, encouraging interest has been shown and in most cases advice has been given to depend on producing hybrids by crossing with the best varieties of our common apple.

The desirable qualities of our native crab as a jelly fruit or to tone up the flavor of sweet apples and other fruits would be lost in this inharmonious combination, and it is difficult to conceive how the cultivated apple would be benefited. Certainly not through hardiness, for we have no evidence that our native crab-apple is more hardy under cultivation than our hardy orchard varieties, nor would it be improved in quality, for each has qualities of its own which do not harmonize with those of the other.

It is possible that our native crab-apple may not become a dessert fruit, yet it seems probable that we might have a fruit for culinary purposes equally as popular and much more valuable for this climate than the quince.

Let us consider the qualities of the subject under consideration. All varieties are yet too small to be satisfactory, although we find some over two inches in diameter, while others are quite small. Some have a considerable degree of astringency and bitterness while others are very free from the above. All are sour to a varying amount, but when free from bitterness, as is the case with some kinds, this acidity with the delightful aroma of many kinds offers us a combination which is gratefully accepted by many and is as much in harmony with the character of the fruit as is the same quality in the quince, currant, and our cooking cherries. All do not possess the same degree of acidity, there being as wide variation in this respect as is found in the currant. The flavor varies in the same degree as the aroma, and some kinds are without scent, so in our work in grading there is a chance for nice discernment in selection for flavor. While none of the varieties are mellow, yet there is a wide variation in texture of the flesh, some being tough as well

as hard, while others are quite tender, crisp, and juicy; so we have great reason to expect improvement in mellowness.

The flowers, too, are general favorites with their exquisite odor and wide range of delicate coloring, from light pink to deep rose. They also possess a great variety in fullness and size of petals and season of blooming, which together with the graceful form of the tree make them desirable as an ornament.

Many of the states have adopted a state flower, but the question is still open for Wisconsin. It seems desirable to choose one which is strictly a native and has good qualities to recommend it. Such we have in our native crab-apple, and the Wisconsin State Horticultural Society might well take the initiative by selecting this as the state flower.

It seems fitting here to refer to the beautiful double form, the Bechtel Crab. It can be held as a shrub for so long a time that it should be included in every collection of shrubs.

I have in view, then, the following lines of improvement for our crab-apple: increased size of fruit and selection of most shapely form; preservation and improvement of flavor with probably a variety of flavors; improvement in the texture of flesh which varies greatly; choice color of fruit, which although confined almost wholly to shades of green and yellow, yet gives us some pleasing combinations of tints; breeding out astringency and bitterness; keeping in mind all the time a vigorous, hardy tree of shapely form.

Considering the flowers alone our subject is worthy of our best efforts.

This experiment to improve our native apple has been carried on but three years and already friends have been asking for results, but thus far the only reward has been in finding different varieties in the wild state and learning something of its hybrids. Seeds have been sown and the young trees cared for, but progress in breeding can only be made at the rate of production of succeeding generations of seedlings, and as it takes several years for fruit to be produced from seed, for some time our knowledge of what to expect can only be theoretical.

Reference has been made to hybrids of the native crab. These seem to be mostly the result of natural crosses, so here we may have a disturbing element in our plans, but if there is

an outcropping of such results, careful note will be made and we shall procure and make experiments with some of the best hybrids to see if these outcrosses may help to break the tendency to hold to Nature's established line of breeding. But the endeavor shall be to breed up a line of pure natives, and this study of hybrids will be separate and independent of our efforts to improve the native crab.

DISCUSSION OF MR. TOOLE'S PAPER.

Mr. Thurston: The paper I think contains a great deal that is of importance. I just want to point out one thing, and that is, that this same work is being carried on in another part of the continent, and I would suggest that the men carrying it on here would correspond with those carrying it on elsewhere, because they might exchange valuable suggestions. Last June I was in Assiniboia, Indian Head, and at the experiment station I found a great many crab-apple trees growing, and they carried on that same work of developing the native crabs, because they cannot raise the apples that we raise, and they are determined to develop something that will stand their climate. They have grown apples that will measure 2½ inches in diameter already. I do not know how long they have carried it on, perhaps eight or ten years, perhaps longer, but I think it would be a good idea to correspond with the experiment station at Indian Head and get a full report of what they are doing and get some of their seeds and grafts.

Mr. Hartwell: I would like to suggest to the young man that Mr. Arthur Bryant, of Princeton, has in his experiment station a crab-apple that I think I am safe in saying is three inches in diameter, and I think likely he might get scions in connection with this work, and would enjoy sending him some.

Mr. Cranefield: I think this is a very excellent paper and very good work that Mr. Toole is doing in this line, and I wanted to call your attention particularly to the fact which was plainly brought out in the paper, that he is not trying to make an apple out of it. Some years ago when I first heard of this work, I was afraid that he was trying to make an apple

out of the wild crab-apple. I thought that was rather up-hill work and was trying to discourage it. If you will notice, he is trying to make a quince out of the apple, which I think is good. He does not want to breed it up to take the place of the cultivated apple, but he wants to improve the taste and texture of the fruit, so as to have a fruit that will take the place of the quince, and I think that is a most excellent line of work and should be encouraged.

Mr. Watrous: I just want to say that in Iowa we have been for some time doing this work. I have myself three or four sorts of the best crabs that we could find there, and we are hybridizing those each year, pollinating the blooms with Ben Davis and other apples, and then the apples upon the trees which are not crossed we gather and so grow the two up together. We are growing hybrids in one end of the seed bed, and the unadulterated kinds in the other, and purpose to continue in that.

Mr. Toole: I would like to ask what good the crossing it with the Ben Davis will do?

Mr. Watrous: We aim to inject a larger degree of color into the apple, and the Ben Davis there is a large fruit and it bears abundantly. Now, if the marriage goes on successfully, and they do not have a divorce, maybe we will get an apple that will be large and red and not as sour as the wild crab.

Mr. Moyle: There is one part of this paper that has not been considered, and that is in regard to the blooming quality of the crab. It is one of the most beautiful flowering shrubs we have; there is nothing to compare with it under the sun and we should have it planted in all our yards. I am shipping some crabs this spring to Minnesota.

Mr. Kellogg: In my early history among the wild crab-apple trees of Wisconsin I never found anything since that has equaled the wild crab-apples that I picked in Pine Grove, two miles north of Kenosha, in 1836. They were so fine and large, and I have never found anything in this state or anywhere else that equaled those crab-apples. If Mr. Toole has any acquaintance in that region, I would advise him to look up some of those kinds.

President Loope: You were young then, they tasted better.

CROWN GALL.

By Prof. Sandsten.

The disease known as crown gall is little understood by fruit growers and nurserymen in Wisconsin yet it deserves more than a passing attention from both. The prevalence of this disease in the state and the possible danger of a general spread are matters which I wish to present to this society.

First let us consider the nature of the disease. In 1889–90 Professor Toumey, formerly of Arizona Experiment Station, discovered the exact nature of crown-gall. Up to this time nothing definitely was known as to the probable nature of the disease. Professor Toumey found by a series of experiments running over a period of several years that the disease was due to the presence of a specific organism belonging to the lowest group of vegetable life and known to the botanist by the interesting name Myzomycetes, commonly known as slime moulds. The organism discovered was a new one to the botanists and a new name was given to it, namely Dendrophagus blobosus. The organism as previously stated belongs to the lowest forms of plant life. It is a unicelular plant, devoid of cell-walls, consisting merely of naked bits of protoplasm, capable of rapid increase by simple division of the individual cell into two new ones. Under certain conditions the organism is capable of producing spores which are in a great measure responsible for the spread of the disease on the land in proximity to diseased trees. The disease is known by the appearance of gall-like protruberances at the crown of the tree, though the protruberances may also be found on the main and lateral roots. If one of these galls is cut in two with a knife it reveals the growth of a spongy tissue extending from the cambium layer outward. The center of the root or stem is not affected by the disease at first, though later it may become so. This hypertrophied growth of tissue is due to the endeavor of the plant to rid itself of the parasite by incasing the same with new tissue. The presence of the parasite in the tissue of the plant has also a tendency to stimulate the abnormal growth. The immediate effect of the disease is not necessarily fatal. Often the tree will show little or no bad results from its presence for two or more years, but gradu-

ally the disease will entirely encircle the crown, causing hypertrophied tissue which greatly interferes with the nutrition of the whole root system, resulting in a slow death through starvation. Some kinds of fruit trees are less resistant than others. For example, it is well known that a young peach tree infested with the disease will live for a relatively short time, while apple trees may live for a number of years. The germs of the disease live within the rapidly growing cambium cells and feed upon the protoplasmic content of them.

Crown-gall is known to infest apples, pears, plums, peaches, cherries, almonds, and grapes and citrous fruits. Its spread over the fruit-growing area has been rapid and fairly well marked. In Wisconsin the disease has heretofore caused no alarm, nor has it received any attention, but with more general distribution of nursery stock from infested regions we cannot remain idle to its presence nor to the danger that may come through its introduction. Few of Wisconsin fruit growers and nurserymen are familiar enough with the disease to be able to tell of its presence. This is undoubtedly due to the fact that the disease has heretofore been found only to a very small extent and mostly on stock shipped into the state. The disease is quite contagious and spreads rapidly over the land, and on this continent it is doubly dangerous. If the disease once gains a foothold in a block of nursery stock a large portion of the trees in the block are very apt to become infested.

In many fruit growing sections in the east, southeast, south, and southwest the disease is causing great damage and there many fruit growers consider it more dangerous than the dreaded San José scale. Perhaps the chief reason why the fruit growers fear the disease is that just about the time when the trees become profitable or when the trees have attained the age of eight or twelve years, they begin to rot off at the crown and die. This is especially true of apples. I have particularly in mind a thriving orchard in the southeast, of twenty-five acres of apple trees eleven years old which bore a few crops, then all at once about one-half of them began to fall Upon examination it was found that the trees had been killed by crown-gall. The fruit grower does not only lose his trees but the time, which is the greater loss. The first cost of the tree is very small compared with the value when they have attained the bearing age.

The disease generally gains an entrance into the tissue through some injury to the roots. Some times through a wound made in grafting. This is especially true if the grafts are wrapped with a few twists of cord leaving exposed openings between the cord. It also gains entrance through wounds made by borers and other insects. It is doubtful whether the germ can gain an entrance except through some wound or some place where the bark has been bruised.

The disease spreads both by spores which are produced at certain stages of development of the gall. These spores are exceedingly small and are carried by the wind to all parts of the orchard. Also in cultivating, the old galls are rubbed off the crown and carried around in the field by the cultivator. Often diseased roots and parts of the dead tree are permitted to remain in the orchard forming a source of infection.

REMEDIES.

The habit and the life history of the disease makes it difficult to effectively combat it. After the trees have once become infested nothing can be done, since the seat of the disease cannot be reached without killing the tree. Cutting off the gall does not stop the progress. Precautionary methods must therefore be relied upon. Trees infested with crown-gall should not be planted no matter how cheap they may be for they are expensive even as a gift. Infested orchards should not be replanted to fruit trees for a few years. Rotation of crops should be practiced by nurserymen having infested trees, since the disease will die out in a few years if left to itself. Dead and dying trees should be carefully removed and burned.

DISCUSSION ON PROF. SANDSTEN'S PAPER.

Mr. Kellogg: How does it differ from the root gall?

Prof. Sandsten: Root gall and crown gall are probably not the same. It may be due to another disease. We have another fungous disease that causes root gall, but this is almost entirely confined to the crown, and from the crown it may go out on to the smaller branches.

Mr. Periam: Will you please describe the root gall?

Prof. Sandsten: Well, the root gall is due to a fungous disease that works on the root and is introduced generally from the bruises and wounds that happen to be on the roots; it is a fungous disease.

Mr. Hartwell: I think when you said that the root gall and crown gall were different, you used the word "probable."

Prof. Sandsten: The reason I said "probable" is that I have not any specific name for the root gall.

Mr. Hartwell: Is it demonstrated that the germs of the two are different?

Prof. Sandsten: Yes, that has been demonstrated.

Mr. Hartwell: Now, let me ask you another question that is of very great interest in my district in Illinois, and that is, we have a gall on bushes, such as red raspberries and blackberries.

Prof. Sandsten: That is a different one entirely. The Geneva Experiment Station at New York have worked that out pretty thoroughly.

Mr. Hartwell: Have you any remedy except annihilation?

Prof. Sandsten: No, all you can do is to annihilate it.

Mr. Hartwell: Can you answer this question—supposing I should destroy the plant entirely, how long, probably, will the germs subsist in the soil thereafter?

Prof. Sandsten: I do not think that is definitely known. We know that three or four years are generally sufficient to eliminate the germs of the crown gall, but I have not looked up the record of the anthracnosis, or the question of gall on blackberries or raspberries; I have not looked up the subject.

Mr. Patten: Will you please tell us, so that the nurseryman and the planter can distinguish between the crown gall and the root gall?

Prof. Sandsten: Well, the crown gall you can always tell by the position of the gall, it is invariably on the crown; but the other one will be farther down.

Mr. Patten: That is, at the junction?

Prof. Sandsten: Yes, at the union. You cannot tell by superficial examination just where, but there is generally the place.

Mr. Patten: That is, right at the junction of the root and the cion?

Prof. Sandsten: Yes.

Mr. Patten: Well, now, the common root gall commences right there.

Prof. Sandsten: Well, no, not exactly. I have seen it further down. It gets down further on the root.

Mr. Patten: Well, I have had quite a little experience with what is known as root gall, and I would like to know what is the cause that produces it, so that I can be determined which is which.

Mr. Barnes: Are some varieties more susceptible to the gall than others?

Prof. Sandsten: I would not like to say.

Mr. Barnes: They are liable to be found on the peach trees.

Prof. Sandsten: Yes, they are most dangerous on peach trees.

Mr. Menn: Now, if the disease is in our orchards, how can we detect that the disease is there by the growth and appearance of our trees?

Prof. Sandsten: Well, it is pretty hard to give you advice, because you cannot diagnose a tree; in that respect we are all at sea about it.

Mr. Kellogg: Does this same gall occur on the plum?

Prof. Sandsten: Yes, plum, pear, apple, cherry.

Mr. Patten: In reference to the common root gall, we have noticed in our grafting that that appears commonly on the ends of the cions, that it comes down below the root and generally where the cion has not been clipped off from the previous cutting, and it will turn—this being the end of the cion, this gall will form and seem to turn the end of the scion right back, leave a large ball right on the cion. We have found a great many of them at times created in that way, and we would like to know what the cause is, whether it is in the material in which they are packed, or what the cause is.

Prof. Sandsten: In that case I should say that it would not be a fungous or germ disease at all, because it would be a callous of the tissue, an extraordinary growth of it due to the wound, and the plant is trying to heal that wound, and that enlargement is in no case dangerous or hurtful to the plant. That happens quite often.

Mr. Patten: Do you leave the tip of the scion uncut, so as to produce roots to form on the cions?

Prof. Sandsten: Yes, we do that, but it should be cut away, the two should be even, so as to get unity clear down to the tip; but often in making grafts we do not do as nice carpenter work as we ought, and we leave out the tip and that has no connection at either side.

Mr. Kellogg: We leave that out on purpose to catch root.

Prof. Sandsten: I do not know that they do catch. At the same time you get that enlargement of the tip that Mr. Patten refers to.

Mr. Kellogg: That tissue does not throw out roots.

Prof. Sandsten: No, that does not throw out roots; the roots of a cutting do not come from that callous tissue at all, they come from the cambian layer underneath; the tissue itself has no connection with the roots.

TALK BY MR. F. C. HALE, OF MICHIGAN.

Mr. Hale: I was selected as a delegate to attend this meeting, and Mr. Philips asked me on leaving Traverse City what I would prefer to talk on. I said I am not a speech-maker but he said I should give him a subject. I mentioned three or four, and I observed when I got the program a couple of days before leaving, that my topic was to be chosen.

What to talk about I do not know. I am a fruit grower, raise a great deal of fruit, and I love it, and I say no man has any right to raise fruit that does not love the work. I am not only raising peaches, but apples and plums and nearly all kinds of fruit that grows, and while perhaps we make a specialty of peaches over on the shores—peaches and plums—yet we do raise the other fruits. Some of you are inclined to think that peaches is the staple article, and some gentleman asked me, "How are your peach buds?" Well, I am happy to state at the present time that the peach buds are in very good condition for a good crop. You have been telling me about having 30 to 35 below zero; ten is the lowest we have experienced in the peach belt.

Now, I would like to mention a little particular on the market question. Three years ago I think it was, you sent a

gentleman from your state who criticised us a great deal on our marketing. I admit that Michigan is criticised, and I think you have a right to do it, because a great deal of fruit is put onto the market that is not put on the market as it should be, and yet, gentlemen, I am going to blame you somewhat for the circumstances. This gentleman undertook to say that he would go to Milwaukee and buy a basket of Michigan peaches, the Michigan man would ask him ten cents for that basket of peaches. His first thought is, How in the world can that grower grow that basket of peaches, put it up in such a neat looking package, nice red tarlatan, send it over and pay the freight and sell it for ten cents, and have anything left? Well, I will tell you, gentlemen, we are out just four cents on the basket when we do it. "But," he said, "when I take the basket of peaches home, take off the covering and top layer, I think I have paid a big price." Well, that was a slur upon us which perhaps we deserved, but where I blame you is here,—when we put up our peaches and put them on the market, warranted that they are put up strictly number 1, and honestly, that basket of peaches has got to be paid for, and it is because you want a cheap article that the grower has a tendency to put everything that he may raise into the market, which is wrong, yet he is tempted to do it by the buyer.

Now, about six or seven years ago we conceived the idea at our place, at Shelby, of a co-operation in marketing our fruit, what we term the union packing house system. I had given considerable study to the subject, in California and other places, and we decided to organize a shippers' organization for shipping fruit, and we organized about forty growers, and we put it up and warranted it, put it up so we could stand back of it, but before we got to the point we disagreed in this much. We were to establish the grades and mark our crates, but each grower was to be judge of the grade shipped. For instance, Mr. A. would bring his fruit to the place to ship, marked No. 1 and No. 2, and Mr. B. would bring his fruit marked No. 1 and No. 2, and so on, and we would load it in the car and ship it out, so many baskets No. 1 and so many baskets No. 2. Well, when it got to its destination they found that the grades varied so, some man's No. 1 would be equal to another man's No. 2; I very soon saw the difficulty and made up my mind that there

are so many dishonest people among the growers, I commenced to look around and see how the growers were putting up the fruit, and I found this, that the growers were honest in marketing this fruit, they were honest as far as they knew, but it soon came that we could not ship a car of fruit or anything, and I said, we have got to go a step further, we have got to have that fruit packed at one place, under one general supervision, so that if a man had one basket of No. 1 fruit, it has got to come to the standard. Then we decided to do that kind of work, and every farmer brought his fruit from the orchard to the packing house just as it came from the tree; it was received and placed in the hands of the manager, he got credit for so many baskets of ungraded fruit. This man's business was to see that it was graded uniformly. Then he could say to the buyer, "I have got so many baskets of No. 1 and No. 2 and I will guarantee it." We built up a market that is surprising to all of us. If that thing could be carried through the different growing sections it would be the way to market fruit for everybody; but the trouble is, fruit growers and farmers are very jealous, it is almost impossible to get a lot of farmers to agree to anything and stand by it in the way of an association. We have run our association for seven years, we have the name of being the only one in the state of Michigan that has existed and stood together so long. Unfortunately we have lost some members; we have not twenty per cent. of the standing orchards; with many of our largest growers in the past season the interest has waned, they are discouraged and they are going out of the business, but the principle is right, and that is the way fruit should be marketed.

Mr. Barnes: Do you people in Michigan pay any attention to the propagating of new seedling varieties of peaches, and do you believe that it is possible for us to originate and propagate new seedling varieties that will stand a fair show of growing in Wisconsin?

Mr. Hale: Well, you have asked me a hard question. I will answer the first one, yes. Rather too much, I think; every grower is anxious to get some seedling that he may give his name to and propagate it, hoping that his name may be perpetuated. On the other hand, I do not know whether you can do it so as to make a success in Wisconsin or not; I think it can

be improved, I think there are varieties that you might get, and perhaps one or two years out of five you might grow peaches.

Mr. Barnes: I know of seedling peaches that have borne fruit a hundred miles north of this perhaps, four years in succession, what would be called very fair peaches. I saw several, probably a thousand or more seedling peach trees that bore very abundantly last year; one tree I had in mind in Waupaca county that bore the past six successive seasons; it bore so heavily last season that the tree broke down.

Mr. Hale: Those trees were not budded?

Mr. Barnes: No, sir, they were seedlings, never budded or grafted.

Mr. Hale: Yes, I think you can do more with seedlings than with budded stock.

Mr. Kellogg: What degree of cold is the limit that the peach bud will stand?

Mr. Hale: It depends on the condition in which they go into the winter. This winter they went into the winter in prime condition, there has been no thawing, and they will stand perhaps ten degrees colder weather than they would have stood last year, the buds are just dormant along the coast. Ordinarily if you get, you might say ten to fifteen below zero, you need not look for many peaches.

Mr. Kellogg: Won't they pull through in 25 degrees?

Mr. Hale: If they are in right shape they may stand it. With the cold winter we had in 1898, we raised peaches next year that we thought were killed, but they went through in prime condition. I have seen the time when five would kill.

Mr. Smith: Up until this year I have never seen any ripe peaches in Green Bay, but there were very elegant ripe peaches exhibited there this year, and we have one tree standing in our flower garden that I had a few on; I got it from F. C. Edwards, named the "Bokhara No. 3." It had a few peaches on this year. The tree, however, has been tied up and protected somewhat with a hay covering.

Mr. Barnes: The trees that I have referred to have never been covered or protected; they have stood out in the open, usually where they came up voluntarily from seeds. I saw paeches and know of peaches in Marathon county, and I think

that is more than 100 miles north of here, I have seen them grow there and fruit there.

President Loope: I would like to have you report next year how many you have left.

RELATION OF NURSERYMEN TO FRUIT GROWERS AND THOSE WHO ARE HOME BUILDERS.

By F. C. Edwards.

In discussing this question I hope to use a spirit of fairness. The relation of the grower of nursery stock to the planter is an important one, as he has to trust very largely to the honesty of the nurseryman in what he procures. In many kinds of plant and tree life varieties, even by an expert, cannot be determined at the planting period. But in the commercial world, such as grains, stock, minerals and lands, they can be inspected and their value taken very closely at time of sale.

In no department of industry does a business call more emphatically for honor in growing carefully and dealing conscientiously than in the nursery business. The selling price of nursery stock grown *right* and *true* to name should be made to *live* and *let live*. But I would rather pay two prices and get good stock than to pay a small price and get inferior specimens. Some nurserymen apparently think and act carefully on the growing, pruning, grafting, sale and advice after goods are sold; others think of selling and care nothing about where it was grown, whether well grown or stunted, true to name or not, in condition to live or die, but passable in appearance at time of delivery so that money is paid and deal closed is all that engages their attention.

The latter class does not deserve our tender consideration. I have good reasons for believing that there are a considerable number of men in this country who act very carefully all along the line, and only by their fruit will you know them and not by show and noise. The oldest established firms in the United States that have made a genuine success and stand high with

best grade of trade have come up to the front steadily, honestly, having the people's welfare at stake and theirs at the same time. I regret to say that in the east and our northwest there are by far too many who stick out their shingle "Nursery" who have not more than a strawberry bed and a few transplanted apple trees, and perhaps not that, growing on their grounds. A nursery is a place where trees, plants, vines, etc., are nursed, cultivated and propagated, so you see, many of the so-called nurseries are misnomers. But one of the greatest harms comes from the fact that some of the so-called nurseries and dealers order from irresponsible parties, poor goods, perhaps infested with harmful insects, and many times untrue to name, and palm them off at time of sale and delivery with all the promises you could print into a book and they do not care or intend to fulfill said agreements.

As a rule first-class goods, well grown, are by far the cheapest. There is a class of planters that is always looking for cheap nursery stock regardless of quality. It is the demand for these goods that has created the supply that we see advertised so often at less than it costs to produce first-class, well grown stock. I have no doubt this will always continue, as such is the case in all other lines of manufacture and trade.

The relation of the planter to the nurseryman must first contain confidence, as all business hangs on this word, and in order to obtain confidence you should be able to show what you have, and how you grew it, and by experience of yourself and others, state approximately what returns are obtained. It is a pleasure for a nurseryman to trade with his customers ten, twenty or thirty years with satisfaction to both, either by catalogue, correspondence or personal interview. In other lines of trade this naturally takes place and it should also take place in the growth, sale and use of nursery goods. We are living in a fast and in many ways a progressive age, and when a more conservative period comes along perhaps the people will pay us to grow with greater expense a more costly line of nursery stock that will win out with a greater certainty ultimate results.

Treat very carefully your customer if he wishes to plant something you consider hazardous for this climate, dissuade him, if possible, even if he takes the article against your judgment. Do not ship him a tree, plant or vine that you would

not use if you were in the market for same. Treat your customers with kind words. Sometimes he may think you have wronged him, when such is not the case; talk the matter over candidly with him, and you will gain a friend.

We see a feeling all over this country on tree, shrub and vine planting—a great cry goes up that the grower or dealer has cheated them. Now when the verdict is so general there must be some cause for it. The Golden Rule is the only high standard to follow, "Do unto others as you would they should do unto you." This will solve the whole question, and if this were practiced the cry would cease.

The planter must judge for himself who that honest grower or nurseryman is, and stay by him in his dealings as long as he proves "Simon pure," or willing to correct errors, if any, and deal fairly. I put in a plea for the greater care in the growing of nursery goods, better grading, less errors in goods being true to name and more rigid laws against importing worthless and infested stock. The time is coming when the people, as well as the gardeners and state institutions will rate nurserymen, and nurserymen will rate gardeners and planters with the accuracy the commercial world is using, so it behooves the genuine nurseryman to work for high ideals and better graded goods, better dug, better packed and delivered and true to name by your personal knowledge. The nurseryman owes much to the planter who is his customer and who reposes a trust in his word and honor in his goods. The planter owes much to the nurserymen for putting into this business money, brains and energy, demonstrating in his state what can be done in the plant and tree kingdom. He can easily inspect nursery and they can be quickly transplanted to his grounds from same.

When the nurseryman looks after the interests of the fruit grower and tree and shrub planter he is looking after his own interests. And this is true of all industries.

But I am optimistic and I am glad of it. There are laws that can be enacted so that the people are protected, and shortly your attention will be called to this matter. Our inspection law is very faulty and we can place same in competent hands to revise. I think, to be a little more personal, I can see in the Northwest—in fact all over this country—a general house-cleaning. The inspector should have certain powers to order

and enforce same, where the welfare of the public is at stake. The stringent laws in Michigan enable her to stand very high in peach culture, and were it not for this (*the often house cleaning*) the industry would cease by the ravages of a disease called "yellows" that has ruined many fortunes and prospective fortunes in the past. And who can say that Wisconsin planters have less interests at stake, counting the yearly cost of all transplanting done.

Be assured of one fact, the reliable nurseryman who makes business appointments every year with his customers and treats them O. K. will establish relations that other parties cannot as a rule sever. Confidence well deserved, goods that will enhance the value of our country and homes and be a source of pleasure to all and profit to the planter, is what the market wants today.

I trust in the foregoing I have touched some of the relations of the nurseryman to the grower and home builder.

Mr. Cranefield: I wish to say one word, that I think the speaker is under a little misapprehension in regard to the powers and duties of inspectors. Of course when he began to talk about the nursery inspection, that came pretty near to where we live. The misapprehension probably arises from the fact that the inspector has found no cause for complaint in Mr. Edwards' nursery, but I wish to say that the inspector has full power, that he could root up and burn an entire nursery if he chose, without going to ask anybody's permission; the inspector has full power to clean out any infested or suspected stock. I will admit that our inspection law is somewhat faulty, there is chance for improvement, but there is, as I understand, no limitation on the powers of the inspector.

Mr. Watrous: I want to say that while the National Fruit Growers and National Nurserymen have been trying for five or six years to procure the enactment of a federal inspection law, that while the most of us still think that that would be the proper course to pursue, yet the opposition of the eastern nurserymen is such that we have failed and have been compelled to definitely abandon all effort in that direction, and it is

now with us here in the West, "Save yourself if you can," and we have got to look out for the state laws, for we shall have no federal law.

Mr. Philips: Is it possible for a nursery inspector to get off his train at ten o'clock in the morning, look over a few trees on say, 100 acres, take his dinner, then go out in the afternoon a little while and look over the evergreens and take the afternoon train, and give his certificate that he did not find the nursery infected?

Mr. Edwards: I want to say in justice to the inspector that came to our town this year, that he did three times the work of any inspector that ever came there before, so they are certainly improving. I think they never can look over the nursery in the time that Mr. Philips speaks of and know much about it.

Mr. Herbst: That accounts for the short time then, Mr. Edwards, that he put up at my place; he put in too much time on your place.

President Loope: I have often thought that providing there were places in the nursery that were infected with, say, the San Jose scale, it would be very likely that the inspector would fail to see it on account of the little time that was put into the inspection. We will pass to the next paper.

THE CLASSIFICATION OF PLUMS.

By Frederic Cranefield.

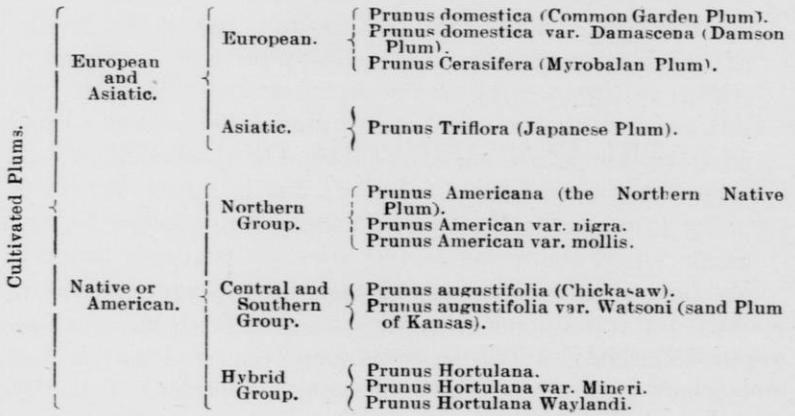
My few remarks to-day deal largely with plum botany. My apology for introducing this subject arises from the numerous questions asked by fruit-growers, an occasional nurseryman, and others regarding the classification of plums. I am frequently asked regarding the distinction between "American" and "Americana" plums, also to describe the Chicasa variety of plums, etc. I do not forget that I am speaking to trained horticulturists largely and that the facts presented here are familiar to most of you, but I have in mind also that the record may fall into the hands of others who are seeking information.

The classification offered in the following chart is pomological rather than botanical. It includes only the cultivated plums. Such species as the Beach plums, the Alleghaney Sloe and others are purposely omitted.

The European plum is characterized by upright growth, the branches not forked, large flowers, large and rugose leaves. The fruit is large, commonly purple, yellow or green. The Damson group is marked by small leaves and fruit, the latter usually dark purple, the Myrobalan is slender in habit with small serrate leaves, the fruit being cherry like in size and shape.

The European plums have been further divided by Waugh into several sub-groups, as the Green Gage, the Prune and the Bradshaw groups, etc., but these divisions are of interest mainly to the European growers. The origin of prunus domestica has been more or less clearly traced to Eastern Europe.

The Japanese plums have not as yet been separated into subspecies or groups. Although known as Japanese plums from the fact that the first cultivated varieties were introduced from Japan, there is no doubt that the original home of this species was in Central Asia. The Japan plums are strong growing with smooth deeply serrate leaves and flowers in clusters of three or more.



When we come to the native or American plums the grouping is more complex. The botanists have wrangled over the separation of the species until the layman who has attempted to follow their lighting-like changes has become confused.

The Northern or American group is the one of most interest to Wisconsin fruit growers on account of the reliable hardiness of its varieties. The trees of this species are spreading, with much forked and thorny branches. The leaves are thick and deeply veined, never smooth or glossy. The fruit of the pure Americana is invariably glaucous, never shiny. The range of the species is from the Atlantic on the east to Montana on the west and from the Ohio river north to Manitoba. In the extreme north a type has been found with larger and pinkish blossoms, early and flattened fruits and tender skin. This is var. nigra. Another sub-species, var. mollis, is found struggling southward as far as Texas and is marked by its woolly leaves, small and nearly worthless fruits. While this species covers the whole of the Nothern and Eastern portion of the United States it is in the Northwestern states of Iowa, Minnesota and Wisconsin, that the best and largest varieties have been found and brought into cultivation. None of the leading varieties now in cultivation with the exception of Miner have been found elsewhere.

The Central and Southern Mississippi valley and the Southeastern states is the home of the Chicasa species. The trees are always slender and willowy and the twigs slender and zigzag like, the leaves thin, deeply-toothed and shiny. The fruit thin skinned and glossy. We are not especially interested in this group as the varieties are too tender for Wisconsin conditions.

Early in the history of plum botany a type was found in the central—south, intermediate between the Americana and Chicasa species, the tree resembling the Chicasa and the fruit the Americana. Of this type the Wildgoose is the best representative. For a long time no place could be found for the Miner, the first native plum cultivated; but in 1892 Bailey grouped these scattering hybrid forms into one class under the title prunus hortulana. Waugh divides this group into three distinct sections as indicated on the chart which only leads to confusion, for among plum botanists the hortulana group is no longer considered as a rigid species but merely a convenient term to designate a group of hybrids.

So far we have spoken only of the native forms with no reference to the numerous varieties that have originated under cultivation. With these the botanist refuses to deal as they

profess to scorn horticultural forms. It remains then for the plum grower to step in here and finish the classification. Of above a hundred varieties that I have had an opportunity to observe it appears plain that over 9/10 may be safely referred to the hortulana group. A very few, among them Brittlewood, appear to be pure Americana seedlings, the remainder bear unmistakable ear-marks of Wildgoose or Chicasa origin. The reason for this is easily determined when we trace the source of these varieties. The bulk of the best varieties that have originated under cultivation have the Wildgoose or a closely allied variety for the seed parent. In the following lists are given names of 40 well known varieties of natives, the species to which each belongs and the source of origin, whether from the wild or under cultivation.

List A—American varieties found wild: Aitkin, American Eagle, Baraboo, De Soto, Forest Garden, Louisa, Ocheeda, Quaker, Rockford, Rollingstone, Weaver, Wyant.

List B—Americana varieties that have originated under cultivation: Bomberger, Brittlewood, Diana, Etta, Hammer, Hawkeye, Jones, Lottie, Sadie, Silas Wilson, Stella, Wolf.

List C—Chicasa varieties (wild): Caddo Chief, Emerson, Newman.

List D—Chicasa varieties (Cultivation): Pottawatamie, Robinson.

List E—Hortulana (wild): Forest Rose, Maquoketa, Miner, Moreman, Wildgoose.

List F—Hortulana (cultivated): Choptank, Downing, Freeman, Jewell, Milton, Mrs. Cleveland, Surprise.

In regard to the adaptability of the different species to cultivation in Wisconsin there is but little to be said but that little is positive. The extensive variety tests at the Station as well as other Northwestern points show clearly that the Americana species and its hybrids include the only reliably hardy varieties. There may be certain limited sections of our state where the hardier of the European class may succeed fairly well for a time but our "test" winters will eventually clear them out. The same is true of the Japanese section except that these as a rule are shorter lived than the Europeans.

In conclusion a few words about the selection of seedlings, sometimes called plum breeding. Observations of several thousand seedlings at the Stations show clearly certain points.

1st. At least 90 per cent. of the seedlings of any given variety will fruit earlier than the parent. Best varieties produce best seedlings.

2nd. Certain varieties as the Quaker produce seedlings varying but little from the seed parent, while others as the Wildgoose breaks easily into a multitude of types.

Notes.

1. Quality is dependent upon culture.
2. The serious enemies of the native plum are as many as those of the apple.
3. The curculio is as bad as the codlin moth.
4. The fruit rot is more destructive than blight.
5. Plum scab may be as bad as apple scab.
6. The plum aphis is as bad as the apple aphis.
7. The shot hole fungus is extra.

DISCUSSION OF MR. CRANEFIELD'S PAPER.

Mr. Marshall (Iowa): Is the Burbank a pure Japanese?

Mr. Cranefield: So far as I know it is pure Japanese. The original home was probably eastern and central Asia; it happened that the first varieties brought across the Pacific were brought from Japan, but the botanists claim to have traced it to Central Asia. Under high culture they attain good quality. The serious enemies of the native plum I believe outnumber those of the apple. If we take the insects, the curculio is certainly as destructive and as hard to control as the codlin moth, and the brown rot of the fruit is quite as destructive as the blight of the apple, and the plum scab might be as bad as the apple scab. Then we have something extra in the shot hole fungus. To the nurserymen who sell native plums you want to preach culture and care just as much as for the apple.

Mr. Hale: How is it with regard to the quality of the native plum, as compared with the European?

Mr. Cranefield: That is perhaps a matter of personal taste, largely. We esteem many varieties of the native plum more highly than the European, for cooking as well as dessert.

Mr. Hale: With us we do not grow any of the native plums, and we are inclined to think the quality is not so good.

Mr. Cranefield: In Illinois they told me that they would not grow native plums, they feed them to the hogs down there, but the people present here today are pretty well informed as to the quality of the native plums. I do not dispute that there are certain Japanese plums and certain of the native plums that are of a higher quality as a dessert fruit than some of the Americana, but for high cooking qualities I think, as a class, they excel the European. Of course it is largely a matter of personal taste. To my mind, if there is any sour, miserable thing on the face of the earth it is a canned European plum, whereas in the native plums, canning appears to bring out high quality.

Mr. Thurston: Is there a better Japanese plum than the Forest Garden of the Americana?

Mr. Cranefield: No, to my mind there is no Japanese or Americana plum that comes in quality to the best of our native plums.

Mr. Thurston: Please describe the quality of the Brittlewood?

Prof. Cranefield: It is simply a great big Quaker, it is the Quaker plum in everything but size, and it outclasses the Quaker in size, it is perhaps twice as large.

Mr. Thurston: On my way home from the Minnesota meeting in December I called on Mr. Lord and he went into the plum orchard with me, and he has some very nice trees, both topworked and otherwise, of the Brittlewood, and he has a very nice Surprise orchard, and then he has an experiment orchard of different kinds, and the greatest regret that he has now, as he is not expected to live long, is that there are no labels on any of those trees, and there is no one there who knows anything about it. He has one son way down in Kansas and he does not care, and it seems to me that you or Mr. Marshall, or some of you plum men ought to take a trip up there while the old man is alive and mark some of the trees and get the benefit of his work. He is one of the old plum breeders of the country.

Mr. Toole: In regard to the comparison being made be-

tween our native plums and the Domestica or European plum, they are so distinct, each have qualities of their own, I do not know why we should endeavor to make a comparison. That has been very forcibly shown to me by some friends in Milwaukee whom I had sent some of our native plums, but one year I had a fine lot of Moore's Arctic, and a part of them I sent in a shipment, quite a large basket full of them. When they came to see them, they said, "Oh yes, those blue plums are nice, but we can get lots of those over in Michigan, but what we want is our native plum." Of course there may be very few people in Milwaukee thinking that way, but I think there are quite a lot that they can have of any kind of Domestics, and yet they want the natives too.

Mr. Bingham: I would like to ask Prof. Cranefield if the native plums will fruit if planted alone?

Mr. Cranefield: I do not know a great deal about it; it is generally recognized that they are unfertile to their own pollen, all the varieties. Many have been investigated; I believe it has been said that the DeSoto is fertile to its own pollen, but as a rule we have to plant more than one variety of the native plums. I think you will find that is true of the Japanese plums, and it is true of apples and pears and all the fruits.

Mr. Thompson: I have between 80 to 90 varieties of plums, nearly all of them native and for cooking and canning, especially, would prefer the native plums very much to the Japanese plums, for they are a very low quality of plum, especially when they are cooked, and they will not live over seven or eight or ten years at the outside. But we find in our native plums, that when they have got used to them and understand them, they like them very much better than they do the Michigan plums, and we have a few varieties of rather small plums that are most excellent plums when they are cooked, and I have nearly all of those varieties that are mentioned and a great many more, and I have received plums from pretty much all the plum growers, but to a great extent from Mr. Terry in Crescent, Iowa, and I find his plums turn out remarkably well, and I am very much in favor of native plums over the Japanese especially, but when you come to European plums, they are better plums, but they are soft and they rot much worse than the native plums.

Mr. Marshall: I want to say for the benefit of Mr. Hale and Mr. Bingham that a year ago this past summer I could have taken a basket of my native plums to Madison and take two baskets of their best Japanese and European plums for what I got for my native plums.

Mr. Hale: What about the peaches?

Mr. Marshall: There is no doubt but what we could buy one or two baskets of Michigan peaches for one of our plums.

Mr. Bingham: While Madison may be a good market for American plums, we know it is not so all over the state, in regard to getting the price for one basket of natives for two European. And another thing I think it might be well to emphasize, if you wish to grow American plums, you have to fight your way all the time. The mark of the curculio shows more on them, and there are a great many enemies of the native plums that we do not find on the other.

Mr. Kellogg: I wish to ask Prof. Cranefield,—he has been ten years propagating these seedling plums,—I would like to ask how many varieties they have got that are worth putting on the market, and how are you going to do it, how are these men going to get hold of them?

Mr. Cranefield: You must ask some one higher in authority than I am. I have been doing that work, now the policy of dissemination does not rest in my hands, therefore I regret I am not able to answer your question. In regard to the first part of your question, we have many good varieties, we have some that we think are a little better, in fact, considerably better than any of the named varieties now on the market. On the whole it has been a somewhat discouraging task.

Mr. Kellogg: Haven't you a plan of dissemination?

Mr. Cranefield: I think a plan of dissemination is about matured, but the trouble is, the fruit growers are too impatient. Not until you get into the work, until you get to growing seedlings and selecting and studying the different points of a good fruit will you know how long it takes and how slow and tedious the work is. Now, another thing, the average nurseryman, or fruit grower or enthusiast may grow a dozen common seedlings, the chances are that he will put six of those on the market. We cannot do that sort of thing; if we put out a plum we have got to know that it is a good one. We have grown, not thousands of seedlings, but tens of thousands. We have today nearly ten

thousand seedling plum trees growing on our ground; I am sure I am not over-estimating, and have destroyed thousands of others, and we are sifting the chaff out of the wheat, and if you will be patient we will give you the result of our work in due time.

Mr. Hale: This has been an interesting talk to me, and it has been a source of information. I am growing a great many plums, both European and Japanese varieties; I marketed this year nearly 4,000 bushels. As far as the Japanese variety is concerned, I do not think it ought to have been introduced into this country; they are good to eat out of the hand, and that is about all it is good for, except the Burbank.

In regard to the European varieties compared with the native plums, the gentleman said we should not make any comparison. We have been led to suppose in Michigan that the native plum in Michigan was not worth the raising. We did not know you do not like our European varieties; it is news to me; I can go back to Michigan and say you do not like our plums, you like the native varieties best. In the last few years our plums have deteriorated. Now, is it a fact that the native plums are coming forward and taking the place of the European, is this the fact and is this the explanation?

Mr. Barnes: Is there not a way in which we could secure those seedlings in some way instead of destroying them?

Mr. Cranefield: You must remember that at the time we destroy them they are too large for any purpose that you could use them for. We test them two or three years, fruit them two or three years and they are trees ten to twelve feet high, a good big top, they are no use for any propagating purposes then. We destroy them after they are fruited.

President Loope: Can any one answer Mr. Hale's question, is the native plum coming forward sufficiently to crowd out the European?

Mr. Marshall: I do not think the European plums raised in this state will get any vigor.

GROWING AND MARKETING THE BLACKBERRY.

By Wm. Van Sant, West Salem.

You ask me to prepare a paper on the growing and marketing of the blackberry. In doing this I have thought that perhaps it would be better to give you our methods of managing the Linden Grove Berry Farm, located at West Salem, Wis.

We are vain enough to think that we have an ideal location for a berry farm. It is located eighty rods distant from two depots. It is on the north side of a grove of timber,—mostly basswood. The land slopes gently to the north. The soil is a dark loam under-lain with a rich subsoil of clay. We have the rows running east and west and eight feet apart. The plants are four feet apart in the row. We have the rows running east and west for this reason. When the bushes are in full foliage the ground is shaded from the rays of the sun. As the bushes stand from six to eight feet high the ground is shaded and the young berries are protected in such a manner as to prevent scalding by the sun as is sometimes the case in time of drought. We have frequently seen the top of the ground moist many days after a rain. Another advantage in having the rows run east and west is in making it more comfortable for the pickers who may be in the shade a portion of the time.

We pinch back the young canes when they get to be from thirty inches to three feet high. We have to go over the field three or four times during the season. Our bushes grow vigorous so that by picking time we have to go through the rows with corn knives and cut off the overhanging bushes so that the pickers can go through. We endeavor to keep the yard free from weeds by hoeing under the bushes and cultivating between the rows.

Our berries have never suffered from drought. If the weather is dry we start the cultivator between the rows and stir the ground and get a dust mulch to conserve the moisture in the ground.

The blackberry blooms about the first of June and is in full blossom in about a week. We consider it is one of the safest of crops for we rarely have frost so late as to do much damage.

The past season we did have a frost when the berries were in full bloom that killed some of the blossoms but notwithstanding the cry that went up that "blackberries were killed," we had the largest crop we ever raised.

From seven acres we had about 1,200 bushels. The previous season from the same ground we picked 950 bushels. The best crop I ever picked was on an old garden which was very rich. I picked from one-fourth acre sixty bushels, which is a crop of 240 bushels per acre.

After the berries are picked we go to the yard and cut out the old canes while they are yet somewhat green as they cut easier than when they get dry leaving from three to five new canes in the hill for next year's bearing. The blackberry makes new wood every year and hence we can, if conditions are right, expect a crop every year. By cutting out the old canes early we give the new ones a chance to mature the short buds for next season. We endeavor to keep all the sprouts between the hills cut out and those between the rows the cultivator will take care of.

We have to lay down and cover all our blackberries and raspberries. Three men make a crew for laying down the brush. We have a fork made of half inch round steel, the tines being eleven inches long and eight inches apart, with a strong shank and put in a two-inch handle about four feet long. Two of the men have round pointed shovels. We dig under each bush taking away the earth about four inches deep. We begin at the end of the row and lay them toward the east. The man with the fork puts it in the ground on the west side of the hill and pushes the hill down gently. The fork must be put into the ground deep enough so that the pressure will be against the crown of the hill so as not to break the canes. He crowds the hill over and slips his fork up bringing the tips of the brush together and places them on the south side of the preceding hill. One of the shovelers stands on the south side of the row and cuts off the tips as they lie on the ground, with his shovel, which has to be sharp. The whole field is gone over covering the brush partly and then there is a furrow plowed throwing the earth upon the row from both sides.

It may seem that a good deal of the work is trivial, which is mentioned, and might be dispensed with. Every one should be able to give a reason for the faith that is within him.

Our reason for placing the brush on the south side of the row is that when we run the plow in the spring to uncover the brush it will not run against the tops of the brush and break them as it would if the brush was placed on the north side of the row. Why do we cut off the tips of the brush with the shovel? Because in laying down the brush we necessarily break more or less of the small roots and if the tips are not taken off the sap is not equalized, the bush languishes for want of support from the roots. The bush will blossom, fruit will set and perhaps grow to one-half or two-thirds size then dry up, starved for want of nourishment. There will not be vitality enough to throw up new canes for next year's crop and hence the crop of the following season will be lessened.

If we prune too much the result will be that we will have strong and vigorous canes for the next season but perhaps not as many berries, but larger ones. But our yard will grow stronger year by year, otherwise if we did not prune a yard would grow weak and uneven. Our yard has been set six years and we laid down the heaviest growth of canes we ever had and there is no reason why they should not last for years if the ground is kept in good heart by applying plenty of manure.

MARKETING THE BLACKBERRY.

The marketing presupposes that they are picked.

When we first began the berry business we were the victims of the pickers and the common sharks, that is men who sent us their circulars giving the prices they were selling for and the rosy prospects for the morrow. Of course they sent the references of banks and prominent men. We bit and were taken in. One case in particular remains fresh in our memory was that of a dear friend of one of the partners of the firm who said that berries were selling away up in "G," that he could do as good if we favored him with a good shipment. We shipped him 150 cases of strawberries and after many days we wrote him and he sent a statement of sales and a remittance of $15. We got pay for the cases but were out $40 for labor.

It was new business and we were learning. We thought then we were paying exhorbitant tuition but such is life.

When we began we had the pickers put the boxes in the cases

and credited a case at a time but when we got notice from the commission men that our cases had four empty boxes in them we began to think we were being victimized at home as well as abroad.

Since then we make each picker take a stand holding six boxes and when they are filled she calls "boxes" and the boys who gather the filled stands supplies her with an empty stand and checks the six boxes. The boxes are carried to the end of the row and there place on a stone boat and on this are hauled to the packing shed where the packers examine every box. All the imperfect berries and leaves are removed and the packers see that every box is full. Since we have adopted this plan everything moves off satisfactorily.

After the cases are filled and nailed up they are placed on a dray which stands at the packing shed. They are placed on the dray in two tiers with ends facing out so that we can mark them. We put about 100 cases on the dray. As the time approaches for the arrival of the train we hitch the horses to the dray and pick and nail up until within thirty minutes of train time. We can deliver and put aboard the train, 100 cases, in less than half an hour. We ship in refrigerator cars mostly. We do not like shipping by express as the berries are handled to roughly.

Most of our shipments are made to commission men in Minneapolis. Sending to retail stores has not been satisfactory besides we have such a quantity of fruit it would require the services of a traveling man to do the collecting.

The berries arrive in Minneapolis in the night and are placed on the market and by nine o'clock we were notified that they were all sold at satisfactory figures and ordered to ship more.

We trust that the thoughts herein given you on the blackberry will furnish food for future reflection.

I am yours,

WM. VAN SANT,

Manager Linden Grove Berry Farm.

Mr. Philips: Mr. Van Sant is a neighbor of mine, and has a berry patch right outside of my place; and he told me if any questions came up after the reading of the paper, if I could answer them, to answer them. But I want to say one thing in regard to that great field of berries, there are very few people that have the ideal site that Mr. Van Sant has. That soil is very rich, it is an ideal place for the Northwestern Greening apple tree. A great volume of snow falls in that woods, the woods run the length of the berry patch, and more snow falls on the north side of that hill than any other place; it is drifted in there to the depth of five or six feet; now there is continual moisture coming down in the spring, and there is moisture there that those berries feed on, and they are the most vigorous blackberry plants that I ever saw.

Mr. Hanchett: I think in giving that description of this location, Mr. Van Sant has given you the key to his success; the fact that he has never suffered from drouth is fully accounted for by that gently sloping situation, sloping to the northeast, with the grove on the south side to break the hot winds from the south, and the soil he describes is one that appears to be the ideal soil for blackberry production.

Mr. Kellogg: Some years ago we had a very fine description of a blackberry plantation at your place that was irrigated; what has become of that?

Mr. Hanchett: That was Mr. Brooks' blackberry plantation near the Milwaukee depot; it passed out of existence long ago. They found out that simply sand and water would not continue to grow large crops of blackberries. This plantation that Mr. Kellogg refers to was on a very high, sandy soil, and it was made very successful for, I believe, two or three crops by irrigation from an artesian well, but afterwards it depreciated, played out; water did not seem to supply the need.

Mr. Rieck: I would like to inquire in regard to varieties planted in blackberries that would produce these large crops?

Mr. Philips: They are nearly all Ancient Britons.

Mr. Rieck: I would like to ask Mr. Philips, Do you know of any blackberries that we could plant safely in this latitude that will stand without covering?

Mr. Philips: Well, they cover theirs. Mr. Hanchett has a blackberry that he banks on.

Mr. Hanchett: I want to say that we banked $1,600 that came off the 2 acres of Black Eldorado this year. In connection with this I want to say that once upon a time I came before this Society and bragged on the Van Deman strawberry; and later on before this Society I bragged on the raspberry, and when I hear those two varieties mentioned now, I begin to feel ashamed; we do not grow them any more, they have suddenly played out on us, and I want to say this is the first full crop of Eldorado blackberries that we have harvested. We have experimented for three or four years, but if I am to judge from what experience we have had with it, it is an exceedingly good variety. The Eldorado, I think, is freer from fungus growth than the Briton; it is, if anything, a little hardier, but not hardy enough to go without covering in our locality. It is a larger berry, finer flavored berry, I think, fully productive enough and better shipper. Judging from this year's experience we have a great deal of confidence in it.

Mr. Menn: I would like to have an answer to my question asked yesterday afternoon as to that patch of blackberries near Baraboo that received no attention, and I asked how many years that has been grown.

Mr. Hager: That is not near Baraboo; that is in Brown county. Now, I think that is some ten or twelve, possibly fifteen years; there are two or three patches there, from half an acre to an acre. Now I have not known them all this time; I have this man's word for the length of time they have been there, but I did see them last year in fruiting time, and I never saw a more beautiful lot in my life, and he said they were Snyder.

THE FARMER'S VEGETABLE GARDEN.

By J. W. Lloyd, Urbana, Illinois.

The gardens on some farms are more bother than they are worth. They are usually the ones which are not worth very much. They are planted in a hurry without any preconceived plan, worked occasionally with a rusty hoe during the early part of the season, and then allowed to become a forest of weeds.

The products of such a garden are likely to be meager in quantity and poor in quality, and the garden is considered an unprofitable adjunct to the farm. Gardens are not unsatisfactory and unprofitable because too much time and thought and labor have been expended in their establishment and care. They are usually successful and satisfactory in proportion to the amount of time and thought given them, provided the energy is well directed. Careful and proper planning of the garden during the winter while farm work is not pressing, will result in a saving of considerable time during the busy season. This planning should include the determination of the location, size, shape and arrangement of the garden, and the selection of the seeds for its planting.

As a matter of convenience in gathering the products as needed for the table, it is well to locate the garden near the house; but if fowls have the range of the premises, it may be necessary to place the garden at some distance from the dwelling. Whatever the location with reference to the house, the soil should be rich and well-drained.

The size of the garden will depend upon the number in the family and their fondness for vegetables. As a rule, the general farmer can afford to devote more land to the growing of a given amount of produce than can a market gardener, because his land is cheaper and his labor higher. The most effective way for the farmer to save labor in the garden, is to plant everything in long rows sufficiently far apart to admit of horse cultivation. The preparation of the land for planting can also be accomplished entirely by horse power; and if the garden is so arranged that the early planted vegetables are together at one side of the area, the unplanted portion reserved for later plantings can be kept in a friable condition by the occasional use of a harrow.

A satisfactory garden—one that will furnish a continuous supply of vegetables through the whole season—cannot be secured if all the planting is done in one day. Successive plantings should be made to extend the season of vegetables which do not remain long in an edible condition. The temperature requirements of the various vegetables also differ greatly. Some grow best at a comparatively low temperature and may be planted as early as the ground can be worked in the spring; while others require a high temperature and are killed by frost.

Fortunately many of the vegetables demanding a low temperature have a short period of growth, so that they may be grown as early spring or late fall crops. Some of the warm season crops have a sufficiently short period of growth to allow them to perfect their products if planted in the open, while others must be started under glass and transplanted if grown in the north.

I have already mentioned horse cultivation as a means of saving labor in the care of the garden. A judicious use of the wheel hoe, especially early in the season while the plants are small, will still further reduce the amount of hand labor necessary to keep the garden in a high state of cultivation. However, there still remains one item of labor which is likely to be a bug-bear to any man whose tastes run mainly in the direction of corn, wheat and potato culture. I have reference to the weeding and thinning of the small vegetables like onions, beets, carrots and parsnips. The thinning is nearly always necessary, but needs to be done only once and would not be a very serious task in itself. The amount of hand weeding necessary can be materially reduced by the following means: (1) Clean tillage the preceding year, so that no weeds have been allowed to go to seed; (2) avoiding the use of manure containing weed or grass seeds; (3) surface tillage of the soil immediately before planting; (4) the sowing of radishes in the drill with onions and carrots to mark the row so that tillage with the wheel hoe may be commenced before the plants from the slower germinating seeds are visible; (5) frequent and thorough tillage close to the plants; (6) the planting and cultivation of some late crop on those portions of the garden from which early crops have been removed. By practicing these methods I have seen the labor of weeding and thinning the same garden reduced from 23½ hours to 6½ hours.

The farmer should not be fully satisfied with his garden unless it furnishes a large assortment and continuous supply of fresh vegetables throughout the growing season, and also provides an abundance of vegetables to be stored, canned, pickled, or dried for winter use. Such a garden is a source of pleasure to the farmer, to his wife, to his children and to his hired man. It is a source of pleasure to the farmer because he appreciates appetizing meals; to his wife because it is a constant and reliable source of materials which aid greatly in preparing such meals; to his children because it furnishes them plenty of ripe toma-

toes to eat; to the hired man because he can sit on the back stoop and eat muskmelons after the chores are done.

DISCUSSION OF PROF. LLOYD'S PAPER.

Mr. Silas Smith: The gentleman makes quite frequent reference to a wheel hoe, and I wish he would tell us what is meant by a wheel hoe? We have a great many different implements with wheels attached to them.

Prof. Lloyd: I had reference to what is known as a wheel hoe, or hand cultivator. There is an implement sometimes called a horse hoe, that is, a V-shaped cultivator with various shaped teeth put on. I have reference to an implement which the man forces along somewhat as he does a lawn mower. These are of two types. There are single wheel hoes and double wheel hoes; the double wheel hoe strides the row, the single wheel hoe goes between. There are various shovels and attachments that may be placed on these implements; one set of cutting knives, somewhat on the plan of the harrow, may be mentioned in connection with orchard cultivation; it will shave off all the weeds under the ground. There are also small cultivators, sometimes very fine teeth, about the size of rake teeth. I might say in reference to the use of this tool, it will do satisfactory work only when the ground is kept in good condition. After the weeds get started it is not much good, but it is designed to take the place of so much hand hoeing, if you get right up close to the plant with it and stir the ground only to a slight depth. In early cultivation, cultivate between the rows with the horse cultivator; and as the plants get a little bigger, do away with the wheel hoe and do all the work with the horse cultivator. I use an entire tooth cultivator more than a spike cultivator, because it does not throw the dirt so much, and you can get closer to the plants. After a heavy rain, if the ground becomes packed, use those five-shovel cultivators.

Mr. Toole: In my own practice I recognize the value of the rotation of the garden. We have a certain ground given over for a certain length of time, say two or three years, for a garden, and after that it is seeded down to clover again. And I will say, in planting green corn, plant enough for winter as well as summer use: it is easily put down and very acceptable in the winter. I think that any one who once sets out and follows up

the practice of a rotation in his garden, instead of planting everything in the same place, will find great value in the system.

Mr. Smith: In regard to taking care of the garden, I do not see why, if we can afford to hire men for the hay field, we cannot afford to hire men for the garden, if it is worth the work that it costs to take care of it. We as market gardeners have to hire that work done, and I do not see why the farmer cannot afford to let one of his hired men take this hand cultivator or horse cultivator and do that work.

Mr. Cranefield: If you preach the gospel of long rows, three feet apart, in the vegetable garden, as Prof. Lloyd has preached it here to the farmers, you will have solved the problem to my mind. Is there any reason why you should crowd up your rows of vegetables to 10, 12, or 14 inches apart? You have got room enough, you have got 160 acres, surely you can spare a few square rods to a garden. If you put the rows three feet apart, then when you are cultivating corn, or whenever you are using the one-horse cultivator, you can swing in there and in 15 to 20 minutes you can pretty nearly cultivate the garden. The market gardener cannot afford to do that sort of thing when he is working high-priced land; he has got to do intensive gardening and get as much as possible out of it, he must crowd his plants, but there is no reason why farmers could not do that; they can do nine-tenths of the cultivating with the horse rather than by hand.

Mr. Periam: I must differ as to the rotation; there is no such thing in a market garden; you will follow one crop with another, but it is not necessary with al the strong-growing plants like cabbage and potatoes and all that kind of crop that will take coarse manure.

Mr. Everett: I have always felt friendly towards crop rotation, in farming and gardening, and I am in sympathy with the suggestion made by Mr. Toole. We have with us Mr. Smith of Green Bay, whom we recognize as one of our greatest commercial gardeners, and I would like to have him tell this convention his opinion of the value of rotation in gardening.

Mr. Irving Smith: We plant one crop immediately following the other, frequently putting one in between the other before it is out—before the first one is out. We consider that absolutely necessary in market gardening.

To illustrate one of the most remarkable instances of rotation which I call to mind in our own place. Quite a number of years ago we planted in the spring about a half acre—possibly three-quarters of an acre—with early peas. As our usual custom was, we planted one or two rows—I think it was two rows in this case—of radishes in between the rows of peas. The radishes came up in three or four weeks and were pulled out in perhaps four or five weeks from the time they were planted. At that time the peas were up and in bloom, and very soon after the radishes were out we planted some very small sweet corn in where the radishes had been, of course having cultivated thoroughly first, and by the time the corn got up a foot high, the peas were done; we pulled those out, cultivated through between the corn and planted a row of cabbage where the peas had been, and before the cabbage had got very far, the corn was done and we cut that out and cultivated thoroughly again. By that time it was getting pretty late towards fall; we did not plant anything more, but we had a very good crop of peas, radish, corn, and cabbage between the months of April and November on the same ground. That is perhaps the most marked instance that we have had, but almost all the radishes that we grow are planted in between something else, between our rows of parsnip, for instance, which are from 18 to 24 inches apart; we plant a little radish between our rows of strawberries which are 3½ feet apart; we raise our early cabbage, which perhaps some of you will remember my stating in the society before, brings us enough to pay for the entire cultivation of the year on cabbage and strawberries, and leaves a profit above that.

Mr. Patten: You mean with fruiting beds of strawberries?

Mr. Smith: We set out a bed of strawberries in the spring, in perhaps the latter part of April we set a row of cabbage between those strawberries, and the cabbage is harvested now about the middle of August. By that time the strawberries are running very freely, and we take out the stumps and cultivate very thoroughly, and devote the land entirely to the strawberries for the balance of the season. Then in the following season when they pick our strawberries off, we immediately put in the plow and raise a crop of celery on the same ground. That is what we mean by rotation, and we consider it as essential for market gardening as high manuring or good cultivation. We would simply be in the poorhouse if we did not practice it.

Mr. Toole: We horticulturists sometimes seem to differ in regard to certain discussions because we consider them from different view points. Here we are today discussing the farmer's garden, and to prove that farmers do not know what they are talking about we call on the market gardeners with their intensive culture and contrast it with the extensive cultivation which we might consider in the paper read to us, and of course in that case there is a wide difference; and this rotation of crops, simply one after another during the season, does not come in effect with the ideas suggested for the farmer having room enough, but it does not contradict the fact of the advantage to the farmer of following these ideas suggested.

Mr. Menn: You recommend applying forty loads of barnyard manure; would you apply it late in the fall, or in the spring?

Mr. Lloyd: I would rather apply it in the fall and plow it under; under the conditions in central Illinois.

In reply to a question, Colonel Watrous stated that anyone can become a life member of the American Pomological Society by paying ten dollars, and that all available reports of the society will be sent to such member. On payment of two dollars one can become a biennial member and receive a copy of the current report.

Mr. Periam: I think I have as large a collection as anyone of the American Pomologcial Reports, and whatever I have, at my death, if not before, this society is perfectly welcome to, and I will be glad to furnish them to you.

President Loope: This society wil be very thankful for this contribution.

President Loope: The report from the Eagle River orchard I suppose is due from me. I have not a written report. I was sent to Eagle River more for the purpose of replacing trees and looking at the general features of the orchard, than anything else. Those who have been to Eagle River will agree with me that the orchard is not in an ideal location; it is rather light soil, but thought it best perhaps to try one orchard in such a soil. I gave the society due notice when I located that orchard, before I located it, that I was not going to find the very best place I could find, because I think that is sometimes misleading to the general community; they think because trees are grown successfully in the very best location in that country,

that they can grow trees on any soil, which is a mistake. Nevertheless, the orchard at Eagle River has made a fairly good growth, in some cases quite a phenomenal growth. There were a few varieties that were killed; I do not know but I ought to say the climate did it; for instance, the Seek-no-Furthers were all dead; I did not put in any more. I filled in the places of those that were dead and noted each one as I filled in, and I believe that the orchard is going to be a fair success. It will need some considerable attention before long, but as yet, being a young orchard, it is not in any particular danger. I find, too, that our instructions are not being followed out, even though they intend to follow them. For instance, we told them to mulch the trees, and when I went there I found the manure right around the body of three trees, 8 or 10 inches high, and I made them go to work and pull it away. There were from 150 to 200 plum trees sent there, and when I went to the place where they were heeled in, I found four-fifths of those plum trees dry, and they were dry before they were heeled in, and I do not know whom to blame for that. The orchard is well located and creates a great deal of attention. I have not seen the sign, because I have not been there since the sign was put up, but everybody in the whole country, and they go for twenty to thirty miles on that road, referred to the state trial orchard; that is what they call it—the State Orchard— and it created a great deal of comment and interest and people are ordering trees for their own selves in that locality, which is rather a poor locality, being light soil; there are some good locations that are being stocked with trees.

Mr. Lambert: I am not in charge of the orchard at Medford; the man that is was unable to come, and asked me to come and get some information in regard to raising an orchard in our northern part of the state. It was as cold as 40 to 42 below zero, and it is pretty uphill work, but we are trying to get something that will stand that climate, but do not know how.

We have 200 trees; the first 100 trees that we got two years ago survived pretty well, except about half a dozen; the second 100 trees that we set out last spring we cannot say anything about yet. The cherry trees have not done well, the apple trees all made pretty fair growth. Last spring the trees were on the ground before we had a chance to prepare the ground for them, and if last year's product is a failure, I believe he is not to

blame, not knowing what his contract called for. I have seen the orchard several times during the summer and even in the fall and winter I have been there, and the trees had made a good growth and apparently were in good condition. We are trying to show the people what the trial orchard is for. I know in Medford there is a great deal of money spent for nursery stock, as I have to give the secretary a report; I know that $1,700 was collected by one nursery firm last spring for stock sold in our city, to be delivered over the surrounding country. That is a great deal, but if the farmers do not know how to go ahead with their nursery stock, they will soon kill it. I am experimenting with 250 trees and I want to keep it up; I always gather good information here, and I think I will succeed before anybody else, at least I hope so. The orchard is five acres, about two of which have been planted, and the location is very good, and the soil is extra good. Mr. Harris has been supplied with trees and he wished very much that the society would supply him with tree protectors; I believe that is a good thing for that country; the cold is so severe that the tree should be protected. We have received 200 trees and only 100 protectors. The idea of tree protectors is something I have tried myself, and there is a great deal in it.

Mr. Barnes: In confirmation of what our friend Lambert said about the Medford orchard, I would like to second the request that he makes that that orchard have more attention. There should be more missionary work done in that orchard; it is in a worthy place, it is a magnificent site for an orchard, and even if it is cold there, the man in charge should be educated along the line of taking care of the trees.

Mr. Marshall: I would like to second Mr. Barnes, and wish to explain that Mr. Tarrant had charge of that orchard and we had the misfortune to lose Mr. Tarrant, and were rather handicapped.

BUILDING UP AND MANAGING A SUCCESSFUL NURSERY.

To build up a successful nursery, the man operating it must give his undivided time and attention to the business, and must go into it with a determination to stay at it.

The nursery business cannot be built up in a day, so the fellow who is easily discouraged and has not stamina enough to survive its ups and downs had better leave it alone.

To attain any degree of success in the nursery business, the nurseryman must be thoroughly acquainted with every detail of the business, not only with the propagating and growing but must know how to get rid of the stock after it is grown; so that it will not only be profitable to himself but satisfactory to the purchaser. The nurseryman must be energetic, alert and up to date in business perception, and scrupulously honest in every move he makes.

The soil is a very important factor in the nursery business. It should be a well drained piece of land; if not naturally, it should be artificially; for the main point is dryness, as no kind of fruit trees will thrive where the soil is saturated with stagnant water. New land requires no fertilizing but old land should be so fertilized as to grow a good crop of grain.

The all important factor is to plant and grow good stock. Good cultivation, judicious trimming, thorough spraying, using all the modern methods and implements, and the employing of the best help to be had who are able and willing to do the work in the best possible manner must be strictly adhered to. Cheap or poorly paid men usually turn out cheap work. If the laborer is paid well, he will put forth his best efforts and the unprofitable one will soon be located and a good man found to take his place. A careless, brainless man will spoil more in a week than it costs to employ a pains-taking, intelligent man a month.

A storage and packing building should be so constructed as to be thoroughly frost proof; supplying all ventilation possible; also admitting all the light to be had. It should be large enough to hold all the stock and room for boxing and loading. Appliances for loading should be installed so as to be able to load with rapidity. Time is money with nurserymen during the shipping season when so many are employed.

The grading of stock takes considerable time but it pays in the end. Nothing disgusts the purchaser so much as careless grading. Four to five foot trees mixed in with the five to seven foot when the order calls for strictly five to seven foot. The same is true of small stuff, vines and shrubs.

In placing the trees on the market we should not be too anxious to get rid of the second and third class trees. Raising trees is like raising live stock, only more so, for in spite of all you can do when you come to dig you will find many stunted, ill-shaped trees, poorly rooted, and black hearted among all varieties, which if transplanted will occupy the place of a good tree but will never give the desired results. A planter can far better afford to pay 50 cents each for a first class, thrifty apple or plum tree, five to seven feet high, ¾ one inch caliber, of a variety adapted to our soil and climate, grown in this trying region, than to pay one-tenth of that price for a poor variety or for one that has been injured in any way. The good tree will not take up any more room than the poor one and it will continue to be a source of profit after the cheap tree is dead and gone.

If all nurserymen would deliver only first class stock of varieties adapted to the locality in which it is to be planted, and keep experimental and untried stock off the market; pack and ship properly so the planter would receive in first class condition; instruct the planter in an honest, intelligent way; encourage him by replacing free of charge one or more trees should any die, and by so doing show the confidence we have in our product; and demand what such stock is worth; then we would soon see the farmers devoting at least part of their time to the growth of fruits, not only for their own use but would supply the markets with good profits.

If an agent is employed we should assure ourselves that the fellow has the following qualifications: first, honesty; second, ambition; third, a pleasing and weighty bearing; fourth, a hard worker; then, if that sort of a chap goes out he gets orders and continues to get them year after year from the same men, if the nursery continues to deliver good goods, and does as it agrees.

The secret of success in the nursery business will apply in all lines of business. An honest, persistent effort on the part of the nurseryman, the gaining of a reputation to put out a good arti-

cle at a living, honest price, good men to grow the stock, good varieties grown, good honest men to sell, good goods to deliver, fair treatment to the customer, then successful will be the man who conducts his business in this manner.

DISCUSSION OF MR. CASHMAN'S PAPER.

Mr. Pearson: I would like to ask the gentleman what his method of ventilation is in his cellar in this cold weather.

Mr. Cashman: We have free air space in our walls, and we have a range of chimneys, so to speak, between those walls, with an air chamber at the bottom of the wall and also a chimney above. We have a cap on the chimney above, on the outside, and another one on the inside, so that any time we want to ventilate the building the cap is put on or taken off. Those are constructed opposite each other, the same as the chimneys here, only there are caps to pull out.

Mr. Edwards: Did you ever heel in trees in the cellar?

Mr. Cashman: Yes, I have.

Mr. Edwards: With what results, compared with cording?

Mr. Cashman: I never heeled in but once, and that was in a building that was not thoroughly frost proof, that is, it was not frost proof next to the wall, and the trees heeled in next to the wall burst open, while the ones in the center of the building did not. I could not see any difference in the trees in the center of the building; they all came out in first-class condition.

Mr. Edwards: Don't you find that trees that are corded up are far more dormant in the spring than the ones that are heeled in?

Mr. Cashman: Oh, yes, that is true, more dormant in the spring.

Mr. Edwards: This summer we took a trip through Illinois, Indiana and Michigan, and we found a German in Monroe, Michigan, that all through his nursery business has heeled them in sand. He was the only one that we found in our trip that followed that plan. Now, when spring came along, his trees heeled in the sand would start far earlier than trees corded up in the other cellars where we visited. It seems to me there are three plans of dealing. We have a class of nurseries in this

country that furnish trees on a plan that where a tree dies, it dies yours. We also have a plan where a man makes a contract with you, that if this tree does not show growth after you have planted it, another will be furnished you in its place, and it has been our experience that the greatest degree of satisfaction is given when you stand back of your customer and see him through to success, even if you charge him a little more to start with. I heartily endorse the paper that has just been read.

Mr. Moyle: I would like to ask Mr. Cashman if he delivers for retail, or wholesale, also if he has a catalogue trade?

Mr. Cashman: We are doing a strictly agency business. We have catalogues, but the catalogue prices are the same as charged through our agencies; we have to do that in order to protect our agencies.

Mr. Moyle: I think this would be a good rule for any one to follow. If you undertake this, stick strictly to one trade, either have a wholesale or a catalogue trade. I think a great many make the mistake in doubling in everything.

Mr. Edwards: That opens up a fertile field. I do not think you can point to a nurseryman in the United States that runs a bevy of agents that can do a catalogue business; one of the oldest concerns in this country had to discontinue the agency business, and today out of this same nursery another business is being conducted by different parties, but the goods come from the same nursery. If a nurseryman is going to furnish a catalogue trade and also an agency trade, it certainly has got to be two firms that do that business, or they will get into trouble.

Mr. Moyle: I would like to ask the gentleman in regard to substitution in the nursery business, do you think it is advisable?

Mr. Cashman: We make it a point not to allow our men to sell what is not adapted to the place where it is sold to, and also make a point to deliver exactly what we sell.

Also, speaking about the catalogue business, I find it is almost as expensive to do a strictly catalogue business as it is to do a retail business through agents. It is true we have to pay our agents a good, large commission, but at the same time, when doing a catalogue business, the orders are scattered all over the country, each order must be packed with moss and baled with straw, roots covered with burlap and shipped by express. Now those goods are shipped to the express office, the customer is noti-

fied when to call for them, if he is busy he will say, "Well, I will put that off a few days." In the meantime dry weather comes along and it has dawned upon him that those trees have become a little dry, and if he is a little careless, and not overscrupulous, he will refuse to take those trees, if it is no one's fault but his own. Take the extra expense of baling, packing, express, and the number of orders you are going to lose by shipping in that way to people who are not responsible, unless there is somebody there to deliver them, there is not much profit over the other method. We get a little catalogue business, but the prices are identically the same as those that our agents give.

HORTICULTURE IN THE ORIENT.

By Mr. C. A. Marshall, Iowa.

I remember when a lad visiting the Crystal Palace in London. It was a bitter winter day, but a goodly share of the building was finished off as a winter garden. It was a delightful change from winter to summer. Inside, the air was balmy as in a rare day of June; birds were singing, paroquets were chattering, flowers blooming everywhere, and loading the air with their perfume. It all came back to me as in the first week of February, 1903, we sailed away in the good ship "Moltke" of the Hamburgh-American line, said to be "the most luxurious steamer afloat." Leaving the snowbanks and two foot thick ice of Iowa and wafted by the fog and of a Dakota blizzard we sailed out through the narrows of New York harbor for southern seas. Rapidly, as we crossed the gulf stream the air warmed, the skies brightened and the springtime came in with a bound. And I wondered then as I wonder now, how it will seem when we launch out on "that mysterious sea whose shore is never shadowed by a homebound sail" to enter our desired haven and find there—

> "A land where everlasting spring abides
> An never withering flowers."

Madeira was the first land we made and surely if Paradise is anywhere upon earth it is here. Sixty years had come and

gone since I visited this favored isle. We dropped anchor at Funchall about sundown and gentlemen came on board in "white ducks" and straw hats a great contrast to the wraps and furs of New York. The soil of Madeira is scanty but rich. A variation of but 10 to 15 degrees in the temperature the year around enables the people to raise anything they want to. There is considerable moisture there but I noticed they were watering the plants in the public garden where I sat a good long hour enjoying the scene and taking note of the shrubs, trees and plants. But on the favored isle flowers bloom everywhere and all the year round; roses, camellias, geraniums, lilies, flowering vines and nasturiums make the island a veritable garden of the Gods. Madeira was probably the finest grape country in the world at the time of my first visit, and its wine has made it famous. But the dreaded phylloxera or grape disease came, and though the grape industry has somewhat recovered, it can never be the same again. A Methodist minister who had lived many years on the island told me that not 5 per cent. of the decoction exported and sold as Madeira wine was the juice of the grapes. I noticed, however, that it had lost none of its exhilerating effects. A young tourist of the "Moltke" was struggling with two deck stewards the night we left the isle. "What's the matter, steward, had too much Madeira wine?" I asked. "No, sir, that's not it," he replied. Trouble is "he'd not had enough!" Then they "puckerowed" him and took him below.

Gibraltar was the next point visited and the warm, soft air that swept across the sea from Africa's coast made the trip delightful. Notwithstanding the British have made Gibraltar a veritable arsenal, they have also found time to beautify many favored spots with flowers, and in places I noticed flowering vines creeping over the battlements and even looking into the cannon's mouth. "So idly that rapt fancy deemeth it a metaphor of peace." Crossing the bay to Algerias we took train for Grenada and the Alhambra immortalized by our own Washington Irving. The route lay for nearly 200 miles through the heart of southern Spain. Near Gibraltar the country seemed to be poor and the inhabitants poorly clad and fed, but as we sped onward the soil seemed better and more highly cultivated. Here we noticed the first signs of irrigation an art introduced by the early Moors. Fences of cacti surrounded some of the poorer fields, but near Granada where a high state of cultivation

prevailed there were none. Near Gibraltar at every station waiting shipment were bales of cork bark, many of these curious trees growing here. But the greatest sight was the olive orchards, millions of trees covering hill, valley and plain for twenty or thirty miles Someone sent a telegram up the line that 500 American millionaires were coming and every station was crowded to the full. The orange orchards too were very fine and at every station peasants offered baskets of the luscious fruit for a mere song. It was February yet when we rode through southern Spain but the peasants, men and women were working in the fields under the bright clear skies and the cheery sun. No wonder the women are handsome and the Caballeros a jolly set of fellows. As I thought of Iowa buried under the snow and sealed up tight by the frost king, it set me to thinking whether with all our boasting we really have the finest country and climate in the world.

I was very much struck with the fine avenue of trees skirting the road leading up the hill from Grenada to the Alhambra while the snow-capped ranges of the Sierras lift their silver crowns high in air and impart a delicious crispness to the atmosphere. The Moors were evidently past masters in the art of horticulture. The pinkish grey turrets of the citadel palace may enchant the tourist. The magnificent far-reaching views may inspire the artist, but the trees, vines and flowers which wreath the crumbling walls and fast their glamour over a wonderful chapter of the world's history will cause the footsteps of the true horticulturist to linger there as in a dream. And in the years to come his brightest visions will be of the Alhambra, its palaces and parterres. Its walls, radiant with color, but most of all its flowers laden with perfume, and when he awakes he will say, "Let me dream it again! Let me dream it again!" From Gibraltar after a few busy hours we landed at Algiers. Here the French have done some fine colonization. Its mild climate makes it a favorite resort for the wealthy English and French families. Many handsome villas and beautifully located white stone hotels are built along the heights overlooking the blue waters of the Mediterranean, in the midst of rich tropical vegetation. At one of these, the "St. George," we dined and after dinner I spent an hour or two in the grounds. I should think there were 8 or 10 acres exquisitely laid out; the oranges and lemons on the trees being very fine; flowers and flowering

shrubs being arranged in the highest skill of the landscape gardener. Driving out through the country I noticed the vines in the vineyards, of which there were many, were not trained on trellis and were trimmed down quite short and I wondered if we have fully learned the Oriental skill in the pruning of the vine. The Botanical gardens were an interesting sight for the tourists. The Avenue of Palms half a mile in length was composed of almost every variety of this enchanting tree. Some growing with tufted tops swaying 60 or 70 feet above our heads, others wide spreading and curiously branching. Then a long avenue of enormous magnolia trees that must be a very fine sight when in full bloom. Then there was an avenue lined with a dense growth of bamboo trees creaking and sighing in the wind. Scores of immense banyan trees with great central trunks wide spreading and sending down roots from the branches which form additional trunks so that the one great tree has many trunks to support it. Then there was the wilderness where one seems to be buried in the wild growth of an African jungle and looks furtively for the spring of the lion or the dropping down of some great boa constrictor. It was while sitting in the drawing room of the St. George that I picked up a London paper and among the telegrams was one from Iowa saying that the thermometer was 25° below zero.

A lovely sail along the African coast took us to Malta. It is an island full of interest but not a great deal for the horticulturist to note. The soil seemed as poor and stony as the most sterile New England farm. From Malta with its frowning fortress and small fields walled round with stone piles we steered for Athens. Entering the port of the Piraens we took train 5 or 6 miles to the Grecian capital. Greece, I was told, is a land of vineyards and the plains between the Piraens and Athens across which the ancient Greek troops marched to take trireme for the war are dotted with huge distilleries where the refuse of their vineyards is made up into a decoction labeled "brandy" which can discount for fierceness the corn juice of our western distilleries. The Greeks will have to brew another brand before they undertake to fight the Turks again. At the King's palace where our tourists were kindly allowed to enter we found gardens in a high state of cultivation and in the public park a splendid statue of Byron looked down upon an array of shrubs and flowers as fine as any we saw. The sun was gilding the old

grey columns of the Parthenon as we steamed out of the port of the Piraens and we felt glad at heart to think that for one brief day we had stood among the immortals and that our feet had pressed the rock whence St. Paul declared unto the ancient Greeks the love of the Unknown God. Twenty-four hours later the mosques and minarets of Stamboul rose out of the Bosphorus. We were in the land of the "unspeakable Turk." Dirt and dogs. Dogs and dirt everywhere. There are some fine gardens around Constantinople, but even the vegetables they brought to town seemed grimed with dirt. I hope our missionaries preach strenuously to those frowsy fellows the gospel of soap and water. Some one said a while ago that if the text "cleanliness is next to Godliness" was not in the bible it ought to be.

Smyrna in Asia Minor was the next point of interest with a trip by rail of 40 miles to the ruins of Ephesus. The almond trees were in full blossom, beautiful sprays of pink and white. There were many orchards of fig trees along the road. We expected to get some fine figs at Smyrna but the best all go to London and New York and those offered for sale we would not buy at home. The same was true of the dates in Egypt; the best of the fruit is all exported. At Ephesus after viewing the ruins we returned to the railway depot and there saw a train of 50 camels each laden with two bales of the finest Turkish tobacco file up to the platform and kneel down while their burden was removed—patient, noble animals!

Beyrout was the first point made in the Holy land. Here we saw a fine open country backed by the lofty ranges of Lebanon, snow capped, while in the distance we could see the far famed Cedars. Palestine seems quite destitute of timber. We saw but little all along the coast. We touched at Haifa to land tourists to Galilee. Most of the party went direct to Jaffa and landing amid its dangerous surf, took train for Jerusalem. In the orchards around Jaffa are raised the best oranges in the world. Our party bought liberally at the rate of 20 cents for a basket containing about one-third of a bushel. They fetch the highest price of any oranges in the London market. Our train passed for a few miles amid orange orchards, long rows of eucalyptus trees and fig trees just budding into new life; the gardens and fields were fenced with prickly pear or cactus. The farmers were plowing with camels, one camel to a plow and the

plow looked like a crooked stick. Sometimes an ox and a small donkey would be hitched to the plow.

The first 25 miles out of Jaffa lay through the plains of Sharon and I could understand then what was meant in Scripture by "a land flowing with milk and honey." The rose of Sharon is a red poppy with a black center on a short stem. The barley was still growing rank as in the days when Sampson found his fun in sending forces with firebrands into the fields of the Philistines. The Holy City itself is not much blessed with foliage and shade. At the Kraminski Hotel where we stayed there was a fair garden but much of the land around Jerusalem is of a stony barren nature. The garden of Gethsemane is the brightest and most beautiful spot about Jerusalem. Here one of the priests in charge presented me with a sprig of olive from the garden and some lovely flowers. They are among my most cherished souvenirs of the voyage. The cauliflowers raised about Jerusalem are the finest I have seen anywhere and the honey has no equal in any part of the world for delicacy of aroma. Here and there we saw peasants plowing little patches with a single donkey and crooked plow or digging between rocks and around grape vines with a heavy hoe. The grape vines like those in Algeria are trimmed back to within 3 or 4 feet of the ground and are not supported or trellised. We were glad of some olive tree grubs to keep us warm during a cold rain on the Sunday. This appears to be almost the only fuel they have and sometimes the weather is bitterly cold. Anyone who should come here expecting to see a city beautiful for situation would I fear be disappointed. The verdure covered hills and bluffs around Madison and McGregor are beautiful in their ever-changing hues and tints but the bare grey rocks and treeless hills around Jerusalem, though unique and interesting from hallowed associations, cannot be called really beautiful. One lady at our hotel said that she never wanted to hear again of heaven as the "New Jerusalem," the comparison was too odious—alas! the blight of Turkish misrule is everywhere. Jerusalem will be a beautiful place when the "great assassin" is cast out.

It was the middle of March when we started up the Nile from Cairo. Rain is almost unknown in Egypt; without the overflow of the mighty river which is fed by the great inland seas of the Nepanzas; without the great retaining dams and irrigating ditches all the Nile valley would be a desert. There is

no more joyful message in Egypt than the word which is passed around about August 1st, "The Nile has begun to rise." We went to Luxor by train; our hotel looked out upon a magnificent orchard of date palms; under my bedroom window a great oleander in full bloom loaded the air with a rich aroma. Roses, geraniums, in short every kind of flower seemed to thrive amazingly. The secret was in the irrigation. Every third day the waters of the Nile are let in and everything living rejoices and blossoms as the roses. I found more pleasure in that lovely garden than in the tombs of the mummied Pharaohs. Everywhere in Egypt the beneficence of British rule is manifest; law and order, improvement in agricultural and horticultural conditions are prevaling. The overflow of the Nile may give but one crop but the irrigation by the new dams will give three or four crops a year aided by the warm Egyptian sun and the most fertile soil in the world. It is said that the new dams will pay for themselves in five years or even less. What Egypt of today needs is homes and gardens for its rapid increasing population. The land of the Pharaohs seems to have but few homes between the harems of the rich and the mud huts of the fellaheen. Egypt may have a glorious sky and a winter unmarred by frost and snow but the showers which fall on the rich gardens and broad corn fields of Wisconsin and Iowa bring treasures of far higher worth than all the wealth of the Nile. I contrast the poor fellah toiling in the scorching sun as he dips his buckets to pour the slender stream into the irrigating trench, with the western farmer who sits in his veranda while the showers drop the early and the latter rain on his thrifty fields and those lines of Cowper come back to me:

"There's mercy in every place
And mercy encouraging thought,
Gives even affliction a grace
And reconciles man to his lot."

WHAT MEN SHOULD NOT EXPECT OF WOMEN IN GROWING SMALL FRUITS FOR FAMILY USE.

By Miss Ella Menn.

The question is not so much, what fruit can a farmer grow as what fruit will a farmer grow in this state and will he take care of it after planting, because it has long since been fully established that Wisconsin farmers can grow small fruit for family use. Look at a list: Strawberries, blackberries, raspberries, currants, grapes, gooseberries, etc.

I think it will be generally conceded that as fruit growers one should encourage our farmers in Wisconsin in the matter of fruit growing, because we cannot help feeling that the farmer who depends on the town or city market, instead of his own garden or orchard, for the fruit his family uses is not quite normal in condition, or does not live an ideal farmer's life at least, such as every farmer should and will have when he awakens to the full sense of duty. He owes his family a small fruit garden, one-half acre or more, in proportion to the size of his family, for right here he has the very best home markets that will take at good prices every day in the week many quarts of the choicest product of his plants. Three times a day, either fresh or canned, the whole year around, our tables should be supplied with these refreshing and health giving fruits of our own growing. A taste for fresh fruit is growing fast. Many a farmer returning from an institute or his county fair to his home will with his family talk over the advisability of growing small fruit for family use. He is quite enthusiastic of what he has seen and heard; the housewife is happy to learn that her family is to have an unlimited supply of choice, delicious fruit that she so long has been wishing for. They enter into a partnership business, John agreeing to do all the work of planting, cultivating, hoeing, she to attend to picking and canning.

The plants are bought, John looks for a suitable site. It is a question with him, Can I afford to take one-half acre of this choice corn ground? Next to the pasture will do as well; it is stony and the soil not so good; there will not be any fruit this season anyhow, but I will speak to Mary. Mary pleads with

him not to use the poor soil because of the extra work required in cultivating and hoeing owing to the stones and stumps and the danger of cattle breaking into the fruit patch. She finally wins. The plants are set in nice straight rows on the best soil of the farm.

The climatic conditions are favorable, the plants grow nicely, so do the weeds. Mary reminds John of his agreement; he realizes that the weeds are coming on pretty fast, but his corn field takes his time and attention, also other work crowding. He finally puts Sam (the hired man) to work with horse and cultivator, telling him to finish as quick as possible. The weeds are checked between the rows, also some of the plants by being covered, but the weeds, not disturbed, grow faster. Mary reminds John of the hoe. He finds this too small a tool to think about; he is all wrapped up with the golden ears of corn growing, and the profits derived therefrom. She pleads in vain. The only thing she can do is to wield the hoe herself. John is often reminded of the agreement, but with him it's work, work; he can't see any profits in that one-half acre. Mary loses all faith in man's promises and becomes silent but continues to keep the weeds under control with the assistance of her children. Tired and weary she returns from the field to prepare the meals which John expects to be served at the regular hour.

The season is past; John's golden ears of corn harvested. He figures the profits, 40 bushels of corn per acre at 40 cents per bushel, means $16 or $8 lost on the half acre. He doesn't figure his time in growing his crop. What has Mary to show on the half acre? Nothing in dollars and cents, but a good standing of plants and bushes for another season's crop.

In the rush of mind and body after the almighty dollar, that mother or that wife or daughter, whose life gives the world home its meaning to every man, should not be forgotten. The farmer owes debts of honor first to his wife, second to his children, and lastly to his business. His wife who has paid him the high compliment of marriage should be a preferred creditor, instead of that in many homes the marriage contract seems to stand as a bar against thoughtful and just judgment.

The man whose mind dwells more on his crop or improving his farm buildings than his wife's comfort should be severely punished. A farmer's wife not only has a right to be thought

about, but she has a right to think herself; she is or ought to be considered a partner in her husband's business.

Should not the husband find ample time to cultivate the small fruit patches during the growing season, and not expect the wife or daughter to wield the hoe in this work? Has not the busy housewife all she can do to attend to her home duties? As a business partner the wife's main duty pertains to those things which are attached directly to the home. There is a natural and proper division of labor up to a certain point, but when the husband has no thought or knowledge of the daily growth and training of his children and the so-called little things of the household.

The wife or daughter will gladly attend to the picking and cleaning and canning of the fruit, but do men ever realize what it means to stand by a hot stove during canning season?

Must we not take care of the home, to do our best to make the home happy, and prepare the meals to feed the men, to soften their cares, to frequently assuage the savage moods?

Should men be so inhuman to expect women to stand in the hot sun weeding and cleaning the fruit patches, when with all their regular routine housework they are kept busy from early morning until late at night?

The farmer's wife has a right to an equal share of the profits of her husband's business. Success should mean as much to her as to him. If to him it means larger barns and broader fields and better stock, it should mean to her, if she so desires, more time for social pleasures and better clothing for herself and children; also books, furniture, pictures, and those unnumbered things which add to women's comfort.

THE TWENTIETH CENTURY WOMAN.

By Miss Eva Loope.

Of late we are hearing a great deal relative to the twentieth century woman Did it ever occur to you what man's idea of her really is? If not, I shall endeavor to paint a composite picture (a most startling color piece) from the standpoint of a twentieth century man.

First he will mingle the ambitions, high-headed, caste-worshiping matron, whose aim is to lead in public functions; the spectacled young lady, whose whole soul is intent on the latest, the very latest style of dress and personal adornment, whose aim is to walk with a kangaroo curve and stare with a stony gaze—the non-seeing glare that betokens exclusiveness, and whose chief desire is to build her own reputation on merciless criticisms of her less favored sisters in folly—who rates her male friends on the footing of the pocket book and has no heart nor hardly a conscience.

He will then add the business woman who carries an alert manner and keen perception, who is always looking out for the main chance, who plunges into affairs with the air of one who understands all the "ins" and "outs," who discusses grave matters with perfect poise and self satisfactory acumen and affects chiefly as comrades men of prominence and importance in civic affairs.

He will now mix in the languishing miss in her teens (who always stays there), with her affected lisp and simple, giggling ways, who is so clinging and unsophisticated in manner, who appeals to you with a look and question in even the most trivial matter.

He will not forget to put in the soulful woman, with her romantic ideas ever uppermost and who dwells on her capability of ideal enjoyment with her esthetic affinities. Here he will put in the social reformer who prates of purity and elevation of the standard of morals for horrid man and who has a hatchet concealed in the folds of her gown ready for any occasion.

Then he will mention the jealous woman who has suffered

untold agony through the manifold transgressions of base man and baser woman. He will not forget to add the woman whose heart and hands are full of home duties, who is the joy and serene light of her household, whose heaven is the love of her children and husband, and whose influence over all is tending to draw down blessings and benedictions on her angelic head. The look of the Madonna is over her countenance, and his composite picture is immeasurably softened and lightened by the mingling of her beneficent virtue.

And now the question that comes is, What can and will the twentieth century woman do? But, indeed, we are unable to say what the twentieth century woman will do or will not do, for she has burst upon us in so many new and startling roles and in such unexpected ways, that we try not to be surprised at anything. But this we do know, that she will be a progressive woman. She will not be content to give way to man who has considered her, for so long, his inferior. She has already taken the initial step and stands out in the arena ready to solve the problems of her time and age and to grasp the opportunity that shall fit her as an equal on the same plane with her co-worker, man.

In glancing over the daily paper this glaring heading met my gaze: "The New Woman Has Broken Out in a Fresh Spot." It gave me quite a shock, thinking perhaps it was the smallpox or some other dreadful calamity that had befallen her. But no. She had simply approached a civil service commissioner and had requested him to assign her to the responsible duty of field examiner. Being qualified, she received the appointment and started out in this new field of labor.

But now the men have begun the cry that women are crowding them out of their domain, becoming lawyers, doctors, brokers, bankers, preachers, and in fact filling almost every position of honor or trust in the land. So they have; but it was from necessity as the men have pushed into their sphere, becoming weavers, bakers, dressmakers, and milliners. Every third man we meet knows a female broker, manufacturer or physician.

Women are mastering the technique of all branches. They sit in the councils of art, literature, finance, and religious advancement. Indeed, men grow more and more ashamed of the old foolish contention, that certain innumerable barriers shut women out from achieving distinction in the various profes-

sions until recently monopolized by men. Women do foolish things, certainly, but they have never been foolish enough to argue that *their* sex prevents *men* from succeeding in certain lines. Every woman of fashion knows that there are man milliners who do simply incomparable work, and I see no reason whatever why at some time or another a military genius like Washington, Napoleon or Frederick the Great should not find expression in a woman's brain and a woman's personality.

Experience has taught working women that they have not yet fully convinced man of the equality of their positions. I have heard of a New York millionaire who, not long ago, had a *chef* to whom he paid a salary of $5,000 per annum. Note that when a man is a *cook* he becomes a chef and draws a salary, not wages. So man stepping into woman's place becomes an autocrat and receives better pay for the same work. Where woman takes the man's place conditions are reversed. The twentieth century woman's principle is, "Equal wages for equal work," and I am sure the world is coming to her way of thinking.

To some masculine minds woman seems to be wasting time in attending clubs. Club life is uplifting. It takes her out of the usual ruts of thought and action and gives her a broader outlook, a deeper insight and a clearer understanding. It aims toward the intellectual development, toward culture, toward betterment of self and society. There is no class in any community so interested in all departments of progress and improvement as women.

The Woman's Federation of Clubs is dong much good in many lines of work, but they are especially interested in the American League of Civic Improvement which aims to promote the higher life of American communities. These civic improvement clubs have been effective in arousing public sentiment and local leagues have sprung up all over our land. The widespread growth of interest in this movement for public beauty was one of the notable developments of the closing years of the century just ended and *civic improvement* promises to be the watchword of the twentieth century.

The women of our state have done much to revolutionize the communities in which they live. They realize as they never did before that in this twentieth century public opinion demands a pure water supply, perfect drainage, pure air, abundant light, together with well paved streets, a system of parks,

and houses with their home-like surroundings, as being among the essentials for a beautiful town or city.

I do not deem it necessary for one to belong to a league of any kind in order to make improvements but I do think more and better work could be done by concerted action. The thought that came to my mind was this: why could not the women of our local horticultural societies form themselves into a club or league for the purpose of doing what they could toward making their town, neighborhood or city more beautiful and healthy. They could meet in conjunction with their local horticultural society and I have no doubt that the men of their society would gladly lend their aid toward so desirable a movement. In this way much good could be accomplished. The needs of a community differ so widely that each association would have to decide for itself that which a locality most needed and to try to supply what is lacking, if possible, whether it be window-garden, shade trees, water works or sidewalks.

A vital factor for the success in any community is to have an intelligent, enthusiastic, untiring and tactful leadership. Having this, all things may be secured in due time. Lacking this, the immediate step is to find, interest and educate the leader.

Get the children interested. The children of today are to be the workers of the next quarter of a century. We must imbue them with an interest and a love of the beautiful and a sense of responsibility, that they may take a hand in the welfare of the community, and I believe the earlier in life you can do this the better. So I say get the children interested and through them we may interest their parents.

Let us resolve, therefore, to make America the most beautiful country in all the world, the most wholesome, the most lovable, then we will have fulfilled a glorious mission and can say with the poet Montgomery—

"There is a land of every land the pride!
Beloved by heaven o'er all the world beside,
Where brighter suns dispense serener light,
And milder moons imparadise the night!
A land of beauty, virtue, valor, truth,
Time-tutored age, and love-exalted youth;
The wandering mariner, whose eye explores
The wealthiest isles, the most enchanting shores,

Views not a realm so bountiful and fair,
Nor breathes the spirit of a purer air.
* * * * * *
Here woman reigns; the mother, daughter, wife,
Strew with fresh flowers the narrow way of life;
In the clear heaven of her delightful eye,
An angel guard of love and graces lie;
Around her knees domestic duties meet,
And fireside pleasures gambol at her feet.
'Where shall that land, that spot on earth be found?'
Art thou a man?— patriot?—look around;
O, thou shalt find, howe'er thy footsteps roam
That land *thy* country, and that spot *thy* home."

TRAVELS AMONG THE MOUNTAINS AND FRUITS OF CALIFORNIA AND IDAHO.

By Mrs. Daniel Huntley.

In the summer of 1902 it was my pleasure to visit many places on the Pacific coast. The traveler who would see magnificent mountain scenery, will find the scenic route a continual delight. But little need be said of the mountains. No language can describe the grandeur of the Rockies. The enthusiastic tourist will gaze with untold admiration upon their lofty heights, tremble upon the edge of some fearful precipice, and thrill with delight as he passes the pictured rocks and enters the "Castle Gate" and sees in the distance, sheltered by the dark mountains, beautiful castles of buff colored rock standing in groups like elegant buildings in some ancient city. So perfect were these castles with towers and domes, with elaborate cornices, and projections like dormer-windows, that lost in admiration we fancied, that some gay throng had sometime lived within those spacious walls. Along the course of a winding river, through deepest gorge, over yawning chasm, past pretty lake Palmet, at seven thousand feet elevation, the tireless engine bore hundreds of pleasure-seekers to the cities of the coast with innumerable

memories of that western land. In the beautiful state of Washington the wonderful view of mountains, lakes, forests and rivers surpasses description. The Cascades and the Olympics look down from their snowy peaks upon the glittering waters of lakes Washington, Union and Puget sound, and away in the distance alone, among surrounding hills covered with perpetual snow, stands Mount Ranier four thousand five hundred feet in height, the queen of the mountains.

A delightful winter in Seattle where there was neither ice nor snow was a pleasing contrast to the bitter cold of the middle west, flowers were blooming all the year long, the lawns were beautiful as a carpet of greenest velvet, the English ivy-covered wall, and arbors, and gate posts with no touch of frost to mar the beauty of its glossy leaves, and roses in bloom at Christmas time made one forget that it was winter.

The fruits of the Pacific coast, particularly apples, pears and peaches, surpass those of the middle west in size and beauty, but they are not superior in quality. Small fruits, especially strawberries, may be an exception. In Washington they are very large and fine. In western Oregon many fields of forty acres are devoted to this excellent berry. The Hood River strawberries are widely known for their fine quality. Cherries are plentiful and very large, much better than those grown in the east.

Only those who have seen the fruits and flowers of California can fully appreciate them. The orange groves are more beautiful than any artist could show them in pictures. Acres of trees covered with living green and golden fruit from topmost branch down to the ground is a sight never to be forgotten.

The flowers of California are beautiful beyond description; acres of golden poppies grow wild in many places and little patches of them are seen by the roadside and on many ranches. The passion vine so rare in the east adorns fences and gate posts with gorgeous scarlet blossoms. In parks and gardens roses of every variety grow everywhere, over trellises, arbors, and porches, climb to the roofs of dwellings and wave their sweet blossoms over fences by the wayside. Heliotropes cover the sides of buildings, fuchsias blossom higher than one can reach and geraniums make a perfect hedge of scarlet bloom.

The ornamental trees of California surpass those of the north in size and in beauty of foliage, and flower. Many varieties of

palms adorn lawns and streets, some of them very tall and slender, others of immense breadth. The eucalyptus is used for wind break among the orange groves, its peculiar flowers are quite conspicuous. The fragrant camphor tree, the acacia with its bright yellow star-like flowers, the pepper tree with its graceful willow-like foliage and clusters of bright berries are some of the finest in the south. After leaving the orange groves of southern California we stopped two months on the mountains in Santa Clara county, sixty miles from San Francisco where prunes are grown extensively. After the spring rains frequently there is no rainfall for three months. The fruit matures at an elevation of fifteen hundred and two thousand feet without irrigation. The soil is deep and rich. Clean culture is necessary and no weeds are allowed to grow beneath the trees.

On these mountains, far up the side, may be seen a clearing of native trees where some ambitious ranchman has built his white cottage and planted the prunes, and away on the summit can be seen another white cottage and another ranch; at evening the twinkling lights among the trees tell of other ranches, and in the early morning a tiny cloud of smoke can be seen rising amid the trees from another ranch where the mountain like the desert will blossom like the rose. This view was wonderfully fascinating, more interesting, if not as beautiful, as the orange groves of the south.

Many grapes are grown in this region; they are trimmed like shrubs and need no support, and are very prolific. It is said that sixty pounds of fruit have been gathered from one vine which an umbrella would cover.

Pears, peaches, figs, quinces are grown on these mountains for home use, but not for market in large quantities. Cherries, black and white, are grown extensively and are very fine. Apples are not considered profitable or desirable for family use. In fact, one ranchman cut down his apple orchard and planted the land to grapes because they were more profitable.

If the traveler would see fruits and flowers growing in luxuriance among nature's wildest scenery he should visit the Snake river country in western Idaho. After leaving railroad conveyance, a ride of thirty-five miles by carriage over the flower-covered hills of Idaho was very delightful. The wild flowers of Idaho are more beautiful than we have ever seen in any country; a low growth of purple and white flowers much

like lily-of-the-valley covered the ground in many places. Flowers in every color, scarlet, yellow, blue and white grew in groups like a garden flower bed; in the crevices of the mountains long rows of the white syringa grew among the rocks, and all along the shelf roads of the mountains wild roses and yellow and white flowers grew so closely on either side that we could reach them from the carriage. We gathered many of these mountain beauties, while we regretted that they could not be transplanted to eastern homes.

After two weeks of ranch life, interspersed with many carriage drives to the mining villages, a party of three left Indian creek ranch on horse back over a mountain trail for the Big Bar on Snake river. The ride on the summit was through a low growth of trees and shrubs, but as we descended the mountain the trail became very steep and narrow, often turning at right angles on the edge of a precipice, where one misstep would send the horse and his rider to sudden death. After passing many of these perilous places, the trail wound around the mountain through bits of woods and grassy slopes, among ferns and tiny waterfalls, till we reached the Big Bar, six miles from Indian creek. Snake river is a deep and rapid stream which flows in zig-zag course between two mountain ranges; in many places on its western bank the mountain rises nearly perpendicular from the water's edge; on its eastern bank the big bar extends half a mile to the opposite mountain.

Here in this wild place, accessible only by mountain trail or by raft on a treacherous river, fifteen miles from any inhabitants, forty miles from a postoffice, sixty miles from any food supplies, a lone man past middle life, in love with horticultural work, sought this isolated spot to escape the depredations to which all fruit growers are subject, and now after seventeen years of patient toil, in a climate of intense heat in summer, by irrigation from mountain streams, he has a fine orchard of choice apples, also many of his own seedlings, pears, cherries, grapes, berries of many kinds, lovely trees from southern lands, sweet roses and beautiful animals add countless charms to the solitude of this ever desolate mountainous land. Long may this pioneer horticulturist be remembered for making "the world better because he lived in it."

With many pleasant memories of the magnificent scenery of the Pacific coast, of the unrivaled beauty of its flowers, the ex-

cellence of its fruits, we returned to Wisconsin with delight. We are proud of her record among her sister states; we love her rugged hills, her beautiful lakes, her delightful summers and her lovely autumn days. We cherish the memory of her honored dead, and while we deplore their loss, we know

"When good men die for years beyond our ken,
The light they leave behind them fall on the paths of men."

Many of the pioneers in horticulture who often met with this Society have passed to the great hereafter. To the younger members their life work is a rich legacy; their words of wisdom will be long remembered, and the fruits they have originated and the flowers they have perfected will long remain to perpetuate their memory and to beautify the earth.

Specimens of apples grown on the Big Bar in Idaho were shown in connection with this paper, among them was the Eckle's seedling, a sweet apple, as large as the Northwestern Greening, color light yellow, often striped with red, quality excellent, good till December.

A SYSTEMATIC STUDY OF TREES IN OUR PUBLIC SCHOOLS.

By Miss Grace Troutner.

The heart of education, as of life itself, is purpose. To learn what is true in order to do what is right is the summing up of the whole duty of man. But Lowell says:

"Who does his duty is a question
Too complex to be solved by me;
But he, I venture the suggestion,
Does part of this, that plants a tree."

There seems to be a growing demand that everything should be taught from the standpoint of the practical in education. Therefore simply to study trees is not enough. There should be a purpose in that study. Particular trees should be studied

because they are worth knowing about and particular facts should be learned because they have a bearing upon one's life. "Learning those things in nature that are best worth knowing to the end of doing those things that make life most worth living" has been expressed as the purpose of nature study. It surely applies to the study of trees. One of our best modern educators says that a child's first lesson should begin with the study of trees. (If this suggestion had been put into operation eight and ten years ago we would not find five-sixths of the children who enter the high school today unable to tell an oak from an elm or a linden from a pine.) Zoroaster made the cultivation of trees a religious duty. The loss of reverence for trees goes with a loss of reverence for the beautiful. Only a commercial age could have sloughed off moral obligations to make the world beautiful and to preserve for the future "God's inarticulate children."

When the Pilgrims first landed in America the almost universal forest was the remarkable feature of the scenery. In those solitudes the ax of the woodman had never been heard and for thousands of years the forests had been subject only to the actions of natural causes. To man, who had been accustomed to the open and cultivated plains of Europe, that waste of wood, with its pathless wilderness and its inhabitants as savage as the aspect of the country, must have been equally sublime and terrible. But how soon did our ancestors learn that these noble trees proclaimed freedom from every branch and leaflet, and dispelled their solitude by gleams of civilization which they seemed to radiate. They supplied their fuel and lumber, the raw material which has built their cities, as well as every great achievement of material progress the world has known to this day. From every point of view, the tree has been the most helpful friend of man. No other natural agent has done so much for the human race and has been so recklessly used. But these conditions could not have been foreseen by our ancestors or they would have taken some measure to prevent their almost universal destruction.

President Roosevelt says that twenty years ago meetings for the care and protection of our trees would have been impossible, and again: "That the success of home-making depends upon the wisdom with which the nation takes care of the forests." That seems a strong statement but it is none too strong.

In awakening and arousing a universal interest we would strike directly at the public schools. The rise and growth of "Arbor Day" as a school enterprise has done much to develop a love for trees. But one day out of 365 is not sufficient to devote to a subject that touches the very heart of the material progress of a nation. Then, too, one may strike wide of the purpose for which the day was set apart.

The result of Arbor Day upon the school grounds have not been marked. Too often the work has been impulsive and the interest transient. Trees planted with ceremonious dignity in April have died of sheer neglect before September, and those that have survived have been left to fight unaided the struggle for existence. Little attention has been given to the choice of trees and to the method and place of planting so that they may serve useful purposes when grown. Where an acre of trees in a solid block has been needed, only a half dozen specimens have been planted. To be of permanent value the planting must be of concern to the whole district. Nevertheless, the educational results of Arbor Day endeavors have been most beneficial. Pupils, teachers and parents have learned much about forests as great sources of national wealth to be protected and perpetually maintained. Among the influences that count most in the healthy development of the individual pupil is the spirit of his surroundings. This has a decided effect upon the students' tendencies according as it stands for excellence in scholarship, high-minded purpose and strength of character. The public opinion found among pupils practically determines the conduct and tendency of individual life and decides the ideas that most assert themselves in the career of the pupil. Children interested in the work of selecting, planting and growing trees and shrubs about the school can gain in the work no little knowledge of right principles and methods. If the boys of a neighborhood make the raising of peaches and grapes impossible, a better remedy than the law would be to start them raising peaches and grapes of their own. Some people believe the planting of a tree necessitates only the digging up of a sapling and setting it in a hole. This mistake is undoubtedly responsible for many failures. Some knowledge of tree planting is sure to prove useful to a large proportion of school children.

Wm. L. Hall of the U. S. Department of Agriculture, in one of his Bulletins, states that in the country an improved school

ground is rarely found. (If this is true of the United States in general, I hope that I am not drawing my conclusions too hastily if I conjecture that it is also true of Wisconsin.) "The lack of improvement," says Mr. Hall, "is not due to causes evident at first sight. It is not on account of poverty, for it is almost as common in wealthy as in less prosperous communities. It is not due to a lack of appreciation of the elements of beauty, for where homes are surrounded with trees, grass and flowers, the school ground is entirely neglected.

"Neither is it to indifference in educational affairs, for none are more cordial in their support of school systems and institutions of learning than the American people." The cause seems to be in the failure to realize the importance of comfort and beauty in education and the interest of the American youth in the natural world around him. He also suggests that some mistrust the willingness of the boys and girls to allow trees to grow unmolested on the school ground. It is because of this that I beg each to be given some part in planting or the care and protection of such, because a common cause with a better understanding will help early to awaken a regard for the beautiful and a disposition to respect and help all movements so essential to good citizenship in a modern republic. It is money well spent to make the school house and everything about it attractive and beautiful. The school aims at securing the highest possible development of mind and character. Every element of order, neatness and beauty, every broadening influence, every appeal to the finer nature of the child means better men and women and a more thrifty, prosperous and attractive community.

The United States Department of Agriculture can furnish for the asking, to the school district, any information desired. It is so readable that the average fourth reader pupil may handle with ease. Here the teacher in the rural district may place in the hands of the youth the material by which he will gain at least some practical knowledge. This would be putting into the school something that has to do with the life of the people who have to go to that school. In this respect Wisconsin already leads many of her sister states, in-as-much as Elementary Agriculture is already successfully taught in her public schools. Lest I may be misunderstood, let me say that a knowledge of trees can be best obtained from the objects themselves. There

are some things, however, that can be more easily learned from books. First, what to study; second, many inaccessible kinds must be studied from books or not at all; third, there are some things that can be more readily learned about trees from books than from experiment, such as handling, transplanting, pruning, etc. Thus knowledge will be more comprehensive, less likely to include erroneous notions, if obtained not alone from the natural object but in part from the best works upon the subject.

The nature study work in the first three years of the school life of the pupil should pertain in particular to learning the kinds of trees, creating a healthy sentiment and teaching the pupil to observe. In the rural schools and the grades below the high school the characteristics of trees, the transplanting, pruning and the care of wounds, time of pruning, spraying, grafting and hardy varieties, should receive careful attention. The nature study work should be so systematized that in the end much practical good would result. Why not teach, as we teach facts in history, that the tree gives to us tannin and coloring matter, turpentine and alcohol, rubber and oil, food and medicine, fuel and shelter, that they are soil reclaimers and retainers, holds moisture and forms windbreaks, besides purifying the atmosphere. We might then lead the masses to understand the practical side of the study of trees. How may this be done? By creating the proper spirit among the patrons of the school district. By placing in the library of every school room the reports of the Park and Forestry Associations and other good books upon the subject. By placing in the hands of the ignorant teacher a "Hand Book" on Wisconsin trees. I can bespeak the willingness on the part of the teacher, when she is once aroused to her duty, to work unceasingly. Trees are living things with vital functions and parts. They have systems of digestion, assimilation, and respiration, with special organs for carrying on these life processes. Their leaves have the power under the action of sunlight, to absorb the poisonous carbonic acid gas from the air, to break it up, and, with the carbon obtained and water to form starch. The oxygen is returned to the air unused. They also turn into the air, in the form of vapor, the excess of H_2O, which is necessary for the roots to absorb in order to get the required amount of material for their growth. They breathe, the same as we do, by day and by

night, but much more rapidly in summer than in winter. They have a definite life history as an organism, with periods of growth, maturity and decline and characteristic development in matters of form, structure and size. It takes years to recover from the wounds that man so carelessly inflicts. The many spores of bacteria and fungi which constantly float through the air take lodging in these wounds and the tree dies.

As was said, we are certainly a commercial people and look not to the right or to the left, when we can turn material at hand into wealth. We have demanded of the tree the sap, its very life blood; the bark, its very clothes; the roots, its only means of taking in substance in solution for its growth; its fruit, and, yes, the tree itself and then murmur because it gave not more. This certainly is a lack of knowledge and appreciation. But the day is coming and not far distant when we can say as the Man of Galilee said: "Peace be still." For the Park and Forestry and the Horticultural Societies of Wisconsin have awakened and aroused a universal interest in trees and thus it can truly be said, "Of all that is good, Wisconsin affords the best."

LAND THAT NEEDS DRAINING AND HOW TO GRADE.

By Mr. Irving Smith.

Mr. President, Ladies and Gentlemen:

What is a need? It is an urgent requirement, a want which can not well be left unsatisfied, that which we can not well do without. One may need a new suit of clothes, or he may need to go to the barber. Why not do without both, wear your old clothes and let your hair and beard grow? Because you can not *be* and *do* your *best* without these things. So there is land which is entirely worthless without drains, and all the way up to the point where drains would seem to be as useless as the wet land without them. There can be no argument regarding the wet land, but when one is getting what is usually considered good crops, there may be a point raised against the drainage.

How may we judge the point? Does the crop suffer from water in a wet season? Are there spots here and there which suffer? Is the crop near the dead furrows as good as that ten or twenty feet distant? If the land is a little uneven in elevation, is the crop largest on the higher or lower portions? Does the land dry out in spring as early as is best to put in the desired crop? If the land was drier, could you not grow some more profitable crop on it? By noting these and other kindred points and carefully considering whether the differences observable are due to an over-supply of water, one can judge pretty closely whether drains would benefit or not. If there is enough variation between the best and the poorest to be noticeable in the growing crop, or in the amount harvested without weighing or measuring, should it be weighed you would probably find sufficient difference to make at least one good working profit. This profit is what we are after.

Remember that successful underdraining always decreases the cost of caring for any given crop, and that it is less work to care for a good than a poor crop. Let us say, therefore, that land needs under-draining when it will return the investment, with interest, in from one to five years.

Having decided to drain, how shall we go at it? First, to do first class work, it is necessary to have a drainer's level mounted on a tripod, an extension rod, and a common surveyor's chain. A tape line would answer, but the chain is much more convenient, as it is not injured by being dragged around in the wet.

Do not attempt to do any draining without an instrument, or engaging a surveyor, as it is impossible to do a first class job by guess work, unless you have a fall of several inches to the hundred feet, or continuous running water. Even then it is much easier and quicker to have ditch laid out.

Set instrument perfectly level and where you can see over the entire tract to be drained, if that is practical; if not, set where the lower end can be seen and ascertain the comparative elevation of the outlet and the tract to be drained as far as can be seen. Then move instrument to some other point from which the balance of the tract can be seen. To get at the difference in elevation of your instrument in the two sittings, set the rod at the last point sighted from the first stand and the difference in the indicated elevation is the difference in elevation

sought for; that is, if the elevation indicated from the first stand be 5.4 feet and from the second stand the same point shows 7.9 feet, the difference, 2.5 feet, is the height of second stand above the first.

After going over the ground in a rough way once or twice, one can readily ascertain where the lowest points are, and the amount of fall you have between the lowest points of the upper section and the outlet.

Now measure with the chain and get the distance from the outlet to the farthest point, by the line of the proposed ditch. Suppose the distance is 30 chains, or 120 rods. You want a depth of three feet at the upper end, add to this a fall of one-tenth of a foot to each chain, thirty-tenths, which makes in all six feet. If, on comparing this with the difference in elevation, you find this will bring you below where the outlet must come, cut off one-half of the grade on the main ditch and raise the laterals a little, if necessary. If this will not let you out, reduce the grade one-half on the laterals, as good work can be done with one-twentieth of a foot to the chain (4 rods). If there is a greater fall than six feet, simply keep the required depth and give a little more fall where land is sloping.

Now, as to staking out the ditch. If ground is nearly level, pegs about 1½ feet long are most convenient. If there is considerable unevenness, have assorted lengths. Pegs should be smooth on one side at top so pencil marks may be made on them. Start at the outlet and measure with the chain, putting a peg at each length, then drive them, the man at the instrument directing the driver by a motion of his hand. When the first one is driven set the rod on it and adjust the target in line with the instrument, then follow up the ditch and drive as many as possible to the same level. When it is necessary to make a new elevation, drive an extra one near the last one, leaving it one or two feet higher, readjust target and go on as before.

Next comes the markings. Suppose the peg at the outlet is 3.75 feet above where the bottom of the ditch is to be. Subtract this from 6.50 and you have 2.75 feet. Then write with a heavy pencil, 2.75 above and 3.75 below on the peg. The lower figures indicate the depth from top of peg to bottom of ditch, and the upper figures the distance from peg to grading line; the sum of the two, 6.50 feet, indicates the distance from bottom of ditch to grading line, also giving you a check on the

correctness of your work. As you go up the ditch, subtract from the lower figures the amount of the grade and add same to the upper set. The sum of both must always be the same.

If your ditch be very deep it would be necessary to set the line more than 6.50 feet from bottom, but this is a very convenient height for ordinary work.

To set line, drive a post near the first grade peg and another on opposite side of ditch, six or eight feet apart, and with a common spirit level, set a straight edge board at the height indicated above the peg, and nail. Set another similarly at second peg and then draw a common carpenter's line very tight from one to the other and then put two supporting board across under the line to take up the sag of the line. These may be sighted over the tops of the first two to get the level.

In digging, it is desirable to straighten up the surface, if uneven, the first time over, so one may dig a full or partial length of spade each successive time and still maintain the same grade. To make the final finishing grade, use a common tile scoop of proper size and a light pole about seven feet long with 6.50 foot mark on it, to enable one to get the ditch just the right depth. Be very careful here, as there is not much room for variation in a grade of one to two inches to the hundred feet.

Go over all work twice with the instrument to make sure it is correct. Make out grade peg figures on paper before putting them on the pegs.

Do not disturb any grade pegs until the ditch is complete. Make a light pole with proper marking on it to use instead of the extension rod in setting boards. Lastly, be careful. It pays.

Mr. Silas Smith: While this is all very fine and very necessary on such land as my brother is cultivating, where he has to be careful to get any grade at all, I consider it very unnecessary in a great part of the country which has plenty of grade. We have sixty or seventy acres, most of which has been under drain, and we have never yet used one of these drains, and while I do not by any means mean to say that the instrument is not necessary, what I do mean to say is that there are a great many farmers who, in my estimation, have no need of the instrument,

so do not think you cannot drain the land simply because you have not the instrument.

Mr. Irving Smith: That point was mentioned in the paper, that it is impossible to do good work unless you have several inches of fall to the 100 feet.

Mr. Edwards: How deep do you have to have your drain in order to be successful?

Mr. Smith: Well, the effect of frost on the tile, as near as I can judge at this time, is due very largely to the manner in which that tile is laid.

Mr. Barnes: Is it necessary to put this below the freezing point?

Mr. Smith: The work that we have done I have endeavored to get three feet where I could, but there was considerable of the laterals ran over two to two and a half feet in the dead furrows, where, if you would make the ground perfectly level, it would add another six inches to the depth, and as near as I can judge, the effect of the frost on this tile is not very serious, provided those tiles are laid so that there is no water standing in them. If the grade is perfect, there will be no water standing in them, but if they are full of water and freeze up, they will burst; in most cases it is better to put them below the frost if you can.

Mr. Philips: That is the reason why you want the perfect grade?

Mr. Smith: That is the reason why I want the perfect grade, so that the tile may drain completely, and of course any one knows that water will run better through a perfect grade than through an uneven grade.

Mr. Wilkins: I would like to hear what your experience has been in making use of the siphon principle?

Mr. Smith: We have never adopted that plan.

Mr. Wilkins: There were two drains put in at Whitewater, one on the siphon principle, the other in the open grade, that is, the opening was as large as the main pipe, and the siphon was by far the most successful.

Mr. Hager: I wish to ask Mr. Smith if it is not true that where no water stands in these tiles, that the action of the frost, where they freeze up and are damp, they do not chip like a brick that is wet and frozen. That has been my experience in some cases.

Mr. Smith: It depends a great deal on the tile; we have

one main in which the tile was too soft, was not properly burned, and that tile has continually given us trouble nearly every year since we have put it in; we have had to dig up somewheres a tile that has collapsed either from frost or other causes, whereas, where we have had what seemed to be perfect tile, we have had them laid for twenty years through our severe winters and they came out perfect.

Mr. Barnes: In draining black muck soil along the river banks, where the drain would not necessarily be to exceed 40 rods in length, how close together would you put the drains, each drain emptying itself into the river?

Mr. Smith: I do not see how we can put that question in with grading, but with the permission of the president I will say that there is a general rule which may be reasonably near correct, that for every foot of depth you get one rod in width; that is, if you put your ditch two feet deep, it will reach two rods on either side, and if three feet, it will reach three rods on either side.

Mr. Philips: I was out in Minnesota last week, attending some institutes, and there was a man there from Ohio who said he had fifteen miles of underdrain in his farm, and that one of the first things to do was to get good hard burned tile; next thing was to get an instrument and have a true grade; never to put in any tile unless you took pains to have the grade true, put the brick in well, and you never will have any trouble. Always have a true grade.

THURSDAY MORNING.

President Loope: We have with us some delegates who have not been properly introduced. Mr. Cashman, of Minnesota.

Mr. Cashman: I am very happy to be with you today, as it has been my good pleasure to meet some of your eminent horticulturists in the past, Mr. Philips, Mr. Barnes, Mr. Kellogg and the President and Secretary and a number of others. I felt that if you had many such gentlemen here in Wisconsin, that it was really my duty to meet them. You will probably hear from me later.

On motion of Mr. Marshall, Mr. Cashman was made honorary member of the Society.

Mr. Marshall: I would like to hear Col. Watrous give this Society a few ideas of what the American Pomological Society is doing.

Col. Watrous: The American Pomological Society has been in existence in America for more than fifty years, and had its origin from the need discovered amongst men who loved to propagate and send out good fruit, and men who loved to plant and grow and sell good fruit properly named. It was found at that time that the best fruit, apples, pears, cherries, plums and peaches were grown largely under local names, the same fruit would have from two to half a dozen different names, as it was grown in different places in the United States. So there was called a congress of expert fruit growers, and it is a curious commentary on the state of things then existing, to read an account of the first general meeting that they had, and the secretary goes on to say that the noise was so great that it was almost impossible to understand what was going on, but they were going and tasting the different varieties of apples and then voting, after having tasted them, to see which were worthy of cultivation, and in disputed cases they tried to study out which were identical and which were not. Then they finally tried to obviate that noise and confusion and agreed to have the exhibit in another room, and then trust the work mainly to a large committee chosen for skill and absolute impartiality; then they published the biennial catalogue of the American Pomological Society, which has been the most authoritative deliverance upon the name and the proper value of all fruits in the different states in this Union of any and all things that have been printed, and the work has gone on from year to year. We meet biennially and have papers from practical fruit growers and from young scientific men in charge of the work at the Agricultural Department in Washington, and in charge of the work at the various state experiment stations, so that the American Pomological Sociey gets the first new thought of the works that are on the horizon of horticultural progress. Then we have exhibits of fruit, and if a man thinks he has a valuable new seedling it is brought up there and submitted to a test, and it may be decided to be a new seedling, or it may be an old apple come up from a new place under a little different appearance, but it is

properly classified, and one good thing about the judgments of the American Pomological Society is that they are absolutely beyond suspicion. It has never been charged at any time by any person, disappointed or otherwise, that the decision of the juries of the American Pomological Societies have ever been biased or partial, or have been the subject of improper influence, money or otherwise. The work is of the very highest importance to American pomologists, so much so that there is not anywhere else on earth a scope of country like that of America, where, if you buy a fruit from a nursery, a tree, I will say, in Maine, you are almost absolutely sure that you will buy under the same name on the Pacific Coast. It is also true that if you buy a fruit in any market, you are almost certain that the name on it will bring you absolutely the same fruit that the same name would bring anywhere within that scope of thousands of miles. There is no other place on earth where that work has been carried on so long and so unselfishly and so exactly as it has been in America, and we owe that to the American Pomological Society. It stands to the Horticultural and Pomological societies of the states as the United States supreme court stands as a court of last resort of all. I think every state society ought to be a life member; you ought to have the catalogues, you ought to have the biennial report in your library; it is a small matter, it costs but very little money, but when you want authoritative decisions on a great variety of fruits, there is no other place in existence where you may have it so far beyond suspicion and so exactly done and with so little cost.

President Loope: We have with us also Mr. Patten of Iowa, who has not been regularly greeted, only in a general way; Mr. Patten, have you a word to say?

Mr. Patten: Mr. President, I think I have spoken so often that it will become me not to say anything now.

Mr. Kellogg: I wish he would talk five minutes on cross-fertilization of apples.

Mr. Patten: Mr. President, I hardly know where I shall begin to talk about the matter of cross-fertilization of apples. I can refer to our own work somewhat briefly in the state of Iowa in this matter. We began some twelve years ago at our different horticultural stations to experiment in this matter of artificial cross-fertilization, and we have carried it on as best we could in an initiatory period of this work, and under a great

many discouragements, as must be done in all places that are comparatively new. We had no foundations; we knew nothing of the parentage of any of our apples, and the first thing to do, in my mind, was to endeavor, if possible, to begin to lay a foundation and pedigree, if you please, of fruits, and so, as I have stated to you before, knowing the origin of the Briers' Sweet crab, the parentage being the old large red Siberian and the Bailey sweet apple, we had something of a beginning there, and we began to cross-fertilize that with the Pound Sweet, and we also used Wolf River in this cross, but we have hardly had time to produce very much result. We have quite a number of crosses at my station that we have not had time to produce the results that we are looking for, simply because it takes so long to repeat the generation of the apple. To most men it is very discouraging, to begin to breed up from so low a foundation as we had to begin on with that crab-apple to secure hardiness in the apple that we hope to secure for the future. Hardiness in all this Northwestern region is the first essential thing; without that our work is comparatively a failure, and so we worked altogether with those things that we thought would be the most successful in obtaining hardiness. Then of course quality must be considered, and when we come to cross-fertilize the seedling crab with the better apples, we do not know in two or three generations just where we are going to land, as the saying is, sometimes.

I also began at my station with cross-fertilization of the Soulard crab that was spoken of yesterday, in the very excellent paper read by young Mr. Toole in reference to his work with the native apple. We have quite a foundation laid in that direction. I have now at least the third generation; if the Soulard is a hybrid, we have the third generation from that, it gives a beginning for the state horticulturist to work from, for these young horticulturists to go forward from, so we have secured a foundation for two or three crosses, which makes a solid basis from which to work. The Patten Greening, originating from the Duchess of Oldenburg, and, as I believe, from the Rhode Island Greening, we have thought a very desirable variety to secure greater hardiness and size and quality, perhaps both commercial and home qualities. In crossing the Greening we have used largely Grimes Golden, being an apple of very high quality, and we have several seedlings that have

just come into bearing, and some of them quite promising. Of course we are saying nothing now, comparatively, as to results, that is to be proven yet. But there are some that are quite promising, while crossing with others like the Roman Stem, we get very inferior seedlings, so you will discover it is really a matter of experiment. We have a great many seedlings of this cross, and there are great varieties in them, and I do not know that I can interest you by going further.

I might add just a little to what I have said by the way of selection. Now, in the selections of varieties, every least detail of growth and leaf and freedom from blight, freedom from rust of foliage and everything that contributes to perfection in the tree and perfection in the fruit, if we would secure the highest type that we are after, every one of those little items must be considered, and if they are not, if we do not use great discretion, we may lose a great deal by working comparatively at random, as we have been all these years that have passed.

PLUM GROWING IN THE MISSISSIPPI VALLEY.

By C. L. Watrous, Des Moines, Iowa.

Plum growing in the Mississippi Valley has only started. Mr. Darwin said forty years ago or more that the Mississippi Valley promised to be a fine fruit growing region because the native fruits were of such high quality—so much finer than the natives from which the fine fruits of Europe had been developed during two thousand years. Mr. Budd, who has enjoyed a good deal of reputation as a horticulturist in Iowa, gave it as his judgment several years ago that our native plums had reached their highest development and were inferior to the Europeans, wherefore, in his judgment, men ought to plant Russian plums instead. The facts are that our best American plums, for instance, De Soto, Wyant, Forest Garden and others have absolutely not begun their civilization through the arts of horticulture. They are the self same fruits which offered pleasure to the palates of the savage aboriginies—Black Hawk and others

of his kind. It seems therefore that the culture of plums in the Mississippi Valley offers a most tempting and promising field for intelligent labor.

What I say must be based upon experience in central Iowa and if it seems unadapted to Wisconsin, all due allowance is asked.

It is found in the latitude of Des Moines that the man who grows plums for market makes his best profits from the very early and the very late varieties. As the American plum is strictly indigenous to the soil and thoroughly adapted to all the changes of our climate, many problems confronting the grower of naturalized European fruits are avoided. In fact, it seems to me that the two main problems confronting the planter are: First, the hardiness of the tree and: Second, the matter of pollination; and the matter of pollination is to that of hardiness, as twenty is to one. In the latitude of Central Iowa it is coming more and more to be the accepted judgment that varieties having a large infusion of the Chickasa or narrow leaved species are, on the whole, more profitable than the strictly Americana sorts such as Wyant, De Soto and the like. Varieties from the north are more subject to rot than those from the south. The most skillful breeder of plums whom I know says he can, in a short time, breed from seedlings of any thick leaved Americana sort a variety with smooth and comparatively narrow leaves and that in the latitude of Des Moines and Omaha. Also that he can take a narrow leaved Chickasa from Texas and from it, without crossing, breed in the same latitude a variety having a leaf much like the one last above described. This shows the importance of selecting the varieties to suit the latitude and conditions of the planter.

After this comes the problem of securing adequate pollination. Very few of our American plums pollinate themselves properly. Therefore more kinds than one must be brought into close companionship—and I use the word companionship advisedly. Some of our best growers believe that trees need companionship as much as men and mourn when left alone. The ideal method of securing proper cross pollination is to graft several sorts into the same tree. The most successful plum breeder and plum grower whom I know says that he has, on an average, from two to five varieties in every tree in his market plum orchard. Planting the trees alternately in the same row

is not enough, as I have found, although it oftentimes seems to do very well. The better way is to plant a thrifty young tree and graft two or three of its branches with other sorts of those that are, in specific characteristics, as near like the stock as possible and which bloom at about the same time. Of course it is not as convenient to gather several varieties from the same tree as to have a tree or a row or a block of one thing and no mixtures, but it is easier to gather ten bushels of plums from ten trees, each bearing four kinds, than it is to gather five bushels from ten trees standing by themselves and having only a peck of plums all told. Therein lies the crucial test of the whole matter. If you can bring into close companionship several sorts that are of nearly the same character and time of blooming, you may have reason to expect fruit every year unless natural conditions prevent. The ideal beginning of a plum orchard is, in my judgment, a strong growing, hardy and fruitful variety, adapted to the locality, top grafted with two or three other sorts leaving always a branch or two of the stock untouched. In the latitude of Des Moines the Miner plum makes the ideal stock, according to my experience. In Wisconsin something else might be the one, but having selected the stock and placed the scions of other varieties in the proper position, one has only to care for the trees reasonably well and trust in Providence.

One other point: I maintain that no man can be the perfect pattern of the plum grower without doing something to produce new and valuable varieties. Select from trees bearing desirable sorts the largest and finest fruits growing in positions favorable to cross pollination. The first to ripen will tend to produce early ripening offspring; the very last to hang on the trees will tend to produce late ones. We can breed bitterness out and sweetness in—just as Europeans have, and almost any other quality desired.

When the seedlings are one or two years old they should be critically examined and those showing weak and straggling growth or small, rough leaves should be weeded out and destroyed, or used for stocks, for size of leaf is an indication of size of fruit and a weak, straggling grower can never be made commercially successful in nursery and therefore cannot be widely disseminated. The healthy vigorous ones, with large, healthy foliage are the ones of promise. Cions may be set in

a young bearing tree and fruited sooner than the original tree will. After fruit is seen new combinations may be planned and carried to fruition in the same manner.

A few years of united effort will make this Upper Mississippi Valley the home of the finest of plums in all the world.

THURSDAY EVENING.

NATURE OF FUNGUS DISEASES.

By A. H. Christman.

When the activity of a plant has been so impaired as to result in its death or in the production of an inferior or deficient crop of fruit, that plant to the horticulturist is diseased. The injuries that bring about these conditions are (1) physical, those due to weather, mechanical wounds and the like, (2) insect injuries, those caused by mature insects, their larvae or both, and (3) the injuries caused by the attack of other plants. Nearly all of the disease-producing plants belong to the groups known as fungi.

The symptoms resulting from the fungus attack are various. The diseased plant may become swollen, twisted, discolored or it may die without external modification. In very many cases the presence of the disease is not made known until the fungus fruits. The practical horticulturist is acquainted with these various superficial conditions and does not concern himself with what goes on within the diseased leaf or stem. It is this latter side of the question that may be briefly discussed here.

If we cut a very thin section out of the diseased region of a plant before the structure has been completely destroyed we would find in the spaces within the tissue many fine thread-like structures (hyphae). These threads are the vegetative body of the disease. They multiply and spread, taking up nourishment from the plant which contains them and it is this which causes

the destruction. After the hyphae have become sufficiently nourished they begin to collect at points near the surface and fruiting of the disease begins.

The structure and behavior of the hyphae and the great variations in the methods of fruiting has lead to the dividing the fungi into several large classes or groups which are sufficiently distinct to warrant a separate discussion of each.

PHYCOMYCETES.

To this group belong the downy mildews, those of the potato grape, spinach, etc. In general these appear as the fruit soon after infection in the form of a downy white blotch.

The hyphae is a long branched tube which lies in the intercellular spaces of the tissue of the host. In order to obtain nourishment which is within the host cell, small branches or suckers (haustoria) are developed, which penetrate the wall and enter into the cell. These haustoria vary in shape from small globular projections, as in the grape mildew, to large club-like structures which nearly fill the cell, as in the spinach disease. It is the duty of these suckers to absorb the content of the host cell.

When the fungus fruits, branches are pushed to the surface through the breathing pores of the leaves. These often divide to form a tree-like structure. Rounded swellings occur on the free ends, which are cut off by a cross wall. The little body of the fungus so set free is called a spore. In another disease of this class (cystopus), the branches bear several spores in a row, one remaining attached, while a second is cut off beneath it. The spores are now scattered by the wind and by insects and serve to spread the disease. If a spore now comes to rest on a healthy leaf and if the weather be damp or if the leaf becomes covered with dew, germination takes place. A tube is pushed out which creeps on the leaf for a short distance, when it pushes down to the interior. This often takes place through the breathing pores or the fungus may burrow through the outer cells or between them. Other large spores are formed at certain times by the fusion of two sections of the fungus. The spores so formed are very resistant and may serve to carry the fungus over winter.

ASCOMYCETES.

To these belong the powdery mildews and many spot diseases, etc. They often produce discolorations. Such forms as blackknot and leaf curl produce characteristic swellings and distortions.

The hyphae of these forms are cut into sections by numerous cross walls. In the powdery mildew type they may live on the outer surface of the leaf and send short haustoria into the surface cells. This forms a white patch or network on the surface of the leaf. After a time erect branches are put out which bear rows of spores at the top. The hyphae and spores give the surface of the leaf a powdery appearance, hence the name. The spores are spread and other plants infected, as was the case with the fungi of the preceding groups.

Another kind of spores is formed here also. These are borne in long sacks. Each sack or ascus contains several, often eight spores, as in the case of the powdery mildew. The sacks are enclosed in small cases which appear as black dots on the leaf. In other forms the hyphae may enter the host tissue when swellings often occur. The ascii may also stand erect in pits or on free surfaces.

BASIDIOMYCETES.

To these belong the smuts, rusts, bracket fungi, and the mushrooms. These are so different in their general habit and appearance that they may be discussed separately.

The smuts are particularly injurious to the grains, with a few species on flowers and vegetables. The hypheal thread here is much divided by cross partitions. It ramifies through the host and after being well nourished the threads develop in masses at certain points, often within the seeds, then the section of the thread round up and become the spores. The rusts are injurious to the grains and also occur on both large and small fruits and on vegetables, the hyphae spread from the point of infection destroying the tissue of the host. Hyphae gather under the epidermal layer of cells where the spores are formed. These break out as a red or brown powder. Here and in the smuts the fruit is often the first evidence of the presence of the disease. The form on cedar produces great swellings,

(Cedar apples) on the fruit trees, characteristic spots sometimes appear just before fruiting.

Among the bracket fungi are found the timber-destroying forms. Some attack live trees in the forest and orchard, producing decay, others cause rotting in lumber, fences and the like. The hyphae here enter through wounds and crowd into the cells of the wood. Here they throw out ferments which dissolve the wood and upon this solution the fungus feeds. Such a fungus may live within a tree for as much as thirty years. Finally the tree becomes so weakened as to be broken down or cracked by the wind. Access of air seems to stimulate the production of fruit bodies which are formed and stand out as shelves or brackets. The spores are borne on the underside of these brackets. The spores by entering wounds on other trees produce disease and decay there.

Only one or two of the mushrooms are injurious. The honey mushroom, growing in orchards, has been said to attack roots. Hyphloma fasiculare in the same way injures the roots of raspberries. In these the spores are borne on the under side of the umbrella-shaped cap.

It is by studying diseases from this standpoint that it has been possible to arrive at a clear understanding of their nature and to intelligently devise means for their treatment. It is not hard to see that after a fungus is well within the tissue that there is little use of covering the leaf with a spraying mixture. The spraying must be done while the delicate spores are just germinating on the surface. If one is to prevent the attack of wood-destroying fungi, all wounding of the tree must be carefully avoided or the wounds should be protected. To prevent the decay of pieces of timber, such as posts, the task is not so difficult. The whole structure may be saturated with a poison so that no fungus can feed upon it. Such a poison must be soluble, which renders it liable to be washed out by the action of rain. This is met by the application of the deadly and only slightly soluble corrosive sublimate. A discussion of the remedies will not be entered into here, since that alone would be a subject for a paper many times the length of the one here presented.

Mr. Kellogg: Will you tell us if the Bordeaux mixture is too late and does not get the fungus, whether we can get it with the powdered sulphur later in the season?

Mr. Christman: The poisoning of the fungus must be applied at the same time, it does not make any difference what it is, and that is while the spore, which is very delicate, is on the outer surface of the leaf, and at the same time it is taking up the moisture of the leaf, and of course taking up the poison with it and before it goes into the leaf.

Mr. Marshall: We are to have a paper on spraying; I would suggest that we wait until after that paper and discuss these two together, as they are almost interwoven.

BULBS FOR WISCONSIN.

The flowers of bulbous plants are very well known and admired, but few people understand how easily this class of plants is cultivated and how inexpensive they are. The first cost is more than that of seeds but most bulbs multiply rapidly, so with a little care, one may always have a supply. They are especially adapted to the busy man's garden who admires flowers but who has not the time to care for seedlings.

There are a great many bulbs that may be grown in Wisconsin, but in this short paper I can only mention a few of the most popular and easily cultivated ones. These may be divided into two groups according to the method of cultivation, namely, bulbs that are planted in the fall, or flowering in the spring, and those which are planted in the spring for summer flowering.

Of the former I shall mention only those which are hardy in this latitude, as the others need special appliances or a greenhouse to successfully flower them, which the general cultivator has not. The term hardy must not be taken to mean that they do well without protection. No bulbs appear at their best, if they are permitted to become frozen, without covering, although tulips and some of the narcissus will stand freezing and still flower fairly well. Besides protection, the soil for all bulbs must be well drained. Nothing will more surely lead to failure

in the cultivation of bulbs, than to plant them in soil where the water stands at any time of the year.

Of the fall planted bulbs, Dutch Hyacinths, Tulips, Hardy Narcissus, Crocus and Spanish and English Iris do well under much the same treatment. They should be planted in well drained sandy soil late in September or early October. When we commence to have sharp frosts or about Thanksgiving, they should be covered with a mulch of strawy manure or leaves at least six inches deep. Covering them earlier is apt to start them to grow in the fall which injures the subsequent flowering. This mulch should be removed in early spring as soon as they start into growth. Hyacinths, Tulips and Narcissus should be planted about 4–6 inches deep in light soils, shallower in heavy soils. Crocus and Iris about two to three inches deep.

Hyacinths and Tulips are well adapted for design bedding. Tulips are better for this climate as they are hardier. The early flowering class is the one best adapted for this work. They may be obtained from the dealers under name very cheaply and in a wide range of color. The late flowering tulips are in my opinion the handsomest, with their beautiful markings. Most of these, as Bizarre and Byblooms classes are wonderfully flaked and feathered. The Darwin class has large flowers of solid colors. The type from which the late tulips were all raised, Gesneriana, is of a bright crimson and one of the best spring cut flowers. All the late tulips are excellent for cutting.

To have the best success with tulips and hyacinths the bulbs should be dug when the foliage yellows and dies. They should be dried and stored away in a dry place until planting time.

The Narcissus is a bulb that every plant lover should have in abundance. It perhaps is the best of our early spring flowers for cutting. When once planted they should be left alone, until they crowd badly. They may be planted among shrubbery along fences or in any out-of-the-way corner of the garden or lawn. The only care they will need, will be to have some litter thrown over them in the fall. Among the best varieties are, Horsfeldii, Empress, Emperor and Princeps of the long cup type. Barru Conspicus, Leedsii and Incomparbilis, Poeticus and Poeticus Ornatus of short cup class; of the doubles, Von Sion, Alba Plena Odorata and Double Incomparbillis.

The Crocus, one of the earliest bulbs, is very popular. They

well deserve to be popular as they are the prettiest of very early bulbs. Snowdrops and Scillas flower about the same time. All can be left in the ground untill they crowd badly.

The Spanish and English Iris have been termed the orchids of the spring garden. For with their bright colors and beautifully formed flowers they are among the handsomest of all our garden flowers. These may also be left in the ground until they crowd.

The lilies are the most beautiful of all the bulbous flowers. They are also more difficult to successfully cultivate than those before mentioned, but are not very difficult if their requirements are met. The soil must be well drained and they must be protected from frost for the best success. It is best not to disturb them after they are planted in a permanent place. It is advisable in this state to mulch them in summer for they cannot endure drought well. They may be planted in late fall as soon as obtainable or in the spring, except Candidum which must be planted in August when it is at rest, as it makes a fall growth which is necessary for subsequent flowering. They should be planted eight inches deep and it is advisable to place pure sand around the bulbs to prevent too much moisture and decayed vegetation to come into contact with them. Among the best garden lilies are Auraturn and its varieties, these have very large fragrant flowers appearing in August, Speciosum and its varieties one of the best of the garden lilies for Japan, Tigrum, the Tiger Lily of the old garden and also the hardiest lily. The Umbellatum varieties, red and yellow dwarf upright lilies flowering in July, Candium the old Easter lily and the best white garden lily, and our native lilies Superbum and Canadensis.

Among the summer flowering bulbs that are planted in the spring the gladiolus stands out as the most popular. The hybridists have done wonderful work with this flower and especially in late years so that those who are only acquainted with the old red gladiolus, can not conceive of the beauty of the new hybrids. The gladiolus bulbs may be planted any time from the first of May until the end of June and will flower fully before frost. It is advisable to plant at different times so as to have a succession of blooms. The large bulbs should be reserved for the later plantings as they return their vitality longer than the smaller ones. The only care they require in the summer is to keep them free from weeds. In the fall after the

foliage is killed by frost, they should be dug and stored away in a dry, cool place until spring as they will not stand freezing. They are easily propagated by saving the small bulblets which form around the old bulbs. These should be sown thickly in the spring. They bloom the second or third year. They also increase slowly by division.

The varieties of gladiolus are almost innumerable so I will only speak of the classes of the hybrids. The oldest of these is the gandivensis, produced about fifty years ago in Belgium. Their origin is disputed. They are the general type of gladiolus cultivated. The flowers of this class are well opened, and arranged closely on the spike and are of good substance. The colors are white, pink, red and yellow, with intermediate shades. Very few are of solid colors but are blotched and feathered. The Lemoine class was produced by M. Lemoine, Nancy, France, by crossing. They have the colors of the Gandavensis and also shades of blue. The flowers are more campanulate and have two distinct dark blotches on the lower petals. The Childsii and Nameanus are the giants and they have very large flowers but lack the substance of the smaller flowered varieties. They contain all the colors of the older varieties at present. These and the Groff hybrids will probably be the Gladioli of the future. The Groff hybrids are crosses of the best varieties of the four classes. They won a gold medal as the best gladioli exhibited at the Pan-American Exposition.

The new Hybrid Princeps was produced by Dr. Van Fleet of the Rural New Yorker. It has a large scarlet flower with a white blotch on the lower petals. It is one of the most vigorous growing gladioli that I have seen. The gladioli will illustrate what can be done by a systematic hybridization and breeding in the plant world.

The tuberose is very well known as one of the most fragrant of bulbous flowers. It is very impatient of cold and should not be planted until June. The rest of the cultivation is like that of the gladiolus. The bulbs only bloom once so it is best to throw them away and buy new ones for another year. The offset may be planted but as it takes them three years in this latitude to make blooming bulbs, it is better to buy the southern grown bulbs which are very cheap. The flowers are white and are both single and double. There is also a variegated leaved form.

This ends the list of a few of the most popular bulbs. There are many more species but they are rarely cultivated. Bulbs are one of the most fascinating of all flowering plants and a person who takes up their cultivation soon becomes greatly interested in them.

Commercial bulb growing is a great industry of Holland and Japan. It is a profitable industry for one who is interested in it. The United States ought to be the greatest producer of bulbs in the world with our great diversity of climate we can produce cheaply all the known species of bulbs. The bulbs that probably could be grown successfully on a commercial scale in Wisconsin are gladioli, Tigridias, and some of the hardy lilies. There is one commercial grower of lilies in Vermont, and in Wisconsin Mr. Toole of Baraboo grows a few gladioli commercially.

DISCUSSION.

Prof. Henry: In regard to gladioli, it may be interesting to report that that wizard of plant life, Mr. Luther Burbank, has experimented with that group of flowers, and of course he has brought out something that is helpful or interesting. You know in gladioli the blossoms begin below on the rachis and you have a flower here which is perfect, and a flower there pretty near in bloom, and farther up you have the buds almost concealed, and this first flower that is nearly out will wither and will drop off, perhaps, before the upper ones are in full bloom. Now that wizard, and it has been my pleasure to walk and talk with him, has made the whole stem, the whole rachis, blossom at once. That is one of the little things Luther Burbank has done, and you can imagine how it has improved the plant in that particular.

Dr. Everett: I would like to ask Mr. McLean whether in his opinion it makes any difference in the time of bloom as to whether a gladiolus is planted deep or shallow?

Mr. McLean: I have had quite a little experience in gladioli; I never saw any difference in planting them shallow or deeper. I set two rows, same variety, same date, and tried them both deep and shallow. While they come up a little sooner

when they are planted shallow, I do not think it makes any difference in blooming.

Dr. Everett: I find in planting them the last of June shallow, makes them blossom sooner in my ground.

President Loope: What is that soil?

Dr. Everett: It is the soil about Madison here, good loam, and I put in a lot of sand with it, so it is really very good soil.

President Loope: I have found that in planting them rather shallow in my soil, that later in the season they get nearer the top, some way, and they are likely to be torn up easily in cultivation, but I never have noticed any difference in the blooming. I am very fond of gladiolus and grow a great many of them, and think that they are the easiest flower to grow for the amount of blossom and gorgeousness that you get.

Mr. Wilkins: I think I planted about ten bushels of those bulbs last spring, and I found in shallow planting that the plants will tip over; I cannot get along without putting them in four or five inches deep, so that the stalk will stand when it is in bloom. Shallow planting may be favorable in other respects, but the stalks will not stand. My stalks are so long and heavy that when planted two inches deep they will tip over; I have now decided on about 4½ inches and then the stalks will stand up.

Dr. Everett: What is your soil?

Mr. Wilkins: A good clay soil, but they would tip over.

Dr. Everett: They require staking from the time they are eight inches high, to get a better growth. I would like to ask Mr. McLean, in the matter of bulbs, whether they are planted deep or more shallow, whether it makes a longer or shorter stem.

Mr. McLean: I do not know that I can answer that question, because the length of the stem depends a great deal on the amount of light that it would have. If they get a lot of light and the stem is close to the ground, the stem is apt to be short. If they grow a little while in the shade, the stems are liable to grow longer, more upward, to get the light. It is more the amount of light.

Mr. Rieck: I would like to ask the gentleman whether he plants in a furrow, or how he plants the gladiolus?

Mr. McLean: The gladiolus I generally grow in the garden; make a furrow, just drop them six or seven inches apart in the furrow, sometimes closer.

Mr. Rieck: Do you bury them six inches deep right on the spot?

Mr. McLean: No, bury them about four or five inches deep, six inches apart in the row.

Mr. Rieck: When you come to hoe them, do you keep adding to the depth?

Mr. McLean: No, I think they will stand the drouth better.

Mr. Rieck: I have had the best luck where I planted about four inches deep, but made a six inch trench, then in a few weeks as they began to come up, I kept filling in with the soil.

Mr. McLean: Did that make them stand up? We have great trouble with drouth, and we have no figure on that, and I think if we heel them up, the more liable they are to dry out; we always wall them up to raise the flowers.

HOW PLANTS FEED.

By H. Beckenstrater.

In order to follow out the complex process of plant nutrition it is necessary to have in mind some general idea of the structure of the plant and of its chemical composition, its relation to the air and soil by which it is surrounded and from which it derives its sustenance.

A microscopic examination of any plant reveals the fact that it is composed of one or more units or cells. The lowest and simplest plants are composed of but one single cell and the further we ascend in the scale of plant life the more complex they become until we reach the highest forms as in a tree or in the sun-flower.

At the beginning all these cells appear so much alike that no difference can be detected in them either by chemical or microscopical means. The embryo cell which produces a blade of grass presents the same appearance and begins its activities in the same way as the one that gives us an oak tree.

The simplest forms of vegetable life commence as a single cell and remain as such throughout their existence. The increase

in number by simple division like the bacteria, while the higher plants form colonies which differ in structure from the parent cell. In the simpler forms these cells all resemble one another but as we ascend in the scale of vegetable life we find that some gradually become altered in shape and chemical composition so that we have several sets of cells each carrying on a special function. The development of the higher plants from the simpler ones may be well compared to the advancement of a civilized race from the savage state. Under the barberous condition every man was for himself and had to do all his own work—had to raise his own food, make his own clothes and build his own house. In short, to use a common phrase he had to be a "Jack of all trades," and thus could not become very proficient in any of them. In the civilized state, these different classes of work are alloted to different classes of men—farmers, carpenters, manufacturers, and each class becomes specially fitted for its particular work. All the work is done better and quicker resulting to a mutual benefit to all. These advantages, however, are not obtained for nothing. They are bought at the cost of independence. In the savage state each individual was perfectly independent of his neighbors. In the civilized state the farmer relies upon the manufacturer for his clothes and implements and the manufacturer relies upon the farmer for his food.

The same is true in the cells of the higher plants, every one of which starts as a simpler cell dividing up into a large number of similar cells which later become specialized and different from the rest. They begin to perform special work and their structure alters so as to especially adapt them to the special work they are expected to do. Some on the peripherey of the plant take on the functions of protection as the epidermal cells. Some cells become store-houses for nourishment as the cells that form the potato, others become elongated and tuberlar for the conveyance of water from the roots to the leaves; others in the leaf are turned into chemical laboratories where the green chlorophyl bodies are busy breaking up carbon dioxide by the aid of sunlight and manufacturing starch and sugar under secret methods.

We may then look upon our higher plants as colonies of highly specialized cells united together and working for their mutual benefit, each having its particular function to perform. Each

passes through the various stages of its life history, performs its function and dies without interfering with the general welfare of the plant of which it forms a part. Indeed many cells do not begin to be of service to the plant till after their death as for instance those that form conducting tubes and woody fibres.

In all plant cells at some time during this growth the following parts may be made out: first the cell wall giving the cell a definite form, it consists chiefly of cellulose a carbohydrate, a non-nitrogenous organic compound not itself soluble in water but permitting its easy passage. Second the protoplasm a granular sticky albuminous compound lining the cell wall. The protoplasm is really the only living part of the cell; it is the seat of all vital function or phenomenae and hence the residing place of that mysterious process we call life. In fact protoplasm or cytoplasm as it is often called is the only substance that contains life.

New cells are formed by the division of cells already existing and in this the nucleus and protoplasm take an important part. The nucleus first divides forming two daughter nuclei and the whole protoplasm of the cell then separates into two portions by the formation of a cell wall between the two portions. Space will not permit the description of the interesting and complicated steps that accompany nucleur division.

After the cells are formed they undergo a variety of modifications to fit them for the special functions they are to perform. Should we examine the cross section of a stem, a cross section of the trunk of an apple-tree for instance we should find the cells differentiated into the following tissues easily distinguished. First, beginning with the exterior, the cortex or outer bark, second the bast or inner bark; third the cambium and fourth the wood proper forming the greater portion of the trunk. The cambium is really the only portion of the trunk that is alive. It is in this layer that the cells are in an active state of longitudinal division. The cells that are pushed to the outer side give rise to the bast or phloem portion of the so called vascular bundles and the cells that are pushed to the inner side of the cambium give rise to the wood proper or zylum portion of the vascular bundles. The vascular bundles form a system extending from the roots high up into the leaves. In this system the sap of the plant flows. The water and the substances dissolved therein pass up to the leaves through the zylum or wood portion of the trunk,

i. e. the portion on the inner side of the cambium layer. In the leaves the raw sap is worked up into available food material for the plant. From the leaves the sap in the form of available food flows downward through the phloem or bast portion of the trunk. For this reason a tree will continue to remain green after it is girdled (the bark cut around the trunk) for this in no way interferes with the upward movement of the sap, and thus the leaves will remain green and continue to prepare food as long as the roots supply the raw material; but none of this food can any longer reach the roots and sooner or later they must die of starvation.

In the leaf we distinguish three kinds of tissue, first, the epidermis forming the outside covering of the leaf and consisting of a single layer of protective cells; second, the mesophyll forming the interior of the leaf and consisting of soft delicate green colored cells. These cells contain the chlorophyl corpuscles whose function it is to absorb and assimilate carbonic acid from the air. The passage of the various gases to the cells of the mesophyl is facilitated by the large intercellular spaces that it contains. These spaces are always filled with air. These spaces communicating with the outside air through the stomata, small openings situated in the epidermis. Each stoma consists of a pair of crescent shaped guard cells placed with their concave sides facing each other and forming a small opening between them. When they contain much water and are distended they tend to separate farther; when they become flaccid their sides fall together and the aperture becomes partly or wholly closed. Third, this tissue of the leaf comprises the fibro vascular bundles already referred to in the trunk, forming the veins on the back of the leaf and carrying water to all parts of it.

Since the substance of every plant is constantly wasting away by reason of its own activity it becomes evident that it must be constantly repaired. Without a constant supply of food neither growth or repair is possible. To understand what materials are necessary for growth and repair it is necessary to know the composition of a plant.

The greater portion of fresh or living plant is found to be water. Fresh grass contains about 75 per cent. water, potatoes about the same amount and the more succulent vegetables a still greater proportion; beets and carrots contain from 80 to 90 per cent. and a ton of turnips may contain more than 1,800

pounds of water; even trees seldom contain less than ⅓ of their weight of it. The solid material left after driving off the water is found to consist chiefly of three elements, carbon about 50 per cent., oxygen about 40 per cent., hydrogen about 5 per cent. The most abundant in addition to these is nitrogen about ½ to 4 per cent. If the then dry substance now be burned these four elements are driven off as a gas leaving behind a white powdery substance, the ash. The ash upon analysis yields sulphur and phosphorous to considerable amount (from 1 to 4 per cent. of the plant) and smaller quantities of the following elements, iron, magnesium, potassium, calcium, chlorine, sodium and silicon. All the above elements with the exception of the last three are essential for the normal and healthy development of a plant. The elements C, O and H forming about 95 per cent. of the solid matter of a plant are derived from the air and water leaving nitrogen and the mineral elements only about 5 per cent. of the dry matter of the plant to be derived from the soil.

The chief organic compounds found in the plant are the following: Carbohydrates, such as starch, cellulose, lignin, inuline, dextrine and gum.

Thus we see that the plant is built up of a number of complicated chemical compounds. The questions still to be answered are, in what form is the plant food contained in the soil and air, and how does the plant get at it. Unlike the animal the plant can not take solid food and hence its food must be in a fluid condition either liquids or gases. In the plants the organs for the absorption of water and the mineral constituants are the roots. The cells of the epidermis absorb the water and substances dissolved therein from the soil by the process of osmosis and pass them onto the cells of the interior by the same process. Osmosis is purely physical phenomenon, thus when two fluids are separated by a porous membrane each of them tends to pass through the membrane and mix with the fluid on the other side until both fluids are of the same density. Thus, if a bladder full of sugar solution will pass out and the water will continue to rise in tube, if it be high enough, until the bladder bursts showing that the water passes through the membrane even against a tremendous pressure. Now, in the same way that the bladder acts in the experiment so are the cells of the roots supposed to act in the soil. They are so constructed, that the plastic materials find great difficulty in passing out while the water solution from

without pass in with ease. Now it is evident that water must continue to diffuse into the cell from the soil so long as room continues to be vacated there for its reception. And this is indeed the case; for land plants are continuously losing water to the atmosphere in the process of transpiration and the salts in solution are continuously being worked up inside of the plant, so that opportunity is constantly being given for the passage of further supplies of the same things and the passage of the solutions from cell to cell within the plant obeys exactly the same law as the original passage of it into the epidermial cells of the coat. If it be conceived for example that the contents of one cell have combined to form starch or some sluggish colloid substance like albumen or dextrine an osmotic vacuum will be formed there and at the same time a movement of liquids will be started throughout the entire plant to kill this void space.

We have already seen that the greater portion of the dry matter of a plant consists of carbon, oxygen and hydrogen, elements derived from the air and water. Just how these elements are elaborated into food material is a process not fully understood. We however know this much. We know that the process is limited to green plants. Other plants must derive their carbon from other sources. It is only in the presence of chlorophyl that carbon dioxide is decomposed, and as it is chlorophyl that gives plants their green color. The process is confined chiefly to the leaves. Hence the leaves are the chief digestive organs and it is from them that the other portion of the plant, stem, flowers roots, derive there food. The process goes on only in the presence of sunlight or other light sufficiently strong and containing the proper elements. A strong electric light will answer the purpose. The chlorophyl itself outside of the living protoplasm has not the power to decompose CO_2. It is therefore the vital forces of the protoplasm manifested in the presence of chlorophyll that does the work. It is believed to be the function of the chlorophyl to absorb certain portions of the light that falls upon it. This absorbed light furnished the energy or motive power necessary to carry on the work of taking apart the CO_2 and rearranging the molecules into a more complex substance. During the process the leaves absorb CO_2 from the air and give off oxygen.

The steps in the process in the building carbohydrates are not known for certain. It is believed by most plant physiologists

that the first product of reconstruction after the breaking up of the CO_2 is the formation of a molecule of the simplest carbohydrates, formaldehyde. Formaldehyde readily undergoes polinization so that grape sugar may easily be derived from it.

The formation of proteids or albuminoid compounds is still more obscure, but using a carbohydrate as a basis the plant constructs fat and albumin and all other substances found in the plant. The process of food assimilation is often confused with that of respiration. It must be borne in mind that in respiration plants absorb oxygen and give off CO_2 the same as animals. Assimilation builds up organic compounds and closes up energy, in respiration organic compounds are broken down and energy liberated.

ORCHARD SPRAYING.

By James Milward.

The increased fruit acreage in the state has aroused a general interest in spraying operations among horticulturists. Most satisfaction has followed in those parts of the state where spraying has been conducted, consistent with a rational understanding of the subject. Failures have been due to carelessness, lack of knowledge, and probably in many cases to undue enthusiasm. Fictitious firms sending out worthless mixtures under mysterious names have probably found occasional victims in Wisconsin. The first thing to understand then is, that spraying is not a mystery, but a business. The farmer must spray understandingly, if he wishes to be successful. The mixtures for the most part are made from compounds with which he is perfectly familiar. By reading and studying the reports of Experimental stations and the testimony of successful fruit growers he may in a short time become well posted on the subject. The basic facts of orchard spraying are simple and follow naturally a few general principles. First why do we spray? We spray to kill harmful insects and secondly to prevent the growth of fungus diseases. For spraying purposes insects are classified under two heads, those which eat, chewing the tissue and those which

merely suck the juices of the tissues. For the former a poisonous mixture such as Paris Green must be applied but for the latter a mixture which kills by contact, such as Kerosene Emulsion must be applied. These mixtures and their formulas will be mentioned later. For fungus diseases a fungicide which destroys the parasite germ before it can develop is used. Bordeaux mixture is commonly used in this treatment. It must be understood that these mixtures cannot be used inter-changeably. Bordeaux mixture is worthless as an insecticide. Neither is it a cure but merely a preventive. Also the merely poisonous mixtures will not reach the juice sucking insects. Each mixture has been prepared for a definite class of enemies and this classification the farmer must learn before he can spray intelligently. After it has been decided to which class the enemy belongs, one must next determine when it is most susceptible to treatment. Fortunately the most destructive of the orchard insects are most active at a time when spraying for fungus diseases is necessary. Then the mixtures can and should be combined. The ordinary treatment of the apple orchard will illustrate this point. Two common enemies to the apple are the coddlin moth and apple scab; the former in its larvae stage an eating insect and the latter a parasitic fungous disease. About the time the buds open the trees should be sprayed with Bordeaux for the scab. Authorities differ as to whether a poison is advisable at this stage. About the time the petals fall a second application of the Bordeaux should be made with an addition of the Paris green to catch the coddlin moth. The poison lodges in the calyx of the little apple as the larvae of the moth enter at this point, they are destroyed before they get very far on their journey. Ten days later this treatment should be repeated. Some advise at this spraying the use of Bowkers Disparine instead of the Paris green because it sticks more tenaciously and thus reaches the second brood of moth. Whether any other spraying is necessary or not will depend upon the weather. A wet rainy early summer would certainly make necessary another application. It should be remembered that in spraying as indicated above the orchardist also reaches many insects and diseases such as the canker worm and apple rot.

Wisconsin people are intensely interested in plums. The successful plum grower must spray. The plum rot is probably his most deadly enemy. It is a fungous disease which may lie

inactive for quite a time and then when favorable conditions present themselves break out with uncontrollable power. An orchard once infected is probably never freed from danger. Hence the necessity of spraying as an insurance. Early in the spring the buds should be sprayed with Bordeaux mixture. A poison probably Bowkers Disparine should be added. After the fruit has set a second spraying of the combined mixture should be applied. The plum is more sensitive to the copper sulphate than is the apple. Probably three pounds of the copper sulphate to fifty gallons of water would be of sufficient strength. At least four pounds of freshly slaked lime should be used. A surplus of lime is always advisable. After the second application the spraying is governed by the weather. A thin film of Bordeaux must be kept on the trees and fruit in early summer and if the rain washes it off it must be reapplied. Some claim the use of poison kills the curculio. It is quite certain that spraying will not completely exterminate the pest as in many places where poison has been thoroughly applied the curculio has flourished. A dry early summer lessons the cost of spraying in the plum orchard quite materially.

A few facts concerning the preparation of the mixtures might be interesting. If Bordeaux mixture is used in any quantity, stock solutions of the lime and copper sulphate should be made. About 25 pounds of copper sulphate should be suspended in a barrel containing 25 gallons of water. This makes one gallon of the solution equivalent to one pound of sulphate. All copper solutions should be kept from all metallic vessels excepting copper. The lime should be slaked slowly to a thick white paste. It must never burn. The concentrated solutions should never be mixed directly.

The mixing ingredients must first be diluted to an extent depending upon the capacity of the spraying tank. The standard strength of bordeaux is a matter of opinion. An average of all the formulas would be about 5 pounds of lime and 5 pounds of copper sulphate to 50 gallons of water. All poisons in combining bordeaux mixtures with, should be thoroughly mixed before adding. About one quarter of a pound of Paris green is necessary to 50 gallons in the ordinary formula. Bowkers Disparine comes in a thick paste and should be tempered down to a thin liquid before it is added to the bordeaux. All mixtures should be thoroughly strained before being put into the spray tank or

barrel. When spraying is done to any great extent it is customary to have an outfit of mixing utensils kept for that purpose exclusively. The barrel especially must be clean as a small piece of grit or unslaked lime is likely to cause man exasperating delays which if repeated often enough might prove quite costly. The matter of machinery and apparatus is a matter of local opinion and will always work out rightly with any one who undertakes spraying intelligently.

The actual operation of spraying seems simple and, probably is simple. But it requires a great amount of painstaking and patience to do a proper job. The trees should not be drenched but they are not thoroughly sprayed until a thin film of the mixture covers all the branches and both sides of leaves. An orchard may seem thoroughly sprayed from a distance, but close examination will often reveal many untouched parts. It is always a problem to get the top of a tall tree thoroughly covered. Where the trees are far enough apart a wagon with an elevated platform is preferred by many. Low trucks and even stone boats have given satisfaction in many localities. Small iron pipes enclosed by bamboo poles greatly facilitate in reaching the tops of tall trees.

For those who contemplate spraying next season, now is the time to prepare. Apparatus may be bought and the farmer may spend some of his leisure moments in studying up the different enemies he must fight. With a well outlined campaign he will start next season's work with much better chances of success than if he allows hurried preparations in the spring to increase the chance of doing the work improperly.

DISCUSSION OF MR. MILWARD'S PAPER.

President Loope: You say these different solutions should be well diluted before being mixed; give us the reason why.

Mr. Milward: Why, the mixture holds up better. Experiments have found that the mixtures will settle more if they are not mixed in that way. Bordeaux mixture, to be effective, ought to hold up well.

President Loope: Is that all the reason, that they hold up better?

Mr. Milward: I think that is the main reason.

President Loope: What would happen if you would put the lime directly with the blue vitriol?

Mr. Milward: Well, it is more difficult to mix that way; if you have them more diluted you can mix them easier, I think, than if you add them directly; your agitator would not mix them as well.

President Loope: If I remember rightly, we are taught in some cases that it spoils the effect of the whole mixture by some chemical action; that is what I wanted to get at.

Mr. Milward: Yes, I think it does.

President Loope: And that is a point that I think all those who spray should remember, that it will not do to put the unslaked lime in contact with the blue vitriol, and that many failures result from some such thing as that, and if I would emphasize one thing it is what he has already said, that great care should be taken to make your mixture perfect.

Mr. Bingham: I want to use dry Bordeaux on bush fruits, such as currants and gooseberries, and I would like to know what strength the blue vitriol dissolved in water would have to be to slack lime with, in order to still have the perfect mixture and not have it too strong to have it come in contact with the bush.

Prof. Sandsten: I do not catch your point. You have the copper solution, you say?

Mr. Bingham: Yes; take fresh lime, and we want to make what we call the dry Bordeaux, and in slacking the lime you can slack lime in a certain amount of water and you have very fine dust, and would that be a sufficient fungicide by using the blue vitriol water to slack the lime?

Prof. Sandsten: I should judge it would be, provided you get it to stick on the leaves.

Mr. Bingham: Apply it in the morning, and if it gets on it will stick on.

Prof. Sandsten: Why, it would stick on part of the leaves, on the upper side, but I doubt very much if it would stick on the lower side. I think that while dust sprays have been advocated a great deal, that they have not been as effective as was expected, and I should hesitate very much in recommending them.

President Loope: I would like to ask Prof. Sandsten this

question, following the same line: Is there any special care to be used in making this mixture, and is there any special amount of dilution required before you mix the two; can you give us something definite, that we may make our fungicide perfect, and can you tell us the dangers of mixing so that it will not be good?

Prof. Sandsten: The greatest danger in Bordeaux mixture is not enough lime to neutralize the copper sulphate. If you do not add enough lime the sulphate is free, and it has a tendency to combine with the water and form sulphuric acid and it burns the foliage; for that reason we recommend rather an excess of lime. The old formula used to be, 6 pounds of copper sulphate and 4 pounds of lime, which was again changed to 5 pounds of copper sulphate and 5 pounds of lime, and now it is generally recommended that they use 6 pounds of lime and 4 pounds of copper sulphate, making an excess of lime, because, as you know, all lime has not the same strength, and for that reason we prefer to have an excess of lime, which is not of itself injurious to any plants.

President Loope: What is your experience with the use of desparine in connection with the Bordeaux?

Prof. Sandsten: We have found it very satisfactory. Of course it is an arsenical poison, the same as Paris green; it is quite safe to use, and it is probably a little more expensive, but I think it is a little safer, and it is not so apt to burn the foliage.

Mr. Hale: This is an interesting topic to me; I have practiced spraying for fifteen years; they call me a crank in my neighborhood. The question that you ask I do not think that you got an answer just exactly as yet: I think I know what you mean—before diluting it, before mixing the two. Now, I cannot understand these scientific words, but of the practical use I know something. Now, if you will take that blue vitriol and put it into your tank without diluting it and turn your lime into it, it will curdle it, it will have the appearance of sour milk; that is what I think you wanted to get at.

President Loope: But the further question as to whether that renders it inoperative or not?

Mr. Hale: Yes, it does; not only that, but you cannot use it, you cannot get it through your nozzles, you will have trouble with that all the time. Now, in regard to having a stock of mixture on hand, which is a very good idea but not necessary;

they say we have a better result if we have this stock prepared a few days or weeks before we use it. I never dissolve my vitriol until I am ready to use it. I spray out on an average about 1,000 gallons a day, and it takes me at least six weeks every spring to do my spraying, and I hold the nozzle myself and generally do most of it, because I cannot trust a man to do it and do it right. The gentleman has brought out this point in the paper, that you should be thorough, and should be in season, and they are the two essential things. I have had my neighbors come after my spraying was done, and say, "Well, what do you think about my spraying my apple trees or peach trees next week; could I get you to do it, or could I get your spray pump?" "What are you going to spray for?" "Oh, I don't know, some fellow said I ought to spray; I did not get around to it before; thought I'd better do it." "Well, what for?" "Well, I don't know; somebody said I ought to spray." I want to tell you, it is not a cure but a preventive, and you have got to do it in season, or your time is thrown away, and you have got to do it thoroughly, or you might as well not do it at all.

Here are some of the points I wish to emphasize: At our first spraying we do not use anything but the blue vitriol; we do not use the Bordeaux mixture nor dust spray on anything whatever. Peaches and apples and plums we use the blue vitriol for the first time. Now, with us we have the disease on the peach tree called the curl leaf; before the buds or anything start, as early in the year as possible, we use it on our peach trees for curl leaf, and it is a very serious thing with us; you folks do not know anything about that curl leaf; it is a very serious thing with the peach growers, and the one spraying is found to be sufficient if you do it in time, and if you do not do it in time it does not do any good at all.

Mr. Marshall: I can answer your question in regard to desparine. I have had a little experience with it; I have used it for two years, and I think when Prof. Sandsten states that it is more expensive, I rather doubt that statement, particularly in a wet season like we had last year. It stays on very much better than any other preparation I have ever used.

President Loope: You put it in the Bordeaux?

Mr. Marshall: I put it in the Bordeaux, and I would like, if I can take up the time, to ask Mr. Hale if he does not think a little lime in the copper sulphate, in the early spraying, would improve it, for the reason that it would stay on better?

Mr. Hale: There is the question right there. Our professors tell us that it is almost instantaneous in its work, that it does not need to stay on long to accomplish its work. If you want it to stick to the tree you better put in a little lime. I want to say another thing. You folks may think in a wet season that you have got to wait until it stops raining; don't delay your spraying on account of the rain, you can't wash it off, it will stay there.

Mr. Converse: I would like to ask Mr. Hale what is a good spraying outfit, that is, a practical outfit?

Mr. Hale: That question I do not know as I can answer. I use the Morley pump, the best pump they make. Now I am looking for a power spray; I have not found one yet that I am willing to accept, but the Morley pump is used in Michigan perhaps more than any other pump.

Mr. Converse: Do they find the gasoline engine satisfactory as a power?

Mr. Hale: Oh, yes, they cannot help it.

President Loope: I wanted to get an expression as to whether the spraying has any effect on the curculio with you?

Mr. Hale: I am glad you spoke about that, because I think the gentleman in his paper said something about doubting it. I used to be a doubter on that very thing; I advocated that when the curculio did its work it did not feed on the foliage, but I want to tell you I have hardly seen a curculio in my plum orchard for the last six or seven years, but you do it by spraying. Use Bordeaux mixture for that.

Prof. Sandsten: The curculio we have been spraying for a number of years, and we use the Paris green or the desparine in a mixture, and while we have decreased the number of curculio, we still have them with us, just like original sin.

Mr. Hale: Keep right on, you will get rid of them. It is a fact with us, where we do spraying, we discard the curculio catcher entirely. I have not had a curculio catcher in my plum orchard for many years.

Mr. Rieck: I would like to ask the gentleman how he prepares his lime?

Mr. Hale: Now you are getting me into trouble. I do it in my own way, as I can expedite matters. The point is that it should be thoroughly slacked, not burned. I go to work and slack enough lime, perhaps all my tank holds; my tank holds

about 150 gallons; I slack enough in the morning to last me all day.

Mr. Rieck: What is your method in slacking it; how do you prepare it?

Mr. Hale: I slack my lime as a mason slacks it for mortar. Generally use hot water. It is not strained before it is diluted; I do not know as that makes any difference.

Mr. Bingham: I would like to ask Mr. Hale what condition his plum orchard is in, that is, the condition of the ground under the trees from year to year, whether it is in grass, or cultivated?

Mr. Hale: I will give you almost any price for a spear of grass that you will find; the cleanest kind of cultivation.

Mr. Bingham: That is the secret in getting rid of the curculio, rather than spraying.

Mr. Hale: No, sir; before I practiced spraying I had to fight curculio night and day.

Mr. Bingham: Do you have woods near your orchard?

Mr. Hale: No, sir. Before I practiced spraying I said you could not kill curculio with poison. I want to tell you some of the results that have come under my personal observation that have not been my own. I will say this much, I sprayed for six or seven years when I was in doubt whether I got paid for my time and labor, and yet when I come to a horticultural meeting and hear such persons like Mr. Morrill and Prof. Taft say what they have done, I say it is something wrong with me, and I got in conversation with Prof. Taft at one time in the spring of the year, and he said, "Have you commenced your spraying?" And he said, "I have done some spraying at the college today," and I had heard him speak about being thorough, time and time again, and I said, "I wish, Professor, that you would get it through my head what is meant by thorough work." "Well," he said, "for instance, I will tell you. Today I sent some of the boys from the college out to spray the orchard, and told them to do good, thorough work. When they got done they came in and they were feeling pretty well, they had done a good job. I went out to look at it, and they said they had covered everything, and I commenced to examine and walked around, lifted a twig; there was just a small place on every twig on every side of the tree that was not covered. I said, 'Here, boys, if you had just that covered you would have

been thorough.'" I grasped the idea of what he meant by thorough, and I went home and began again, and where perhaps I sprayed a thousand trees a day, I got down to about five hundred and did a good day's work. It takes me longer every spring to do the spraying. Now, two years ago we had a state meeting in a certain locality, where we had the topic up of spraying, apple culture and renovating old orchards, because there were some orchards there that were rather old and neglected. Well, there were some that grasped the idea, went home and went to work, and it was my privilege to visit this fall some of those orchards and some of those particular men's orchards that had asked about the pruning and spraying and to see what they had done. I tell you it was a sight. There was one particular orchard that I will mention that when the man sold the crop he said to the man that had in charge the packing, "I will give you a bushel of apples for every fifteen wormy apples you will find. When they had picked and packed 1,500 bushels of apples they had found three wormy apples. Now, that is what I call thorough. He was not the only one that did that; there were several did that in that same neighborhood; it can be done, gentlemen.

THINNING FRUIT.

By A. T. Henry.

In all our operations in the orchard we have to help and protect the trees in all possible ways. Our care for the tree begins when it is first planted. The trees are not set too close together for then they would become small and poorly developed. In the same way as you would not set two trees close together, so you should not allow two fruits to ripen. A tree has just so much food out of which to grow and bear fruit. The tree will try to bear seeds first, then it will send out new growth. But the tree's object is to bear seeds; it does not care for the fleshy part of the fruit. The seed will be developed at the expense of the fleshy part of the fruit, and as it is the fleshy part we are

after we should limit the number of seeds so that the fleshy part of the fruit will be developed.

I have heard people say that if you pick off some of your young fruit you are taking just so many bushels away from your ripe crop, but if you take two like trees and thin the fruit on one and leave the fruit unthinned on the other you will find that the thinned tree will have more and larger fruit than the unthinned tree. How often in our apple orchards have we seen great limbs broken off with the load of fruit nearly ripe. If most of the young apples had been picked off the extreme end of the limb, the fruit would have been larger in size, finer in color and more evenly distributed over the limb. You who have seen thinned and unthinned peach trees must have noticed the great difference. The fruit on the thinned tree is of larger size and the color is greatly improved. This is because in the case of the thinned tree the air has had a free circulation and the sunlight has had a chance to do the most good.

Experiments along the line of thinning of apples have been conducted by the experiment station at Geneva and the results show that the first is much improved by thinning. The number of culls and drops is decreased over half and there is more of A No. 1 fruit. The second class fruit is less but it is out of the No. 1 fruit that most of the profit comes. They find that it costs fifty cents or less to thin a tree and that the market value of the fruit is increased about ten to fifteen per cent. The apples were thinned when about 1½ inches in diameter and from three to four weeks after the fruit was set. For the finest quality they found it best to thin the fruit to about five to six inches apart. Peaches are generally thinned to about the same distance. In the case of a light crop the tree is liable to fully develop all the fruit so it does not pay to thin, but in the case of a full crop you can save your tree and raise the quality of the fruit at the same time by careful thinning. To derive the most good by thinning, the fruit should be thinned when rather small. Many people consider it a waste of money to pay for picking off the small green fruit, but they forget that the fruit must be picked some time and that it can be picked best in the early summer when help is easier to get than in the fall. Then when the harvest actually comes the ripe fruit is more easily picked and graded and there are less culls and inferior fruit.

In thinning a fruit tree the small and inferior fruit should be

taken off. There is no way in which the fruit can be thinned by raking or thrashing the branches for then the small fruit is more apt to remain on while the large and better developed fruit will be knocked off. All the work must be done by hand.

Two men can thin a tree better than one. The lower limbs should be thinned first, taking one limb and thinning it thoroughly before going on to the next. When the upper limbs are reached step-ladders are used. No definite rule can be given for thinning fruit; a person must consider the amount of fruit on the undivided tree and the general condition of the tree.

If a person lives a long way from a market and expects to ship the fruit in bulk it is often a question whether it really pays to thin fruit, but where a person is near market and ships to a fancy trade it certainly pays in dollars to thin his fruit.

DISCUSSION OF MR. HENRY'S PAPER.

Mr. Kellogg: Can you tell us if thinning will throw the tree out of bearing or into bearing the next year?

Mr. Henry: Experiments have been carried on at the Virginia Experiment Station in regard to thinning, as to whether it affects the bearing of the tree, and they could find no difference; it seemed to have no effect on the next crop.

Mr. Hale: In regard to peaches and plums, if they are not thinned, and they are all left on the tree, the tree will overbear, and consequently it cannot make so many buds next season; in that way it would lighten the crop.

President Loope: Prof. Henry, can you tell me any of the reasons why apples should bear every other year. I mean, if you set out an apple tree this year, and you set out one next year, and they came into the same bearing year, is there any reason that you know that makes them bear every other year?

Prof. Henry: My friend at the left says, "Plant Ben Davis and they will bear every year."

Prof. Sandsten: The question of the bearing of apples is rather a peculiar one, because if we go west farther we will find that in Colorado and in Idaho many of the apples bear every year, and in Europe they bear a crop almost every year, but it seems that in parts of the United States, especially in the

east, and in the central west, they bear only every other year, and it is very peculiar that, no matter what time they are planted, it seems that they will swing into bearing the same year. But why they should swing into that general rhythm of bearing at the same time it is hard to explain. I do not think it has been explained, but it is a fact that they do in isolated cases, however, bear on the off year, but as a rule they follow the swing of the pendulum and come together, but why I could not tell.

A resolution offered by Mr. Marshall, thanking Messrs. Christman, McLean, Beckenstrater, Milward, and Henry for their interesting and instructive papers, was adopted.

Mr. Kellogg: Mr. President, we have had in our audience day after day Prof. Henry, and we have not heard a word from him. I would like to have him talk for ten minutes on any subject he likes.

Prof. Henry: I have been too busy to prepare anything for this organization at this time, but may I tell you a few words about Luther Burbank? Mr. Burbank has two places in California; one at Sevastapol, several miles out, and one at the edge of the beautiful little city of Santa Rosa. He is visited by all classes of people, and these visitors have become a tremendous burden to him and he avoids them as much as he can. Our arrangement was made for a number of gentlemen at the same time, and made in advance and we were welcome. It was a beautiful day in mid-summer. We found Mr. Burbank a man of medium stature, I judge about fifty years of age, a kindly, soulful face, who lives with his sister in a beautiful home, modest; his sister watches him with apparently all her devotion, and with a keen, ever-anxious care. It was the first time, with few exceptions, that I was ever in the presence of a genius. Now we use that word like we use a great many others, without meaning at all. We say, "Oh, he is a genius," Well, that means that he is a little smarter than the ordinary. Now, a genius is a man whose mental output you cannot measure by the food he eats, or by the way he works, or by any other method. You cannot measure a genius' needs; he needs no school; he needs no teacher, he can be taught by no one. You may have seen a genius, perhaps, in mathematics, he does not need any teacher. Blind Tom did not need a teacher. Now, this man does not need any

teacher, he simply knows things. As a boy in a cotton factory he became interested in plants. Running across a field of Early Rose potatoes one day, he saw some balls, those green fruits hanging upon one plant, and he stuck a stick down to mark the place, and when they were ripened he gathered them, and he produced numerous varieties of potatoes; he sold some and made some money in business, and probably, had he cared, would have gone on and made a large fortune, but he does not seem to care for money, and only thinks of money as a means to an end. Now, he has used his power with plants in all possible directions; wherever he dips into plant life he can modify it. I told you he has made the gladiolis blossom all at once; he has produced lilies from the size of a nickel up to the diameter of a dinner pail; he has produced the white blackberry; he has crossed the strawberry and the raspberry and got a plant that is between the two, unfortunately it is not used and he has let it die out. He sent down one day to the university where I was, some plums that had the fragrance of the Bartlett pears just as plain as could be; he has crossed the plum and the apricot and produced a new fruit, the plumcot, and as we walked by his seedlings, he said—we had been talking about his discriminating powers, and he said to us now, referring back to that, "There is a seedling that is worthless, I might just as well pull it up; now, that plant when it is bearing will produce a fruit more like the apricot than the plum, this one will produce one that is more like the plum than the apricot; there is one which is very choice, it is going to be about half way between each; that is probably one that I should use, that won't be in bearing for quite a number of years, but I am quite sure there is one I shall want for my future work." He has produced a plum that has no interior pit or meat at all; he has produced a plum that has got a pit in it, but no meat in the pit. He has produced a plum that has got no pit around the meat. As we walked along he named a certain plant to one of the botanists in the party, a plant that was somewhat hairy, like the mullen, and he said, "It occurs to me that that plant ought to be made to produce hair or wool." He said, "Here is one of my crosses," and he picked up a leaf that he had grown, and it was pretty nearly as woolly as a merino sheep. I picked up that leaf as he dropped it and put it into my pocket; I wish I could show it to you, but it is in the city of Washington, where I sent it for a special purpose. Of the trees that are produced

by him, only the good ones are saved, and the others are thrown into brush heaps and burned.

Now, you may be interested in this. At a dinner given to the non-resident professors by some gentlemen in San Francisco I was called on to make some remarks and took Luther Burbank for my text, I said, "Gentlemen, you have here in California one of the rarest human beings, a man who can juggle with plants. Now, you have tried to have him come into your university and become a professor—they have tried to get him to come into the institutions—now, do not try to move that man into the class room and try to make a professor out of him, he is not that kind of a man; here is a man that can do his work better by himself; to put him into a university and try to harness him into that sort of work, or even into an experiment station with other men, would be to blight his life and destroy his usefulness. Now, if you can arrange to do this,—put a man with Mr. Burbank that lives in Santa Rosa, his next neighbor that can go over and sit down and talk with him; let this man be a trained scientist, a man that can write and use scientific terms, put him beside Mr. Burbank, be the kind of a man that Mr. Burbank would like, a man that is congenial, and let those two men live together as brothers, and in his moods Mr. Burbank some day will talk a little, and he will tell something unconsciously that this man will remember and write down when he gets back to his room. Probably when Mr. Burbank sees a pencil come out, he will shut up like a clam; he is so delicately constituted, he cannot help it." I asked him, for instance, "Mr. Burbank, when do you put the pollen on to the pistil?" Well now, he entered into some very interesting facts, he gets his knowledge from watching the insects, and the key to his work I think in that connection is pretty largely the insects, at the same time, I say he is a genius, and he does not even have to ask the insects—he knows. Now genius, as I started out to say, is a God-given spark, a bit of the Divine itself which comes into the human mind, you cannot measure or define it in any other way, and this man seems to have walked with God, and he deals with the plants in a small, finite way, it is true, but somewhat as the Creator himself does.

Adjourned.

FRIDAY MORNING

WISCONSIN FRUIT AT ST. LOUIS

By A. A. Parsons, Omro.

Mr. President, Ladies and Gentlemen of the Wisconsin State Horticultural Society: In taking up this subject, Wisconsin Fruit at St. Louis, I do so with a great amount of that enthusiasm, which made my work at the Pan-American so interesting to me.

In making out exhibit at St. Louis we should profit by our past experience as much as possible. Economy should be your first thought but not to the extent that it would destroy our object, viz.: a first class exhibit, second to none; one that will be an honor to the people of our great state. For such an exhibit, there is in my opinion just three requirements, viz.: Fruit of first class quality in every respect; second, attractiveness; third, cleanliness. Without all of the above your best efforts would be a partial failure.

To secure Wisconsin's best products in horticulture it will require the united efforts of you all; each one must put his shoulder to the wheel as he did at our Pan-American exhibit at Buffalo and for a time lay personal hobbies aside and do that which seems best for the object in view. Of the fruit which has already been sent to St. Louis, that which went from Winnebago county, I know to have been of the best quality when packed, except a small part of it which in my opinion was a little to ripe.

I believe the most difficult time for our exhibit will be from the time it is first installed, to the season when our new crop of apples are ready, about the first of August.

I understand we have at St. Louis 1,160 feet of space. We had at Buffalo 450 feet, quite an addition you see. In order to make much of a show at first on so large a space, we must use as

much of our small fruit as possible. I believe all varieties picked a little on the green order and properly packed would reach St. Louis in good order, and would stand second to none unless it were blackberries. Our different varieties of small fruit with their high color would make a grand show, and thus establish the fact that Wisconsin is not only an apple producing state but of other fruit as well.

I believe your Executive committee should devise better methods than we had at the Pan-American for collecting, naming and packing fruit for shipment for your exhibit. I believe it useless expense to ship only in small quantities, such varieties as Longfield, Anisim, G. Russet, Hibernal, Switzer and some others or any of the Crab Family. Only enough to maintain the different varieties and as a comparison in size to the other varieties, as this class of fruit creates no great amount of interest to nine tenths of the people who visit the exhibit; but rather confine your efforts to those you know to be the best and most attractive, and of those not in such large quantities as we sometimes had at Buffalo, unless you have convenient cold storage; even with convenient cold storage I should prefer not to use it unless absolutely necessary, as apples never look quite as attractive after being long in such storage.

In collecting I would recommend that you have district inspectors; no fruit shall be shipped unless it has been approved by such inspectors, and none but first class fruit shall be taken. Each of the head inspectors should be in close touch with the Superintendent of our exhibit, keeping him informed at all times just what varieties, and how many of each, and what is their stage of maturity. By so doing the Superintendent will know where he can get those varieties he needs the most, as he alone knows best what is required to keep the exhibit to the highest possible standard, at the least expense. You should not allow apples to be shipped in thin boxes with sides similar to berry cases as such cases usually came to Buffalo with the fruit in bad order.

In taking up this part of my subject I am well aware that some of you will not agree with me, claiming that flowers would detract from the effectiveness of our display of fruit. Such has not been my experience and observation along this line when done judiciously. A large majority of visitors are not professional fruit growers, and in order to get their attention you

must have something besides fine fruit. Something pretty to catch their fancy, get their attention and you will have a most interested group around your exhibit, each one eager to learn all the merits of each variety. You must create an interest in order to show the merits of anything. I do not know of a better way than by the use of flowers as most people admire a beautiful bouquet, get their attention and interest and the success of our exhibit is assured.

Cleanliness is another factor that is equally as important to gain the result which we desire. No matter how costly or how elaborate you have been in placing your exhibit if the tables, plates or fruit is allowed to become dusty and dirty your object is defeated and the result a disappointment to all. But I do not believe that defeat from such causes will be allowed to happen to our fruit in St. Louis. Let each of us step into line, ellbows touching and contribute our best efforts to the good of Wisconsin products in horticulture and the result of our efforts will be at the top of the list again.

In conclusion let me say, collect the best fruits from Wisconsin orchards, pay the growers all it is worth, carefully name each variety, pack and ship by express. With the above arrangements and other conditions equal I believe success will crown our efforts and no person from Wisconsin who may visit our exhibit but will have feelings of pride and pleasure over Wisconsin fruit at St. Louis.

MEMORIAL SESSION.

A. CLARK TUTTLE.

Albert Clark Tuttle was born May 18, 1839, in the town of Litchfield, Connecticut. He died December 6, 1903, at Baraboo, Wisconsin, in the sixty-fifth year of his age.

When Mr. Tuttle was nine years old he came with his parents to the locality now known as Baraboo. Where Baraboo city now stands was a little Indian trading post called Adams. Shortly after their arrival the territory now included in the city of Baraboo and the towns of Baraboo and Greenfield was organized as the town of Brooklyn. The name of "Baraboo" was given to both the village and the town in 1850. In this place Mr. Tuttle lived until 1863 when he responded to the call of his country and enlisted in Company A, 19th regiment Wisconsin volunteer infantry.

He was with his regiment during its first engagement, which occurred May 16, 1864, at Drury's Bluff, Virginia. When the battle was over Mr. Tuttle was detailed to go to the spring and fill the canteens for his squad. While performing this duty he was struck with a spent ball which gave him a wound in the leg from which he never fully recovered. In fact this wound was probably the indirect cause of his death. The immediate cause of his death was heart trouble and disease of the brain. This wound caused Mr. Tuttle intense suffering during the remainder of his life. For years he was unable to walk without the aid of crutches. A few years ago at a reunion of his old regiment he met a comrade whom he had not seen before since the day of the battle and was greeted with "Hello, Tuttle! Where is my canteen?"

Mr. Tuttle was a great sufferer, and he was also a sweet singer. Perhaps the silent hours of suffering had something to do with bringing out the peculiar sweetness of that deep, rich voice. He gave to the public freely of his time and talents. When a young man in Baraboo he belonged to the Choral soci-

ety led by Mr. Hawes. While in Kilbourn he led the choir in the Presbyterian church, and when he returned to Baraboo he performed a similar service for the Congregational church in that city.

In the early years after the war Mr. Tuttle married Miss Mary Savage of Baraboo and removed to Michigan where he planted what has since become one of the famous commercial orchards of the Grand Traverse region. Returning to Baraboo he was associated for a time with his father and his brothers in the nursery business. Later he learned the printer's trade and established a paper at Kilbourn, Wisconsin, known as *The Dells Reporter*. In the management of this paper Mr. Tuttle introduced features, at that time novel, which have since been adopted by local papers everywhere.

In the year 1881 he removed to Webster, Dakota territory, where he established *The Reporter and Farmer*. This paper is still published under the same name and is one of the influential journals of the state of South Dakota. Mr. Tuttle and his family did some pioneering in starting this paper. When they reached Webster they found many and large prospects but very few and very small buildings. Renting a house consisting of one small room, they moved in and went to work. There was not room in the house for the printing press so it was set up out of doors. The first paper was "set up" out of doors, too. The weather was getting cold but Mr. Tuttle managed it all right by keeping on the south side of the house. As the work was done upon the street the village people naturally got wind of what was going on and they were interested. When the first paper rolled from the press a great shout went up from the crowd that had assembled to witness the event—the printing of the first paper in the county. Mr. Tuttle began at once to build a new house and moved in as soon as the roof was on and the floor was laid. This house also consisted of one room but it was longer than the other. They kept house in one end of this room and ran the printing office in the other end of it. Presently one after the other came the Post Master, the County Commissioner, the County Clerk and the Probate Judge, each looking for office room. Each office brought another desk. As each new desk came in, the furniture was moved back to make room for it, until the space left for the cook stove was very small, indeed. Then came blizzards and snow blockades that

lasted for weeks. With supplies by railway cut off it was very difficult to run a paper, but Mr. Tuttle managed to keep it going. Sometimes it was printed on wall paper and sometimes on cotton cloth, but during the two years that he continued to edit and print the paper it came out regularly every week.

When he disposed of *The Reporter and Farmer* he returned to his old home at Baraboo and to his chosen profession.

By nature, by early environment and by choice Mr. Tuttle was a horticulturist. Sometimes circumstances led him into other fields of labor but his natural instincts were always drawing him to horticulture as surely as the magnetic needle is drawn toward the north. As a good soldier he had the love and honor of his comrades, as a citizen the respect of the community, as a printer he was painstaking, tasty and correct, as manager and editor he did not hesitate to take the initiative, as a public officer he performed his duties with fidelity. Each of these positions in life brought out certain traits of character but in no one of them was the real man revealed as fully as in his chosen profession, horticulture. He was always a horticulturist. When he enlisted he gave as his occupation "Nurseryman." When he entered upon his duties as editor and publisher of a local paper he published a guide book to the scenes of natural beauty about the Dells and the region about Devils Lake, in which he classified the mosses and ferns of this region and named the rare flowers that could be found in each locality. When he went to Dakota he continued to cultivate fruits and flowers. When in Baraboo he was always identified with our local Horticultural Society, and was its first recording secretary. He was a frequent contributor to the public press, but never wrote unless he had something interesting to say. He had a terse and forceful way of putting things. He was a close observer and skilled in all the details of his profession.

Mr. Tuttle was associated with his father, A. G. Tuttle, and was of great assistance to him in the important work which he did in the introduction and testing of hardy varieties of Russian apples. He followed his profession not so much for the money there was in it as for pure love. When financial reverses came he still stuck to the propagation of his beloved fruits. As one has said, "He worked out the problem of human existence close to the heart of nature."

To Mr. and Mrs. Tuttle were born two children, a daughter,

Louise, who is now teaching in the school for the blind at Janesville, and a son, Glyde, who is just reaching his young manhood and is now living with his mother at Baraboo.

Mr. Tuttle was a modest and unpretentious man, deeply interested in all that pertained to the general welfare, yet never intruding his personality upon the public,—a useful man in society and in his chosen profession. May we remember the good he has done.

—Franklin Johnson.

HENRY TARRANT.

By Geo. J. Kellogg.

Henry Tarrant was born in Woolhampton, Berkshire county, England, May 23d, 1833. Died in Janesville, Wis., September 2, 1903.

His father was an eminent landscape gardener. This may be the key to Henry's tastes and success in horticulture. In his early years he enjoyed only a common school education. He was messenger boy in London in his youth. His parents came to America and Janesville, Wis., in September, 1850. Henry lived two years at Viroqua and Black River Falls., Wis., returning to Janesville in 1854. He worked one year in a saw mill. He then bought a farm on Sec. 31, Town of La Prairie, Rock county, and I had the pleasure of selling him at the nursery, trees for his first orchard, apple trees two years old, and I think never a year passed he did not come for more. This first orchard was planted in 1856. But eighty acres was too little ground, and his then profitable orchard helped him sell in 1878, and he bought 320 acres near the center of the same township.

In connection with his extensive farming operations he was continually setting trees, until he had three orchards on this last farm. This outlay was one of the factors that enabled him to sell out his farming investments at a good price three years before his death and retire to the city; but he could not stop setting trees, his garden was full of plants, trees and shrubbery, and it is a pleasure to visit the place of his last horticultural efforts.

As a church member, Brother Tarrant was active, consistent and ever serving the Master. He was honored by every office of trust a layman could enjoy in the Methodist Episcopal church, often elected to conference as a delegate. He was superintendent of Sunday schools for nine years, always in church, Sunday school or Bible class, unless detained by sickness. The church has lost a valued and honored member.

As a citizen few men were his equal; he organized the La Prairie Fire Insurance Company, afterward embracing many towns in the county. For thirty consecutive years was its honored secretary, and sixteen years of this time he was its treasurer and agent. He was chairman of the town board eleven years and of the county board two years. He was treasurer of the county one term and member of the state legislature four years.

Henry Tarrant was married to Miss Margaret J. Arnold in 1857. His wife and five children survive him: Elmer C. and Ethel G. Tarrant of Janesville, Wis.; Mrs. Edward D. Kelty of Minneapolis, Minn., and Roy G. and Irving H. of Milwaukee, Wis.

As a husband and father he was honored and beloved; the sacredness of the home and family altar will ever live in the memories of the home circle.

As a horticulturist we have a right to be proud of the man that knew more trees at sight than any man I ever met that was not a professional nurseryman.

From early youth he was a lover of horticulture; he was always planting, grafting and working among the fruits and flowers in their season. His orchards, of which he planted four, were all experimental, yet at his own expense. They ought to have been "Trial Stations," adopted by the state. Nearly every new and hardy fruit from north, west and southwest were planted on his grounds. He was too retiring to let his works be known and appreciated by the public. Had our "Trial Stations" been under his supervision they would have been much farther advanced than they are now. Our loss as a Society is beyond words to express.

We most heartily extend our sympathy to the family and friends of our deceased brother and in token hereof tender Mrs. Tarrant the enlarged photograph that hangs on the wall.

Z. K. JEWETT.

By A. J. Philips.

Mr. Z. K. Jewett, for many years an honored member of our Society, died September 11, 1903. He was also for many years vice-president for Wisconsin of the National Nurserymen's Association. I feel that I can do no better than to read this tribute to him from his home paper, where he lived for thirty years.

Extract from Sparta *Herald,* September 15, 1903:

A VALUABLE CITIZEN GONE—DEATH OF Z. K. JEWETT.

The announcement of the death of Mr. Jewett, which occurred at the hospital in Rochester, Minn., shortly after midnight of Friday night, Sept. 11th, came with the force of a shock to his friends and the community, the hope for his recovery having been so strong. He was taken to the hospital in Rochester something over two weeks ago, his ailment, affecting the intestines, having assumed a phase which it was thought would necessitate a critical surgical operation. He underwent a partial operation successfully, and rallied at once to so marked degree, that his certain recovery was looked for, and he was about to return home, when all at once his strength apparently failed, and there was hardly time to notify his friends here before the end came. He passed away peacefully and without pain.

Mr. Jewett was one of our best and most substantial citizens, and more than that, one so much identified with the life, the business and society of Sparta that hardly a resident of the city but feels his death as a personal loss. He was one of the older class of citizens, having come here in 1865. His birthplace was in Aurora, Portage county, Ohio, but most of his early life was passed in and around northern Illinois. He went to California in 1858, remaining about five years. Coming here, Mr. Jewett located on a farm in La Fayette at first, but subsequently, in company with his brother, A. H. Jewett, established a nursery, purchasing the residence where he has lived so many years, and which was then known as the Damman place, the

late Jerry Damman having established the farm and built the residence. He purchased his brother's interest in 1878, and developed a large and growing business in nursery stock. His son, Arthur, and daughter, Miriam, came into the business, the former managing a branch dealing in packing moss, a conspicuous feature, while extensive greenhouses were established, and developed a large business under charge of Miss Miriam Jewett. The Jewett nursery and greenhouses acquired a wide reputation, and enjoyed a large trade.

He was married in the spring of 1866 to Miss Eliza Judd, whose home was in Antioch, Ill. She survives him, together with Arthur J., son, and Misses Miriam and Maude, daughters. His brother, A. H. Jewett, resides at White Salmon, Wash., and a sister, Mrs. L. C. Morehouse, at San Leandro, Cal.

Mr. Jewett was an active man in public affairs and strongly interested in everything pertaining to the growth and welfare of the city. He has represented his ward on the common council altogether for some eight years, and was one whose judgment and earnest work in the many times perplexing problems arising in municipal affairs were of the utmost value. Moreover, his genial and cheery temperament—one of his most conspicuous traits—won him the hearts of all, and all who came to know him—and few in this city did not—are his sincere mourners.

The funeral services, arrangements for which were in charge of undertaker Letson, at his home yesterday afternoon, were largely attended, there being present besides the many friends, the members of the Odd Fellows lodge, the city council and a large assemblage of citizens. The obsequies were not extended, but very impressive, Rev. Huelster giving scripture readings and a brief discourse full of beauty and pathos. Hymns which were favorites of the deceased were sung by a quartette, Messrs. Jones, S. D. Beebe, Palmer and Morris. There were numerous and magnificent floral offerings. From the residence an extended cortege accompanied the remains to Woodlawn cemetry, where with a few brief words they were laid away to their long rest.

THE PLANTING OF TREES AND SHRUBS.

By F. Cranefield.

(Bulletin No. 1, Wisconsin State Horticultural Society, Issued March, 1904.)

Many thousands of trees and plants are set out every year in this state; some live, many die.

In some cases the nurseryman is at fault. He may send out dead or weakened stock. Sometimes the railroads delay shipments until the trees are injured beyond recovery. More often the planter is at fault. The trees may arrive in good condition but in the rush of spring work the bundle is laid aside until a convenient time arrives to plant, or the trees may be improperly planted.

Trees and plants in small lots are packed in bundles at the nursery. If the work is well done the roots should be packed in damp moss or excelsior and this covered with burlap. The tops should also be completley covered either with rye straw or burlap. This packing is usually sufficient to protect the plants from drying until they have arrived at their destination, but is not intended to preserve them longer.

Never under any circumstances leave the trees in the shipping package, even over night. If possible plant at once, otherwise open the bundle and "heel-in" the trees or plants.

"Heeling-in" is temporary planting. To do this dig a trench wide and deep enough to accommodate the roots with one side sloping as shown in Fig. 1.

Open the bundle, lay the trees separately in the trench with tops resting on sloping bank. Cover the roots with moist earth, sifting it well among the roots. Tramp firmly and when the trench is filled cover again with one inch of loose earth. The heeling-in spot should be on well drained ground. Treated in this manner trees may remain for several days or even weeks if in a shaded and cool place. The same applies to bushes and

even strawberry plants. If trees are shrivelled when received, bend down the tops after heeling-in and cover them with moist earth. Often in two or three days they will be found to be plump and fresh.

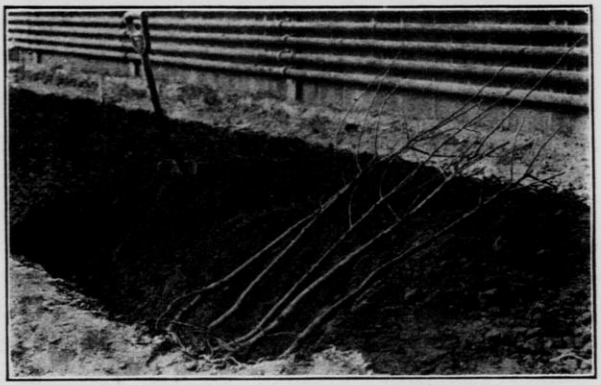


FIG. 1. Showing method of "heeling-in" trees when planting is delayed.

HINTS ON PLANTING.

The ground should be deeply plowed and well cultivated before planting. Do not set out a young orchard in sod. The grass roots will reach out and rob the trees of food and water. If you cannot devote a piece of land to trees alone and keep it in cultivation, do not attempt fruit growing as the results will be disappointing.

Dig holes large enough to accommodate the roots after these have been cut back to sound wood. Fit the holes to the roots, not the roots to the holes. Trim broken and crushed roots back to sound wood. Do not cut off more. The tree was deprived of about seven-tenth of its roots when dug. It will need all that remains. Don't worry about the fine, fibrous roots about which so much has been written,—these are dead anyway if the tree has been out of the ground more than an hour,—take care of the larger roots, for it is from these that growth starts.

Protect the roots from the sun and wind every moment from the time the bundle is opened until the tree is set. When in the field planting throw a wet burlap or grain sack over the roots.

The hole should be deep enough to admit setting the tree about two inches deeper than it stood in the nursery. Get down

on your knees. It is difficult, if not impossible, to plant a tree while standing upright. Spread out the roots and sift earth about the roots and pack firmly, at first with the fingers and when the roots are out of sight get up and tramp firmly with the feet. If the earth is moist and mellow, it cannot be tramped too firmly. It must be in close contact with the roots in order to enable them to take up the water it contains.

PRUNING.

The tree is now safely anchored in the ground but the work is not finished. At this point arises a very common cause of failure. Some of the branches must be removed or the tree is apt to perish.

Before removal from the nursery the tree had sufficient roots to supply all of its buds with water. In digging, most of the roots have been (necessarily) removed, but the buds are left. When growth begins every healthy bud will push out and call on the roots for water to feed its new-born leaves. The very limited supply that the reduced root system can pump up will be distributed equally and as a result none may have enough to develop its leaves and without leaves the tree must perish. We must, therefore, reduce the number of these water pumps by removing one-fourth to one-half the buds. An illustration of the method of doing it is shown in Fig. 2.

The drier the ground and the weather the more we should cut off.

The manner in which the cutting is done will depend to a great extent upon the kind of tree or bush. In apples, plums, etc., we need to bear in mind the ultimate shape of the tree. The framework upon which the branch system is built is determined largely at this time. Remove crowding, crossing, and interfering branches. Aim to leave the main branches spirally about the stem rather than opposite. The lower opposite branches in fruit trees form bad forks that may split down later.

MULCHING.

The work is still unfinished unless the tree is mulched. This mulching may be done with the hoe or cultivator, stirring the soil frequently.

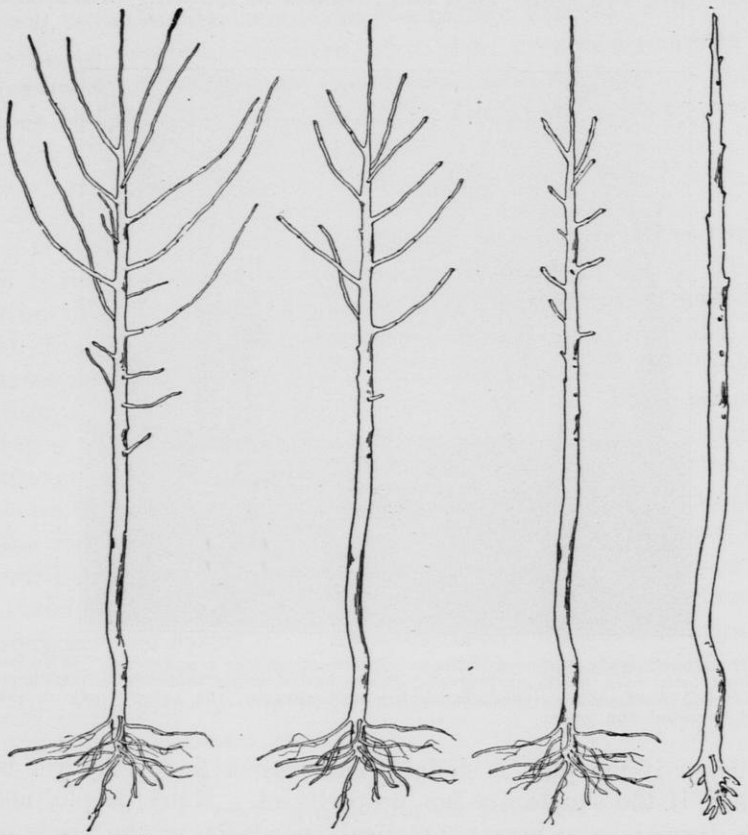


FIG. 2. Showing methods of cutting back trees at planting time. Beginning at left: No. 1, unpruned; No. 2, pruned sufficiently if the tree is well planted in moist ground; No. 3, showing extent of pruning necessary for weakened trees and trees set in dry weather. No 4, Stringfellow method: (See p. 9.)

Another way is to put plenty of strawy manure or straw about the tree. Trees may be well planted and yet die if not mulched. It is a good plan to protect the trunk from sun and wind. Six different tree protectors are shown in Fig. 3. A choice should not be difficult.

In the case of shade trees and sometimes in re-planting in old orchards it is necessary to set in sod. In this case the sod should be removed over a circle not less than six feet in diameter and after the tree is set a heavy mulch applied, or better, a thorough hoeing given once a week. The principles here cited for trees apply equally well to smaller plants. The following

from Bull. 105, Wis. Exp. Sta., relates to planting ornamental shrubs.

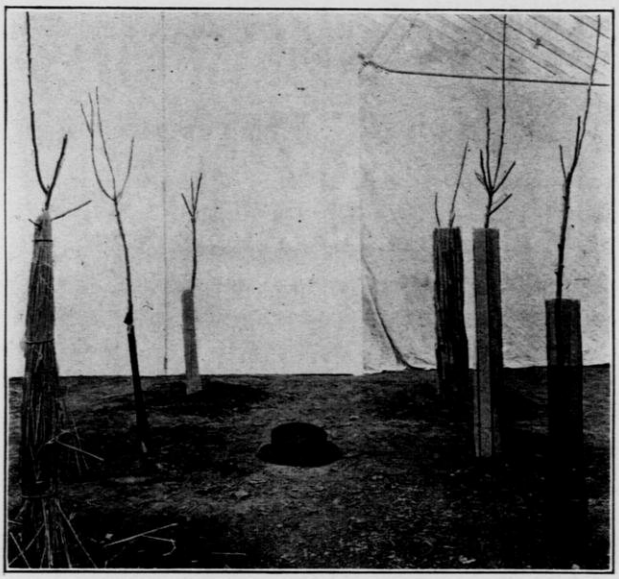


FIG. 3. Showing six different methods of protecting tree trunks, viz.: Wire netting, lath, corn stalks, rye straw, black-enamel paper and veneer. If paper is used it should be renewed spring and autumn, the others may remain throughout the year.

"Even if the plan is definite and correct there may yet be failure if the shrubs are not properly set. Many people, notably farmers who have a practical knowledge of the needs of plants and the requirements for their best development, seem to utterly ignore these needs in lawn planting. A small patch of sod is removed, the plant set and often the sods carefully replaced about the stem. The struggle at once begins between the bush and the multitude of established grass roots. The result may be easily predicted; the shrub is starved. Imagine a hill of corn with such treatment!

We cannot expect, nor should we wish for grass and shrubs on the same area. The sod should be removed from about the roots and the soil kept cultivated or mulched. In planting groups or masses the whole area should be spaded before setting the bushes and afterwards cultivated until the plants completely shade the ground.

The distance apart to set shrubs in groups will depend upon the size of the plants at maturity. They should be close enough

to present a continuous line of verdure. The individuality of each, at maturity, should be completely merged in the mass, with the exception, perhaps, of a plant here and there on the border which may stand out alone. The majority of shrubs may be safely planted three to four feet apart in this climate."

ABOUT WATERING OUT TREES AND PLANTS.

If trees are set in the proper season, viz., very early in spring, it is rarely necessary to apply water at planting time. At this time there is usually an abundance of moisture to start the tree if this moisture is preserved by cultivation or mulching. If trees must be watered out there is but one right way to do it, that is, by watering before the tree is planted, either by pouring a pail of water in the hole immediately before setting the tree or when the hole is half filled with earth. The latter plan is probably the better as the water will compact the earth about the roots. In this case the filling may be delayed for a time until other trees are set, to allow the surplus water to escape. Pouring water on the surface after the tree is set is useless and may even be harmful. The water rarely reaches the roots and only moistens the surface. The roots are attracted to this moist zone, thus growing upward instead of downward, only to perish when drought comes later.

THE STRINGFELLOW METHOD.

Mr. H. M. Stringfellow, a well known horticulturist of Galveston, Texas, advocates a method of pruning nursery grown trees when setting that is a radical departure from the common method described above. It consists, in brief, of removing all fine roots and cutting back the larger ones to mere stubs as shown in Fig. 1. All branches are also removed. The trees are then set with a crow-bar, dibble, or in a narrow opening made by thrusting a spade into the ground.

Peach trees planted in this manner, in the South, appear to thrive, but in northern latitudes it has not proven successful. It is yet a subject for experiment in Wisconsin and should not be practiced except on a small scale until its merits are proven.

The following hints regarding soil, site, etc., for the common fruits may be helpful to the amateur:

APPLES.

Soil: Clayey loam with permeable clay subsoil.

Site: Elevated—north slope preferable.

Distance Apart to Set Trees: 20 to 24 feet.

Age of Trees to Set: Two year old trees preferable.

Culture: Cultivate until July 15th or August 1st, then sow cover crop, oats or hairy vetch. Plow same under in the spring.

Protection: Spray with Bordeaux mixture and Paris Green before leaves appear and after blossoms have fallen, and again when the fruit is one-third grown. Protect trunks with veneer wrappers. Keep grounds clean; rubbish harbors borers.

Pruning: In March cut out interfering branches—keep center of tree open. Head tree low when planting—18 to 24 inches.

PLUMS. (Native.)

Soil: Any well drained land. Native plums are adapted to a wider range of soil than other tree fruits. Many varieties thrive on sandy soil.

Site: Same as for apples.

Distance: 18 to 20 feet.

Age of Trees: 2 to 3 years.

Culture: Same as for apples.

Protection: Same as for apples. In addition jar for curculio and gouger.

Pruning: Cut back annually, in spring, the strongest shoots. Plums require less pruning than apples.

CHERRIES.

Soil: Light, well drained soil. Cherries will not thrive on heavy, moist land.

Distance: 20 feet.

Age of Trees: 2 to 3 years old.

Culture: Same as for plums.

Soil: Light loam with clay subsoil. The bramble fruits thrive best when the roots may penetrate a cool subsoil.

Site: Level ground.

Distance: 4 x 8 feet.

Culture: Shallow cultivation throughout season. After first year provide post and wire trellis about two feet in height.

Some low growing varieties do not require support. Most varieties require winter protection. Bend the plants to the ground and cover with one to two inches of earth.

Pruning: Remove and burn the fruiting canes as soon as crop is picked. Leave but five to six new shoots for succeeding crop.

GRAPES.

Soil: Any well drained soil. Thrive somewhat better on light loam or sandy soil.

Site: South slope preferred, to afford air drainage and sunlight.

Distance: 8 x 8 feet.

Age of Plants: 2 years.

Culture: Clean culture: provide six-foot post and wire trellis for support of vines after the first year. Prune vines in October and protect by covering with earth.

Protection: Spray with Bordeaux once before leaves appear and again when leaves are fully expanded.

Theory of Pruning: "Fruit is borne on wood of the present season, which arises from wood of the previous season." Renew bearing canes every three or four years.

STRAWBERRIES.

Soil: Any well enriched and well drained land. (Good corn land.)

Site: Immaterial.

Distance: 2 x 4 feet.

Plants: Only new runner plants (current season's growth) should be used.

Culture: Plant in spring: use only rotted manure for enriching land. Fall plowing preferable. Keep plantation free from weeds and grass. Confine plants to rows not more than 18 inches wide by cutting off runners. Cover plants lightly with marsh hay in November for winter protection. Do not fruit a plantation more than two years. To keep the rust in check spray with Bordeaux mixture once before the blossoms open and again after the fruit is set.

CURRANTS AND GOOSEBERRIES.

Soil: Well enriched, moist land.

Site: Immaterial.

Distance: 4 x 4 feet.

Age of Plants: 2 years.

Culture: Cultivate thoroughly throughout the season. A heavy mulch of coal ashes may be applied about the roots to advantage.

Protection: Spray with Bordeaux in June to prevent fungus which causes premature dropping of leaves. Spray frequently with white hellebore (1 oz. to 3 gal. of water) as worms appear.

Pruning: Remove one-quarter to one-third of oldest canes each year.

STRAWBERRIES FOR THE HOME GARDEN.

F. CRANEFIELD.

Bulletin No. 2, Wisconsin State Horticultural Society. Issued April, 1904.

This little bulletin is intended as a guide for every one who wants strawberries for home use. It is for the home gardener only and not for the commercial grower. Many people, farmers as well as residents in villages and cities, buy strawberries for home use, when in most cases sufficient land is available to produce an abundance of berries. A space 20x50 feet, if well tilled, may produce annually more strawberries than the average family can consume. Six bushels of strawberries were picked from a patch of this size last year in a private garden in Madison. Every one who has a square rod of tillable ground may have strawberries.

Soil.—The character of the soil is of but little importance. Any good garden land will produce strawberries. An extreme case is shown in Fig. 1, where the surface is covered with stones.

The soil in the Madison garden mentioned above is stiff clay over swamp muck, which in turn overlays fine sand.

Site.—The site is matter of slight importance if not too far from the house. The fruit will ripen earlier and the blossoms suffer less from late spring frosts if located on slightly elevated land sloping gently to east or south.

Soil Preparation.—The ground should be deeply plowed and in every way as well prepared as for corn before planting. On light soils it is a good plan to manure and plow in the fall, as strawberry plants do not start well in very loose and mellow soil. For very heavy soils spring plowing may be preferable.

FIG. 1. Showing strawberry plants on very stony land.

Manure.—Use only thoroughly decayed (unleached) manure. Not only is fresh manure unavailable as plant food but the decaying processes which it undergoes in the soil may cause injury to the roots of the newly set plants if in contact with them.

Best Time for Planting.—Early in spring, as soon as the ground can be worked, is the very best time to plant. Good results, however, may be had by planting later, even at flowering time, if the plants are carefully handled and shaded after planting. Nothing is gained by fall planting, for if the plants are allowed to fruit the following spring a poor growth will result in a very scant crop the following year. We should encourage plant making *this* year that we may have an abundance of fruit *next* year.

Plants.—Good plants may be had of our Wisconsin nurserymen at reasonable prices. It may also be possible to get thrifty plants from a neighbor, but in this case care must be taken to

secure only new plants,—less than one year old. Only young runner plants of the current season's growth that have never borne fruit should be used. These may be known by their light colored roots; plants more than one year old have dark (black) roots.

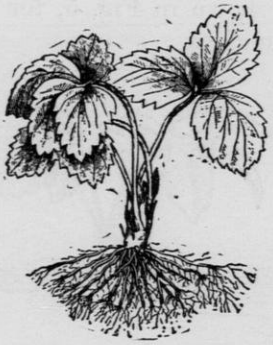


FIG. 2. Showing the branching of roots as a result of root pruning.

Planting.—For the home garden the plants should be set about two feet apart in rows four feet apart.

The plants should be prepared for planting by removing the old leaves and stems and shortening the roots, both to facilitate

FIG. 3. Showing manner of transplanting with dibber; inserting roots.

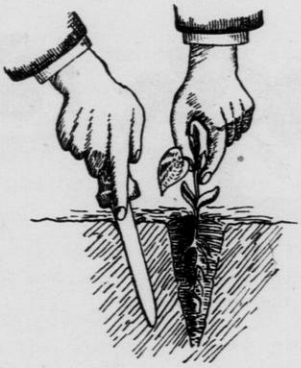


FIG. 4. Pressing earth about roots.

planting and encourage branching (Fig. 2). After trimming dip the roots in water and pack snugly in a basket with damp chaff or straw to prevent drying by sun and wind. With a dib

ber or garden trowel make a narrow and deep opening as shown in Fig. 3, spread the roots fan-shaped and tuck them into this V-shaped opening, close the opening with dibber as shown in Fig. 4 and tramp firmly close to the plant. In this way the roots are down in moist earth. Do not plant by spreading the roots horizontally as shown in Fig. 5, for in this way the roots are all too near the surface.

FIG. 5. "Do not plant by spreading the roots horizontally."

Do not set too high with the roots exposed as shown in Fig. 6. Do not set too deep, as shown in Fig. 7, with the "crown" covered with earth, or the plant will surely die. Fig. 8 shows proper way.

FIG. 6. "Do not set too high with the roots exposed."

FIG. 7. "Do not set too deep."

FIG. 8. This is a better plan.

In large plantations the "spade" method is employed. A spade is thrust into the ground and drawn slightly forward. The plant is then placed in the opening behind the spade, the spade withdrawn and the opening closed firmly by again thrusting the spade into the ground close to the roots.

Watering.—If the ground is dry at planting time it may be advisable to apply water. This should be done by pouring it into the hole before the plant is set. Pouring a little water on the surface after the plant is set is apt to do more harm than good. Only the surface soil is moistened, which attracts the feeding roots to the surface, where they quickly perish.

FIG. 9. Illustrating the "matted row" system of strawberry culture.

Cultivation.—Keep the soil loose, mellow and free from weeds throughout the season by frequent cultivation. An adjustable one-horse cultivator is a good tool to use. Run close to the plants at first and as the runners stretch out into the space between the rows, close up cultivator, allowing the plants to set thickly in matted rows two feet wide, thus leaving a two-foot path between rows. Care should be taken to keep the rows full by training runners so as to fill gaps. If the ground is rich and the season favorable too many plants may set. In this case as the season advances remove the surplus plants until they stand about six inches apart.

Remove all blossoms from the parent plants as soon as they appear. All of the energies of these plants must be directed to plant making the first season and not wasted in the produc-

tion of flowers and fruit. At the end of the season we should have a bed that will appear like the one shown in Fig. 9.

Winter Protection.—As soon as the ground is slightly frozen in the fall the bed should be lightly covered with clean straw, or better still, marsh hay. This covering is not designed to prevent freezing but to prevent alternate thawing and freezing. Some growers use sawdust for covering with good success.

One Year After Planting.—After settled warm weather has arrived and the plants begin to push into growth the winter mulch should be removed. A large part of it may be raked into the paths between the rows, where it will serve to keep down weed growth as well as preserve moisture. Some growers remove the mulch entirely and cultivate the space as in the preceding season. In this case the mulch must be replaced as the fruit begins to ripen in order to keep it clean. The bed should be kept free from grass and weeds which will appear in abundance among the plants in the matted rows. If all these things be done we should be rewarded in June with an abundance of fruit.

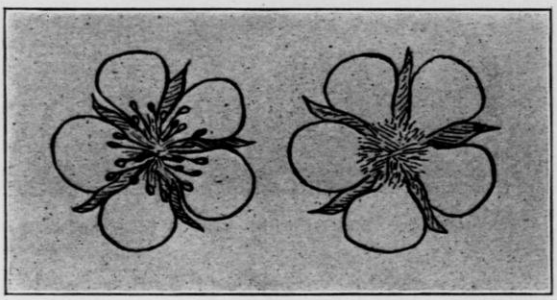


FIG. 10. Showing an imperfect or pistillate strawberry flower.

FIG. 11. A perfect or staminate flower.

Protection from Frost.—Late spring frosts may destroy the blossoms, as these are very susceptible to cold. The mulching may be used to cover the plants when frost threatens. It may be forked lightly over the plants after sundown and removed the next morning. It serves as a blanket, retaining the heat about the plants. This may be repeated as often as frost threatens, at slight expense.

The Second Season—Renewal.—After the fruit is harvested mow the plants close to the ground, rake the bed free of the cut

leaves and mulching and burn them. In this way insects and diseases are destroyed; then plow a shallow furrow from each side of the row into the paths, leaving a strip of plants about 8 inches wide; clean out this narrowed row, cutting out the old plants and as many others as may be necessary to leave the plants 8 to 10 inches apart. After this cleaning and thinning cultivate as in the first year and if season is not too dry, these remaining plants will send out runners and again form matted rows. By taking a new portion of the row each year for the renewal the plantation might be continued indefinitely, but in practice it is scarcely profitable. It is generally considered less expensive and more satisfactory to plant a new bed once in two years at most, and many good growers retain the plantation but one year.

Varieties.—Some varieties of strawberries produce only imperfect flowers, similar to the one shown in Fig. 10. These flowers have no stamens and are therefore incapable of self-pollination. It is important to keep this fact in mind when selecting varieties, for if imperfect-flowered varieties only are selected no fruit will be borne. A small part of the plantation at least must be of kind bearing perfect flowers like the one in Fig. 11. Nurserymen indicate in their calalogues the imperfect varieties by the abbreviation "Imp."

The amateur as well as the professional soon learns that in the selection of varieties he must be guided by local conditions of soil, climate, etc., and that no list can be given that will be satisfactory over any wide area.

The following is given as a "trial list." All are well known to commercial growers and are fairly satisfactory under widely varying conditions:

Perfect-Flowered: Bederwood, Splendid, Lovett, Glen Mary.

Imperfect-Flowered: Warfield, Haverland, Crescent.

If but two varieties are wanted, Bederwood and Warfield may be selected, the former early, the latter midseason to late.

THE IMPROVEMENT OF HOME GROUNDS.*

F. CRANEFIELD.

This bulletin treats of grass, shrubs, vines and flowering plants and suggestions for planting these to the best advantage in the decoration of home grounds.

There are many reasons why the home should be made more attractive without as well as within, but probably the one of most importance is the influence that beautiful surroundings may exert upon the minds of children. A well kept lawn with shade trees, flowering plants and vines will unconsciously develop in the child's mind a love of home and of the beautiful in nature that may in later years repay many fold the expense involved, while bare and cheerless surroundings will engender a feeling of discontent as well as a lessened capability to appreciate the refinements of life. The decoration of the home grounds is of as much importance in the creation of refining influences as the furnishings and decoration of the interior of the home.

Bare walls and a comparatively small amount of furniture will answer for the actual needs of a family, but everyone aims to have something more than this,—an attractive wall covering with at least trifling ornaments and handsome pictures. The lawn should also be provided with a ground cover and beautiful pictures of trees, shrubs and flowers.

Aside from the æsthetic view, there are other and more material reasons why the home grounds should be made restful and attractive. The comfort of all occupants of the home should be considered. A leisure hour during the heat of summer may be spent with more of comfort and refreshment on a shady lawn than elsewhere. The women of the home, especially,

*Reprint of Bulletin No. 105, Wisconsin Agricultural Experiment Station.

appreciate and have a right to ask for cleanly and pleasant surroundings.

The third view, and the one last to be urged, is the question of the increased value of the premises arising from such improvements. If no desire is felt to beautify the home grounds for the sake of the comfort that may be derived, or of the influence that may be exerted, it is well to bear in mind that the value of the premises is materially enhanced by the judicious planting of trees and shrubs. The place in which a tree stands generally determines its value; if in a forest, it may be worth ten dollars for fuel, if on the lawn, it may add one hundred dollars to the value of a place.

It is scarcely conceivable that a man could live fifty years in one spot without planting a single tree or shrub for shade or ornament, yet such is the case, as may be seen by referring to Fig. 1. The owner of this home is a well-to-do farmer who has resided in this spot for nearly half a century, and all that time the best rooms of the home have been exposed to the afternoon sun.

The matter of expense can scarcely be urged as a reason for the failure to make improvements in this line in country homes, as there need be but a trifling outlay of money. Horses, labor, good soil and manure are all available on the farm, and native trees and shrubs may usually be found in abundance in neighboring fields and woods.

DISCUSSION OF PLANS.

A definite plan should be formed before planting is begun. In order to meet with success in planting it is essential to have a definite plan of procedure. A simple plan will answer; in fact, the simpler it is the better it will be, but it must be explicit.

"It should always be kept in mind that the real beauty of a place depends upon the plan rather than the planting. The planting is to a large extent a detail, just as walks and beds are details. They should all be arranged to give emphasis to the leading motive of the plan."—MANNING.

FIG. 1.—Neglected opportunities.

If hap-hazard planting is followed from year to year, the setting of plants wherever there may be room for them, the yard will in the end be filled with a collection of plants all more or less beautiful as individuals, but the whole lacking entirely the features of an attractive landscape. We should plan and plant so that the eye may take in the view as a whole rather than be attracted to individual specimens.

"The trouble with home grounds is not so much that there is too little planting of trees and shrubs as that this planting is meaningless. Every yard should be a picture. That is, the area should be set off from every other area, and it should have such a character that the observer catches its entire effect and purpose without stopping to analyze its parts. The yard should be one thing, one area, with every feature contributing its part to one strong and homogeneous effect."—L. H. Bailey.

It is an axiom in landscape art that the largest possible space of lawn should be maintained open and free. This gives the impression of breadth and extent which is always desirable.

The planting then will be largely on the borders. The house should be considered the central point and all planting arranged with reference to it.

It will often be possible to arrange plants so as to shut out undesirable views as well as to create vistas.

The view from the house should be considered no less than the view from the highway. Fig. 2 shows a common method of planting in which the trees and bushes are set without reference to any plan, and the result is merely a collection of plants and not in any sense a landscape picture. In Fig. 3 a definite plan has been followed, resulting in an open lawn and an abundance of shade with many pleasing effects. Another and too common error is the planting of trees in straight lines as shown in Figs. 4 and 5. This may be called the nursery type of planting and will result in a mass of trees completely shutting out views to and from the highway.

In Fig. 6 is shown the ground plan of a suburban home as planned by the owner. A straight walk, bordered with flowers, served to bisect the lawn, while the drive passed in the rear of the house. Several shrubs and a flower bed were placed in a meaningless manner in front of the house.

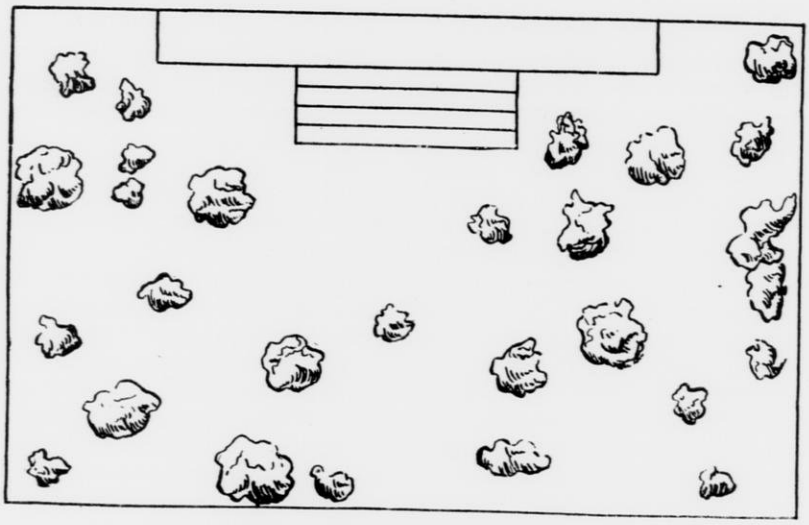


FIG. 2.—Planted but not planned.

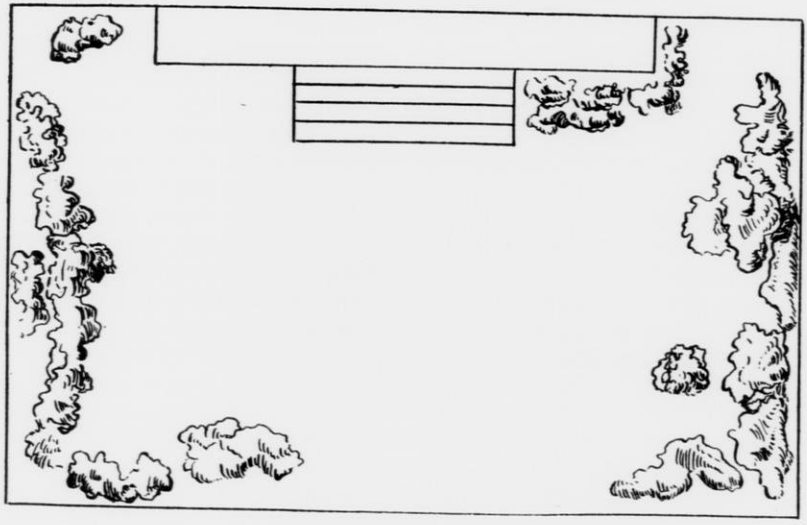


FIG. 3.—"A definite plan has been followed."

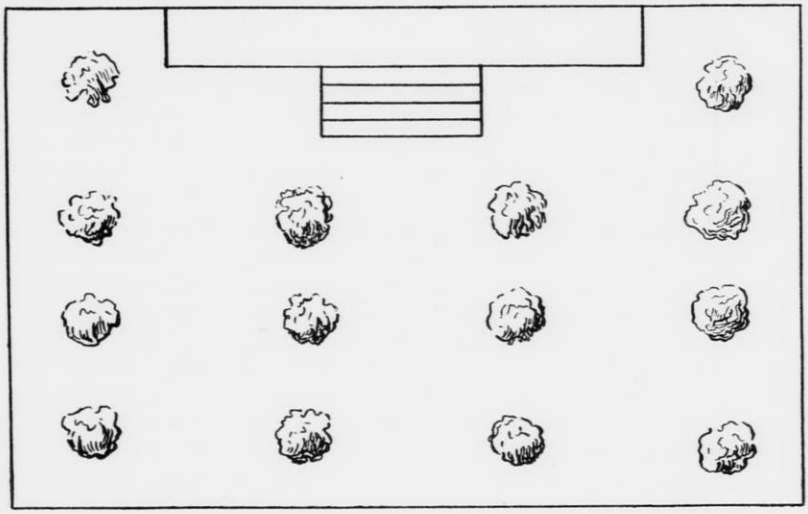


FIG. 4.—Geometrical.

FIG. 5.—A nursery in the front yard.

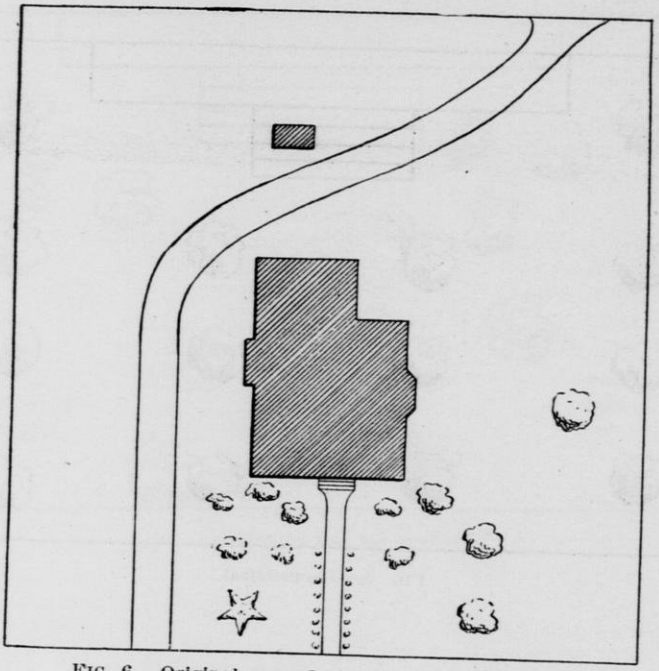


FIG. 6.—Original ground plan of a suburban home.

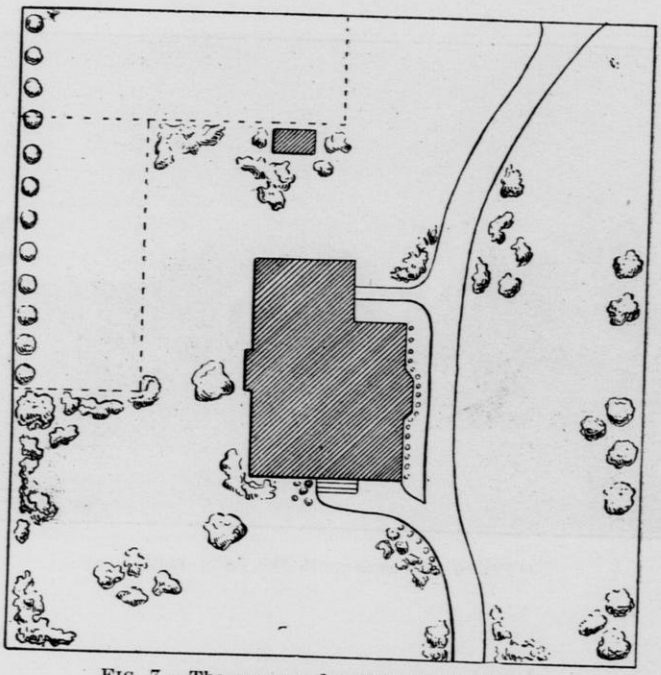


FIG. 7.—The same under different treatment.

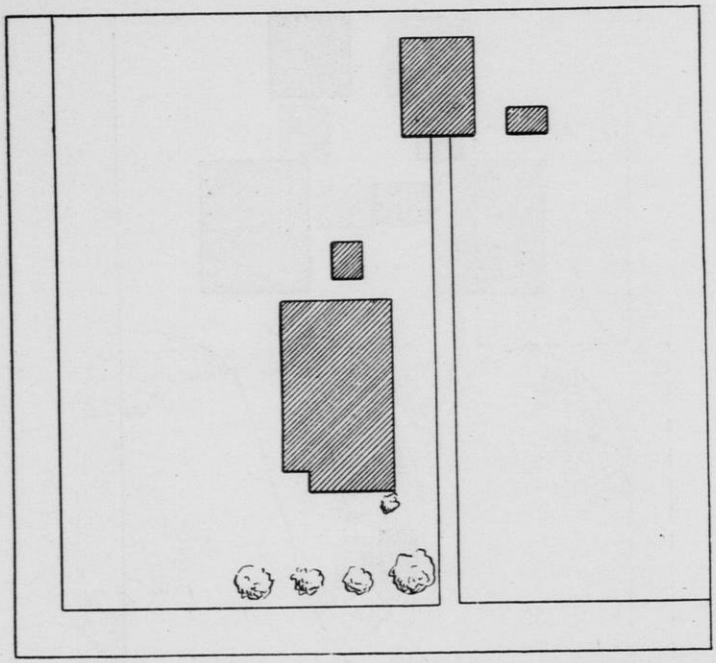


FIG. 8.—Ground plan of a village lot. Suggested improvements are shown in next figure.

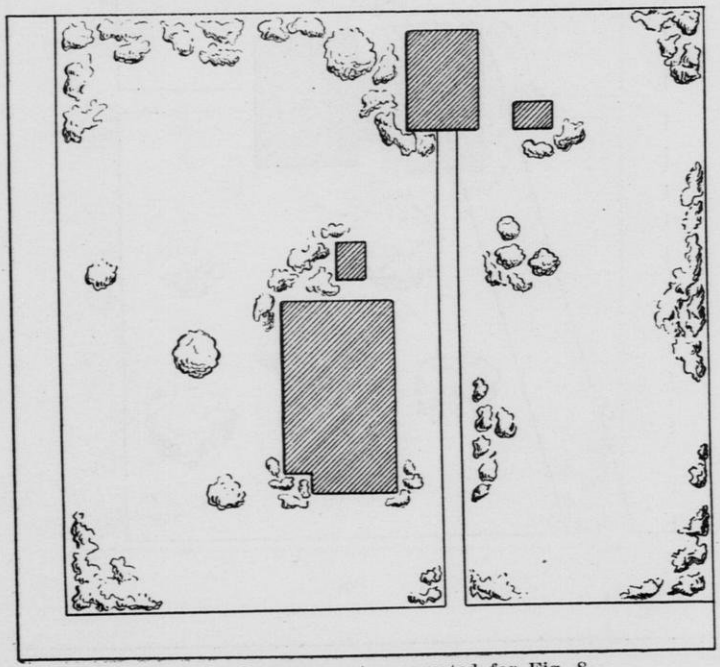


FIG. 9.—Improvements suggested for Fig. 8.

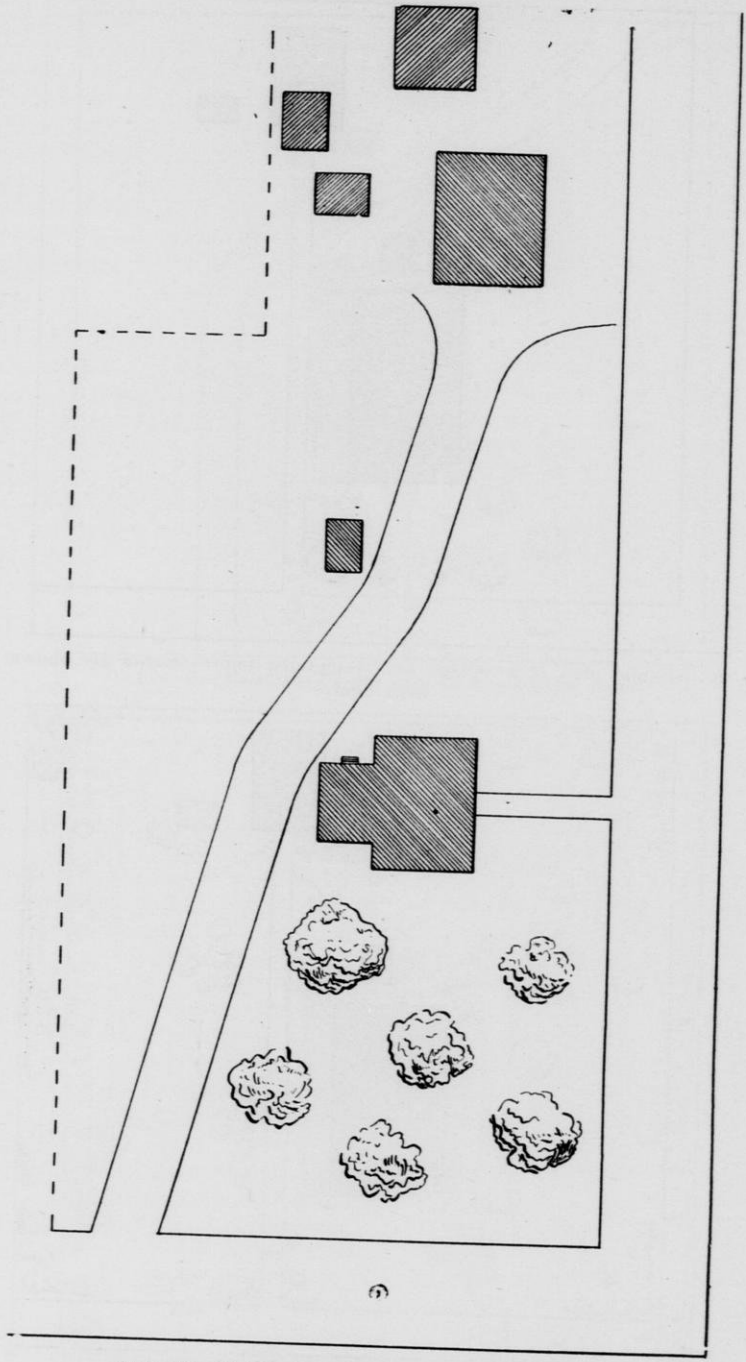


FIG. 10.—Original ground plan of home grounds.

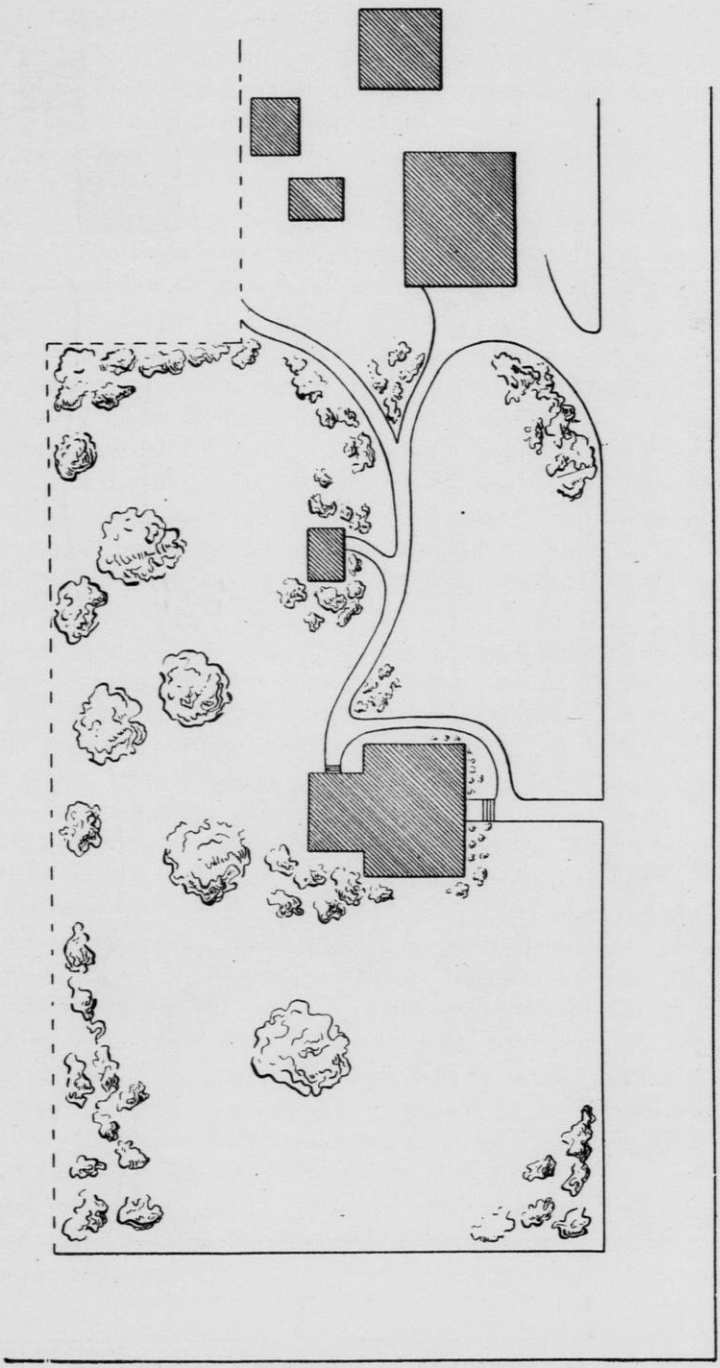


FIG. 11.—Improvements suggested for Fig. 10.

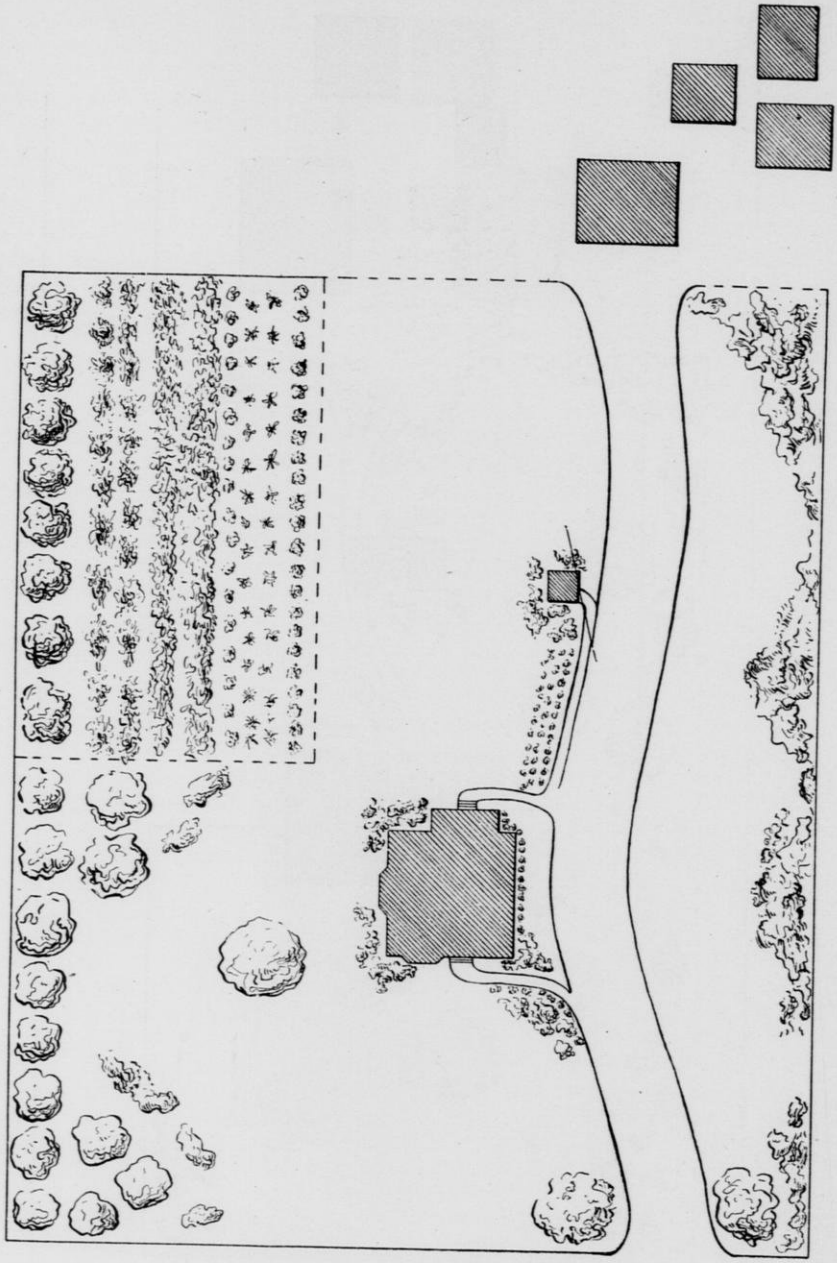


FIG. 12.—Ground plan for home grounds in country.

Fig. 7 shows the area under different treatment. The walk, the flower bed, and many of the shrubs have been removed, leaving an open lawn. The drive now passes near the house with a path leading to the front door.

Fig. 8 shows a corner lot in a village. In this case the entire planting consisted of four trees in the corner of the lot and a shrub by the house. Suggested improvements are shown in Fig. 9. The boundaries have been better defined and the outbuildings masked by groups of trees and shrubs.

The farm house in Fig. 10, fronting the highway on two sides, had a drive across the lawn and past the rear of the house to the barn. Six trees, maple and elm, had been planted in the front yard. The changes shown in Fig. 11 were suggested to the owner and are being executed. An entrance to the premises near the barns has been substituted for the useless drive and five of the large trees removed. The path from the highway to the house has been supplemented by others leading to the outbuildings, gardens, etc., thus affording opportunity for abundant border planting.

The ground plan in Fig. 12 contains suggestions for planting the grounds about a farm home. A continuous row of trees on the left serves as a shelter belt for orchard and house. The border planting on the right might be modified if desired to open vistas. Shrubs have been massed about the house and a flower garden located along the rear walk.

While the above, with the exception of the last, are from existing models, none are given as ideal examples but merely to illustrate the foregoing principles. The improvement of any given area must be considerd as an independent problem involving many local considerations. The foundations of the plan should be smooth turf and shade trees; the details, shrubs, vines and flowers. Formal flower beds, however, are out of place on the open lawn. Flowers add a finish to landscape pictures, but they may always be placed to better advantage than in conspicuous beds on the lawn. The flowers in Figs. 13 and 14 show to excellent advantage with the back grounds of shrubs, while in Fig. 15 the foliage bed is the most conspicuous feature of the lawn and detracts attention from other more pleasing features.

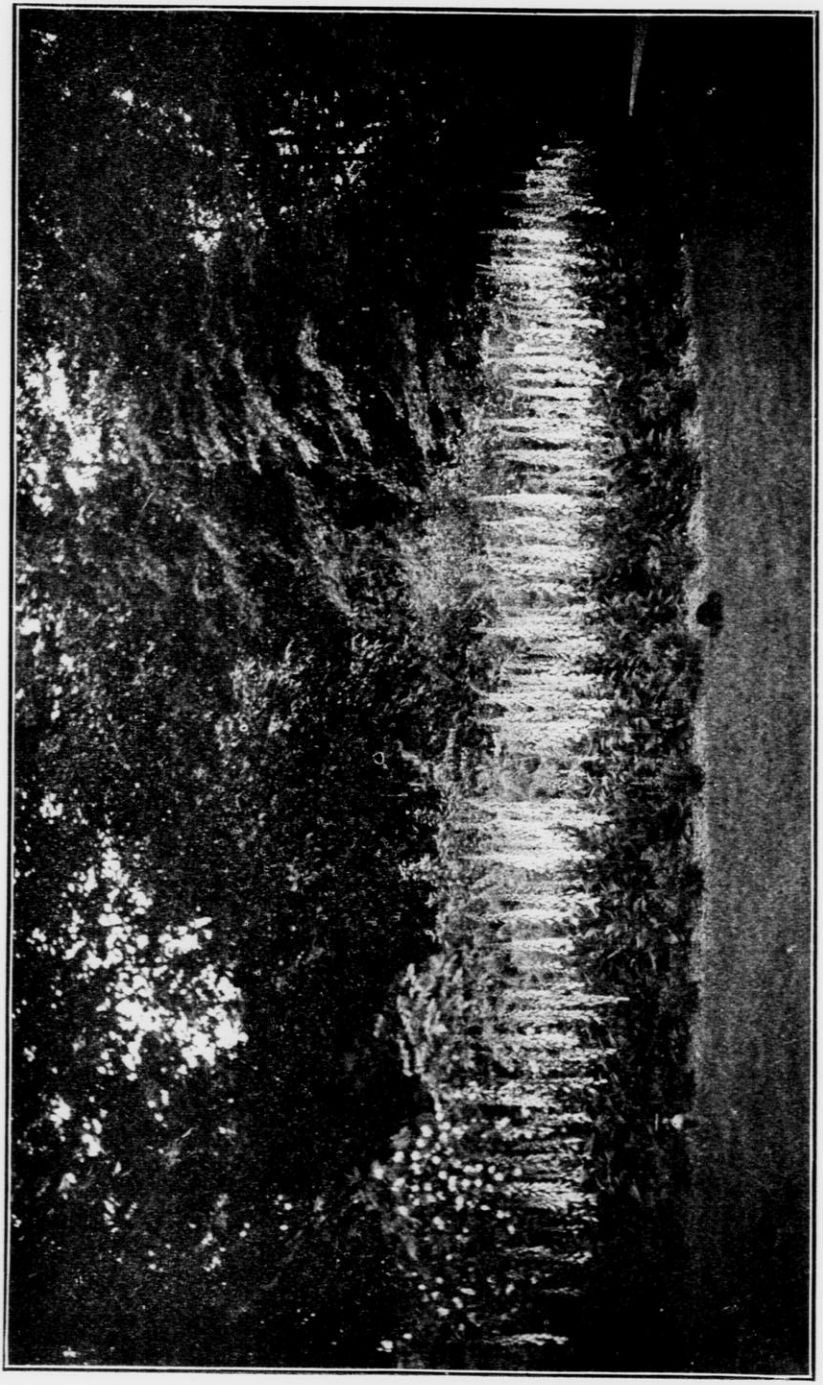


FIG. 13.—Foxglove with background of shrubs.

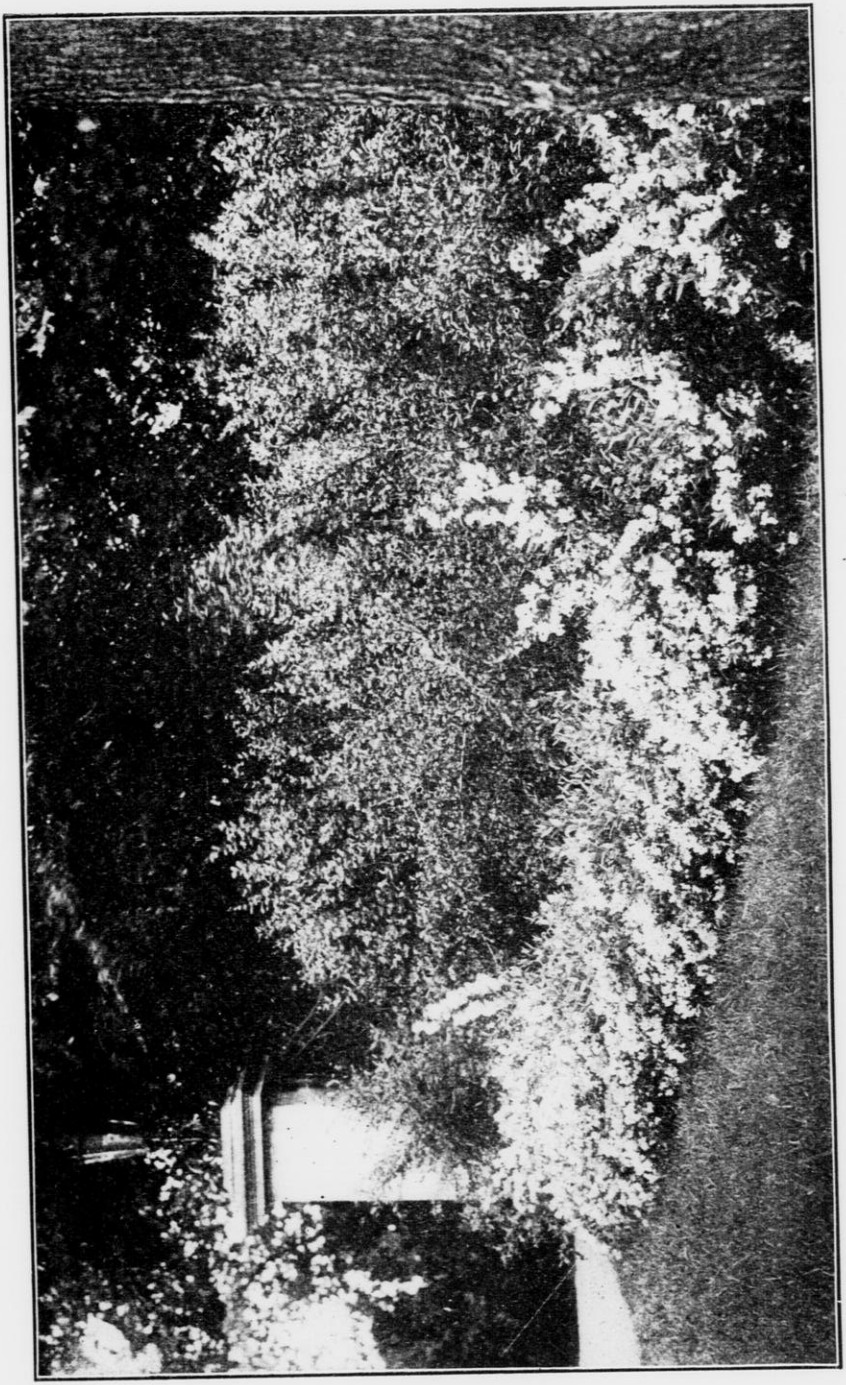


FIG. 14.—Deutzia with background of barberry.

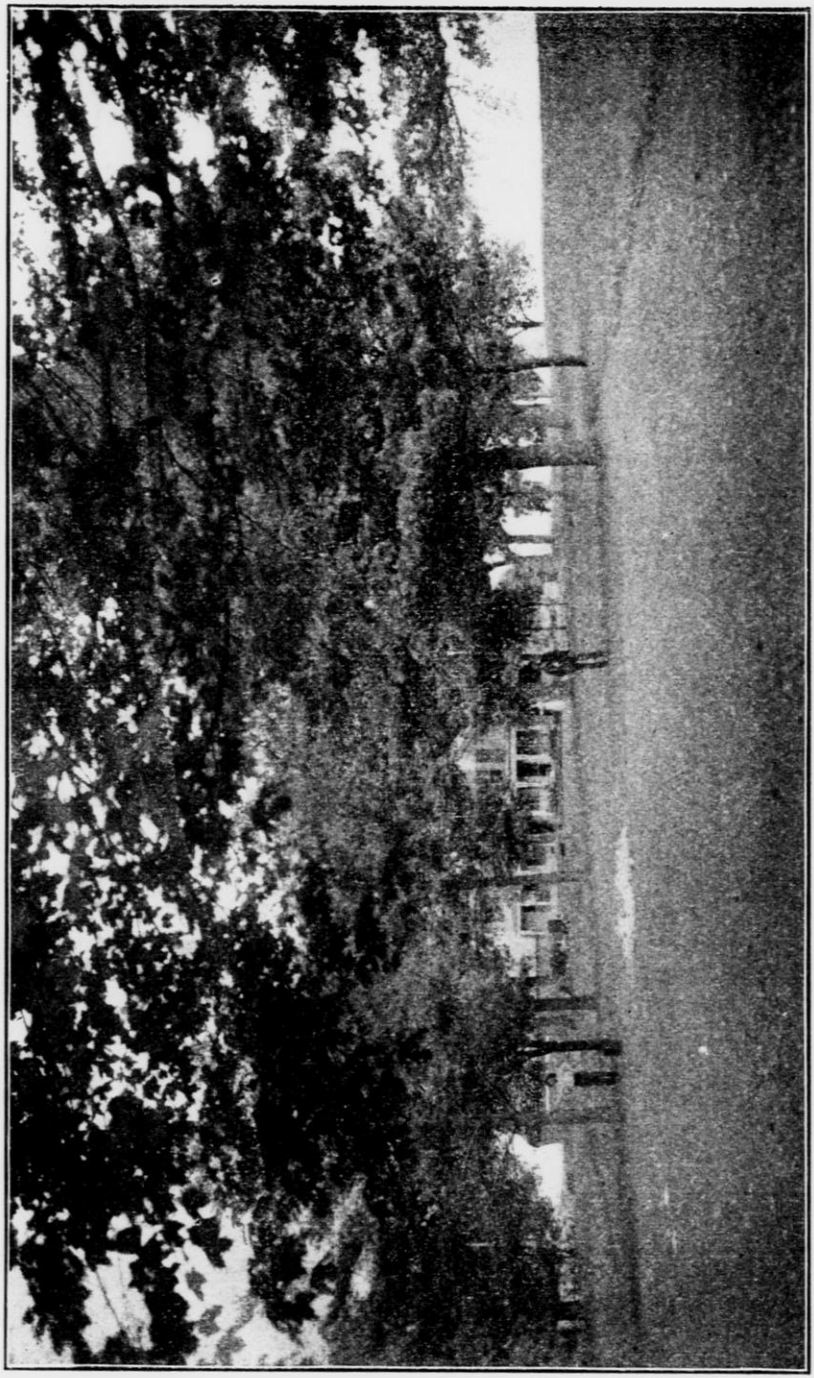


FIG. 15.—The foliage bed in the foreground is a discordant feature.

FIG. 16.—Overplanted.

FIG. 17.—An area equal to that shown in Fig. 16.

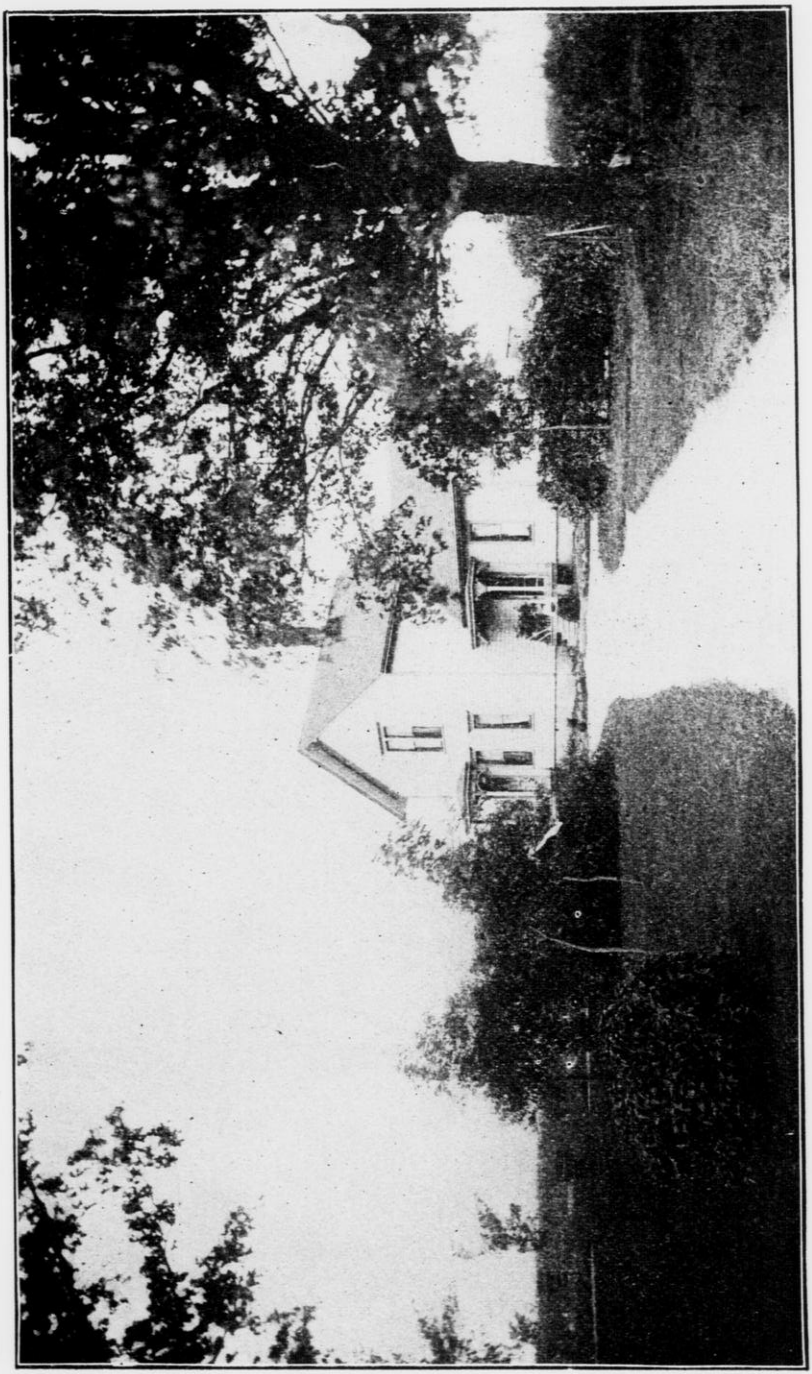


FIG. 18.

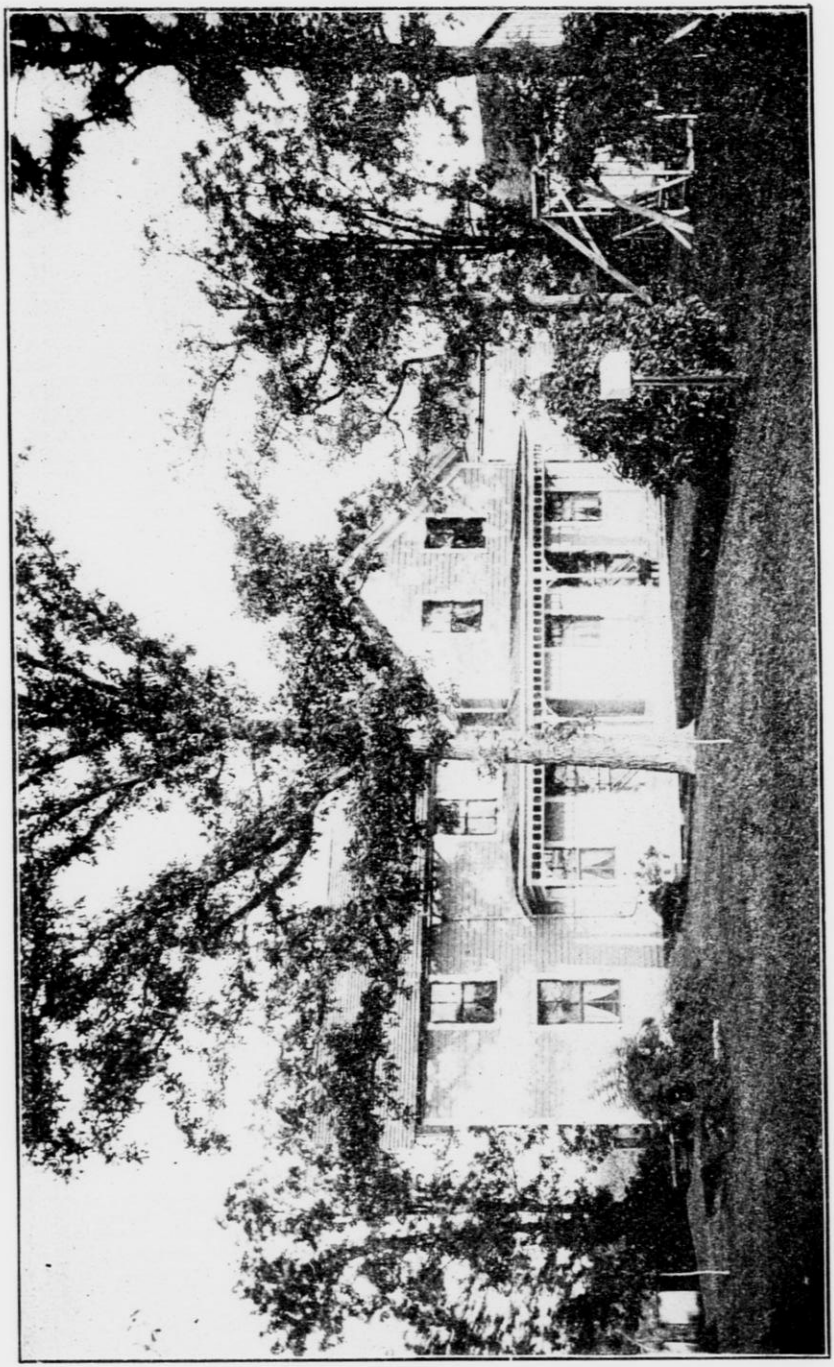


FIG. 19.

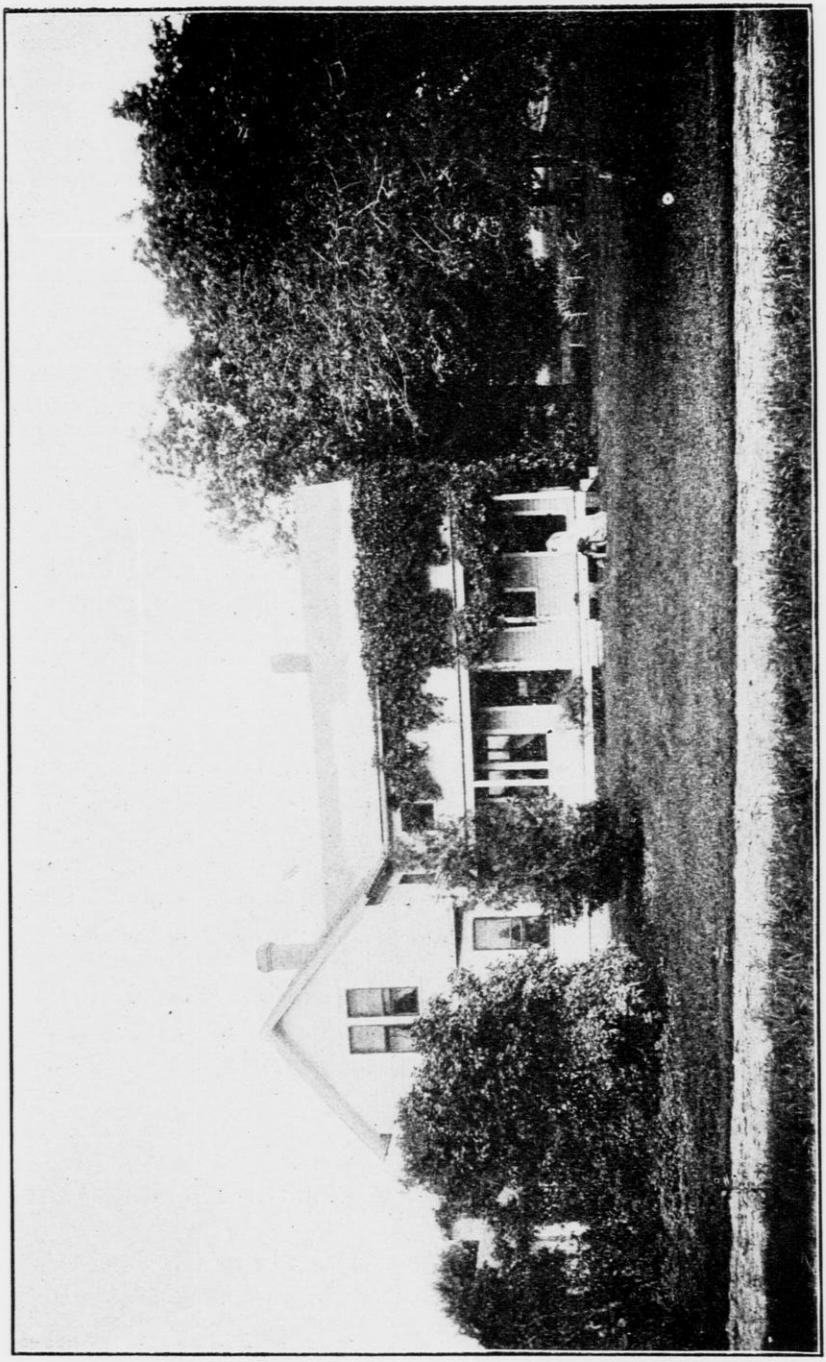


FIG. 20.

Avoid crowding. When the work of improvement is begun there is usually a tendency to overdo it. Figs. 16 and 17 are from photographs of two city lots. The area planted is precisely the same in both cases; in the former, various trees and shrubs have been planted from time to time, mainly in front of the house, and new ones are being set every spring. The result is a thicket, lacking beauty and consistency. In the latter case a few trees and shrubs have been disposed in such a manner that the space appears many times larger than that in Fig. 16, and larger than it is in reality.

Figs. 18, 19 and 20 are from photographs of farm homes in Wisconsin. In Fig. 18 the open lawn, the group at the turn of the drive, and the shrubs on the right, masking the outbuildings, are all excellent. The foundations of the house and porch are bare and unattractive. A half-dozen low-growing shrubs, planted at the corner, as many more in the angle of the porch, with flowers in the foreground, would add finish to the grounds.

The lawn has been preserved in Fig. 19, and this with the large tree is nearly sufficient for a restful picture. A group of trees or shrubs at the left would serve to screen the outhouse as well as define the boundary of the lawn. A Virginia creeper or wild grape planted at either side of the veranda would soon give plentiful shade.

The house in Fig. 20 would scarcely attract attention without the vine. If the tree and the shrub at the left were both removed the view would be greatly improved. A single large shade tree at this point would be valuable. Shrubs and other flowering plants might then be planted near the house. The pleasing effect obtained by planting shrubs close to the house is well shown in Fig. 21.

Ideal home grounds are shown in Fig. 22. The charm of this place lies in the spacious, open lawn and the shrub masses on the boundary. An extensive flower garden occupied the space in the rear of the shrubs.

Equal opportunities were presented in Fig. 23, but were in a measure neglected. Were the scattered evergreen trees massed on the boundary, protection would be afforded where needed, leaving a wider lawn space.

But few trees should be planted on small grounds, one acre or less in extent. A thrifty elm, after 25 years, may cover with its branches one-eighth of an acre. For shade as well as for

ornament one fully developed tree is better than a dozen crowded and spindling specimens. On large grounds, of several acres, trees may be planted in groups with good effect. The grouping of evergreens in Fig. 24 is especially good.

Pleasing effects may be had by grouping trees and shrubs of varying shades of foliage; dark green, light green, soft gray and silvery-leaved kinds may be brought into harmonizing groups.

Shrubs are too often planted with reference to their flowering habit only. The most desirable shrubs are the ones bearing choice flowers and having clean and abundant foliage but for mass effects flowers should be secondary consideration, as these are of but brief duration, while leaves remain throughout the season.

FIG. 21.—Shrubs are effective when massed close to the house.

It is best to plant but few varieties of shrubs on the lawn, as introducing a number of widely different forms, even though all are good, is apt to produce a bizarre effect. Collections of species should be confined to botanic gardens. At any rate there are but few really desirable shrubs for home decoration that are hardy in Wisconsin.

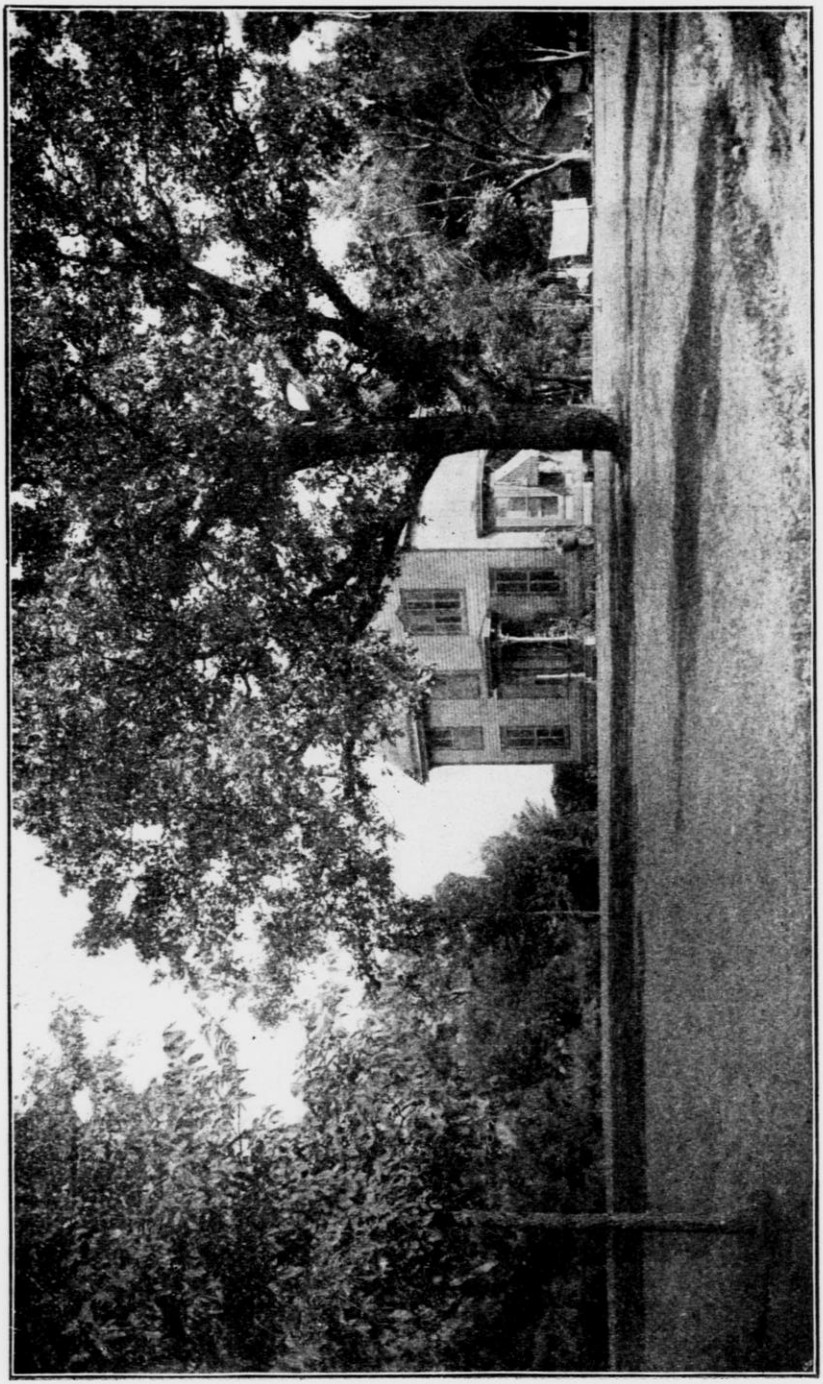


FIG. 22.—Ideal home grounds.

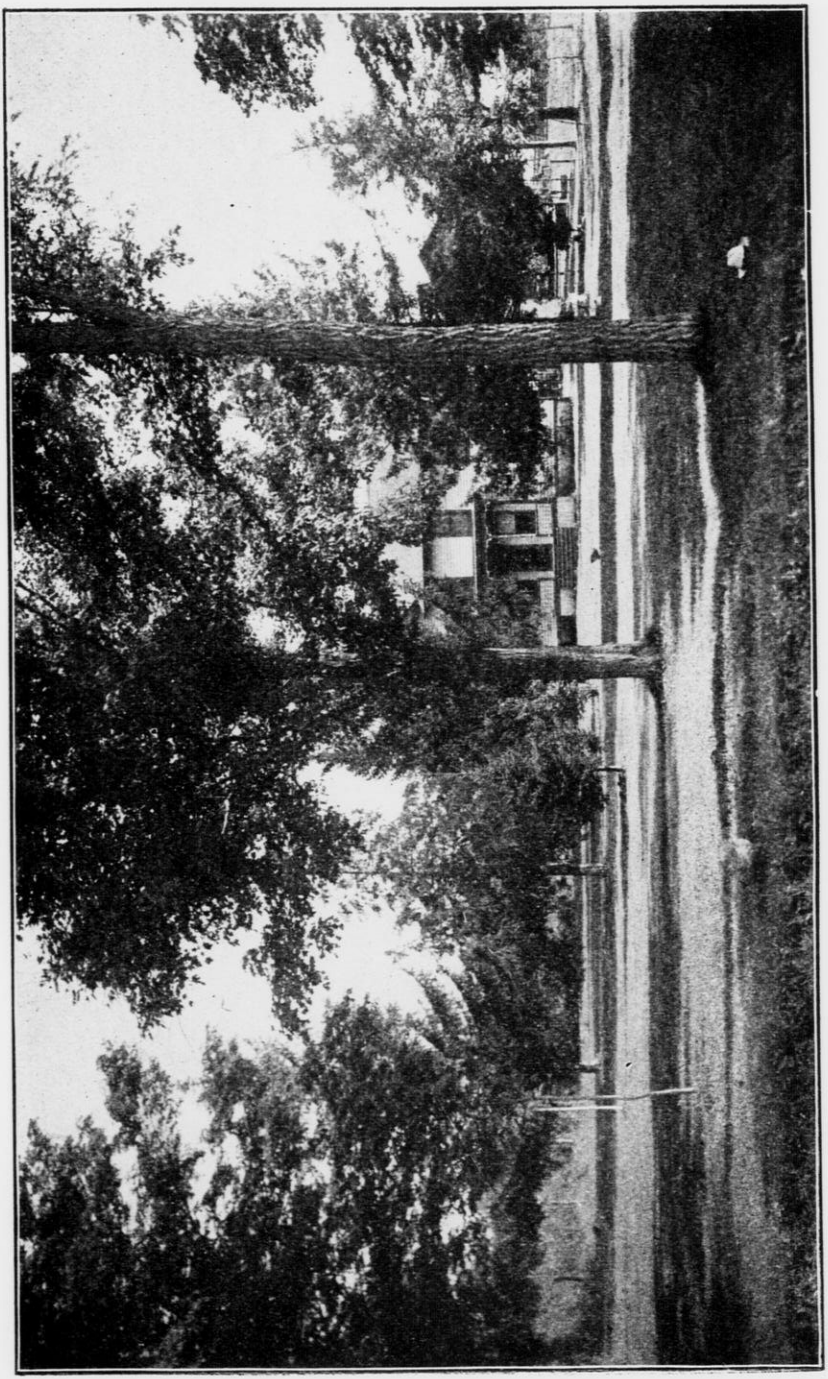


FIG. 23.

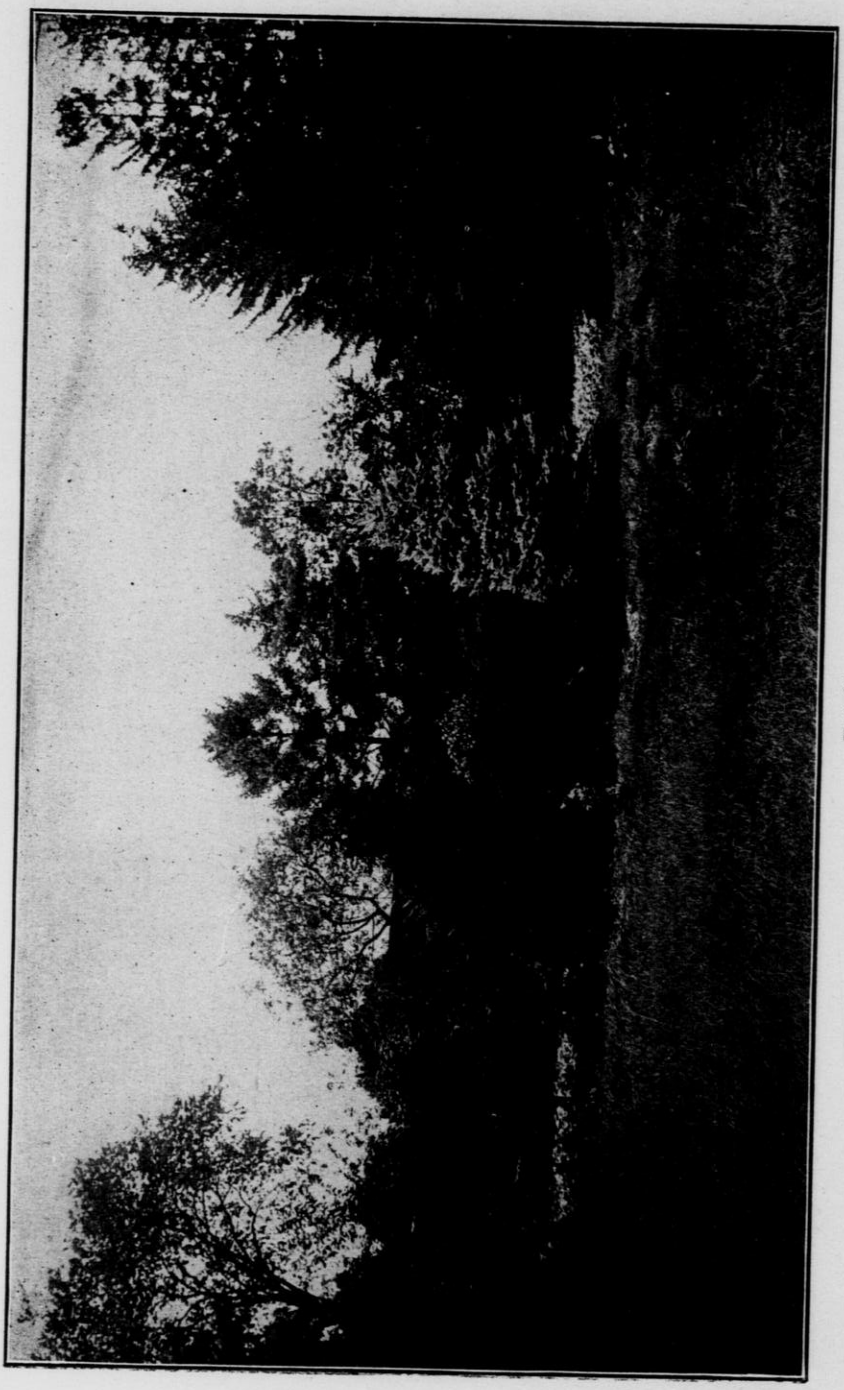


FIG. 24.

A lawn is too often viewed only as a place for plants, a repository for rare or beautiful specimens to be planted where they will be most conspicuous. It is true that without plants we cannot embellish our grounds, but each specimen should be placed so as to blend with others.

Boundaries of farm homes should be sharply defined so that there may be no doubt where the lawn ends and the fields begin. Groups or banks of trees and shrubs serve admirably for this purpose. If the border line exceeds one hundred feet in length good effects may be had by planting in irregular outline with bays and recesses but such irregularities of outline on small places are rarely as effective as a straight line. Excellent border planting is shown in Figs. 25 and 26. In both cases the native woodland has been utilized as a background for shrub plantations. At the extreme right in Fig. 26 the shrub border ends abruptly in order to open a view across the lake. In Fig. 27 the shrubs are bordered with flowers. Fig. 28 shows a bit of natural shrub border.

From these examples, then, it may be seen that best results are obtained by planting shrubs in groups or masses. Occasional specimens of rare beauty of form or flower may stand alone if near the house or other suitable background, but massing should be the rule.

Vines. Even with handsome shade trees, shrubs and flowers the decoration of the home will be incomplete without vines. A sunny porch may be transformed into an arbor, cool and restful, by means of wild grape or Virginia creeper (Figs. 29 and 30), while an ugly fence or weather-beaten summer kitchen may be completely hidden in a mass of Morning Glories.

Walks and Drives. A reasonably direct and easy approach should be provided to every home, both for convenience and as an evidence of hospitality, but it is not necessary in the country that a walk should extend from the front door to the highway; it may often be laid out on one side and approach the front of the house by an easy curve and thus avoid bisecting the lawn.

The drive should be well drained and properly graded both for utility and to remove the temptation to use the adjoining grass for a drive in wet weather.

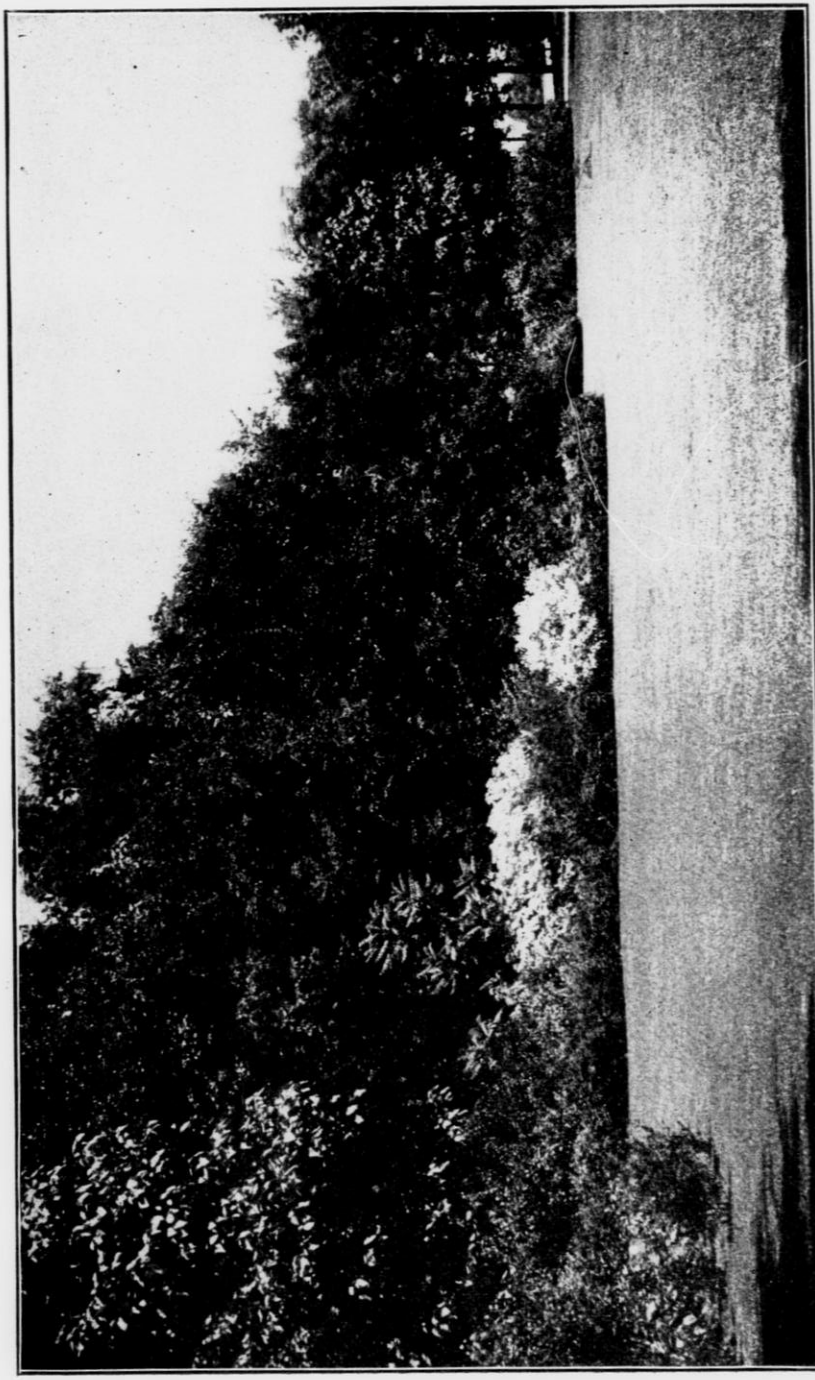


FIG. 25.—Border planting.

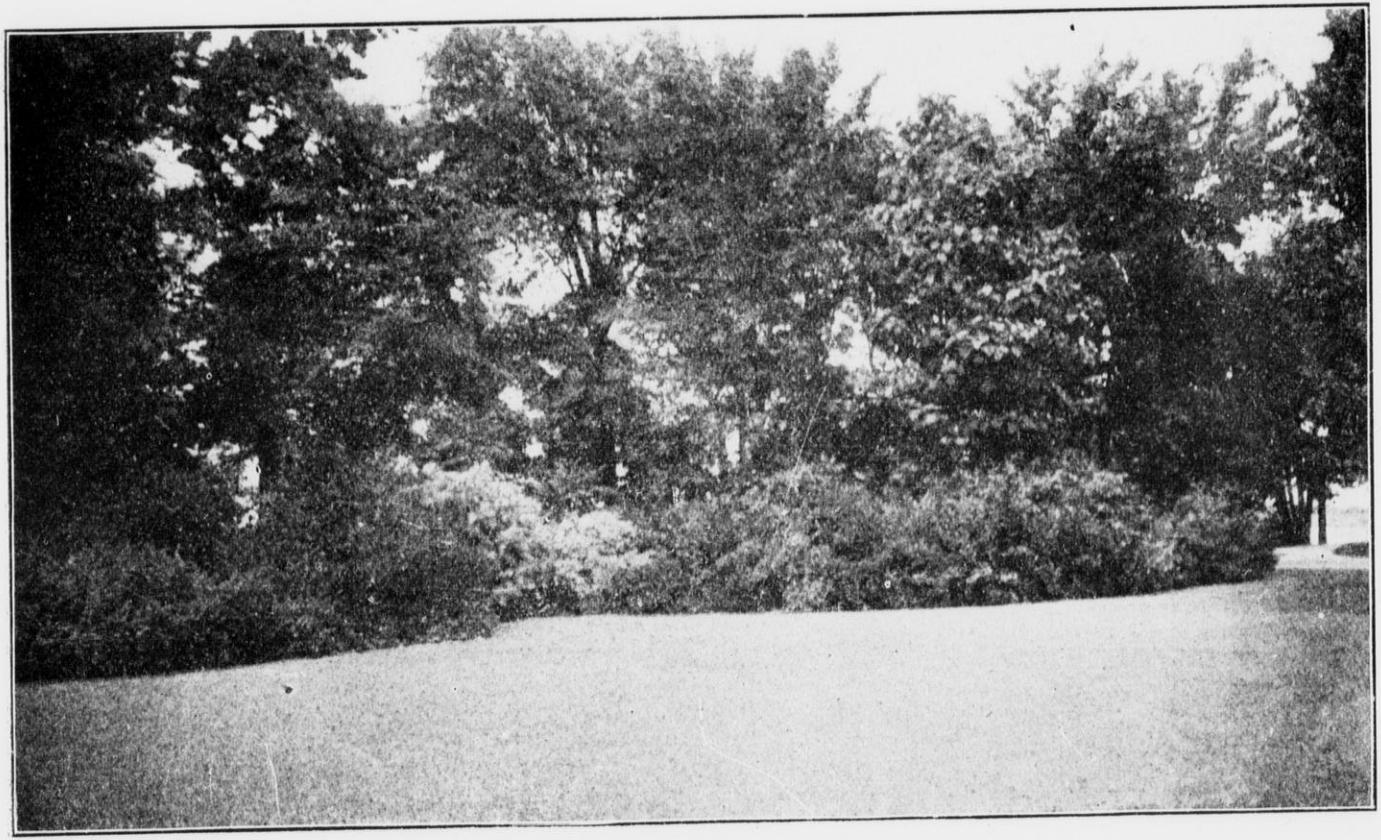


FIG. 26.—Shrubs with background of native trees.

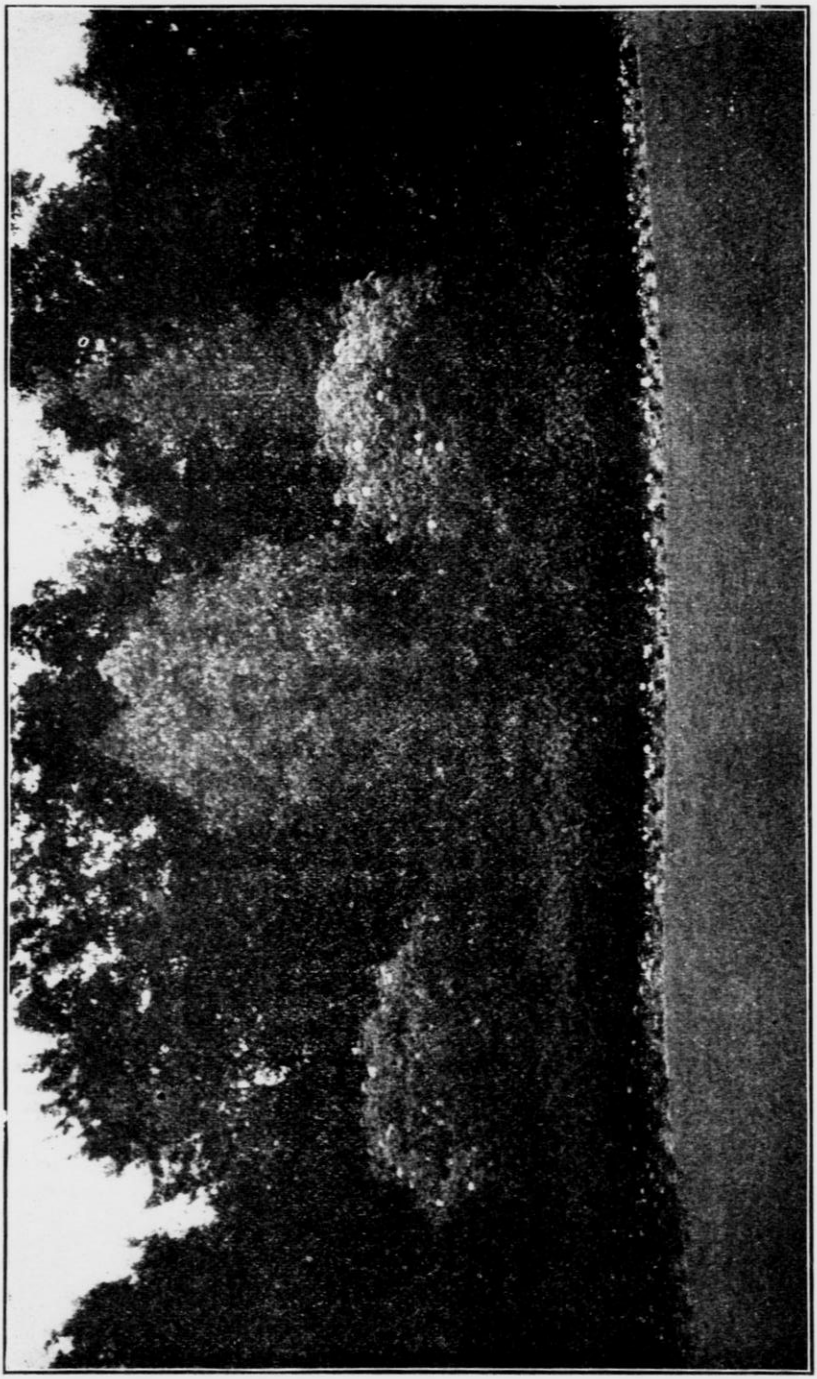


FIG. 27.—Shrubs bordered with geraniums.

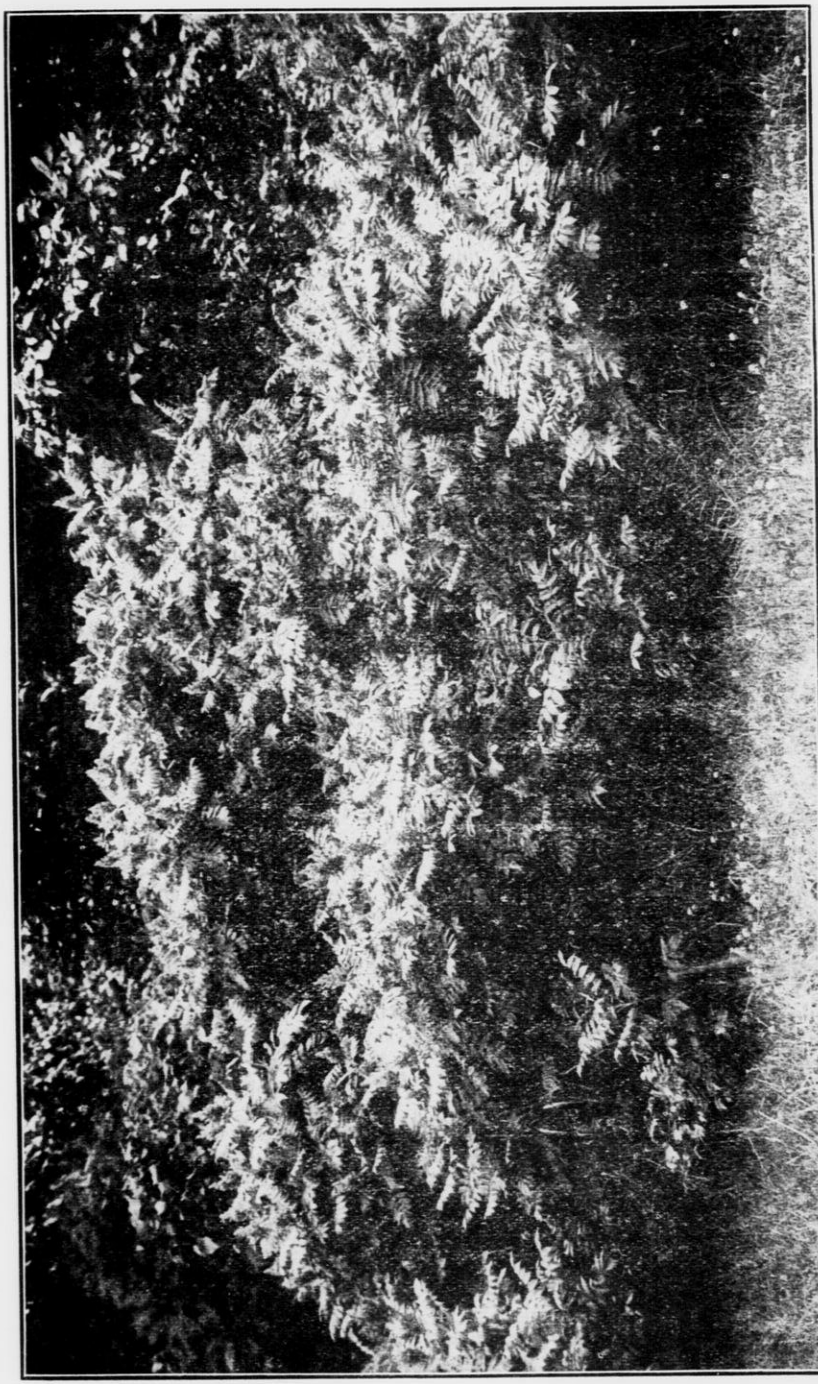


FIG. 28.—Stag-horn sumac on the border of a woods.

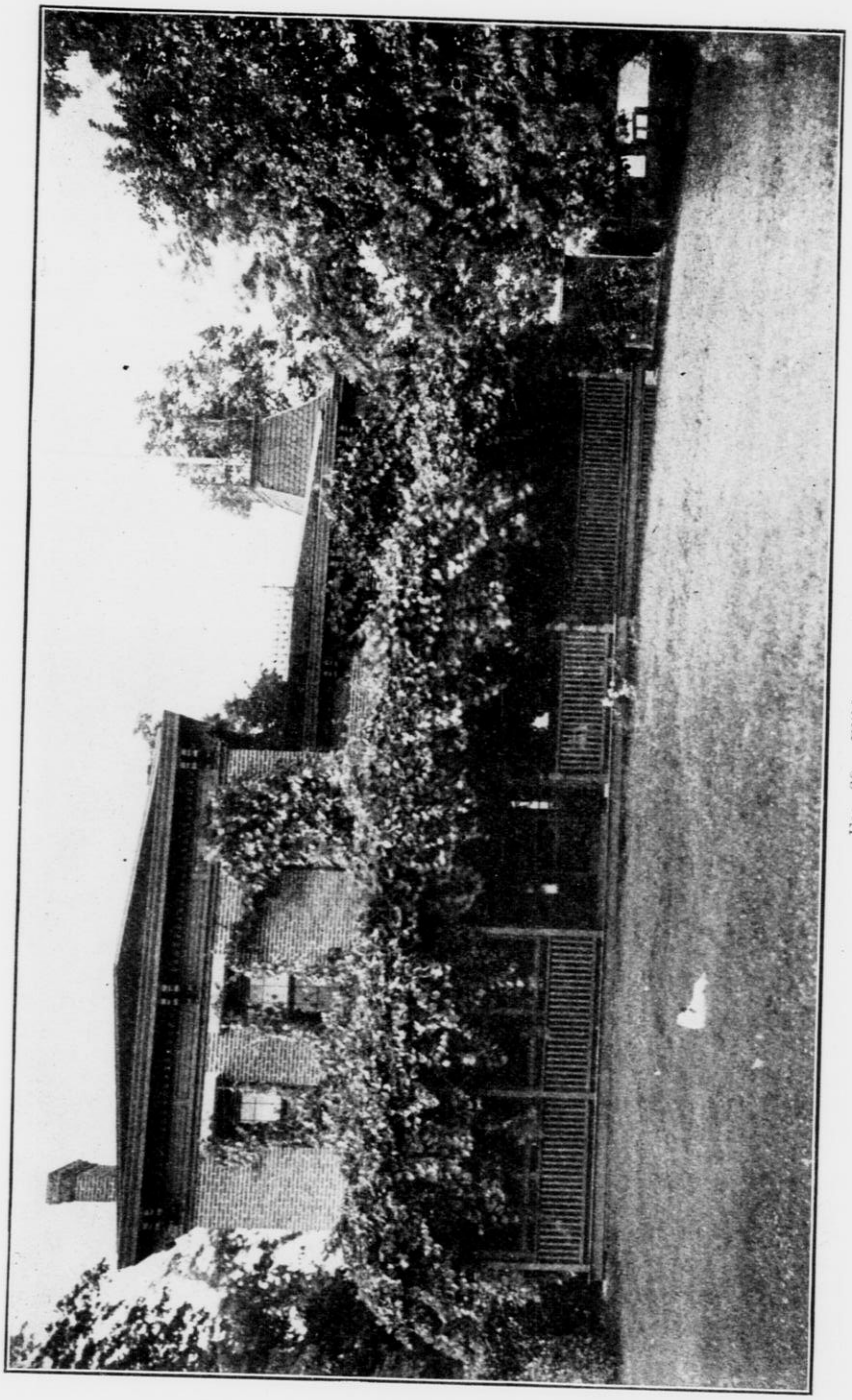


Fig. 29.—Wild grape vine.

The Highway. The portion of the highway between the lawn and the traveled road should be considered a part of the home grounds, kept free from weeds and mowed as often as the lawn. This strip is really the foreground of the picture and any care expended on it should be considered in the light of home decoration rather than as highway improvement.

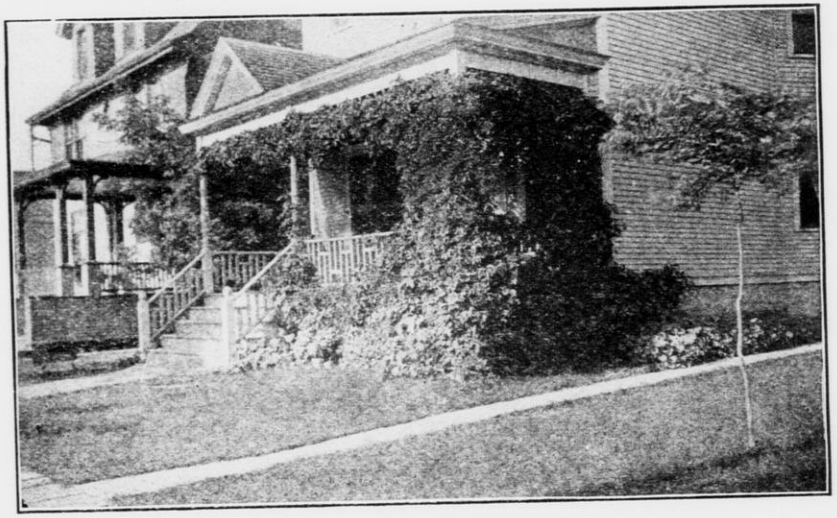


FIG. 30.—Virginia creeper.

Isolated Homes. It occasionally happens that country homes are located a considerable distance from the highway. In this case many of the suggestions here given will require to be modified to meet these conditions; the ground should be wholly enclosed by a substantial fence (preferably woven wire), and gates provided with some automatic closing device. In planting, the view from the house should be considered of the greatest importance and may generally be planned so that neighboring houses may be seen, thus providing a sense of communion rather than a feeling of isolation.

Extraneous Ornaments. An iron kettle may be a useful article but is rarely if ever ornamental, especially when suspended on a tripod over a pile of stones and painted a brilliant red.

Shells are suggestive of the sea shore but add nothing to the beauty of a flower bed or border. Soft green turf is more appropriate.

Whitewashed stones sometimes serve a useful purpose as danger signals on roads or drives, but detract largely from the beauty of a lawn.

Rockeries if skilfully located often add a finish to extensive landscape effects, but when carefully constructed in the most conspicuous place on the lawn, as is generally the case, become piles of rocks and nothing more.

None of these, nor many other extraneous effects, are consistent with simplicity or beauty in home decoration.

Lawn making. In order to obtain a smooth and even turf it is essential that the ground should be well drained, deeply plowed or spaded and well enriched; another essential point is to sow the grass seed very thickly and evenly. Two and one-half bushels per acre is the minimum quantity that should be used and four bushels per acre is not excessive. The surface of the soil should be carefully leveled with a shovel and rake before sowing the seed, but only slightly raked after sowing, as in raking, the loose surface soil with the seed is apt to be moved and bunched, giving an uneven stand of grass, and for this reason a wooden rake is better than an iron garden rake.

It is probably better to cut than to pull the weeds that appear the first season as in this way fewer grass plants will be destroyed. The seed may be sown either in the spring or autumn; if in the autumn it should be sown early enough to become well established before winter, and should be mulched with well rotted manure or other material to avoid injury to the roots by freezing and thawing. Grasses that spread by underground stems are the best to use for the lawn, and of these Kentucky blue grass or June grass (*Poa pratensis*) is probably the best, although Rhode Island Bent (*Agrostis alba*) makes a very satisfactory turf. June grass will, however, succeed on a greater variety of soils and treatment than any other kind. White clover may be added at the rate of three or four quarts of seed per acre if desired. This should be sowed separately to insure an even stand, as the clover seed is smaller and heavier than the other grass seeds mentioned and tends to settle. The best results are generally obtained by using only one kind of grass for the foundation of the lawn. Seed sold as "Lawn Grass," "Special Lawn Grass Mixture," etc., is rarely as satisfactory as June grass alone or June grass and white clover. As a rule the mixtures contain a very large percentage of June grass with

worthless and inferior varieties, as well as considerable foul seed.

The renewal of old lawns may be accomplished without entirely removing the sod. The surface should be leveled with a heavy roller, after which one or two inches of swamp muck or other rich soil free from weed seeds may be spread over the whole space to be renewed. The old grass will easily push through this and grow with increased vigor. In addition, seed should be sown as described above.

Protection of the lawn. Occasionally, in the country, the front yard is utilized as a pasture lot for calves and other live stock. It is rarely that this is necessary and should never be attempted under any circumstances if good results are expected.

Substantial fences should separate the lawn from adjoining fields, as well as from the barnyards, but there is an increasing tendency, at least in the older settled portions of the state, to dispense with the fence in front of the house and generally with marked improvement. A fence is never an ornamental feature in a landscape.

Planting trees and shrubs. Even if the plan is definite and correct there may yet be failure if the shrubs are not properly set. Many people, notably farmers who have a practical knowledge of the needs of plants and the requirements for their best development, seem to utterly ignore these needs in lawn planting. A small patch of sod is removed, the plant set and often the sods carefully replaced about the stem. The struggle at once begins between the bush and the multitude of established grass roots. The result may be easily predicted; the shrub is starved. Imagine a hill of corn with such treatment!

We cannot expect, nor should we wish for grass and shrubs on the same area. The sod should be removed from about the roots and the soil kept cultivated or mulched. In planting groups or masses the whole area should be spaded before setting the bushes and afterwards cultivated until the plants completely shade the ground.

The distance apart to set shrubs in groups will depend upon the size of the plants at maturity. They should be close enough to present a continuous line of verdure. The individuality of each, at maturity, should be completely merged in the mass with the exception, perhaps, of a plant here and there on the

border which may stand out alone. The majority of shrubs may be safely planted three to four feet apart in this climate.

After care of lawns. In order to maintain a smooth, even turf the grass should be regularly and closely clipped with a lawn mower throughout the growing season. Where the area is comparatively large, however, a nice lawn may be had by mowing with a scythe every two or three weeks. The mown grass is excellent material for mulching newly set plants. It is advisable to apply fertilizers each year in order to maintain the fertility of the soil on the lawn and for this purpose well rotted barnyard manure is commonly employed as a top-dressing, usually in the fall, and allowed to remain until the grass starts in the spring. The objections to this are the unsightly appearance of the manure, the danger of introducing weed seeds, and the temporary effects resulting. The grass will grow luxuriantly and assume a deep green color for a few weeks in the spring but by midsummer the growth is less vigorous. If the manure were allowed to remain on the ground better results would be obtained. Where well rotted barnyard manure is not easily obtainable, commercial fertilizers and wood ashes may be employed as a substitute. Concerning the composition and use of these the following by Woll, of this Station, is of interest.*

"Where the lawn is made up largely of a single species of the grasses, as well as where a variety of grasses contribute to the herbage of the lawn, it is necessary in fertilizing the lawn to supply a complete fertilizer containing all the main elements of plant food. One-sided fertilization produces abnormal plants or tends to crowd out some kinds of plants at the expense of others. To illustrate: applications of one-sided nitrogenous fertilizers, like nitrate of soda, cause the plants to grow rank, developing an undue proportion of stem and leaf growth which is undesirable in a fine lawn where a smooth, even surface with uniform deep green color is a prime condition. Nitrogenous fertilizers also have a tendency to crowd out the legumes in meadows or lawns grown from mixed seed and to favor the growth of the grasses proper.

"Potash fertilizers, on the other hand, like Canada wood

*15th Ann. Report Wisconsin Agr. Expt. Station, pp. 216–218.

ashes or land plaster (which is indirectly a potash fertilizer) will favor unduly leguminous plants and bring in, for instance, white clover; potash and phosphoric acid fertilizers make plants grow more compact and tend to produce seed formation and premature ripening.

"Well-rotted farmyard manure to some extent fills the requirements of a proper lawn fertilizer, as it supplies the three valuable fertilizing ingredients generally called for by plants,—nitrogen, phosphoric acid and potash—in about the right proportions. Many object to the use of barnyard manure on their lawns, however, for the reasons previously cited, and recourse has therefore to be taken to a mixture of fertilizing materials which will supply all the required elements of plant food in such proportions that the various parts of each component of the lawn and the various components themselves be stimulated to a healthy, normal development. A large number of different mixtures of fertilizing materials may be made up for this purpose from the common commercial fertilizers."

Pruning shrubs. The rational pruning of flowering shrubs involves a knowledge of the season of bloom of the different species treated.

Shrubs that blossom in the spring or early summer should not be pruned in winter or spring, as the flower buds of this class are formed the previous summer and carried over winter in a dormant condition, being ready to open with the beginning of spring. By pruning at this season we lessen the production of flowers. To this class belong the lilac, mock orange, snow-ball, wiegelia, barberry, flowering currant, Van Houten's spirea, Thunberg's spirea and others. The pruning of these should be delayed until directly after the flowering season. Pruning at this time will induce the growth of new flower-bearing shoots for the following season.

Shrubs that blossom in midsummer or later produce their blossoms on shoots produced the same season, and may, therefore, be pruned to advantage when dormant. The hardy hydrangea, Douglas spirea, Spirea Billardi, tamarix, hibiscus, caragana, and nearly all roses are of this class.

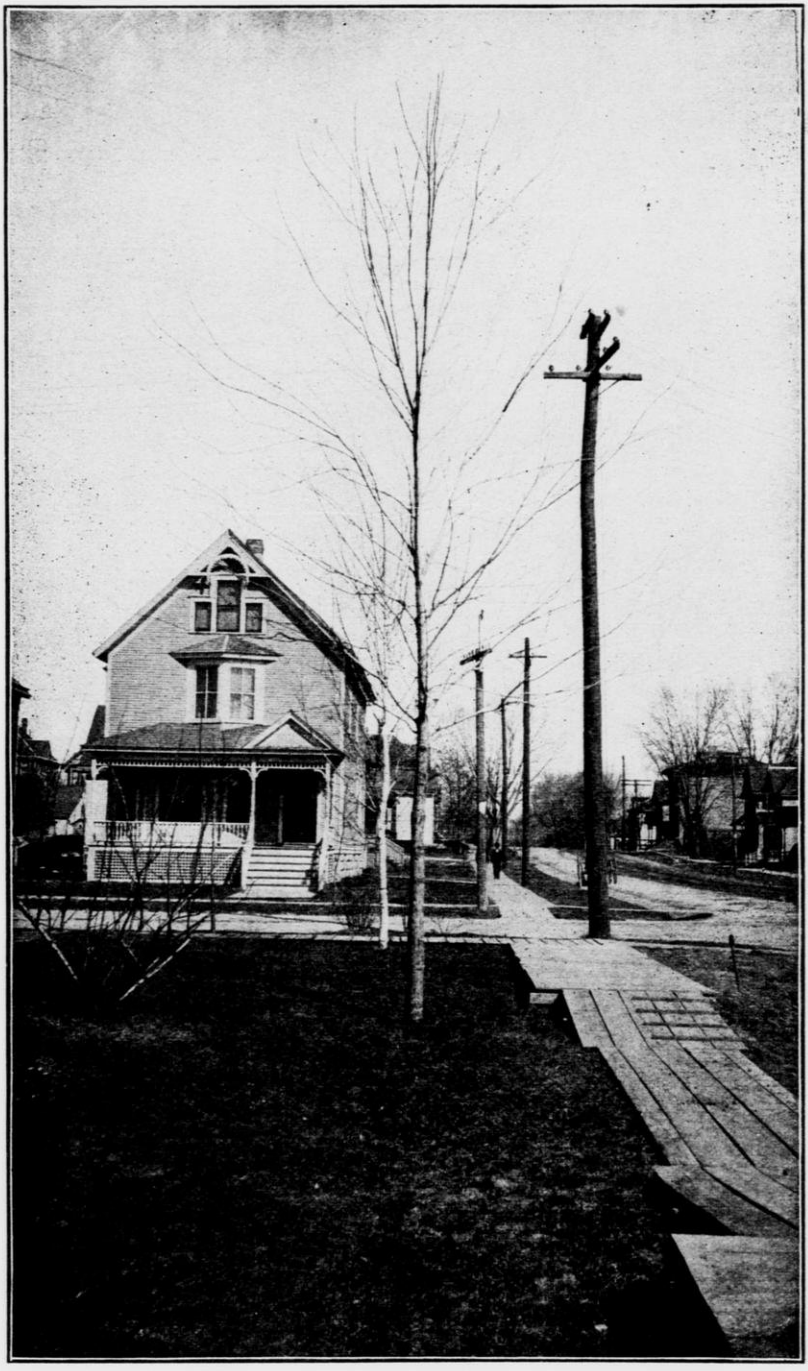


FIG. 31.—The maple tree in the foreground shows the effect of pruning.

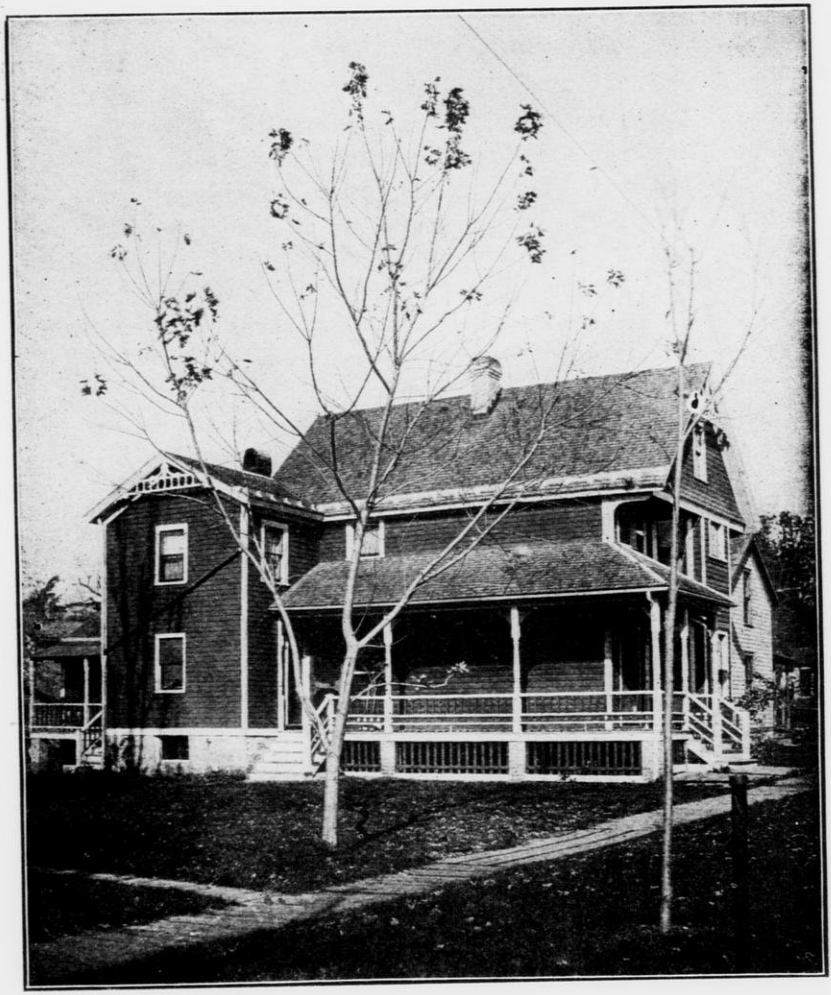


FIG. 32.—A neglected tree.

As a rule, little pruning beyond the removal of dead or injured branches is necessary or even desirable. Shrubs allowed to assume their natural form are commonly far more effective in a landscape picture than when clipped or sheared to an artificial outline.

Pruning trees. Trees as a rule should be pruned as little as possible and no branch should be removed without due consideration as to the necessity for cutting it. When trees are transplanted the branches should be trimmed so as to form a well balanced head, neither top-heavy, nor branching too low. If many of the lower branches are cut off the tree will require staking to prevent it from being broken down by the wind. It is better to defer the necessary trimming up until the trunk has attained a considerable size. Attention should also be given to the shape of the head, as many varieties tend to form forks that may endanger the tree from wind, snow or ice.

The lateral branches of rapid-growing, soft-wooded trees like soft maple should be shortened each year for several years after planting, in order to avoid forking and to maintain a central axis. Fig. 31 shows a soft maple tree six years planted and the branches shortened each year; note the distribution of the branches and the development of the trunk. In Fig. 32 is shown a tree of the same age and species neglected in respect to pruning, from which one large branch has already been broken, and the entire top threatened. Old and ill-shaped trees may generally be renewed by removing all dead, broken and interfering branches and cutting back the remaining ones to conform to the desired shape. Street and roadside trees should be trimmed high enough to prevent annoyance to pasers-by from low-swinging branches and to afford a view beneath, but this is best done gradually for the reasons already mentioned.

INDEX.