Transactions of the Wisconsin State Horticultural Society including addresses and papers presented, and proceedings at the summer and winter meetings of the year 1880-81. Vol. XI 1881 [covers 1880/188...

Wisconsin State Horticultural Society
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TRANSACTIONS

OF THE

WISCONSIN
STATE HORTICULTURAL SOCIETY

INCLUDING

ADDRESSES AND PAPERS PRESENTED,

AND

PROCEEDINGS AT THE SUMMER AND WINTER MEETINGS

OF THE YEAR 1880–81.

F. W. CASE, SECRETARY.

VOL. XI.

MADISON, WIS.:
DAVID ATWOOD, STATE PRINTER.
1881.

REPORT TO THE GOVERNOR.

To His Excellency, WILLIAM E. SMITH,
Governor of the State of Wisconsin:

It is with much pleasure that, in behalf of the Wisconsin State Horticultural Society, I comply with the provisions of the legislative enactment by which the society was reorganized, in presenting to you the following report of its proceedings for the past year. The volume herewith transmitted forms the eleventh in the series of the society's published proceedings, and comprises a full statement of the financial transactions of the society during the year 1880; accounts of the meetings held; reports of the local societies and various papers on practical subjects pertaining to the Agricultural and Horticultural interests of the State.

The past year has been one of remarkable success in the products of the garden and orchard. In fact, it is generally spoken of, and will long be remembered as the 'best fruit year the State has ever seen." The great cause of complaint was not lack of production, but excess; such an abundant yield that the prices realized were very low, not only below the rate of profitable production, but, in many parts of the State, not sufficient to repay the trifling cost of properly harvesting and marketing the crop, so that much fruit went to waste for want of a paying demand. The fruit culturists of the State have had to meet many and great difficulties in the past, but this is the first year in which they have encountered the discouragement of too great success. Such abundant yields may tend to dishearten those specialists, who by better acquaintance with the principles of culture, and by giving their whole time to the business can secure moderate crops, and consequent high prices in seasons of general failure or scarcity, but to the masses, who must depend mainly on favoring seasons and nature's care and culture, they are blessings that cannot come too often. That they may be the rule rather than the exception is an event much to be desired.

The plan adopted by the society four years since, of uniting with local societies in holding meetings for exhibition of fruits and flowers and the consideration of practical questions in horticulture, has been continued the past season and was attended with very gratifying results. Two of these meetings were held, and a number of the members of the society took part in meetings held for discussions alone. The encouragement thus given and received, the interest awakened in places where these meetings have been held in previous years is still very apparent, and induces the society to desire not only to follow up this work, but to increase their efforts in this direction, and to join in holding fall and winter meetings in various parts of the state, where

the citizens take sufficient interest in horticultural matters to make the necessary arrangements.

While the work of the society is much the same from year to year, and the subjects presented and discussed at its meetings are largely such as have been considered time and again, the experience of each season gives new light on these old questions, which is of much practical value to all. In addition to this, each season brings out new facts in regard to methods and results, new lessons in experience, which duly considered will prove valuable in advancing the interests of horticulture. Through a larger attendance at our regular meetings, and the greater numbers reached at the meetings held with local societies, and the more extended circulation of our Reports, the work of the society reaches each year many new comers and even old settlers, who are in need of information on these points, and to whom what may seem trite and common place to those longest in the field is new, and of much practical value. The members of the society are encouraged to believe that in this and other ways the beneficial influence of their labors is steadily increasing, and that it will contribute much, not only to the financial prosperity of the state, but also to the happiness and contentment of its citizens by increasing the attractiveness and comfort of their homes.

The value of the sanitary, æsthetic, educational and social influence of horticulture in its various branches has been largely overlooked, and it has been judged as a pursuit solely by the immediate pecuniary results derived from it. This is truly an important consideration, and it has been, and still is, the desire and aim of the society, as far as it is in its power, to so develop the horticultural interests of the state as to make them a source of revenue which will add material wealth to those engaged in them; but we feel that there are other important considerations which should be taken into the account; other benefits to be derived from horticulture, of greater value even than those represented by dollars and cents; that the fruit of the strawberry bed and of the orchard consumed in the producer's family, not to the extent of necessity alone, but to the fullest desire, gives better returns than when embodied in coin or greenbacks; that money judiciously expended in beautifying the door-yard, the farm and public grounds, in adorning the home surroundings and adding to the attraction and comforts of the home life, is a safer and better investment than when risked in business speculation or put into bank deposits. On account of this conviction, more than the usual amount of space has been given in this volume to the consideration of questions calculated to draw attention to this subject, thus, we hope, adding to its interest and practical value. We trust that in this, and in all its labors, the society will continue to meet with your approval and will have your cooperation, and that of all who are interested in horticulture and the general prosperity of the State.

Respectfully submitted in behalf of the Society.

F. W. CASE, *Secretary.*

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LIST OF OFFICERS, 1881.

PRESIDENT.

J. M. Smith, - - - - - - - - - - - Green Bay.

VICE PRESIDENT.

J. C. PLUMB, - - - - - - - - - - - Milton.

RECORDING SECRETARY.

F. W. CASE, - - - - - - - - - - - Madison.

CORRESPONDING SECRETARY.

A. J. PHILIPS, - - - - - - - - - - West Salem

TREASURER.

M. ANDERSON, - - - - - - - - - - Cross Plains.

MEMBERS OF EXECUTIVE COMMITTEE.

Ex Officio.

J. M. Smith, President, Green Bay.
F. W. Case, Secretary, Madison.
M. Anderson, Treasurer, Cross Plains.

Dist.
1st. G. J. Kellogg, Janesville.
2d. J. W. Wood, Baraboo.
3d. S. J. Freeborn, Ithaca.
4th. J. S. Stickney, Wauwatosa.

Dist.
5th. George C. Hill, Rosendale.
6th. D. Huntley, Appleton.
7th. A. A. Arnold, Galesville.
8th. Augustus Cole, Oconto.

COMMITTEE ON NOMENCLATURE.

J. C. Plumb, Milton. D. T. Pilgrim, West Granville.
G. J. Kellogg, Janesville.

COMMITTEE OF OBSERVATION.

Dist.
1st. George Jeffrey, Milwaukee.
2d. J. C. Plumb, Milton.
3d. George C. Hill, Rosendale.
4th. G. W. Putnam, Ash Ridge.
5th. H. Floyd, Berlin.
6th. C. W. Potter, Mauston.

Dist.
7th. D. Huntley, Appleton.
8th. A. B. Balch, Fremont.
9th. A. J. Philips, West Salem.
10th. G. W. Perry, Superior.
11th. A. R. McDonald, Sheboygan.
12th. J. M. Smith, Green Bay.

MEMBERS, 1881.

Adams, B. F.	Madison	Wisconsin.
Alcott, Wm.	Brodhead	Wisconsin.
Allen, Prof. W. F.	Madison	Wisconsin.
Anderson, Hon. M.	Pine Bluff	Wisconsin.
Arnold, A. A.	Galesville	Wisconsin.
Barter, S.	Markesan	Wisconsin.
Baumback, William	Wauwatosa	Wisconsin.
Case, F. W.	Madison	Wisconsin.
Daniels, E. W.	Auroraville	Wisconsin.
Dibble, G. W.	Evansville	Wisconsin.
Freeborn, S. J.	Ithaca	Wisconsin.
Gill, Wm.	Dayton	Wisconsin.
Goss, B. F.	Pewaukee	Wisconsin.
Graves, S. W.	Brooklyn	Wisconsin.
Greenman, C. H.	Wauwatosa	Wisconsin.
Hacker, T. L.	Madison	Wisconsin.
Haight, Nicholas	Syene	Wisconsin.
Hambright, C. M.	Beaver Dam	Wisconsin.
Hanchett, Mark	Footville	Wisconsin.
Hatch, A. L.	Ithaca	Wisconsin.
Hill, Geo. C	Rosendale	Wisconsin.
Hirschinger, Chas.	Baraboo	Wisconsin.
Holt, M. A.	Madison	Wisconsin.
Hoxie, B. S.	Cookville	Wisconsin.
Howie, John	Waunakee	Wisconsin.
Hunt, Samuel	Evansville	Wisconsin.
Jeffrey, Geo.	Milwaukee, 630 Chestnut St.	Wisconsin.
Jewett, Z. K.	Sparta	Wisconsin.
Kellogg, Geo. J.	Janesville	Wisconsin.
Lawrence, F. S.	Janesville	Wisconsin.
Lowe, Victor	Palmyra	Wisconsin.
McDonald, D.	Verona	Wisconsin.
Mills, Simeon	Madison	Wisconsin.
Morrison, W. H.	Elkhorn	Wisconsin.
Olds, B. B.	Clinton	Wisconsin.
Palmer, N. N.	Brodhead	Wisconsin.
Peffer, Geo. P.	Pewaukee	Wisconsin.
Philips, A. J.	West Salem	Wisconsin.

Pilgrim, D. T.	West Granville	Wisconsin.
Plumb, J. C.	Milton	Wisconsin.
Plumb, T. D., Jr.	Madison	Wisconsin.
Potter, C. W.	Mauston	Wisconsin.
Reid, Wm.	North Prairie	Wisconsin.
Reynolds, Werden	Green Bay	Wisconsin.
Smith, Alfred	Madison	Wisconsin.
Smith, J. M.	Green Bay	Wisconsin.
Spencer, R. C.	Milwaukee	Wisconsin.
Steinfort, H.	Lake Mills	Wisconsin.
Stickney, J. S.	Wauwatosa	Wisconsin.
Stone, I. N.	Fort Atkinson	Wisconsin.
Thompson, H. M.	St. Francis	Wisconsin.
Tuttle, A. G	Baraboo	Wisconsin.
Tuttle, A. C.	Kilbourn City	Wisconsin.
Warren, A. A.	Green Bay	Wisconsin.
West, J. R.	Evansville	Wisconsin.
Wilcox, E.	Trempealeau	Wisconsin.
Williams, Daniel.	Summit	Wisconsin.
Wood, J. W.	Baraboo	Wisconsin.

HONORARY MEMBERS.

LIFE.

Dr. Joseph Hobbins, ex-President; F. G. S., Corresponding Member Royal Horticultural Society, England, Madison, Wisconsin.

O. S. Willey, ex-Recording Secretary.

Peter M. Gideon, Excelsior, Minnesota.

ANNUAL.

Dr. P. H. Hoy	Racine	Wisconsin.
T. C. Arthur	Madison	Wisconsin.
M. S. George, Ed. West'n Rural,	Chicago	Illinois.
Mrs. A. A. Arnold	Galesville	Wisconsin.
Mrs. Ophelia Forward	Appleton	Wisconsin.
Prof. Wm. A. Henry	Madison	Wisconsin.
J. W. Larkin, Ed. Wis. Farmer,	Fond du Lac	Wisconsin.
Mrs. D. Huntley	Appleton	Wisconsin.
Mrs. H. M. Lewis	Madison	Wisconsin.
Mrs. D. C. Ayres	Green Bay	Wisconsin.
Mrs. Prof. A. Kerr	Madison	Wisconsin.

FRUIT LIST.

APPLES.

Six Varieties best adapted to Wisconsin, Hardiness, Productiveness and Quality taken into consideration.— Duchess of Oldenburg, Wealthy, Pewaukee, Haas, Fameuse, Plumb's Cider.

Additional list for cultivation in favorable locations.— Tetofsky, Red Astrachan, St. Lawrence, Fall Orange, Price's Sweet, Alexander, Utter, Westfield Seek-no-Further, Willow Twig, Golden Russet, Walbridge.

NOTE.— The question of adaptation of varieties is one so largely dependent upon local conditions of soil, elevation and aspect, that a general list will not answer fully the wants of every planter, and at best can only be a general guide in the selection of varieties.

For more specific directions, the following rules and lists are furnished by the committee chosen for this purpose:

1. Locations comparatively elevated and well drained, with a cool northern aspect and fine gravelly clay soil, not very rich, may extend the general list named above to an indefinite extent, with fair prospect of success in southern and eastern districts of the state. But for warm, sheltered locations and rich soils, which induce a great growth, no section of our state can safely plant other than those varieties known to be extremely hardy.

2. The best guide in the selection of varieties is for each to plant largely of such varieties as are found successful in locations similar to that each must plant upon. For all unfavorable locations, and extreme northern districts, only the most hardy, well tried apples of the Russian or Siberian type should be chosen for general planting.

3. In the extreme northern districts, only the crown of the hills should be chosen for the orchard, with a firm soil and porous subsoil, and if these materials are wanting naturally, they should be supplied artificially.

STRAWBERRIES.

For General Cultivation.— Wilson's Albany, Boyden's No. 30, Green Prolific, Crescent.

For Trial.—Charles Downing, Kentucky, Prouty's Seedling, Col. Cheney, Sharpless and Captain Jack.

GRAPES.

General List.— Concord, Delaware, Worden, Wilder, Agawam, Janesville, Lindley.

For Trial.— Israella, Massasoit, Brighton, Champion, Moore's Early.

RASPBERRIES.

For General Cultivation.— Miami, Philadelphia, Doolittle, Turner and Brandywine.

For Trial.— Gregg, Cuthbert.

BLACKBERRIES.

For Trial.— Snyder, Stone's Hardy.

PEARS.

Most Likely to Succeed for General Cultivation.— Flemish Beauty.

For Trial.— Ananas d'Ete, Early Bergamot, Bartlett, Swan's Orange, Seckel, Winter Nellis, Clapp's Favorite, Beurre d'Anjou, Doyenne d'Ete.

PLUMS.

For Trial.— Lombard, Imperial Gage, Magnum Bonum, Yellow Egg, Eldridge, Duane's Purple, De Soto.

CHERRIES.

For General Cultivation.— Early Richmond, Late Richmond or Kentish, English Morello.

EVERGREENS.

For General Cultivation.— Norway Spruce, White Pine, Arbor Vitæ, Scotch Pine, Balsam, White Spruce.

For Ornamental Planting.— Austrian Pine, Norway Pine, Hemlock, Siberian Arbor Vitæ, Red Cedar, Dwarf Pine *(Pinus Montana)*.

For Timber.— European Larch, White Pine.

For Live Fence Posts.— Norway Spruce.

TIMBER CULTURE.

For Timber of rapid growth and easy culture. (Valuable in order named.)

Black Walnut.	Soft Maple.
White Ash.	White Elm.
Black Cherry.	Box Elder.
Butternut.	Cotton Wood.
European Larch.	White Willow.

In commencing to plant on a prairie farm, reverse the order of this list.

For timber of fifty to one hundred years' growth.

White Oak.	Red Oak.
Burr Oak.	Hickory.

For street trees. (Valuable in order named.)

White Elm.	Green Ash.
Hard Maple.	Box Elder.
Basswood (Linden).	Soft Maple.
White Ash.	

For lawn planting. (Valuable in order named.)

Cut-leaf Weeping Birch.	European Larch.
Norway Maple.	European Alder.
Linden.	Weeping Poplar.
Green Ash.	Weeping Mountain Ash.
Horse Chestnut.	Weeping Golden Bark Ash.
American Mountain Ash.	Kilmarnock Weeping Willow.
European Mountain Ash.	

ACT OF REORGANIZATION OF THE STATE HORTICULTURAL SOCIETY.

CHAPTER 151, LAWS OF 1879.

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 the 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, 1880, and until their successors are appointed.

SECTION 3. It shall be the duty of the 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 shall be held on the Tuesday next succeeding the first Monday in February of each year, for the election of its officers, the transaction of general business, and the consideration of questions pertaining to horticulture.

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 regularly 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.

SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects the publication and distribution of said report shall be in accordance with the provisions of the law now in force concerning the same.

SECTION 8. The sum of $600 is hereby appropriated out of any money in the state treasury not otherwise appropriated, to aid the said society in carrying out the provisions of this act; said sum to be paid by the state

treasurer upon the order of the president of said society, in such sums and at such times as shall best contribute to the prosperity of the society and the interests it represents.

SECTION 9. This act shall take effect and be in force from and after its passage and publication.

Approved March 1, 1879.

CONSTITUTION AND BY-LAWS.

As amended February, 1879.

CONSTITUTION.

ART. I. This Society shall be known as the Wisconsin State Horticultural Society.

ART. II. Its object shall be the advancement of the science of horticulture.

ART. III. Its members shall consist of *annual* members, paying an annual fee of one dollar; of *life* members, paying a fee of ten dollars at one time; of *honorary life* members, who shall be distinguished for merit in horticultural or 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.

ART. 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.

ART. V. The society shall hold annual meetings, commencing on the Monday next preceding the first Tuesday in February, for the election of officers, for discussions, and for the exhibition of fruit; also one meeting during the fall, for the exhibition of fruits and for discussions, and such other meetings for discussions and exhibition as the executive committee may direct, at such time and place as the executive board shall designate.

ART. 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 a 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 prog ess of horticulture in the various districts of the state, and report the same to this 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 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, consisting of three members; 3d, Committee of Observation, as now provided. Said committees to be appointed annually by the executive committee of the society.

LAWS RELATING TO THE PUBLICATION AND DISTRIBUTION OF THE TRANSACTIONS OF THE WISCONSIN STATE HORTICULTURAL SOCIETY.

Revised Statutes, 1878.

SECTION 339. There shall be printed annually by the state printer, on the order of the commissioners of public printing, * * * three thousand copies of the transactions of the Wisconsin State Horticultural Society, together with abstracts of reports of county and other horticultural societies, and such other matter pertaining to fruit growing and other horticultural interests of the state as shall be deemed important. The volume may include such engravings as shall be necessary to illustrate the printed matter; the cost of said engravings not to exceed the sum of one hundred and fifty dollars in any one year, and to be paid out of the state treasury.

SECTION 363. The transactions of the State Horticultural Society shall be distributed as follows: Five copies to each member of the legislature; fifty copies to each town or county horticultural society that shall report its organization, with officers elect, number of members, and an abstract of its proceedings, for publication in said volume, to the secretary of the State Horticultural Society; fifteen copies to each county agricultural society reporting to the secretary of state; fifty copies to the State Agricultural Society; fifty copies to the State University; twenty-five copies to the State Historical Society; and all remaining copies to the State Horticultural Society. * * * The number of the printed pages of the transactions * * * of said horticultural society shall not exceed two hundred; and all such transactions shall be printed on good book paper and bound in muslin covers, uniform in style with the previous volumes published.

Chapter 151, *Laws of* 1879.

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.

SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand and five hundred. In all other respects, the publication and distribution of said report shall be in accordance with the provisions of the law now in force concerning the same.

LAW RELATING TO TREE BELTS, REVISED STATUTES 1878.

SECTION 1469. Every owner or possessor of five acres of land, or more, who shall successfully grow by planting with forest trees, consisting of the following kinds, or such species thereof as will grow to the height of fifty

feet or more, viz.: arbor vitæ, ash, balsam fir, basswood, beech, birch, butternut, cedar, black cherry, chestnut, coffee tree, cucumber tree, elm, hackberry, hemlock, hickory, larch, locust, maple, oak, pine, spruce, tulip tree and walnut, tree belts in the manner and form prescribed in the next section, shall be entitled to have the land on which such tree belts grow, exempted from taxation from the time the trees commence to grow until they shall reach the height of twelve feet, and after they shall have attained that height, to receive an annual bounty of two dollars per acre for each acre so grown.

Section 1470. Such tree belts shall be planted on the west or south sides of each tract of land, be of uniform width throughout their entire length, contain not less than eight trees, at nearly equi-distance, on each square rod of land, and be at least thirty feet wide for each five acre tract, sixty feet wide for each ten acre tract, and one hundred feet wide for each square forty acre tract, and upon all square tracts of land, upon two sides thereof. All tree belts owned by the same land owner must be planted not to exceed a fourth of a mile apart, and on the west and south sides of every square forty acres, and shall not exceed one-fifth of the entire tract of land on which the same are planted; provided, that when the east and north sides, or either, of any tract of land, is bounded by a public highway, a tree belt one rod wide may be planted next to said highway, although it, with the others on the west and south sides, shall exceed one-fifth of the whole tract; and tree belts may be planted on any other lines within each forty square acres, by permission of the assessor.

Section 1471. The assessor shall, upon the application of the owner thereof, in each year, at the time of assessing the personal property in his district, make a personal examination of all tree belts for which bounty or exemption from taxation is claimed, and ascertain whether they have been planted as required in the preceding section, and are thriftily growing, and if he shall be satisfied thereof, he shall not assess the same for taxation unless the trees therein shall have attained the height of twelve feet, and in that case he shall deliver to the owner a certificate that he is entitled to an annual bounty of two dollars for each acre of such tree belts, stating therein the whole amount of such bounty, and giving a description of the entire land of which the tree belts form a part, and the amount of such bounty shall be credited by the treasurer in payment of any taxes assessed on such land, as so much cash; but if not so satisfied, the assessor shall assess the land for taxes or refuse to grant any certificate for the bounty, as the case may require; and if, after any certificate for such bounty shall have been issued, the owner of any such tree belts shall suffer the same to die out by want of cultivation or otherwise, or shall cut the same down, or in any other way allow the same to be so thinned out, that in the opinion of the assessor he ought no longer to receive such bounty, he shall give the treasurer written notice thereof, and thereafter no further bounty shall be allowed until such owner shall again receive a certificate therefor.

PROCEEDINGS

AT THE

SUMMER MEETING

OF THE

WISCONSIN
STATE HORTICULTURAL SOCIETY,

Held at Baraboo June 17 and 18, 1880, and at Green Bay June 23 and 24, 1880.

At the annual meeting of the State Horticultural Society for 1879–80, it was decided instead of one June meeting to hold hereafter a number of summer meetings for discussions and exhibitions of fruits and flowers, and accordingly propositions were made by the State Society, to the various local societies, to hold six of these meetings and to contribute fifty dollars to each, toward defraying the expenses of an exhibition of fruits and flowers in connection with the local Horticultural Societies, that would make the arrangements necessary to ensure success. Two societies only responded; the Sauk County Horticultural and the Brown County Horticultural and Agricultural. The time and place selected for the first meeting was June 17 and 18, at Baraboo, and the second at Green Bay, June 23 and 24.

MEETING AT BARABOO.

Unfortunately the time selected for this meeting was so near that of the Nurserymen and Fruit Growers' Convention held at Chicago, as to seriously interfere with the attendance of the members of the State Society, who are generally present at these meetings. The local attendance was good and the exercises were pleasant and full of interest.

The convention assembled at 11 o'clock A. M., at the court house and spent the hour in the discussion of strawberries; various fruit growers present giving their practical experience with different varieties. The opinion generally expressed was that as yet there was nothing that would fill the place of the Wilson; that the Crescent Seedling, in hardness and productiveness, was a valuable variety, but was a little inferior in quality to some others, and was lacking in shipping qualities; that Boyden's No. 30 and Charles Downing were of fine quality in berry, and could be cultivated with reasonable success in most locations, and that the Kentucky was unrivalled as a late berry.

NATIVE FOLIAGE PLANTS AND VINES.

At the afternoon session Wm. Toole, president of North Freedom Horticultural Society, who was to have prepared an essay on "Shades of Green as seen in Nature," in lieu of the promised paper, gave a very interesting address on this subject and the cultivation of wild plants, smilax and ferns for, this purpose; of which, he has kindly given the following summary at the request of the secretary.

Attention was called to the bright refreshing shade of green, which rye presents in early spring time, contrasting as it does with all other verdure, until the endless variety of summer's beauty makes us forget the differences so pleasing to us but a short time before. One or more beds of rye on the lawn form a pleasing sight, on which we gladly rest our eyes when the mantle of snow is passing away. It's beauty is in keeping with its surroundings, until the mass of verdure is about two feet high, when the whole

may be turned and make a splendid bed for Ricinus, Caladiums, Cannas and other subtropical plants. It may follow early annuals, or spring flowering bulbs, and should be sown early in September; such a rotation is very beneficial to flowers that delight in a rich soil.

Mention was made of some native or naturalized plants which on account of contrasting shades of green are useful for bedding with each other. Compass plant — *Sylphium laciniatum* — makes a fine contrast with common mullen, which is different as possible from common thistle, that may be used to form the next circle, and this may be surrounded by motherwort, completing the bed with an outer circle of yarrow. A few of our wild plants, in the experience of the speaker and some of his friends, have shown themselves very pleasant company during the winter, bringing with their greenness the freshness of summer woods to grace our homes in winter. Our little trailing Partridgeberry, if carefully removed, will retain its beautiful leaves and bright berries through the winter. Bedstraw grows with almost summer luxuriance, and suggests many a fragrant woodland breeze. Mouse-ear chickweed makes a beautiful basket plant for winter. Our smaller ferns with a great variety of mosses, rattlesnake plaintain, Adam and Eve—*Aplectrum hyemale*—Liverleaf rue anemone, that beautiful little club moss — *Lycopodium lucidulum* — and many others to choose from, will make a beautiful wild garden if planted in a shallow rustic box with sufficient woods earth. They should be kept in a cold, shady place, with a limited supply of water for a month or more, that they may go through the required ripening process which seems to render some substitute for winter necessary. When brought forth to grace the living room, they should have a cool situation and not a very dry atmosphere. Among a large collection of plants, to me the most interesting, was a luxuriant tuft of blue grass, growing in a box, a few winters ago, at the home of one who has since become famous for her skill in the dairy.

As a decorative green the Smilax was warmly commended. Those who desire to commence with the seeds, should pour hot water on them, and let them soak about twelve hours before

planting. Sow the seeds in soil made light with sand and vegetable mold. Cover with a pane of glass until they germinate, after which give air and harden by gradually removing the glass. When the plants are large enough to transplant, from four to six may be placed about the edge of a six-inch pot in a soil having a fair share of fibrous vegetable mold (not black humus) with some sand and manure. Water thoroughly, but not too often. The plants will grow slowly at first, but should be transplanted to separate pots as soon as the roots begin to crowd. They will generally need no rest during the first winter, but if the leaves begin to turn yellow and drop off, withhold water, and let them rest in a cool, dark place for about six weeks; then bring them forward to grow, and be patient. After resting, the Smilax always starts a new growth of roots first. When one year old, the plants will be such as we usually receive from the florist, with the advantage of having been exposed to no transportation hardships.

Repot plants which have been bought, using such soil as has been already described. Soil suitable may be procured in any woodland or among rich hazel brush. Remove the dry surface leaves and secure a supply of decayed leaves and roots which will readily crumble and yet show something of their original composition; mix this with an equal quantity of loamy garden soil and half the same amount each of sand and thoroughly decayed manure. Plant in small pots or boxes, and use judgment in watering. Give enough each time but not too often. Let the surface become dry each time before renewing the supply. Let them have a situation in summer where they can be shaded from the midday sun. Repot as soon as the roots fill the soil, before any of the white roots begin to turn brown, no matter how small the growth of plant may be. If there is any special secret about growing the Smilax it consists in giving more room for roots just as soon as they need it; but never put it or any kind of small plant in a very large pot. As soon as plants are large enough to require a six inch pot, increase the proportion of manure to the garden soil. Like the Asparagus, a near relative, when once established they are strong feeders. Liquid manure may be used with judgment to advantage. A good, strong growth should be

secured before winter, for if winter bloom is desired, it must be expected on early fall growth of vine. The flowers are not showy, but are delightfully fragrant, and the red berries which succeed them, contrasting with the bright green leaves, are quite attractive.

With these, as with many other plants, the change to indoor life is very trying, and too often the frequent and sudden changes are accepted as winter by them and they rest. During winter, do not crowd with other plants; and give plenty of air when it can be done without suddenly lowering the temperature. Avoid too much heat and dry air. Do not let them freeze, but they will almost bear it. Excessive heat and dryness they cannot endure. If, from any cause, the plants turn yellow after having made a thrifty growth, do not fear that they will die. Let them rest in the cellar a few weeks, then repot the bunches of tubers in pots small enough, after removing the useless roots, and wait patiently. Their spring-time will come when the new growth of roots has prepared them for it. If the tubers are separated from the plant, it will be sacrificed, but many of them will grow about as strong as seedling plants.

The value of dried ferns as greens was spoken of. Many persons are mistaken in supposing that ferns for drying should not be gathered before the close of summer. Many species have completed their growth and begin to pass away by midsummer. Notably such are the Phegopteris or Beech ferns, Moonwort ferns, a few of the Shield ferns and Cystopteris. Only matured fronds should be selected. Those which are immature and succulent must be rejected, no matter how delicate and graceful they may appear, for they will discolor in drying. The collection of the evergreen ferns, Polypody, Walking fern, Asplenium trichomanes, Aspidium spinulosum, Aspidium marginale, and Aspidium acrostichoides, may, if desirable, be left until late in the season. A close fitting box may be used to keep them from wilting. Where appearances were immaterial, I have found a common wash-boiler with a close fitting cover convenient to hold wild flowers and ferns, which sometimes must be moved many miles, while collecting a variety.

When drying ferns, the driers should be changed if possible twice during the first twenty-four hours, and once each day for three or four days after; then occasionally, until they are dry enough. A box of stones makes a good weight to assist the papers in extracting the surplus moisture. As the ferns become nearly dry they may be placed closer together to relieve some of the papers to be used again. Spread out the papers, after changing, to dry out the moisture which they have taken from the ferns. When dried they may be packed together in boxes to keep from dust until needed.

Aspidium spinulosum, Aspidium marginale and Poylpody cure with the darkest green color, but the Maiden hair and Clayton's fern curl the least in heated rooms. When autumn leaves are brightening, some ferns may be found which give very pretty effects with their varied shades and markings of creamy white, buff, light and reddish brown, black and green. Maiden hair, Clayton's fern and the common Brake — *Pteris aquilinia* — change their colors before withering more than others.

J. M. Smith, president of the State Society, read a paper on "Strawberry Culture;" Mrs. U. H. Strong, secretary of the Sauk county Horticultural Society, presented one on the "Cultivation of House Plants," and J. W. Wood, president of the local society, followed with one on the subject of "Adaptations in Horticulture." These papers were of much special interest and would have appeared in this report, had the authors responded to the request to forward them. The subjects presented were fully discussed.

In the evening an exhibition and festival was held in the hall. The display of fruits, flowers, house and green house plants and vegetables was choice and attractive. The cut flowers, bouquets, floral and foliage designs and special exhibits were profuse in number and were arranged with great taste, and formed one of the principal attractions of the exhibition; one of the most interesting features was the collections of mosses, ferns and wild flowers for which this region is noted. The hall was beautifully decorated with many large and rare plants, rustic baskets, pictures

and works of art. The refreshments served were of the choicest, and the social features were highly pleasing and attractive, and reflect great credit on the members of the local society and citizens of Baraboo, for the kindly interest, ability and good taste displayed, giving to the exhibition double attractiveness and value. The following are the

PREMIUMS AWARDED:

SMALL FRUITS.

Best cherries. Mrs. H. R. Ryan	$ 50
Best Wilson's strawberries, G. J. Kellogg	50
Second best, Chas. Herschinger	25
Best Green Prolific, Geo. J. Kellogg	50
Second best, W. C. Warner	25
Best Charles Downing, G. J. Kellogg	50
Second best, Chas. Herschinger	25
Best Crescent Seedling, Chas. Herschinger	50
Second best, Geo. J. Kellogg	25
Best Boyden's, No. 30, Chas Herschinger	50
Second best, Geo. J. Kellogg	25
Best Kentucky, Chas Herschinger	50
Second best, W. C. Warner	25
Best Col. Cheney, Geo. J. Kellogg	50
Second best, Chas. Herschinger	25
Best Capt. Jack, Geo. J. Kellogg	50
Best Sharpless, Geo. J. Kellogg	50
Best plate, in quality, Chas. Herschinger	50
Second best, W. C. Warner	25
Best plate, in size, Chas. Herschinger	50
Second best, W. C. Warner	25
Best collection small fruits, George J. Kellogg	3 00
Second best, Chas Herschinger	2 00

HOUSE PLANTS.

Largest and best display, not over forty kinds, Mrs. W. H. Strong	5 00
Second best, Mrs. J. C. Owen	3 00
Best display cacti, Mrs. S. S. Grubb	1 00
Best cactus in bloom, Mrs. S. S. Grubb	50
Best single ivy, Mrs. S. S. Grubb	50
Second best, Mrs. M. C. Waite	25
Best collection of fuchsias, Mrs. J. C. Owen	1 00
Second best, Mrs. M. C Waite	50
Best single fuchsia, Mrs. J. C. Owen	50
Best collection of geraniums in bloom, Mrs. M. C. Waite	1 00
Second best, Mrs. J. C. Owen	50
Best collection foliage geraniums, Mrs. Levi Crouch	1 00
Second best, Mrs. J. C. Owen	50
Best collection pelargoniums, Mrs. M. C. Waite	1 00
Second best, Mrs. J. C. Owen	50
Best collection foliage plants, Mrs. M. C. Waite	1 00
Second best, Mrs. J. C. Owen	50
Best display begonias, Mrs. Levi Crouch	1 00
Second best, Mrs. J. C. Owen	50
Best showy leaf begonias, Mrs. J. C. Owen	1 00
Second best, Mrs. M. C. Waite	50
Best hanging basket, Mrs. M. M. Davis	1 00
Second best, Mrs. U. H. Strong	50

Best century plant, Mrs. M. M. Davis	$ 50
Second best, Mrs. U. H. Strong	25
Best acacias in bloom, Mrs. U. H. Strong	50
Best abutilon in bloom, Mrs. Levi Crouch	50
Second best, Mrs. M. M. Davis	50
Best calla, Mrs. C. Ryan	50
Best smilax, Wm. Toole	50
Best display of vines for house culture, Miss Sneathan	50
Second best, Mrs. M. C. Waite	25
Best primula, Mrs. J. C. Owen	50
Best oxalis, Mrs. M. M. Davis	50
Best heliotrope, Mrs. Levi Crouch	50
Second best, Mrs. C. Ryan	25

CUT FLOWERS.

Best display of roses, Mrs. Lucy Case	2 00
Second best, Miss Julia Avery	1 00
Best basket of flowers, Mrs. Levi Crouch	50
Best round bouquet, Mrs. J. C. Owen	50
Best pyramidal bouquet, Mrs. Levi Crouch	50
Best flat bouquet, Mrs. M. M. Davis	50
Best pansies, Mrs. J. W. Wood	50
Best peonies, Mrs. Wm. Toole	50

WILD FLOWERS AND FERNS.

Best show wild flowers, Mrs. Kate Toole	1 50
Second best, Master John Toole	75
Best display mosses, lichens and lycopodiums, Mrs. Kate Toole	1 50
Best show native ferns, Mrs. Kate Toole	1 50
Best show of rare wild plants and flowers, Mrs. Kate Toole	50
Best ornamental work in this class, Mrs. Kate Toole	1 50
Best cypripedium, Master John Toole	50
Best foreign ferns, Mrs. T. Thomas	00

SPECIAL PREMIUMS.

Best boutonniere for gentlemen, Mrs. Levi Crouch	Rustic hanging basket
Best " for lady (blonde), Mrs. Levi Crouch	Rustic hanging basket
Best " for lady (brunette), Mrs. Levi Crouch	Rustic hanging basket
Best ornamental decoration by person under 17 years of age, Miss Eva Davis	2 50
Best rustic vase of flowers, Miss T. Thompson	——
Third best collection of house plants, Mrs. Levi Crouch	——
Best collection birds' eggs, Master Carl Sumner	——
Fine ornamental designs in mosses, ferns and wild flowers, Miss Belle Crouch	2 50
Fine design in wild flowers, Miss Cora Pimbley	Special premium

VEGETABLES.

Best display lettuce, J. W. Wood	50
Best display asparagus, J. W. Wood	50
Second best, S. S. Grubb	25
Best display radishes, W. C. Warner	50
Second best, J. W. Wood	25
Best display pie plant, J. W. Wood	50
Best display peas, J. W. Wood	50
Second best, W. C. Warner	25
Best display beets, J. W. Wood	50
Second best, David Sansum	25
Best display onions, J. W. Wood	50
Best display turnips, J. W. Wood	50
Second best, David Sansum	25
Best display potatoes, David Sansum	50
Best Sweet potatoes, J. W. Wood	50
Best collection vegetables, J. W. Wood	3 00
Second best, W. C. Warner	1 50

MEETING AT GREEN BAY.

The joint convention of the two societies was opened in Klaus' Hall, at 10 A. M. of June 23d, by J. M. Smith as president of the Brown County Society. The attendance on the part of the members of the State Society was much larger than at the meeting held the previous year, but the pressure of farm work, attendant upon the backward season, interfered somewhat with the local attendance; still there was a fair audience present.

Arrangements had been made to have the Address of Welcome and the response given by Judge T. O. Howe and R. D. Torrey respectively, but both persons being absent, these duties were assigned at the last moment to Hon. W. J. Abrams and Mr. J. S. Stickney.

In presenting the words of welcome on behalf of the citizens of Green Bay and the Brown County Society, Mr. Abrams spoke substantially as follows:

ADDRESS OF WELCOME.

Mr. President, Ladies and Gentlemen of the State Horticultural Society:

In a state like ours, where agriculture is the principal source of wealth, and the advancement and prosperity of the citizens and the whole state depend on the successful cultivation of the soil, we should see to it that we do not fall behind sister states around us engaged in similar occupations, and that we do not rest content with what we have already accomplished, and sit down in inactivity. In order to prevent this, agricultural societies have been organized and are engaged in the dissemination of knowledge and inciting to a friendly rivalry. But something more is wanted; something is needed to make home more attractive and to relieve the burden and care resulting from the hard, delving toil of the farm. To meet this want, horticultural societies were formed, in order to promote the cultivation and development of the beautiful along with the more substantial labor of the farm, or, in other words, to unite the poetry with the prose of husbandry. I say poetry and prose of husbandry, for horticulture stands in the same

relation to agriculture as poetry stands to prose, working upon and developing all the finer and tenderer emotions of the human heart, for few persons can work any great length of time among fruits and flowers, without catching something of their beauty, and having in some way their manners improved; their tastes refined; their intellects elevated, and their social character benefited.

The president of your society, appreciating the value of a society of this kind, was chiefly instrumental in organizing what is called the Brown County Horticultural and Agricultural Society, which has now been in existence about four years, and has been of marked benefit to the people of the whole county. Last year, when your president intimated that the state society might hold its annual summer convention here, we cordially extended the invitation. You came; the convention was held, and the large amount of information we then received from the many valuable papers read, and the memory of the many pleasant acquaintances made upon that occasion have lingered with us till now, and when your society proposed to appropriate a sufficient sum to enable several conventions to be held instead of one, we made haste to secure one here; and I can assure you that it affords us great pleasure in meeting so many of you again; and in behalf of the Brown County Horticultural and Agricultural Society I welcome you to Green Bay, and ask your co-operation in this noble work, trusting that the present interview will be as enjoyable as that of last year; that you will carry with you to your homes pleasant memories of this visit.

Mr. Stickney, in his response, spoke briefly of the interest felt by the State Society in the welfare and prosperity of the local societies, and its desire to join heart and hand with them in promoting the interests of horticulture throughout the state; congratulated the Brown County Society on its thriving condition and on the good influence it was exerting, both at home and abroad, and returned thanks in behalf of the State Society and himself for the hearty welcome received.

Resetting old Orchards.—Owing to the absence of a number of those who were expected to read papers, the regular pro-

gramme for the forenoon was omitted, and a general discussion engaged in.

Mr. Huntley, of Appleton, inquired if it was possible to make young apple trees live in the orchard set where others had died out.

Mr. Peffer, of Pewaukee, said that it had been frequently done with success.

Mr. Stickney, of Wauwatosa, stated that in many instances, and perhaps in the majority of cases, it had failed. There were three causes of failure; first, they failed where the former tree had exhausted the strength of the soil, taking out the elements necessary for the growth of the tree; and second, where parts of the old tree remaining in the ground, souring or decaying, had an injurious effect on the soil; and third, where the young trees were shaded by the larger trees of the orchard. Where the proper precautions are taken to prevent injury from these causes there would seem to be no reason why trees could not be made to grow where others had died out, provided the soil and location were suitable for orchard purposes, and the varieties were adapted to the location.

Mr. Plumb, of Milton, believed that the want of success in such cases was mainly due to the exhaustion of the soil by the old trees. The old soil should be removed and fresh soil put in. If this is done properly the conditions necessary to healthy growth will be secured and success will follow. The question of healthy nutrition is as important in tree growing and floriculture as in stock raising and other branches of farming.

Russian Apples.— President Smith stated, that while at Baraboo, he had visited a thrifty young orchard containing about one hundred and fifty varieties of Russian apples. He was much pleased with their appearance, but wanted to know if any reliable results had been yet secured by the cultivation of this class of trees.

Mr. Stickney spoke of very fine thrifty young orchards of this kind of trees, that he had visited in Minnesota. They were apparently strong, vigorous growers, and he was in hopes that some of the varieties would prove valuable. He thought that probably

out of the one hundred and fifty kinds, eight or ten might be found of some value.

Mr. Plumb had paid some attention to the Russians. They have been set in various parts of the country, but nothing of special importance had yet been developed. Perhaps it is too early to expect definite results, but as a general principle we find that a strong, vigorous growth of tree is accompanied by a coarse and rather inferior quality of fruit, and that where the wood growth is compact and slow, there is a much richer and more delicate quality to the fruit. Some of our finer crabs are good samples of this, while all the Russians that are generally cultivated, like Tetofsky, Alexander and Red Astrachan are deficient in quality and flavor.

Blight.—Mr. Huntley stated that in his orchard, the present season, Golden Russet trees, standing near other trees that were subject to blight had been affected with it, while those in other parts of the orchard were not touched with it. He would like to have this subject discussed, and to learn the cause and remedy.

Mr. Plumb had closely observed this blight for many years, and had long ago formed the opinion that it was not produced, as some held, by insects, but was a disease of the circulation. Excess of nutrition, especially when accompanied by hot and moist weather, produced blight. The late heavy rains, followed by very sultry weather had caused considerable blight in various parts of the state. The excessive heat produces a chemical change in the sap crowded into the cells of the tender wood, and favors the development of fungoids which are often found to accompany blight. He regarded these fungoids as a result, rather than the cause of the disease. Trees in soils that are rich and retentive of moisture are much more subject to mildew, scab and blight than where the land is poor and dry. The remedy is to under-drain; to plant the trees on lighter soils, and, by culture, to secure early growth and maturity of both wood and fruit.

Mr. Peffer said that up to June 11th, everything had been favorable for a heavy crop of fruit, but then there came a hot wind from the south, which withered or scorched the leaves and tender twigs on most all trees and plants, and stopped growth at once.

This was followed by a cold rain and the sudden change turned the sap in the cells of the overburdened leaves and twigs into poison. This caused the fire blight seen in so many thrifty growing orchards. The fungus growth or black spots seen on the fruit, and the rust on the grain are likewise produced by the decomposition of vegetation thus effected.

Meeting adjourned.

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2 O'Clock, P. M.

The society was called to order by President Smith, and the following paper was read, by Mr. Huntley, of Appleton, on

THE FARMER'S ORCHARD.

One of the first recollections of my early childhood is of looking in the grass for large yellow apples under an old honey sweet tree, among the green hills of Vermont. I could not have been more than three years old at that time. I have many pleasant memories of looking for early apples when a boy, of putting them in the new hay to ripen, of rising very early mornings after windy nights, to gather the mellow fruit from some particular tree that just suited my taste, and I have witnessed the same pleasure in my own children. There is real enjoyment in watching the growth of a fruit tree. How anxiously we look for the first blossoms and wonder if they will bring fruit. All the farmer's family partake of this pleasure.

There is profit also, which is invariably in direct ratio to the amount of intelligence with which one prepares the soil, plants the trees, and cares for them ever after. Some have the idea—or so we would suppose from their practice—that to dig a hole and put in the tree, very much as you would set a fence post, is all that is required, except if it should live, to pasture sheep and cattle in the same field and use them for fodder. Then the tree peddler, the nurseryman, and the country come in for about an equal amount of cursing. Such persons will always tell you that you cannot raise fruit here.

The location of the orchard should be near the house if possi-

ble; back of it, or one side instead of in front, as some have it. If there are any fruit trees in the door yard, they should be of the upright-growing kinds, like pear trees or the Tetofsky; if the front yard or lawn is large, a few of these and a few crabs may be interspersed among the ornamental or shade trees, but much care and judgment should be used or they will be much too close and thick, excluding the sun, and hiding the view either to or from the dwelling. If the site for the orchard has natural drainage much is gained, but if not, it should be under-drained, if possible. No water must stand for the slow process of evaporation by the sun. If not able to underdrain at first, do not wait, but set on the crown of a back furrow and underdrain afterward. Prepare the ground by deep plowing and fine pulverizing; have a nice tilth, as good cultivators say, much as you would for a premium crop of corn or potatoes. Mark the plat off, so that the rows shall be twenty feet apart, and make a furrow with a plow each way and plant the trees where the furrows cross, no deeper than the land has been plowed which should be eight or ten inches at least; a foot is better; draw with a hoe some fine mellow soil around the roots, just enough to make the tree stand alone, leaning a little to the west; continue in this way till all are set; then take the team and plow, with orchard whiffletree, and backfurrow twice around each row of trees, smooth off and level down with hoe, and pack with feet and the work of setting is done. I then prune off all but two or three branches besides the leader or central shoot and cut back these one-third their length. Then mulch with coarse manure, three or four feet in diameter six or eight inches thick. If the trees left the nursery in good condition, with good roots and have been kept moist, not thrown into a wagon with roots uncovered and carried eight or ten miles over a very rough road, in a windy day, as is often done; but instead, cared for properly, ninety-five per cent. of them will grow and become established as orchard trees.

I would not set less than one hundred trees of the hardy varieties, even if the farm did not consist of more than fifteen or twenty acres; and not less than five of any one kind, and these should not include the crabs, or untried aspirants for public favor. I

would experiment with new kinds, but with caution, certainly not with those, without a recommendation better that of some unknown tree peddler from some unknown nursery, telling of some unknown somebody who said he had grown them and knew them to be very hardy and great bearers of splendid fruit, price $1.00 each. This tells the whole story, and humbug can be seen as plainly as the nose on your face, and still how many bite at this bare hook. On the basis of of one hundred trees I would want twenty-five summer, twenty-five autumn and fifty winter. I would set a succession in regard to time of ripening so that I might have apples all the year through, or certainly from the first of August and as long as Golden Russet can be kept. Quality and productiveness would influence in this selection, commencing with the earliest and naming them in the order of ripening. I would set five Tetofsky, because they are early and hardy; I think but little of their quality, five Red Astrachan, early, hardy and of good quality, but with me very shy bearers; some top grafted are more productive; five Sops of Wine—I have found them profitable; ten Duchess of Oldenburg, or, if one wishes a sweet apple, five Sweet June and five Duchess. The Sweet June is a very fine deserts apple; the children always visit these trees. I have them bearing now that were set in 1863; five Saxton or Fall Stripe; five St. Lawrence's, Plumb's cider, Fall Orange and Utters; for a sweet fall apple the Sweet Pear; it is not as delicious as the Sweet June, but a better grower and more hardy. Ten Fameuse, and ten Tallman Sweet. These two are the best of all. Twenty-five bushels of Talmans is none too many where there is a family of children. They will carry them to school, and eat them baked in their bread and milk upon their return. They are good for pickles and preserves, and best of all the tree will live where other hardy kinds die. The Fameuse is equally desirable. Every body likes them. Everybody eats them. They are productive and though usually classed as a fall apple, will keep till nearly spring, if picked early and handled with care. Twenty-five bushels is none too many to put in the cellar for winter's use; ten Seeknofurther; ten Perry Russett and ten Golden Russett. This makes the one hundred. If one wished to set more, they should consist largely of Duchess,

Fameuse, Tallman Sweet and Golden Russett. For crab apples, plant as many as you wish of Transcendent, Hislop, Montreal Beauty, Whitney's No. 20, Lake Winter, Briar Sweet, etc. The Pewaukee, Walbridge, Wealthy, Wolf River and others are growing, but have not fruited much yet. The Ben Davis we have tried and discarded, as of too poor quality for anybody to eat.

The care, culture, and pruning of an orchard are subjects upon which fruit-growers differ, and no positive rules can be laid down to govern all cases. I have been of the opinion that the orchard should be cultivated to some hoed crop till coming into bearing, but others think it should always be in grass, or if cropped at all, with buckwheat, occasionally. There is great danger of injuring the roots by too close or too deep plowing, and bruising and barking the tree with the whiffletrees. A common whiffltree should never be used in an orchard. I use one eighteen inches long, with tug hooked on back side some four or five inches from the end, the tug passing around the end, which is made flat to fit the tug. This never barks the tree, no matter how close you drive. I am experimenting with an acre of young trees in grass, keeping them mulched to kill the grass. I think it may do; they are looking and growing well.

I have lost large trees by faulty pruning when small, which no after-care could remedy. There must be some calculation as to growth and how the tree will look when large. I think no branches should be left directly or nearly opposite each other, for they are apt to crowd the central or leading shoot. Neither should they grow nearly upright, or at too acute an angle, for they are likely to become false, than which nothing is worse; more trees are ruined from this cause than from any other. We have many trees sent to us from the nursery in very bad shape in this particular. Many a farmer sees nothing wrong, supposing the nurseryman knows better how to prune than he does, and so the tree grows to bearing size and splits to pieces. For this reason I should never order large trees. Small trees lose less roots when dug; have smaller branches to support, and the freight is much less.

The farmer who intends to grow a good orchard—and all should

have one—should be a close student of his business and of nature. He should know how to prune for fruit or for growth of wood, and when not to prune at all. The question is often asked, when would you prune? The answer should be, as soon as the tree needs pruning; any time when you discover a limb or branch that needs removing. Always have your pruning knife with you; many times it can be done with the thumb and finger, which is better still. For larger branches, say from half-an-inch to two inches in diameter, pruning shears are better than saw or chisel.

Budding and grafting should be learned. This can be done very easily by studying such works as Barry and Thomas on fruit culture, with a little practice. Every farmer should not only take agricultural and horticultural papers, but also have a good library, with some volumes pertaining to his own calling. Many persons find fault because trees die, and get discouraged about planting any more. I think this is not as good a fruit country as some points of the east or west. But that is not a good argument against the cultivation of fruit. Some localities are not as healthy as others, but this does not deter people from living in such places. We must have fruit. We must raise if we have it in any quantity. There are hardy kinds, of good quality, that will live and bear fruit; yes, and die too—and the only way is to keep planting as fast as they die, or a little faster.

After you have decided how much land you will devote to the orchard, plant it in the best manner possible; tend and care for it with all the intelligence you have and can get. Know all your trees by name, each and every one—you will soon learn which varieties do the best in your orchard. As fast as trees die, plant in others bought of intelligent and honest nurserymen—for I believe there are such—of those kinds that prove the best with you. By setting a few each season I believe pears can be grown, so that a family may have a few bushels at least every year, and where is the farmer that cannot set $2 worth of pear trees each season? This would buy four trees at retail prices, or eight trees at club rates, purchased of the nurseryman.

Experiment with new kinds when you have good evidence that they will be an acquisition; of course the nurserymen will bring

out the new varieties, and the country, all of us, are very much indebted to them for what they have done in this matter of new varieties which have proven hardy and adapted to our climate. I would not be particular about keeping the trees rowed both ways, in fact I have given that up, and frequently plant in a young tree while the old one, that is going the way of all trees, gives me one or two partial crops more before giving up the ghost entirely; some say never plant a young tree where an old one has died, the soil has been poisoned, soured, etc. The using of fruit is not only a luxury but a necessity; it is much better than paying doctor's bills. A good orchard with the varieties of early and late apples in their succession will do much toward making children happy and contented with living on a farm. The love of home is next to the love of country, and pleasant memories of childhood will bind by the strong power of love the youth who leaves the parental roof true to virtuous and noble living.

Mr. Plumb said he could heartily commend the views advanced in this paper; they were the result of the practical experience of a practical fruit-grower. While he approved of the main points in the paper, he should differ in regard to the proportion of summer, fall and winter varieties there recommended. He would set more of the last and fewer of the first two. We have too many early varieties. We cannot use them when apples are abundant, and they cannot be sold to advantage with ordinary market facilities. We want more late keeping varieties. These we can use and sell to better advantage.

Mr. Stickney remarked that there were two points in the paper which differed from the result of his own experience; one was in the manner of transplanting; instead of pressing the earth gently around the roots and leaving it loose, he would be careful to press it down firmly about the roots. The other point was as to the amount of mulching; he regarded three inches of covering as better than eight or ten.

In reply to an inquiry by President Smith, if he had had any experience with Whitney's No. 20, Mr. Stickney replied that he

had tried it and liked it very much. It was a free bearer, the quality of the fruit was very fine, but one fault was, that it would not retain its flavor but a short time after ripening. This was an objection to it, except for immediate use or quick sales in the market.

Mr. Plumb said he could indorse the opinion expressed in regard to the quality and excellence of No. 20. It was a crab of much merit.

Fruit Growing in Northern Wisconsin.—At the close of this discussion Mr. Plumb spoke of the advantages possessed by northern and especially northeastern Wisconsin for fruit growing, explaining and illustrating the subject by reference to a geological and climatic chart of the state. In the composition of the soil and modifying influences of location and exposure, he stated that many portions of Door, Calumet, Brown, Manitowoc and Kewaunee counties were better adapted to fruit raising especially apples and pears, than the more southern and middle parts of the state. That section of the state might truly be called the Michigan of Wisconsin; he believed there were many locations in these counties that could compete advantageously with the most favored sections across the lake. He also cited the celebrated pear orchard near Green Bay as proof of this. He believed this orchard was just beginning to do its mission work, and that it is the seed, so to speak, from which many pear orchards will develop throughout that section. There were hundreds of locations in the counties named, and especially Door, where the conditions are just as favorable, as in this orchard, and where, with proper care, investments in fruit culture would yield large and sure returns. Another advantage this section enjoyed was that the codling moth, tent caterpillar and other insect foes are not so prevalent, so destructive as in the southern part of the state.

Thursday, June 24.

Most of the members availed themselves of the morning hours to visit the well known pear orchard on the Dougherty farm near Green Bay, and also to examine the fine garden of President

Smith and those of his sons, near by. So many were the objects of interest, and so pleasantly passed the time, that it was near the noon hour before the convention gathered in the door yard of the president, where the balance of the session was to be held. Owing to the fact that the dinner hour was near at hand, it was decided to defer business and proceed at once to the discussion of the bountiful provisions for the inner man, prepared by Mr. and Mrs. Smith and the hospitable members of the Brown County Society. The tables placed under the native pines in the grounds of our host were soon loaded with good things for the occasion, which were partaken of with great relish and with social good cheer. Dinner over, the president called the convention to order and the reading of the papers on the programme was commenced. Mr. Stone of Appleton came first with a paper entitled,

HORTICULTURAL PROGRESS.

When we glance at the progress being made in this country we exclaim: "It is just like them; it is truly American! What it takes other countries a century to accomplish, is here but the work of a decade. And this is more true in no branch than in horticulture. As the frontiersman clears a patch in the native forest or subdues the open prairie, he begins to plant fruit trees and blooming plants, that his new home may have some of the attractions of civilization. He is encouraged in this from the fact that he usually possesses the soil he tills, instead of being a tenant, subject to the will of some lord. A little idea of the great progress horticulture is making in this country, may be formed from the fact that the products of the garden, in our large cities, can be purchased at a much lower figure than in the large cities of Europe, while the laborer gets much higher wages here than there. Showing that the process has been greatly simplified and systematized, so as to produce greater result with less labor. Although we may not be able to boast as fine parks and botanic gardens as they, yet we do claim that among the masses, horticultural embellishments are greatly in our favor. The old monarchical idea that it is the duty of the many to labor for the happiness of

a privileged few has done much to prevent a general diffusion of horticultural knowledge among the people, with its corresponding effects on their homes, and when the time comes, as I surely believe it will, that the laborer shall reap the rewards of his labor, then you will see greater strides made in horticulture than ever before.

There is another reason why the Old World can not advance as rapidly as the New, although at the first glance it might seem to have the opposite effect. There, a gardener, as in other trades, is required to serve a certain term of years, say from three to six, in order to learn his trade. During that time he is taught to do everything just as his tutor before him was taught. Thus robbed of all necessity of thinking and planning for themselves, they become mere machines, and instead of studying to see how they may accomplish the most with the least amount of labor, they rather try to make a long job of a short one. With us many of our most successful horticulturists have taken up the business without any previous training in that line, and with the assistance of books, horticultural periodicals, conventions, etc., have made great proficiency in their new calling. They may make many great mistakes and be the subject of ridicule for the old professional gardener, but these very mistakes sharpen their wits and they inquire into the cause of their failures and the best means of shunning them in the future. Moreover, their time is their own and they will try and apply their labor in a way that will accomplish the most with the least exertion, and while their hands are engaged in their duties, their minds are busy planning some improvement in their business.

Our overdue reverence for old institutions and superstitions does much to hinder our progress, not only as a nation but as horticulturists. Our colleges consume about three-fourths of the students' time in studying the history, languages and superstitions of nations far inferior in civilization, enlightenment and the arts and sciences to our own. And after the student graduates, he is but little better fitted for advancing civilization or the arts and sciences than he would be if he had never seen the inside of a college. If more time were devoted to scientific studies

and original researches into the great undeveloped future, and less in delving into the ruins and ashes of the past, we would find our people would reap an hundred fold more benefit from our schools than they do at present. Any branch of horticulture would afford a fertile field for the investigations of a whole army of students, and the more they would investigate it the broader the field would become. We can scarcely realize the important position horticulture holds in our social economy. The demand for the products of the garden and orchard increase in a much faster ratio than the population. With increased facilities for transportation and the improved processes for drying and canning fruits, they have become an every day necessity, even to the masses, and the more labor saving machinery is introduced and the more wealth accumulates, the greater will be the necessity for extending our productions, in order to draw the wealth from those who have an abundance and give labor and the means of living to the laborer, thus making all happy and contented.

Mrs. Lewis, of Madison, followed with a paper on

PSYCHOLOGY OF COUNTRY LIFE.

Were I to choose a text, I think it would be one like this, "Oh Lord how manifold are Thy works! in wisdom hast Thou made them all; the earth is full of Thy riches." How little many of us realize what a blessing it is to live in a land full to overflowing with the best of earth's riches; with food and clothing in abundance; with the most intelligent people and the best government in the world; with healthful seasons of heat and cold; with excellent soil for producing grain, grass and fruits, and yet how little we heed these rich blessings; we take them as our rights and forget to give anything in exchange for them. We sometimes could almost wish that green leaves, lovely flowers, and singing birds, would refuse or forget to obey nature's calling for single year, or month, just long enough to properly awaken our slumbering sensibilities to the obligations we owe to God and man. The earth, sun, moon and stars, that have been objects of such veneration to millions of earth's inhabitants since the begin-

ning of time, are nothing to many of us but servants who are to warm, feed and clothe our bodies. Why is this? I believe in the main it is because we are wrongly educated. We go to school to learn something of the ancient Greeks and Romans, of Alexander, and Napoleon, of French and Latin, but of ourselves and this wonderful life about us we know but little. I would not like to be understood as condemning classical studies — far from it; but from the infant school onward we would have the young instructed in Natural History. By this course of study they would early become familiar with nature and her laws, and with the life that is about them, and life would become greatly enriched; lives that are being frittered away on sensational reading, cards, vain society, and useless fancy work.

The eminent Dr. Playfair says: "The whole yearnings of the child are for the natural phenomena around him, until they are smothered by the ignorance of the parent. He is a young Linnæus roaming over the fields in search of flowers. He is a young conchologist or mineralogist gathering shells or pebbles on the seashore. He is an ornithologist and goes bird-nesting; an icthyologist and catches fish. Glorious education in nature is all this if the teachers know how to utilize it." We are not educated in country or city until we can name all the birds of the air, the animals and insects of the field, and know of their haunts and habits. We should name all of nature's plants, and understand their virtues, and upon turning the soil know what it is, and how it was made, and tell at a glance whether the rocks dug out of it were formed by fire or water. We should know much of the clouds and wind currents, of summer's heat and winter's cold. We want to be educated in the living truths of the living present. Thomas Carlyle wrote: "For many years it has been one of my constant regrets that no school master of mine had a knowledge of natural history, so far at least as to have taught me the names and habits of the little winged and wingless neighbors that are continually meeting me with a salutation which I cannot answer, as things are."

How much I want women to enjoy this science of true and happy living, for it makes the very atmosphere full of love, light,

music and peace. Then she can gather roses where others gather thorns; then she can never grow old, no matter how much the body decays. We see so many women about us who are actually dying of mental starvation, or stagnation, as you may be pleased to call it, that if I could lead one dispirited woman, whose heart is full of pain, in this sweet path by living waters, I would feel content. There is no denying the fact that life in the country, to many women, is but a ceaseless routine of endless work, care and disappointment, and as they look into the future nothing but work, work, work, seems to beckon them on. Is it any wonder that after struggling on for years against fate, many of them become morbid, fretful and unreasonable, so much so that love is withdrawn from them, soon health and hope is gone forever, and many of them become subjects for the insane asylum — for statistics are showing that a much larger proportion of farmers' wives are becoming insane than of any other class. This is a dark picture, and one I would gladly turn from could I do so.

It is next to impossible for a man who is out in the open fields, in sunshine and storms, among stock and growing crops, to understand what the needs of his wife are, the routine of whose life must, of necessity, be monotonous and warping. It has been said of her that it is nothing outside of her that kills, but what is within. She needs more love, sunshine, sympathy, society and books; something for mind as well as body. Every intelligent and kind-hearted farmer ought to understand this more fully, and insist upon his wife's taking respite from care for a certain time each day, if she will do it, for himself; for he as well as she will reap the reward. The body must be recreated after severe toil, and the mind must be wholly freed from care for a time, until reaction takes place. Each person must select the kind of recreation most suited to his or her wants.

Every farmer's table should be supplied with the most palatable and digestible food. Good health and common sense teach this, but there is no necessity of a woman's being a slave to pies and cakes. Many women feel that they would be of little value to their households were they to omit making and baking a ton of cake and a thousand pies a year. Let us be sensible and adopt

the English and German custom of simple living, and discard, if necessary (which it probably is not), both pies and cakes for freedom and smiling faces. Living to gratify only the animal wants is a very low form of existence. Let us not sell the soul to the body, but have higher aims and aspirations, for God has planted them in our hearts.

"Then sing the song that gladdens—
Leave out the sad refrain;
Raise up the drooping spirit,
And thou'll not have lived in vain.
O, glorious life! to feel the thrill,
To live, to work, and sing!
O, golden hours! drift slowly by;
Life is a priceless thing."

One of the most encouraging signs of the times is that women as well as men, are becoming deeply interested in self-culture. Thousands of women are taking the Chatauqua, or Boston course of study, and graduating at home. Clubs or societies for the study of art, history, botany, natural history, and household science, are being established in every city and village; and why should the people of the country-town be behind. Cannot every country-town organize and sustain a society or club of men and women students, who will come together weekly, semi-weekly, or monthly, on Saturday nights, after the week's work is done, to study from the book of nature, as it is opened and revealed to them day after day? Nowhere can natural science and natural history be so successfully studied as in the open fields, deep waters, and quiet woods of the country. A year's careful study, at times not missed from the daily avocations of life, would give a "paradise of intellectual enjoyment" unknown before.

People living in the country should make friends with nature. Then there can be no such thing as isolation; for nature is a companion and teacher that speaks a thousand tongues to her admirers as she constantly unfolds her mysteries that are so old—yet ever new. Wordsworth says:

"Nature never did betray
The heart that loved her; 'tis her privilege
Through all the years of this our life to lead
From joy to joy; for she can so inform

The mind that is within us, so impress
With quietness, and beauty, and so feed
With lofty thoughts, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Nor greetings where no kindness is, nor all
The dreary intercourse of daily life
Shall e'er prevail against us, or disturb
Our cheerful faith that all that we behold
Is full of blessings."

Beecher and Greeley, Parker and Alcott, and a host of other large-brained men have said that they considered it the best part of an education to have been born and brought up in the country. Some writer has said that "if there is a room in every farmer's house where the work of the family is done, there should be a room in every farmer's house where the family should live; where beauty should appeal to the eye; where genuine comfort of appointments should invite to repose; where books should be gathered; where neatness and propriety of dress should be observed, and where labor may be forgotten. The life here should be labor's exceeding great reward. A family living like this, and there are families that live thus, will ennoble and beautify all their surroundings. There will be trees at their door, and flowers in their garden, and pleasant and architectural ideas in their dwellings. Human life will stand in the foreground of such a home. Human life, crowned with its dignities and graces, while animal life will be removed among the shadows, and the gross material utilities, tastefully disguised, will be made to retire in an unoffending and harmonious perspective."

However mean and humble life in the country may be, meet it and live it, and love it, and study ways and means to make the children love it. Teach them to interest themselves in everything about them. Train their eyes to see and their ears to hear, and listen occasionally with them in the twilight of the morning to the first bird's call, far, far away, to the answering voices nearer, until hill and dale echoes and re-echoes with earth's sweetest melody. And, as you listen in this enchanted hour, view with them the sun as it silently rises in the east, painting a picture of wonderful beauty where before all was darkness and desolation.

"Can Imagination boast,
Amid its gay creation, hues like this?"

Everything in nature is awakened by this new force. The nodding flowers shake off the pearly dew and stand erect; soon is heard the lowing of the cattle, the neighing of the horse, crowing of the cock, the barking of dogs, the tinkle of the sheep bell, the milkmaid's merry song, the plough boy's honest laugh, and the earnest voices of the workers, all mingling together in one grand symphony. No earnest healthy nature can participate in such a scene as this without sending up a prayer of thankfulness to God, the giver and maker. Cling to the farm, take root and grow there, teach the young people to beautify, adore, and adorn it, and make the home the one sweet spot on earth whose price is above rubies. And take the old German motto for your own: "While I live I ascend," and life will be a success, and as you advance into the sweet autumn of life, time will so mellow and sweeten you, that before you pass to the great beyond, Heaven will appear almost in view.

Mr. Huntly said it was a sad thought that the description so graphically drawn was true of many farmers' homes to-day. Could they but attend these meetings and hear such papers, or have them to read in their homes, it would not fail to produce a great improvement in their comfort and happiness.

Mr. Plumb said every parent should try to preserve the natural instincts of the child, as he comes in contact with nature. Cultivate and encourage the development of his tastes when closely manifested towards any special subject. It is wrong to force children into channels for which they are not adapted, both in taste and inclination. He cited an instance where a fond mother was anxious to see her son a professor, and educated him for that position, and after a few years of attempts to carry out his mother's desires, he returned home a disheartened man, mourning that his education had been a failure, his life misspent in fitting for and trying to be what was at variance with his tastes, his nature.

Mrs. A. Kerr, of Madison, read a paper in regard to

TREE PLANTING.

A small boy who knew more about trees than he did about grammars and dictionaries, was asked by his younger brother what the word *idiot* meant. "Don't you know," said Ben, "an idiot is a person who doesn't know an Arbor Vitae from a Pine—he doesn't know anything." There are a good many people in the world who would hardly be sane, judged by Ben's "terrible test." To them a tree is a tree; something to be cut down and hauled off. The farmer whose home is in the woods looks on the trees about him as interlopers, who have pre-empted the land which he wants to sow with wheat or plant with corn. They are not friends but foes which he must exterminate before he can have acknowledged ownership of the land for which he has paid his hard-earned dollars. The lumberman sees in trees so many feet of logs to be taken to the saw-mill, destined to reappear at no distant day in the form of houses and fences.

For more than two centuries the one great achievement of Americans, has been to cut down trees. When the Pilgrims landed on Plymouth Rock, an unbroken forest stretched from the Atlantic Ocean to the western prairies, and, tree by tree, that forest has been felled. The man with the ax has been hailed as the herald of progress, and the echo of his sturdy blows resounding through the woods has been the announcement of advancing civilization. The first president of these United States was the boy with the little hatchet who cut his father's cherry-tree, while the noble Lincoln is known to every one as "Honest Abe, the rail splitter." But now a change has come. The warnings of the clerk of the weather are being emphasized by our own experience. The signs of the times are really alarming. Our springs are later, our summers are dryer, our winters are more unreliable, and we are assured by the scientists of two continents, that these evils, and other more serious evils which threaten us, are caused by the wholesale destruction of these forests. Something ought to be done. We must not only stop cutting down the trees which remain but we

must plant others. Somebody has said that the sentiment which has prompted the tree planting organization at the west and caused a day to be set apart for a united, voluntary public effort in this behalf, is akin to that which set on foot our charitable and missionary societies. That is, we find that things have been going wrong and we decide to face about and try to set them right. Yes, we must plant trees.

It has been estimated that ten years hence not less than 20,000,000 railroad ties will be needed annually, while the immense consumption of lumber of all kinds will be greatly increased. Is it not worth our while to consider how we may provide for this certain demand of the future? A step in the right direction has been taken by the people of New York state, where a bill has been introduced into the legislature making it obligatory upon every county to spend $500 yearly to encourage tree planting. I am told that "our agricultural population is not easily convinced of this necessity; that the benefits are too vague, the profits too prospective to cause them to look with enthusiasm on what seems a doubtful undertaking." I shall not attempt to convince them. Let them read in the Popular Science Monthly and the reports of state boards of agriculture able and conclusive arguments. But let us plant trees. And what shall we plant? The good, old-fashioned farmer will tell us to plant the Lombardy Poplar. It does not take up much room; you can set it by the roadside and it will not overshadow the growing crops. But do you not know that it was brought from Italy, and that its tender constitution cannot bear the vigor of our northern winters? Have you not noticed how every spring bears witness to the decay of its branches, and that it becomes prematurely old? Let us not plant the Lombardy Poplar.

Shall we plant the locust tree? When the prairies were first settled thrifty farmers had a fashion of bringing with them from the east a little bag filled with the seed of the locust, and on many a farm was seen a locust grove. The rapid growth of its straight and lofty stem, covered with a thick irregularly furrowed bark and furnished with rude strong branches, made it widely sought for as screen to check the force of the cold winds on the wide and

unobstructed plains. But now it seems to have few advocates; if for no other reason, because the locust tree borer has made such inroads upon it that comparatively few healthy specimens remain. We will not plant the locust tree.

If we are from Old England we shall have a bias in favor of the oak, that tree which has long been the emblem of strength and grandeur. — For in England many

> "A cottage chimney smokes
> From betwixt two aged oaks."

Divine honors were formerly paid to this tree by the ancient Druids, and it is now hardly less sacred in the eyes of the inhabitants by reason of its usefulness to the human family, as well as from its classic and historical associations. Many species of oak are indigenous to the American Continent. The white oak bears most resemblance to the classical tree; the red oak, the most northerly species, exceeds all others in size; the common black oak is used for fuel, while the evergreen oak, a common wayside tree at the South, is one of the most beautiful. Indeed, it may be said, that to the majority of the human race the oak is the favorite tree. Let us plant oaks.

If we are natives of New England, we associate all that is delightful in scenery and much that is dear to memory with the elm. It has for us a sacredness which no other tree possesses. We remember the low-roofed cottage over which that venerated tree spread it broad and benevolent branches, as though it would shield from sin and sorrow all who dwelt under its shadow. We remember the spreading elm on the village play-ground, where as happy children we gathered during the sultry hours of summer and talked of what we should do when we should be men and women. And can we ever forget that long, noble avenue, formed of elms, the favorite resort of old and young alike? Oh, if we would keep our hearts fresh and young as the years go by, let us plant elms.

We must not forget the Maple, of which there are ten species enumerated by Gray as belonging to the United States; a tree of rare beauty of outline, and whose autumnal tints of gold, scarlet

and crimson recommend it for an ornamental tree; nor the linden, better known by its prosaic name of Basswood. Then there is a very well known and a very common tree, celebrated for its usefulness rather than its beauty, confined to the western continent, unknown in other parts of the world, — the Hickory; it is a term indicative of a sturdy and vigorous character and may be taken as emblematical of our hardy yeomanry. The squirrels plant it; let us allow it to grow. But why do I rehearse these names familiar to you all? — We have but to open our eyes on this beautiful June day, when each tree is hanging out its leafy banners, and choose the ones that please us most; and when the revolving year brings around the spring, let us not forget to plant trees.

I have read that in Spain they have a proverb, which has been in use in that country for centuries: —"He who plants trees loves others besides himself." And it is said that whenever a Spaniard eats a peach, a cherry or a pear by the roadside, he makes a little hole in the ground with his foot and plants the stone, and in that sunny southern land the most tempting fruits are free to all. Here in our rigorous climate we must exercise great care if we would insure even moderate success. In planting a tree "handle it gently, as if you loved it," as Isaac Walton bids the angler do with his worm; plant it as if you were tucking a child away for the night, or as Bryant says:

—"gently lay the roots, and there
Lift the dark mold with kindly care,
And press it o'er them tenderly
As 'round the sleeping infant's feet
We softly fold the cradle-sheet."

Did you ever know a tree which was planted in that careful way to refuse to grow? Trees must have something in common with children, else why do we call the place where both are reared, "the nursery?" Or, why so fond of that old saying, "Just as the twig is bent, the tree's inclined," which we are fond of applying to growing boys. Children and trees alike need room, and sunlight and tender care.

If we love trees then, we shall not plant a mis-shapen tree, or a stunted tree, or one whose root has been frozen or dried up. We know it is worse than useless to plant a tree which will ever re-

main a cumberer of the ground. Hence we shall beware of tree-peddlers, and shall pay careful attention to the catalogues furnished by good and reliable dealers, those men who belong to our horticultural societies.

But if I teach you to regard tree planting from a practical point of view merely, I have failed of saying all I would. That Scottish Laird was worldly wise, who while on his death-bed, gave this parting advice to his son: "Jock, when ye hae naething else to do, ye may be aye sticking in a tree, it will be growing, Jock, when ye're sleeping." But that old Roman, Cicero, was wiser than his generation, when he wrote, "If any should ask the aged cultivator for whom he plants, let him not hesitate to make this reply: 'For the immortal gods, who, as they willed me to inherit these possessions from my forefathers, so would have me hand them on to those that shall come after me." Let us ennoble our daily living by the high purposes we carry in our hearts.

What more delightful time for this reunion than delicious June?

"Then, if ever, come perfect days."

We gather from city and village and farm house to take each other by the hand, to speak a word of cheer and to get courage for that which the future has in store.

"No matter how barren the past may have been
'Tis enough for us now that the leaves are green,"

sings the poet. Let us take with us through all the year the gladness and the confiding trust which come to us with these rare June days; and as we go forth from beneath the shadow of these sheltering pine trees — the survivors of the "forest primeval," let us return to our homes with a new strength gained from communion with nature and with one another.

The next paper was read by J. S. Stickney, of Wauwatosa, on

WHAT SHOULD HORTICULTURE DO FOR OUR HOMES?

It should furnish the poetry, the music and the pictures of our everyday lives. As we go and come, the varying landscape, the trees, grouped by nature's own hand, or modified, not always improved, by our efforts; the shrub, the climbing vine, the wayside flower, the waving grain, the smooth green pastures, with here and there a glimpse of river or lake, should each and all impress upon us a feeling of coolness and comfort, rest and happiness, impervious to the common fret and worry of business life. From the delicious strawberries of June to the noble apples of autumn and winter, our senses of sight, smell and taste should be gratified, our appetites stimulated, our blood cooled and purified, our bodies healthfully nourished and strengthened. Taking all these as nature gives them, it should be our work and our pleasure to improve and increase them, and to gather them so liberally about our homes that we may be constantly within their influence.

Yes, all this should be, but it is not, neither do we expect that it will be, for degrees of skill, effort and progress, come as naturally into our horticulture, as into our agriculture or mechanic arts. Yet it is a little strange, when the love of, and taste for the good and beautiful is so universal, we should be so easily turned aside and discouraged.

Send a hundred children to the woods for May flowers and notice the eager pleasure with which every one searches and gathers. Is it not safe to look a little further on and see them all cultivating flowers? Lead the same party through orchard or garden at the proper season, and the owner thereof will not doubt their hearty approval and appreciation of ripe fruit. If these are not the material for horticulturists and horticultural societies, where are we to find it? Yes, the material is abundant and good, but how sadly do we waste and spoil it in the working!

The child is passionately fond of flowers. Very simple flowers they may be, wild violets and daisies, or grass pinks and sweet peas, as easy of culture as corn and potatoes. From his earliest

days he sees the corn and potatoes carefully planted, cultivated, harvested, stored. They are thought about and talked about, until they become part and parcel of all his plans. This is as it should be, for these and kindred things are the very beginning and foundation of all prosperity. They nourish our bodies; but in our zeal for them we too often forget the needs of our finer natures. Right here we too often lose sight of that love of the beautiful in our little child which has such need of nourishment, culture and training. Right here it seems to me our work begins. True, to be teachers we must have knowledge, and, in most cases, it is equally true that our early surroundings, teachings and opportunities were far less than we are ambitious to give to our children; but the past is no longer ours, its record remains, as will the record of each succeeding day, but our business is only with the present, and whatever we lack must be supplied, if at all, by extra effort and diligence.

Earnest, enthusiastic interest on the part of parents, can hardly fail to kindle similar interest with the children. Undertaking only what can be *well done* and then carrying our work through to a perfect success, will sustain and increase the interest of both parent and children. If time and means are limited, our beginnings may be very simple and inexpensive and yet bring their full quota of pleasure. No seed was ever more eagerly sought and carefully planted than that from which I grew my first double sunflower. People of fine tastes, who could see beauty only in roses, smiled, but my harvest of real pleasure was as great as theirs. No crop has seemed more valuable to me than that gathered from the dozen plants of wild black raspberries dug from the fence corners and planted in my first garden. Ten pear seedlings, bought with my pocket money, grafted and planted with my boyish hands, were of more interest to me than acres of them have been since; and in fact I have often done a less successful job, for eight out of the ten grew, and came to maturity. Similar objects of interest are all about us, abundant, cheap, and wasting for want of use; so, want of means can have no place among our excuses.

Want of time may have more weight. This is such a hurrying world, impatient even of steam and electricity, pushing us through

schools and colleges at eighteen and twenty, and prematurely into all the responsibilities of life, that the plea of no time seems at first thought allowable. Yet, even amid this haste, are there not in all our lives, many hours worse than wasted, which, if spent in horticultural pursuits, would bring pleasure rather than a blank or a pain? Believing that these things are possible and practicable, let us possess and use them. Into our lives and the early lives of those about us, let us weave all that we can of the good and the beautiful.

Such work and such pleasure need, yes, to be fully successful, must have the co-operation of all the members of the family. Very helpful to the little one is an encouraging suggestion or a moment's aid from the parent; very stimulating to the parent is the evident interest and admiration of the younger members. Efforts by the "rulers without," to locate stables and pig-stys in retirement; to remove unused farm implements from their prominent resting places into a place of shelter prepared for them; to deposit all rubbish on the woodpile or compost heap; to remove from the house surroundings all worthless weeds and grow choice grasses instead; to plant here and there a flowering shrub, or group of noble trees; to place upon the well-kept lawn a bed of flowers, a vase, or at least, the present very popular heap of stones or inverted stump, nicely filled or covered with creeping plants and flowers, all these will be appreciated and enjoyed by the "rulers within" and will find their counterpart in neatness and good order; in well chosen pictures upon the walls; choice flowers from the field and the garden will grace the table and mantel, rich autumn leaves will beautify curtain and wall. Luscious fruits in their season will adorn the table and be made a prominent part of the daily food. The sitting room will be a reading room as well, but among the books and periodicals there will be no place for the dime novel, and in the young minds interested in the good, the real, the useful, there will be no room or call for its teachings. Reading, music and social games will make the long winter evenings seasons of improvement and happiness, remembered with unalloyed pleasure by all, and in time to be re-enacted by each child in homes of their own.

This is our gala day, and I will bring to you no plodding considerations of dollars and cents, but, for the sake of contrast, suppose we arrange along the broad highway we are traveling, all the places adorned with the things we have described on our right hand, and all those where they are wanting on the left. Commence, if you please, with the beautifully and highly kept public parks of our cities, where the hurried and overworked people may, at intervals, enjoy an hour of cool and refreshing rest, and over against them, our glittering and equally costly theatres and Sunday beer gardens. They have many things in common; fine music and high decorative art lend their aid to both. Each has its votaries by thousands, and to these, each brings more or less pleasure. Yet which, and the after memories and influences of which, would we choose for ourselves and our children?

Passing on to the homes of our millionaires, the right hand far back among green lawns and spreading trees; the left high and broad, most elaborately adorned by sculpture and gilding, close upon the street, approached by polished marble steps; to which would you most hopefully apply for a cup of cold water? Were our onward movement by car or omnibus, would there not be an active demand for seats facing to the right? Were our errand to find congenial society, or a pleasant boarding place, the left would have few attractions for us. If in a speculative frame of mind, and inclined to divine the character and qualities of people by their surroundings, which line of delineation will be most pleasing? Far on down the line, among the log cabins, board shanties and sod houses, a single house plant, or a morning glory by the porch, will still attract us to the right, while a glance to the left will almost make us feel that it might better have been left a blank.

Now you will say, and I shall freely admit, that I have not very closely followed my text, yet, whatever else I have presented is so mingled and blended, and, in influence, so much in harmony with horticulture that it seemed easier, if not wiser, to present them as I have. What I most earnestly desire to impress is the simplicity of horticulture; coming right down to the wants and capacities of the most humble and inexperienced, yet leading

rapidly onward, step by step, always paying as we go, to the choicest fruits and flowers, and the most elaborate ornamentation, being in all its moral and intellectual influences so pure, unselfish and elevating as to become one of the strongest, safest and pleasantest bonds of paternal and fraternal union and companionship. An eminent horticulturist writes: "I never see a pink, a poppy, or a Sweet William, without thinking of my mother. And I bless God that she is associated with such pleasant memories." Though he is now far advanced in successful horticultural experiences, I am sure the pleasures of those early recollections have never been excelled.

Now, the question comes to each of us, how much of all of this can we make our own? I do not forget that to all of us who are carrying the active responsibilities of life, business cares are often heavy, and material prosperity seems all important, but let us "make haste slowly." Important as these things are, we need something else as well. We must have the hearty interest and co-operation of the boys and girls, and I know of no better way to get this than by "changing works;" step smilingly down from our position of dignity, authority and responsibility, and become boys and girls ourselves. Let us have play days as well as work days, and let our interest be as lively and active as in the work. Our first efforts may be a little awkward, but this will soon come in as part of the effort, and I assure you perseverance will win. In return, we shall find active and willing shoulders ready to share with ours these cares and responsibilities. Let us accept these lovingly, trustingly, and we shall never regret it.

Mrs. Ophelia Forward, of Appleton, read the following paper:

OBJECT LESSONS FROM LIFE.

Glancing over the programme of this meeting a few days ago, I read the following: "Paper, by Mrs. Ophelia Forward, subject to be announced." I felt on the one hand grateful to that ingenious phraseology which put off the evil day of formulating something that did not exist, outside the weary brain of a busy school-teacher, and, on the other, a fearful foreboding as to what

that subject might be if it should take a notion to announce itself. Now it may have leaked out through some traitor to the guild, that the members of my profession, formerly called the wielders of the birchen-rod, now known as the gentle and humane dispensers of "moral suasion," do not know everything. Whatever my convictions on this subject, there are two principles to which I strictly adhere. One is, never to express my convictions, the other, not to commit myself in any way that may prove the ill-natured insinuation true. So then, if the wise and progressive president of this association had launched at me some disputed theme on Pomology, or some intricate question of soils and fertilizers, I should doubtless have tried to look as wise as a fruit-catalogue, while informing him that I should be most happy to read a paper on that interesting subject, but, unfortunately, hadn't any. I had supposed that I was to have a medley. I had noticed that in all high-toned concerts, after a long and soul-entrancing feast of classical music, during which the connoisseurs look enraptured and the other folks try to look so, the musical artist always has recourse to a medley, in order to let his audience down to the plain level of common, every-day feeling, and bring them to a good understanding with each other; and even through the entrancing tones of Remenyi's "Baby" and the divine fiddle-strings of Ole Bull, "Auld Lang Syne" waltzes off into "Capt. Jinks," and "Yankee Doodle" keeps strange company with "The Girl I left Behind me." Not that anybody admits that medleys are particularly improving — they only serve the momentary purpose of rest after mental concentration, and bear the same relation to the entertainment that mixed sweetmeats do to the feast, well enough in their way, but to be taken with caution.

So, dear friends, you have had so much of the practical, the improving, the beautiful, before this, that I am sure your gentle patience, and perhaps your good nature, will hold out while I read to you three little "rhymes" that were once strung together in a pretty grove that slopes to the blue Lake Erie. A few weary people, too poor to go to the seaside, had resolved not exactly to climb a tree and draw up the trunk behind them, but to leave the summer's heat and dust in the town, and camp out. They

took with them their natural histories, their botanies and geologies, and some choice books of poetry and general literature, and for two weeks, shut out from the artificial world, and shut in with blessed mother nature, "Who sang to them night and day, the rhymes of the universe," they learned lessons that made them better men and stronger women. They seemed to leave their baptismal names behind them, and to assume pseudonyms suggested by some peculiarity of taste or temper. One we called the "Divinity Student." He had a clerical air, and there was just a trace of sermonizing in all his speeches, which were full of apt quotations from scripture. Another was the "Humanitarian" — he had large views, was exceedingly charitable in his opinions of others, looked with sublime forgiveness upon the faults of his fellow-tenters and the failings of men in general — full of sweet philosophies as an egg is of meat, something of a scientist too; he seemed to see into the very arcana of things, and all objects, animate and inanimate, whispered their divine secrets into his ear. Then there was the "Mother Superior," so called from her matronly ways and beautiful, unconscious manners, and her lovely Madonna face, warmed and glorified by the tenderest and holiest human passsions. Her helpful presence was everywhere, now superintending the culinary department, now entertaining the younger ones, and always having an eye to the domestic comfort of the camp. She had besides a literary turn, and was always surprising us with rare bits of wisdom, quaint old legends, and sweet quotations from heartsome authors.

Our evenings, which were cool, we spent around a bright campfire, where each took his turn in entertaining the company with song or speech or story. The poet of the occasion wove many of these efforts into homely rhyme, and here we will give "The Divinity Student's Tale," which he named "The Wedding Gift," and prefaced it with the following quotation:

"And Caleb said 'He that smiteth Kir-jath-Sepher and taketh it, to him will I give Achsah, my daughter to wife.' And Othniel took it, and he gave him Achsah his daughter, to wife. And she said to Caleb, 'Thou hast given me a south-land, give me also springs of water;' and Caleb gave her the upper and the nether springs."

The warrior chief had won the fight at last
And leaving Kir-jath-Sepher in the dust,
He sought the vale of Hebron and his bride.
'T is thus through all the centuries of change,
Love works his miracles, and bears his tests,
And wins the symbol of his royal birth,
A crown of victory or crown of thorns.
Achsah, the beautiful, the hero's child,
A Jewish maiden brought to Syrian bloom
The Syrian sunshine in her yellow hair
The spirit of the tribe of Judah in her eyes,
The hero's child went forth the hero's bride.
Achsah went forth with blessings on her head,
The benediction of a wiser age:—
"God bless thee in thy basket and thy store,
And make thee mother of the sons of God."
But when the bride had gone a little space
She paused awhile, then turned and left her lord
And sought her father with uplifted face,
And said, "O, father, thou hast given more
Than my own foolish heart could hope or ask,
A gentle south-land, leaning to the sun,
Smiling in his caresses till she bears
Roses and lilies and all bounteous things,
The nuptial mystery of earth and sky.
But one thing lacketh to my goodly dower;
Grant thy gift may be at last complete,
The springs of water with encircling palms,
That northward bound my good heritage."
Then he, the grandest warrior of the old,
Who wholly followed God and served his race,
Made no dissent or cavil at her words,
But gave the upper and the nether springs.

* * * * *

Dear child, the object of a higher care,
Is aught still wanting to thy sweet estate?
Lives there a sense of something far and rare
And richer than has fallen to thy fate?
Maybe the father knows highest need
And waits thy asking in some tender mood,
Giving the hunger that thy soul may feed
Upon the tokens of his fatherhood.
Maybe we thirst that we may taste and see,
How sweet the rivers of his goodness be,

May ask for wells soul deep, and flowing o'er
With waters that we drink and thirst no more.
* * * * * *

The humanitarian next gave what he called his outlook, and as he was a bachelor and never known to have a sweetheart, this was particularly entertaining to the audience and especially to the "young fry."

"My love and I in that far time
When first we walked together,
Watched, from our hills, the sunset's prime
Slant through the August weather.

The rocks leaned outward, bare and brown,
And leaning softly over,
We saw the rugged hills drop down
To level fields of clover.

The fitful rills that leaped and played
Among the rocky passes,
Lulled to a stream with banks of shade
Deep-set in summer grasses.

And far across the meadows wide,
The city, quaint and olden,
Flashed greeting from its sunward side,
And every spire was golden.

Then spake my love, her eyes o'er-wise
With life's new inspiration:
'One sees the best, so near the skies,
The fullness of creation.'

For when we walked the plain below
We knew but half its sweetness;
Our low horizon could not show
The landscape's far completeness.

But now, o'er all the common lands,
A hundred lines of beauty
Bend to the touch of human hands
In common toil and duty.

Ah! sweet philosopher, I said,
I take your simpler teaching,
The truest creed that I have read
Or heard in prouder preaching.

So, ever since the world was new,
Who climbs to heaven the nearest,
Sees, by the glory shining through,
God's earthward plans the clearest.

And o'er the strange disparity
Of human faith and failing,
Sees Christ's diviner charity
The seamless mantle trailing."

After the humanitarian had retired, in the midst of due applause, we called upon the Mother Superior. Now, the Mother Superior was not a mother at all, as the world counts motherhood; but hers was that higher motherhood that embraces in its holy sympathies all the Lord's little ones; that reaches out in true maternal help and pity to all the poor and suffering, and although he that would have been her husband fell in the great battle of Chickamauga, it might be said of her as of the little gray nun who died in Paris a short time ago:

"She hath more children than she that hath an husband."

And here are the Mother Superior's words, as nearly as the poet can give them:

You do not know, O anxious mother-heart,
Too full of care and love's divine unrest
What ecstacy they hold, what better part,
Is hers who folds her babe unto her breast.

You pine sometimes for quiet and for rest,
Unbroken by the din of childish play,
And deem that stately mansion doubly blest
That rears its vacant panes across the way.

You fret at little finger marks that show
Forbidden handling of some volume fair;
You find rude footmarks ever, high and low,
And broken playthings scattered everywhere.

You moan in nights of weariness or pain:
'A woman's lot is bitterest to bear,"
And think, if you could live your life again,
The wiser choice would give the lesser care.

You think, perhaps, of some supreme desire,
Some young ambition, hardest to repress,

That burns within you, like a smouldering fire,
Mocking the meagerness of love's excess.

O, foolish heart, if you could only see
The aching breasts the weary thousands bear,
Who miss the healing touch of infancy,
On barren heights of fame, you count so fair.

If they could speak to you, who, yesternight
Saw their last darling colder than the clay,
You'd fold your warm young flock with rare delight,
And bless all weariness for such as they.

Could ye, whom love hath honored over-much,
Set life's supremest treasures now and then
Against the loss of all ye hold as such,
Ye would be sweeter women, braver men.

OUR CHILDREN.

Mrs. Arnold being absent her paper was read by Mrs. D. C. Ayers, as follows:

As I cast my eyes about, thinking, wishing so much to know just what would be a proper theme for a short paper, my little girl comes to me, asking some trifling question, and I muse, of all earth's treasures, of all earth's flowers, the children, the flowers of our households, are dearest to our hearts, so of them, and to them, will I write. Their first breath brings with it such a thrill of pleasure, such a feeling of anxiety, such a responsibility. This anxiety does not cease; as they grow in strength their little feet are forever leading them into pitfalls where with bruises and bumps and soiled clothing they are anything but attractive. It needs a mother's love, her kind forgiving way, her soothing words and kisses, to make all well again.

Do we realize fully, that these little ones are critical imitators of every word, and copy our morals and manners with surprising accuracy? It is a saying that "as the mother is, so are her sons and daughters." We wish them to be gentle and lovable. If this saying be true, beware of harsh, quick words, beware lest they be repeated tenfold. They being so susceptible to early impressions, and the first seven years being spent in the mother's society, would

throw most of the responsibility upon her and give truthfulness to the familiar words, "as the twig is bent, the tree's inclined." She must begin as early as the child can talk to teach little lessons of courtesy, else they will appear ill-mannered all through childhood. We all know people who plainly bear the marks of neglect in this particular. They could never have been taught the small, sweet courtesies of life, else they would have now very different manners. "Bluntness," on which some seems to pride themselves, is much like a leper boasting of his sores. It is hard to break up fixed habits, and in this very fact we find both warning and encouragement. How natural that these little ones should re-echo the parents' sentiments. As the stone carelessly thrown into the middle of the silent lake breaks its placidity, the troubled surface spreading itself and widening into ever larger circles, so the example of a father influences his family, spreading, reaching into future generations.

After these first years they leave us for a time each day, to be taught by others in the schoolroom. I have great sympathy for our teachers, especially those of our primary schools, and feel that they need be strong and true men and women, for the charge committed to them is indeed most precious, from all the homes of our land. The teacher who does not feel this has mistaken his calling. Their influence comes next to the parents in forming the character of the young.

These school days are happy days, so free from care and trouble; kind parents to provide food and clothing. Can you not realize that you should improve each moment, that you may be useful men and women? The days seem long to you, and you think that the time when you will do business for yourselves, or take our places, is a long way off. Each year the wheels of time move, seemingly, more swiftly; it will not be long, and you have much to do.

During their school days they can learn habits of business. Give children a share of the profits as they labor for them. Teach them to handle their little earnings judiciously. Better than all, it will make their work cheery and a pleasant thing to look back to with pleasure. One has well said, "there is no capital to be-

gin life with like a sunshiny childhood." There will be a great difference in the disposition of members of the same family as regards their earnings. Should there be such a rarity as a miserly child, we should strive to overcome it. On the other hand, a grandfather's advice to a little boy would be best: "Here Johnny, my child, is a penny; keep it, and whenever you get other pennies put them with this one and when you grow to be a man you may buy something useful."

So many mothers are unwilling (I ought not to use that word, they feel they haven't the time) to take the trouble necessary to teach their daughters the little womanly acts of sewing, knitting, etc. Often the child looks on with longing eyes to the nimble fingers of a young companion, who can fashion such beautiful things with a crochet needle and a ball of bright wool. The common task of washing dishes, picking up chips, dusting rooms, seems such mere drudgery in comparison. They would do the distasteful more quickly and better too, if they felt the other were to come after. We have too little patience in teaching; if they could learn all at one lesson, we would be satisfied, but they tire after a short practice and wish to turn to something else. We must not expect too much; they will take stitches wrong after we have told them a dozen times, even. If we lose our patience, the child will follow the example. Some one recommends, when we are vexed with children for their dullness, that we "write a page with the left hand;" remember that a child is all left hand when he begins to train his muscles. We make too little allowance for this training, and fancy that we always knew how to do such simple things, but it has taken thirty or more years to make you what you are, with all the lessons of experience, and I will dare say you are a faulty being at best. Above all, do not expect judgment in a child or patience under trials; sympathize with their mistakes and troubles; do not ridicule them. Educate them thoroughly; give them full benefit of school and college, give them the practical application, as much as possible, of what they do learn; it will be a great resource, a capital which the world cannot take away and of which the future will not deprive them.

There are but few that reach the age of eighteen years but have

thoughts of what they wish to fit themselves for. Whatever it may be, I would assist them in that direction. Anything that we have an earnest desire to acquire, anything that our "hearts are set on," as the saying is, we will be much more apt to make a success of. Still I could hardly say with Lady Morgan (in her life and times of Salvador Rosa, who so strongly objected to a father's opposing his child's bias), she said, "I am at loss to account for that blind resistance which we see parents so often make to their children's wishes. For my part if I had a son, and if he even desired to become a highwayman, I should certainly not oppose him; on the contrary, I believe I should make him a present of a pair of pistols, and a good horse to boot, and should only say, my dear boy, I'm very unhappy at the choice you have made, but since such is to be your vocation and the gallows your final destination, in Heaven's name pursue it; only begin life like a gentleman, and so giving him my blessing, I'd let him seek his fortune as he pleased." I have a feeling that this dear woman never had a son, else the mother love would never have let her use those words.

There are many who do not feel financially able to do all they would wish to do for their children in the way of education. If you have done all you are able to do you have done your duty. It is a noticeable fact that those young men and women, who after passing our common schools have to "pay their own way," make the best of the knowledge they attain. It is a needful lesson, learning the value of money, and the sooner learned the better. Many a time a father needs the assistance of his son with his work; not feeling able to hire, he ought to have it. No right-minded, loving parent will ask aught that will not ultimately result in the most good to the child. A generosity which makes the recipient weak or selfish, is not a blessing, but a curse. Have you ever seen grown up sons who snubbed their mother's opinions in the same breath with which they called them to bring their slippers? The meek little woman has "trotted around" to wait on them so long, they have come to think that it is all she is good for. And sisters who keep "ma" in the back ground because she "hasn't a bit of style" and is "so uncultivated," forgetting that she has worn shabby clothes that they might wear fine ones, that

her hands have become hard with work that theirs might be kept soft and white for the piano, and that she has denied herself books and leisure that they might have both. There are such, and there are others too noble for such base ingratitude, who feel a keen, though secret sense of loss as they kiss the dear withered cheek and think how much more of a woman mother might have been had she not been so self-sacrificing. If these words I am saying will only make you think of this *now*, and if the thought shall make you in any way more careful and considerate and affectionate *now*, to mother, whom I'm sure you love very much, I shall be glad indeed that I have said them, and sometime you will be glad too.

When your school days are over, and you leave the loved ones at home to find a "situation," you are quite sure, Young-America like, that in ten years you will be worth as much as your father at forty. Hope is a "merry dancing boy and the ideal pictures he paints are very fascinating." Could you realize at the outset that situations are hunting for men and boys far more keenly and far more constantly than they for situations, your ardor would be somewhat dampened. "Why so," you ask, "I can work as well as anyone." Let me see, I'll ask a few questions: "Are you honest?" "Indeed I am." "Are you sure you can withstand temptation? you feel quite sure, again. Are you truthful? How near can you come to telling a lie and not tell one? Did you ever hear of the gentleman who advertised for a coachman? He asked each comer "how near can you drive to the edge of a precipice and not go over?" One man could drive within two feet, another within one foot, another within six inches, still another would try to go within an inch or so. None of these would suit. At last one came who said, "I'd keep as far away from it as I could, sir." This was the very man that the *situation wanted.* Men of business want the boys who keep as far from a lie as possible. Will you be faithful to your employer? you only with modesty say, "Try me." You must make your employer's interest your own; it is the only honest way to earn your wages, the only way to follow the golden rule; and, my boy, I am sure you will never lose by it. When dull times come, employers are not short-sighted in

noting who has worked for their interests, and the unfaithful ones are the first to go. Can you watch with eye and ear open and keep up "a terrible thinking," but keep a close mouth? This is a valuable qualification in a man, in a woman and boy as well, but a little rarer.

Have you accomplishments, which you think grand, in the way of chewing tobacco, or twirling a cigar, playing billiards? Do you think it manly to drink beer, and can you boast of having drank something stronger? The ones to whom you apply may ask you, and you with crimson face will be for once ashamed, for you realize that the situation wants none such. If you feel the need of doing something, do not stand idly waiting for weeks or months; fall in with the humble work you may be able to find near at hand. It may seem but a thread as it were at first, but pull away; at the end of that, you may find a twine, and then a tiny rope, then a stout cable, at last the long hoped for position, that you may well be proud of. Strict attention to whatever you undertake will always be required. Do not overlook or forget trifles. The boy who will tidy up around his desk, who will fold up the sheets of wrapping paper that have been thrown down in the hurry and not leave them to be swept out with the rubbish; the boy who can pick up stray tools and return them to their proper places without being told to do it; who is always watchful that nothing in which his employer is interested goes to waste through any neglect of his, is the boy who is wanted. Do you be that, young man, for fortune is for those who by diligence, honesty, frugality, place themselves in a position to grasp hold of it when it appears in view. Commodore Vanderbilt said: "There is no secret for success in life; all you have to do is to attend to your own business, and go ahead, except one thing; never tell what you are going to do 'till you have done it."

Our daughters should be as carefully taught to do for themselves, as our sons. If they are fortune's favored ones and never have to make practical use of all their knowledge, very well; if ever reverses in fortune's wheel do come, they are the ones the more to be pitied unless they have had this training. Many a parent's heart has ached at the situation they find their delicately

reared daughters placed in. No daughter fulfills her duty who remains inactive, while her father toils and worries to make the family living. Every poor man's daughter should feel it a sort of degradation to hold out her hands for finery, when she has health and strength to earn it for herself. Many a man would live to an old age, who now barely passes the prime of life, if he had the little help given him which his daughters could give by "dressing themselves." Nothing is more contemptible than for a half dozen women to fold their hands in lofty gentility, while some man, father or brother, nearly goes mad under his burdens of toil and care. It is not always what you expend that makes you look well dressed, but the care you take of your clothes after you get them. A tumbled bureau and a carelessly kept wardrobe are sure to speak for themselves, though you fancy no eye but your own sees it.

Many girls know that their duty is not ended when they make themselves pretty. You must cherish noble hopes and purposes, by having something to live for worthy of humanity. Work with energy and resolution, and without the spirit of vain repining that sinks under difficulties and misfortune, or yields easily to temptations. Do not stand idly by and be charged with want of ability. Men with their assumed superior capability of making money and managing it, stand in need of practical education to insure success, and I repeat again, it as rightfully belongs to the daughter as to the son, and I hope that the daughters of to-day will claim the right, and feel that the day is past when the fathers and brothers *alone* are the makers of money for the support of the family, on whose shoulders all care and responsibility may be thrown. Do you realize, my young friends, that all through your childhood and youth, your parents *live for* you; when you reach manhood and womanhood and they are in the decline of life, that they *live in you.* You can only repay them for all this by being *worthy* of their purest love and confidence. Study and think, learn to be strong and brave, that your better natures may be fully developed, and find expression in graceful manners and cultivated and useful lives.

The ideas advanced in the foregoing papers read by the ladies were heartily indorsed by Messrs. Stone, Willard, Richardson, Huntley, Stickney and Plumb, and a unanimous vote of thanks to the authors was passed, and they were also elected honorary annual members of the society.

Strawberries — The discussion of the new varieties of strawberries was called for, for the purpose of drawing out the experience of the members.

Mr. Stickney said that they had twenty varieties under cultivation at present. Their object in raising them was two-fold, partly for plants and partly for berries. For his own use and as market berries, he would select five or six of these twenty varieties and raise them alone, not because they were just what he would like, but they were good and he would hold on to them until he found something better. The varieties he would select would be Wilson, Green Prolific, Prouty, Seth Boyden and Sharpless, and he would set at least one-half of the first variety named and the others in equal proportion. The Green Prolific was not a perfect plant, but was a heavy bearer when set alongside of the Wilson. The Prouty was a self-fertilizer and a great bearer. The berries were soft, and peculiar in form, and of a mild and pleasant flavor. He did not regard the Seth Boyden quite as desirable as a bearer or in quality, but it was a good berry and with him yielded satisfactorily. Sharpless was of excellent quality, berries large and showy, vines strong and vigorous and moderately productive. The Crescent was a strong grower; took full possession of the ground. It will yield as many quarts, perhaps, as the Wilson, Prouty and Green Prolific, but the berries are moderate in size, too soft for shipment and were lacking in quality. He picked his first berries of it this season, and the yield in quantity was remarkable.

Mr. Plumb agreed in regard to the value of the varieties named. He cultivated the Green Prolific a long time ago and had dropped it, and taken it up again and will hang to it. It bears well with him; was the only berry that yielded half a crop the past season. The Sharpless was lacking in hardiness; was a

strong grower, but was liable to be injured in the winter. He would add to Mr. Stickney's list, one-eighth of the Crescent. He had picked his first bushel of berries this year from it. It was nearly two weeks earlier than the Wilson. The berries are earlier on high ground, and of better quality; on a heavy clay soil there is a greater growth of vine, larger berries and greater yield, but the quality of the fruit is not as good. It is not a perfect plant, and does better planted by the side of the Wilson, Prouty or Seth Boyden.

Mr. Peffer would raise the Wilson alone, for profit. The Seth Boyden had yielded well with him, but he would not raise it for market purposes. Did not consider it a perfect plant.

Pres. Smith was better pleased with the Crescent than he expected to be; thought it was worth keeping, and should continue to raise it. It was a wonderful grower, and bore heavily; the berry was too soft for shipment, was very fragrant, but of inferior quality. It ripened with him a week earlier than the Wilson, and continued in bearing as long. He also raised the Kentucky, as it was a late berry and added a week to the length of the season; would raise a few of Seth Boyden for home use, but not for market. The Downer's Prolific was a good table berry, but worthless for shipping. With him, the Crescent had suffered the most from drought.

In reply to an inquiry by Mr. Huntley, if it were possible to lengthen the berry season by a heavy covering of the beds, Mr. Peffer said he had tried the experiment by covering half of a bed with marsh hay; the half that was not covered gave the first picking on the 31st of May; the covered, on June 15th, and the berries were the largest. Left the mulch on until the crowns pushed up through, and pulled the weeds by hand; the other half was cultivated in the fall.

Mr. Stickney said it would be difficult to mulch four or five acres, and he thought it would pay better to lay out the same amount of labor on one or two acres. He made a practice of composting the beds at the time the plants were sending out the first runners; put on about fifteen loads of compost to the acre, to crowd the growth of the plants. The first runners were guided

into the line of the rows, and the later ones were cut off. Cultivated in this way, one acre yields more than two usually do. The proceeds from the plants was generally as great with them as from the fruit.

Mr. M. S. George, proprietor of the Western Rural, was elected an honorary member of the society. Resolutions tendering the thanks of the two societies to the railroad companies for their courtesy in granting reduced rates to those attending; to the citizens of Green Bay for their hospitality and kindly interest manifested, and to President Smith and family for their generous provision to promote the comfort and convenience of the members present, were passed, and the societies adjourned. A social meeting was held in the evening at the exhibition in the Armory Hall, at the close of which the final adjournment took place.

FRUIT AND FLOWER EXHIBITION.

The display of fruit, plants and flowers made at the Armory Hall was excellent, and the taste displayed in the arrangement and the management of the exhibition was greatly to the credit of those who had the matter in charge. The display of strawberries was large and fine. There was a very large collection of rare and choice house and green house plants from the conservatories and private houses of Green Bay and from Appleton. The collection of cut flowers, floral designs, and bouquets was large and magnificent. One of the most attractive features of the exhibition was the display of wild flowers, native ferns and mosses. The following are the

AWARDS MADE.

STRAWBERRIES.

Best exhibition of strawberries, Stickney & Von Baumbach, Wauwatosa.
Second best, Geo. J. Kellogg, Janesville.
Best quart of Wilson, J. M. Smith, Green Bay.
Second best, Mr. Spence, Fort Howard.
Best quart Seth Boyden, Stickney & Von Baumbach.
Second best, J. M. Smith.
Best quart Sharpless, Stickney & Von Baumbach.
Best quart Crescent Seedling, J. M. Smith.
Second best, Geo. J. Kellogg.
Best quart Charles Downing, Stickney & Von Baumbach.
Second best, Geo. J. Kellogg.
Best quart Kentucky, J. M. Smith.
Second best, Geo. J. Kellogg.

VEGETABLES.

Largest and best exhibition of garden products, J. J. Bader, Preble.
Second best, J. M. Smith.
Largest and best six heads of lettuce, J. M. Smith.
Second best, A. A. Warren, Green Bay.
Largest and best six bunches asparagus, J. M. Smith.
Largest and best six bunches radishes, J. J. Bader.
Second best, J. M. Smith.
Largest and best display of pie plant, John Spence.
Second best, J. M. Smith.

FLOWERS AND HOUSE PLANTS.

Largest and best collection of house plants, Mrs. H. F. Spencer, Green Bay.
Second best, Mrs. Tilton, Green Bay.
Largest and best fuchsias, Miss Burns, Green Bay.
Second best, Mrs. D. C. Ayres, Green Bay.
Largest and best hanging basket, Mrs. H. F. Spencer.
Second best, Mrs. Tilton.
Largest and best begonias, Mrs. H. F. Spencer.
Second best, Mrs. Tilton.
Largest and best collection of plants from spring cuttings, Mrs. H. F. Spencer.
Second best, Mrs. D. C. Ayres
Largest and best calla, Mrs. H. F. Spencer.
Second best, Mrs Tilton.
Largest and best geraniums, Mrs. H. F. Spencer.
Largest and best collection foliage plants, Mrs. H. F. Spencer.
Second best, Mrs. D. C. Ayres.
Largest and best show hardy roses, Geo. C. Wirth, Fort Howard.
Second best, A. Stone, Appleton.
Most tasty and best floral design, Theo. Nochle, Green Bay.
Second best, A. Stone.
Largest and best disply pansies, A. Stone.
Second best, Geo. C. Wirth.
Largest and best display cut flowers, Geo. C. Wirth.
Second best, A. Stone.
Best bouquet, Theo. Nochle.
Second best, A. Stone.
Largest and best display verbenas, A. Stone.
Best bouquet from house plants, Mrs. J. M. Smith.
Second best, Miss Bader, Preble.

GREEN HOUSE PLANTS.

Largest and best collection green house plants, Geo. C. Wirth.
Second best, Theo. Nochle.
Largest and best show cacti, Theo. Nochle.
Second best, Geo. C. Wirth.
Largest and best calla, Theo. Nochle.
Second best, A. Stone.
Largest and best century plant, A. Stone.
Largest and best oleander in bloom, Theo. Nochle.
Sweepstakes on green house plants, A. Stone.

FERNS, MOSSES AND WILD FLOWERS.

Largest and best show native ferns, Miss Emma Cowles, Scott.
Largest and best show mosses, lichens and licopodiums, Miss Vira Campbell, Scott.
Second best, Miss Lizzie Rowbotham, Preble.
Largest and best show wild flowers, Miss Lizzie Rowbotham.
Second best, Vira Campbell.
Third best, Miss Etta Potter, Pittsfield.

Best floral design, Miss Vira Campbell.
Best wild cactus, Mrs. C. Lawson, Howard.
Best bouquet wild flowers by child of 13 years and under, class A, Miss Nellie Boyden, Pittsfield.
Second best, Miss Josie Rowbotham, Preble.
Third best, Miss Bessie Campbell, Scott.
Best bouquet wild flowers by child of 13 years and under, class B, Miss Katie McMann, Fort Howard.
Second best, Miss Lucinda Wilson, Pittsfield.
Special mention was made of a very fine collection of green house plants, not entered for competition, from the private conservatory of Mrs. Rufus B. Kellogg, Green Bay.

MEETING FOR DISCUSSION HELD AT THE STATE FAIR.

AGRICULTURAL ROOMS,
MADISON, WIS., September 8, 1880.

The State Horticultural Society had no official connection with the exhibition of fruits and flowers at the state fair of 1880, but the interest taken by the individual members of the society was fully as great as in former years, and most of the usual exhibitors and attendants were present.

A meeting for discussion was announced for Wednesday evening, at the agricultural rooms in the capitol, and at the hour appointed the society was called to order by President Smith.

SUMMER MEETINGS.— In opening the discussion, he gave a brief account of the June meetings held at Baraboo and Green Bay, and assured the society that from what he had seen of the good results of these meetings, especially in connection with their Brown county society, he was most fully convinced that it was the duty of the state society to enter more largely into this work. He was confident there was no other way in which we could do so much good as by thus co-operating with these local societies and encouraging them in their work. He regretted that but two societies responded to the offer made to hold these summer meetings, and would be glad if the balance of the sum set apart by the society for this work could be used for this purpose during the fall or winter.

Mr. Pilgrim proposed that the unexpended $200 be offered in equal amounts to any four local horticultural societies that would comply with the conditions proposed for the June meetings.

The secretary stated that propositions had been made by one or two societies to hold such conventions and exhibitions in the fall, in connection with their county fairs, but it seemed to him this would not be advisable, for various reasons. The most important part of these exhibitions, and that from which the greatest benefit is derived, is the meeting for the reading of papers, and discussions held in connection with them, and that in this, the busy season of the year, and the excitement attendant upon our county fairs, but little interest would be felt in this part of the work; but few would be present, and the sessions would be very brief and unsatisfactory. Again, if this plan were adopted, all the county fairs would be willing and anxious to receive the aid offered, and the money would go in with the receipts of the fairs, adding but little, if anything, to the exhibition, and be without any benefit, so far as the object for which it was appropriated is concerned.

Mr. Philips was in favor of fixing the time for holding these meetings to December and January.

After a brief discussion, the following resolution was introduced by Mr. Plumb :

Resolved, That the remainder of the appropriation set apart by the Society for the advancement of the interests of horticulture in the state may be expended during the portion of the society year after the first of December, in the manner originally proposed, provided such exhibitions shall be strictly in the interests of horticulture and for the encouragement of local horticultural societies alone.

Carried.

The same provisions were made for the payment of the expenses of those who furnished papers and addresses for the meetings thus held.

Blight and Mildew.— Mr. Peffer, in response to a call for remarks on the peculiarities of the season, stated that there had been more blight and mildew in his section than usual. This was the leaf blight, not what is commonly called fire blight. The cause was atmospheric; heat and sudden changes. The season had been warm and moist; growth was rapid. In the hot weather and with a hot wind, the tips of the leaves curled up, and the

dew falling on them at night, and the hot dry air by day, turned them black, killing the leaf, and poisoning the tender wood. The more rapid the growth and the thinner the leaf, the greater the liability to this blight and to mildew. The apple trees were quite generally affected this way, both the fruit and leaf. Plum trees were injured a good deal by the same cause, so that they shed their foliage and fruit, and when the wet weather came on again, new leaves and blossoms started out. In reply to inquiries how to prevent mildew and blight, he gave the application of sulphur, whitewash and salt for the first, and cutting off the limbs where affected with blight, and peeling off the injured bark.

Mr. Philips thought that these remedies were not wholly satisfactory, on account of the amount of labor required in large orchards. The remedy recommended by Mr. Purdy and also Mr. Jordan, of Minnesota, who was with us last winter, was the application of a whitewash made of quick lime and sulphur. He had recently been over to Mr. Jordan's orchard, and found but little blight on northern and eastern slopes where this whitewash had been applied, and considerable on the western slope, where it had not been used. He came home and tried it on his own trees. At first he thought it did some good, for the blight stopped, but it may have been owing to other causes.

Mr. Plumb said that the subject of blight and mildew had been fully discussed by the leading horticulturists, at the Nurserymen's Convention, held this season in Chicago, and while there was still some diversity of opinion in regard to the causes, the belief that they were atmospheric was gradually gaining ground. This was the opinion of Mr. Bush, of Missouri, who had made them a careful study. To avoid blight and mildew, plant both trees and vines where they can have free circulation of air, and where the soil, in its composition and texture, is adapted to the development of vigorous and healthy foliage. In proof of this he cited Mr. Ott's experience in his vineyards in Madison, on the terraced bank along the lake shore, and on the top of the bluff across the lake. The first was a total failure, while in the other, that part was most fruitful, and the most healthy and vigorous which was upon the crown of the ridge. There had been some complaint of

the fruit cracking this season; the cause was deficiency in the foliage; where the fruit is affected, the cause of the trouble is generally found in the leaves. Whatever promotes their vitality promotes the health and fruitfulness of the tree or vine. In Europe, where the grape has suffered so severely from phyloxera, of all the remedies tried, the one which promises the best is improving the strength of growth, the constitution of their own vines by grafting them on our hardy Concords.

Miner Plums.— Mr. Kellogg said he had often spoken disparingly of the Miner plum, and now he wanted to speak a good word for it, for it does occasionally bear a crop. He had seen trees near Beloit this season that were loaded down to breaking with fruit, and they stood in poor soil at that.

Mr. Pilgrim stated that Mr. Stickney's trees bore fruit the past season for the first time since they were set out, twelve or fifteen years ago. President Smith had had the same experience. A number of young trees standing in the yard near his house had borne good crops. He had found it necessary to prop up some of the limbs, they were so heavily loaded.

Mr. Peffer had about thirty Miner trees; some of them were set out six years ago. The trees blossomed full but the fruit did not set. The De Soto, with him, was a good plum. It bears while young, and well. The wet weather had injured his plums this season, causing them to grow so rapidly that they burst open and soon rotted.

Judge J. G. Knapp, one of the early members of the society being present, was called on for remarks, and gave a very interesting account of the tropical fruits and climate in Florida, his present home. He said he often recalled with pleasure the associations of the past, the days when we had labored together to make horticulture a success in the rigorous climate of Wisconsin. In alluding to the efforts made in days gone by to make fruit culture profitable by a study of nature's laws, he said he had long been a close observer of nature, and had ever found her true to herself. Results may appear strange and even contradictory, but they are not produced by chance; they do not come without a reason, and he who studies nature aright will find she is ever in har-

mony with herself; that the variations are the legitimate effects of natural forces, modified by local causes; the agents and conditions being the same, like results will follow, and there will be a similarity in the fruitage and development of tree and vegetable life. As proof of this, note the development of vegetation along isothermal lines. Horticulture in Wisconsin has many difficulties to contend with and always will have, but if we study nature carefully and read her aright, we will be able to meet and overcome many of the obstacles or at least modify their effects.

He gave an instance where salt had been used with good results in freeing a Black Hamburg vine from the phyloxera. He thought it was also good for the blight, but sulphur was undoubtedly better; it not only prevents the development of fungus growth, but when applied in moderate quantities, it gives greater vigor and strength to the trees and vines. It enters more or less into the composition of many kinds of fruits. The grape and the orange, and some other fruits flourish best in soil of volcanic character. They had found it beneficial to use sulphur and ashes on their orange trees in Florida. They were troubled some with a fruit blight there, and had found the best remedy was to cut off the limb two feet or more below the part affected. He had no doubt but that whitewashing the apple trees, as stated, was beneficial, but thought the benefit came more from the sulphur than from anything else.

Motion was made that the president be authorized to appoint delegates to attend the meetings of other state societies, the same as heretofore, which was carried, and the president stated that he would be pleased to give credentials to any of the members who wished to attend such meetings, and he hoped that those who might be present at any of them, would represent the society, even though they might not have a formal certificate.

Exhibition of Fruit at Winter Meeting. — The fine display of fruit at the State Fair was commented upon with pleasure, and it was conceded to be the best exhibition ever made in the state. A general desire was expressed to have a competitive exhibition of fruit at our winter meeting. In accordance with this, a resolution was passed appropriating $100, from the funds of

the Society, to be offered in premiums on fruit at that meeting. The president was authorized to prepare the premium list, and Mr. Plumb and the secretary were commissioned to make the necessary preparation for the exhibition.

Society adjourned.

TRANSACTIONS AT THE ANNUAL MEETING.

Agricultural Rooms,
January 31–February 4, 1880.

The society convened in the Agricultural Rooms at 7:30 P. M., President Smith in the chair.

A motion made by Mr. Plumb that the president be authorized to appoint the usual committees was carried, and in accordance therewith the following appointments were made:

Committee on Programme—A. G. Tuttle, A. J. Philips, D. T. Pilgrim.
Committee on Resolutions—J. C. Plumb, J. S. Stickney.
Committee on Finance—J. S. Stickney, J. W. Wood, A. A. Arnold.
Committee on Fruit on Exhibition—Geo. J. Kellogg, G. P. Peffer, B. B. Olds.

Mr. Plumb moved that a committee of three be selected by those having fruit on exhibition to award the premiums offered by the society, which was carried.

The secretary stated that the amount of fruit on exhibition made it impossible to find the space needed for a proper display in the room where the joint convention was to be held, as had been intended, and if arranged there, it would have to be removed before Wednesday morning. As this would not be agreeable, either to the exhibitors or the public, other arrangements had to be made. The Governor had given permission to place it on tables in the hall, or to permit a room in the basement of the capitol to be used for this purpose. It was not a very satisfactory arrangement to have the exhibition placed so much to one side and so far from the place where the meeting was to be held, but it seemed to be the best that could be done, and therefore, as the exhibitors were anxious to get their fruit arranged, the secretary,

in the absence of the president and the other members appointed to act with him, took the responsibility of locating it in the basement. He trusted this would meet the approval of the society. This arrangement would make it necessary to secure a room attendant to see to the fruit.

By resolution the action of the secretary was approved, and he was instructed to employ an attendant to take charge of the exhibition room.

SUMMER MEETINGS.— President Smith gave an account of the June meetings held in connection with the Sauk county and Brown county horticultural societies, and said he was more than ever convinced that the great mission of the state society was in this work, and that there was no way in which it could better reach the public, and do more to create an interest in horticultural subjects than by these meetings. He said that, at the request of the Northwestern Horticultural Society, located at La Crosse, he attended a meeting held there in December last. This society had thought of inviting the state society to hold a joint convention with them in June last, but were not able to perfect the arrangements to do so. At their winter meeting they had decided to try and secure a convention and exhibition the coming spring, and had sent the society an invitation to meet with them. The Grand Chute Horticultural Society had also sent a like invitation; both of which he would present to the society, hoping that they would be accepted. Other invitations may be handed in, and if so, he was in favor of accepting as many of them as we could.

The communications were presented and read, as follows:

LA CROSSE, WIS., December 8, 1880.

President Wisconsin State Horticultural Society,

DEAR SIR:— At a regular meeting of our horticultural society, held in La Crosse, Wis., December 7 and 8, 1880, the State Society were invited to hold their summer session in connection with this society, sometime during the month of June, 1881. Hoping your society will accept this invitation, I remain,

Yours truly, L. W. BRIGHAM,
Secretary.

APPLETON, Wis., January 28, 1881.

President Wisconsin State Horticultural Society,

DEAR SIR:—At a meeting of the Grand Chute Horticultural Society held last evening, I was authorized, as secretary, to invite the State Horticultural Society to hold a summer meeting in Appleton in June next. Hoping this will receive courteous recognition, I am

Very respectfully yours, Mrs. D. HUNTLEY,
Secretary.

Consideration was postponed until there was a larger attendance, and that other applications might be made.

INSTRUCTIONS TO JUDGES.— Mr. Plumb called attention to the fact that our own was about the only State Horticultural Society that had not adopted a set of rules governing its exhibitions and also a scale of points and instructions to be considered by the judges in passing on the merits of articles on exhibition. He thought we ought to take some action on this subject.

It was stated that as the society had no longer any connection with the state fair, there was now no special necessity for these rules and scale of points.

In reply to this, the secretary remarked, that on account of the society's relation to the local societies and the horticultural interests of the state, it was advisable that such rules and instructions should be adopted, even if not needed in its own exhibitions. They would be used by the county and local societies and would enable the judges to do their work more easily and help to make their awards more in accordance with real merit. Now many are called upon to act as judges who are little acquainted with the articles to be passed upon, and do not know the points to be considered in judging, and being governed by their taste or fancy often get wide of the mark. It is not necessary or best to have such elaborate rules and instructions as have been adopted by some eastern societies, but it would be well to give the main points that are to be considered, and to give them in the order of their importance, and leave the judges free to arrive at their decision on these points in any way they please. Aside from this, it was to be hoped that the results of the present exhibition would be such as to make them a part of our regular winter meeting, and in such case, we should need the rules ourselves.

Mr. Plumb stated that no committee on premium list had been

appointed, but if we are to make these exhibitions a part of our winter meeting it will be necessary to have such a committee.

The subject was discussed at some length and in conclusion the following resolution was passed:

Resolved, That the committee on Fruit on Exhibition be instructed to prepare a premium list for our winter exhibitions, and also to report a set of rules or instructions to judges, specifying the points to be considered in determining the merits of fruits on exhibition, and to give the order in which these points are to rank.

DELEGATES TO OTHER SOCIETIES.— An invitation from the Illinois State Horticultural Society was presented by the secretary, to join with them in holding a meeting next fall, in Chicago, for discussions and addresses.

Mr. Kellogg stated that we usually had representatives from the Northern Illinois Society at our annual meetings, and that our society was generally represented at theirs, but no one from this state was present at their last meeting, and he moved that a delegate be appointed to attend in future.

Mr. Plumb moved to amend this, so as to authorize the president to give a certificate as delegate to any member who would attend them.

Mr. Kellogg moved to still further amend, so as to include the appointment of any member who may be willing to attend, as delegate to all the other state societies. The several amendments were accepted and the motion was carried.

The secretary said he had received repeated requests from other societies to exchange reports, for the benefit of their officers and leading members, and in some instances offers to purchase had been made, in case an exchange could not be effected. The supply of reports was quite limited, hardly sufficient to meet the home demand, and he did not like to exchange to the extent proposed without instructions from the society.

Mr. Stickney said that he had seen some of the reports of the societies wishing to exchange, and he found them very interesting and useful; they were good things to have, and he moved that the secretary be authorized to exchange with such societies at his discretion. Carried.

Society adjourned to meet at 9 A. M., February 1.

February 1, 9 o'clock A. M.

The society assembled in the Agricultural Rooms at 9 a. m., as per adjournment.

A committee of those having fruit on exhibition, to whom was assigned the selection of the judges to make the award of the premiums offered by the society, reported that they had agreed upon Messrs. J. S. Stickney, S. Hunt and A. G. Tuttle as such committee.

The committee on the Order of Business made their report, devoting the forenoon to the revision of the fruit lists. At 2 p. m., the secretary's report; at 2:30 p. m., the treasurer's report; at 3:00 p. m., election of officers for the ensuing year; at 4:00 p. m., reports of committees, county and local societies and committee of Observation; which report was accepted and adopted, and the society proceeded at once to the revision of the fruit lists.

Mr. Tuttle was in favor of recommending two lists for apples; one for home use and another for market purposes. But very little attention has been given hitherto to raising apples for commercial purposes, but much more would be given to it in the future. Of the varieties recommended in the list of the society, some were much better adapted for this purpose than others, and some not on the list would, under certain conditions, be equally as profitable as those recommended. He thought the society should give those who were disposed to raise fruit for market purposes all the aid in their power.

Mr. Plumb introduced the following resolution, which was carried without dissent:

Resolved, That we expect committees, acting as judges in the award of premiums offered by the society in exhibitions of fruits with which this society is connected, to be governed in their decisions by the rules laid down, and by our judgment in regard to adaptation.

Apple List.— Mr. Phillips was far from satisfied with the condition prefixed to our first list, "Hardiness the only test." It did not seem to him that this was the only point to be considered, or that was taken into consideration, and it is calculated to mislead. What we want to recommend is, the varieties best adapted

to Wisconsin. Hardiness is an important point and perhaps the first thing to be considered, but there are other things that come into the question, as quality, productiveness, etc. As the list stands now, it does not fairly represent our recommendation. If a member of the society was called to state which of the six varieties named was the best adapted for cultivation, judged by the test specified, he would be compelled to select the poorest variety there, the Tetofsky, which he regarded as almost worthless, certainly not worthy of the recommendation given it. To be sure it is hardy, but of little value for home use or commercial purposes. He thought it was not to the credit of the society, or justice to the tree-growing public to keep it on the first list any longer.

Mr. Stickney said that "Hardiness the only test," was not satisfactory, as it expressed only one of the qualifications that were taken into consideration, and he moved that it be changed to "Best adapted to Wisconsin."

Mr. Tuttle remarked that he would favor cutting down our list if it were necessary, to make it represent only what we can safely recommend. Our Minnesota neighbors had only recommended two varieties, the Wealthy and the Duchess. We have been compelled to change our list heretofore, and may have to do so still more to make it what it should be.

Mr. Plumb stated that other points had been considered in the adoption of the list, but that hardiness was of special importance, as without it quality, productiveness, etc., would be of little avail. Highest quality of fruit is not usually found combined with hardiness, and the tendency of productiveness, especially where great, is to lessen the vitality, but all the varieties on our extra hardy list should possess all these qualifications in the greatest possible degree. He would not make hardiness the only test, but he was in favor of mentioning it as one of, if not the leading point to be considered.

After some further debate Mr. Stickney's motion to amend so as to read "six varieties best adapted to Wisconsin" was further amended by adding, "hardiness, productiveness and quality taken into consideration," and the motion thus amended was adopted.

Mr. Stickney agreed with Mr. Philips that the Tetofsky was

not such an apple as the society ought to recommend; it don't pay for its cultivation, and he would move to strike it from the list, which was ordered to be done.

It was proposed by Mr. Stickney that the Alexander be added to the list. It was a very hardy and showy apple, much sought after in the market and reasonably productive.

Mr. Plumb was opposed to putting it on the extra hardy list; while it does well in the northern portion of the state, it is very much subject to blight in the southern part, and this should be taken into consideration.

Mr. Kellogg was not in favor of putting it on the list. His own experience with it had not been satisfactory; from two trees, twenty-five years old, he had gathered only one fair crop of apples.

Mr. Philips did not believe that it was necessary to add another variety to the list to keep the old number good. He regarded the Alexander as objectionable on account of the blight, and should prefer to cut the number of varieties down to five than to include it. He thought the Pewaukee was a much better variety, and more worthy of a place on the list.

Mr. Stickney could recommend the Pewaukee as an excellent bearer and a good winter apple; the tree is as hardy as the Haas, the Fameuse or Plumb's Cider; the quality of the fruit is not, perhaps, the best, but it is very good and it keeps remarkably well.

Mr. Tuttle regarded the Pewaukee as one of our best varieties; it is giving better satisfaction each year, and he believed it would prove equally as valuable to this state as the Wealthy in Minnesota. It was, perhaps, not as hardy in the nursery as some other varieties, but it stood well, and in the orchard it was equal in hardiness to the Duchess and was very productive; in quality it was better than the Haas. It was much in demand in the Baraboo market and elsewhere, both as an eating and cooking apple. In addition to this, it is a long keeper. It had done so well with him that if he was to set out an orchard for commercial purposes, he should make it and the Wealthy the two main varieties. He has trees growing in unfavorable locations and in soil where other varieties, even the Fameuse had failed.

Mr. Olds could indorse all Mr. Tuttle said in favor of the Pewaukee.

Mr. Herschinger stated that he had tested its hardiness very thoroughly, in fact, had subjected it to treatment that would have killed most, if not all, of our hardy varieties. He top grafted it into the Duchess, and by cutting off all the limbs had forced an excessive growth of wood, but the grafts stood well and are doing well yet.

Mr. Plumb said there was no question as to its quality and productiveness, but it was not equally hardy in all locations and soils.

Mr. Stickney moved that it be added to the list in place of the Tetofsky; which was carried.

Mr. Philips, to judge by profitableness in his own orchard, said he should put Ben Davis ahead of both Haas and Plumb's Cider.

Mr. Kellogg moved to substitute Walbridge for Haas.

This was opposed by Mr. Stickney on account of its size. The trees bore well, but the apples were too small to market to good advantage. He had twenty-six trees of this variety which he should re-graft on this account.

Mr. Plumb thought highly of the Walbridge on account of its productiveness and its keeping qualities; it might not be equal in quality to some others, but it would last until May and be good when the others were all gone.

The list for general cultivation was taken up, and Mr. Kellogg moved to strike out all the varieties in the first list and to change the title to "Additional varieties for general cultivation in favorable locations."

This motion was carried, and the lists as revised were approved and authorized published as follows:

Six Varieties best adapted to Wisconsin, Hardiness, Productiveness and Quality taken into consideration.— Duchess of Oldenburg, Wealthy, Pewaukee, Haas, Fameuse and Plumb's Cider.

Additional list for cultivation in favorable locations.— Tetofsky, Red Astrachan, St. Lawrence, Fall Orange, Price's Sweet, Alexander, Utter, Westfield Seek no Further, Willow Twig, Golden Russet and Walbridge.

Grape List.— The general list was left unchanged, and is as follows:

General List.— Concord, Delaware, Worden, Agawam, Wilder, Janesville, Lindley.

Moore's Early was added to the list for trial, and list adopted, as follows:

For Trial.— Israella, Massasoit, Brighton, Champion, Moore's Early.

Strawberries.— The strawberry list was taken up. Mr. Stickney said he would like to have some addition to our list for general cultivation. He thought it was time that we had something beside the Wilson. Among the many varieties in cultivation, there were some that were equal to Wilson in hardiness, and in other respects, and were superior to it in quality, and also sufficiently productive to make them profitable. Judging by results in his own experience, he would like to see Boyden's No. 30, Green's Prolific and the Crescent added to the list. All three were as hardy, if not hardier than the Wilson; the fruit was of good quality, and the yield was very satisfactory. He would move to add them to the list for general cultivation. Carried.

President Smith was well pleased with Downer's Prolific. He had raised it for a number of years, and had found it a very fair bearer, and a good berry for family use.

Mr. Kellogg thought the Prouty should be stricken from the list. It was a great bearer, and the fruit was fine and attractive on account of its form, but the stems were very short, and the berries lay in the dirt, and often rotted before they were ripe.

No further change was made and the lists as amended stand as follows:

For General Cultivation—Wilson, Boyden's No. 30, Green's Prolific and Crescent.

For Trial— Charles Downing, Kentucky, Prouty's Seedling, Col. Cheney, Sharpless, Capt. Jack.

Raspberries.— The raspberry list was next in order and in the preliminary discussion, Mr. Adams called for the experience of

the members in regard to the hardiness of the Philadelphia. It had killed with him and with others in the vicinity of Madison.

Mr. Stickney said that in the fifteen years he had cultivated it, it had killed down three times, and had also been occasionally injured. It was apt to kill back, especially where a late growth was made the previous fall. He thought that we could calculate on three full crops out of every five, with a partial crop the fourth season.

Mr. Plumb called on Mr. Stone to give his experience with this and other varieties, to which Mr. Stone replied, that he had grown the Philadelphia side by side with the Turner and the Brandywine for nearly eight years, and did not regard it as hardy, or of as good quality as either of these varieties. In years when all were injured, the Philadelphia was killed back the farthest and was sometimes injured when the others escaped. He had also raised the Miami and Doolittle for eight years, and he had invariably found that the Miami killed back in hard winters more than the Doolittle. He was well pleased with the Gregg; the fruit was large and the quality excellent.

Mr. Plumb moved to amend the list by striking out "Folstaff and Brinkle's Orange, if protected in winter," and by adding the "Gregg for trial," which was carried.

Motion was made by Mr. Kellogg to add the Cuthbert; also Carried.

The lists as amended stand:

For General Cultivation — Miami, Doolittle, Philadelphia, Turner, Brandywine.

For Trial — Gregg, Cuthbert.

Mr. Plumb thought that we ought to recommend a list of blackberries, at least for trial. They were increasing in importance every year, and were destined, he believed, soon to be one of the leading varieties of the small fruits raised for the market. There were large quantities of them now sent to market, but there is rarely, if ever, an over supply, and good prices are realized. A very great quantity can be sold fresh, and in the dry state there is a good demand for them. As they are very productive when they do bear, if we can prevent the bushes from winter killing, it will be profitable to raise the fruit even at low prices.

Mr. Stickney said he thought we could safely recommend the Snyder and Stone's Hardy for trial. He had visited Mr. Stone's grounds the past season and saw the two varieties side by side; both were loaded with fruit, but the Hardy seemed to be the fullest. The canes of one, two and three year old plants were black with fruit. It was a great treat to see them, and paid him well for his journey. The wood of the Hardy was short jointed, and quite stocky. He had great confidence in the Snyder, but more in the Hardy. The quality of the fruit was also the best in the Hardy. He had raised the Ancient Briton. It is apt to kill, but he could not do without it. He thought it paid to cultivate it even though it was killed occasionally. When it does escape it is fairly loaded with fruit. The quality is good, but the berries are too soft for anything but a near market.

Mr. Stone's experience with blackberries was called for, and he said that with reference to the Snyder and Stone's Hardy he could recommend them for trial. He had cultivated both for six years. In that time the Snyder had killed down twice, but he regarded it fully as hardy as the black raspberries that are in general cultivation throughout the state. Stone's Hardy originated near Rockford, Illinois. In 1874 he obtained a few roots from a friend there who had cultivated it for four years in his garden with excellent success. The same spring he bought plants of the genuine Snyder, and set them side by side, and had given them the same cultivation ever since; had not given winter protection to either. Had set out plants of each every season since 1874, and after growing them side by side for six years he could give a better description of both by comparing them with each other. The Snyder is conceded to be the hardiest variety under general cultivation at present; but it had killed, as stated before, down to the ground twice in the six years; the Hardy had only been injured at the tip ends of the branches, not farther down than you would naturally cut back the cane in the spring. The crop of the Snyder for those two years was a failure, but that of the Hardy was good. It was the universal opinion of those who visited his grounds and saw the two varieties side by side in their prime, that the Hardy was the most productive, bore the largest berry, and was

better in quality. It is an upright, vigorous grower, the wood ripens early, is of a dark red color and is very hardy. The first year it does not, perhaps, bare as freely as some other varieties, but after that it produces equal to any variety he had ever tested. The berry averages larger than the Snyder, is black in color when ripe, and of a delicious flavor. It commences to ripen from three to five days later than the Snyder, and continues in bearing ten days longer.

Mr. Adams, of Madison, had raised the Snyder for a number of years, and was well pleased with it. It was hardy with him, and as far as he knew, in the country about; he thought it did the best and was the hardiest on high ground where the soil was well underdrained. He has in cultivation a running variety of the blackberry, which bore the largest berries he ever saw; the yield was reasonable for the ground. The berries ripened the latter part of June. The form of growth will admit of winter protection by mulching, and if the variety proved a valuable one on further trial, it might be raised profitably.

Mr. Stone had a few vines of the same kind, he presumed, called the Bartell's Dewberry. They were set out a number of years since, and but little attention had been given to them, being left to take care of themselves. On looking at them one season he was surprised to find the vines covered with fine, large berries. Since then he had taken care of them and he had picked good crops of fruit. They ripen early and bear full.

A motion was made to recommend the Snyder, Stone's Hardy and Bartell's Dewberry for trial.

Mr. Stickney wanted to inquire what was meant by "for trial;" was it for members of the society, or for the public? He was strongly opposed to advising the public to buy the Dewberry. He moved to amend the motion by striking the Dewberry out.

This was assented to, and the motion as amended was carried.

PEARS.— It was moved that Clapp's Favorite be added to the list for general cultivation. In many places it had borne better and proved hardier than the Flemish Beauty even.

Mr. Peffer said it came from a cross of the Flemish Beauty and the Bartlett. The Bartlett is tender, and the Clapp's Favorite can-

not be hardier than the Flemish Beauty. If in any instance it seems to have proved so, it must be due to some local cause affecting the Flemish Beauty unfavorably, as weakness from overbearing, late growth produced by cultivation or other causes.

The motion was lost.

Mr. Jeffrey moved to add Beurre d' Anjou to the list for trial. Mr. Plumb recommended Doyenne d'Ete for the same list. Both motions were adopted, and the list as amended was adopted, as follows:

For General Cultivation — Flemish Beauty.

For Trial — Ananas d' Ete, Early Bergamot, Bartlett, Swan's Orange, Seckel, Winter Nellis, Clapp's Favorite, Beurre d' Anjou, Doyenne d' Ete.

PLUMS. — It was remarked that the Miner had in quite a number of instances borne heavy crops the past season, and that our action in crossing it off our list might have been hasty. Among others, President Smith said that the trees of this variety with him had been loaded with plums this year.

Mr. Stickney said the cases where it had regularly borne good crops were very rare; his own trees had borne the past season. In striking it out we had judged it by its own record, and he thought we had better let it alone, to work out its own reputation.

It was voted to recommend the old list without change, viz.:

For Trial — Lombard, Imperial Gage, Magnum Bonum, Yellow Egg, Eldredge, Duane's Purple, De Soto.

CHERRIES. — The old list of cherries "for trial" was changed so as to read:

For General Cultivation — Early Richmond, Late Richmond or Kentish, English Morello.

EVERGREENS. — No changes were made in the lists of evergreens.

For General Cultivation — Norway Spruce, White Pine, Arbor Vitæ, Scotch Pine, Balsam, White Spruce.

For Ornamental Planting — Austrian Pine, Norway Pine,

Hemlock, Siberian Arbor Vitæ, Red Cedar, Dwarf Pine (*Pinus Montana*).

For Timber—European Larch, White Pine.

For Live Fence Posts—Norway Spruce.

Mr. Stickney thought that it was important to recommend a list of deciduous trees for prairies and treeless plains. Some attention is now given to timber culture of this kind, especially in states west of us, and in the not distant future, there will be a demand for trees for this purpose in our own state, and it was desirable that those who are to engage in it should have all the aid possible in the selection of the varieties most likely to be successful.

By vote of the society, Mr. Stickney was instructed to prepare such a list and present it for action during the present session of the society.

(The following lists were made out as such report, and were presented in the joint convention, in connection with Mr. Stickney's paper on "Timber Culture," and are inserted here as if reported to the society, though no official action was taken on them):

For timber of rapid growth and easy culture. (Valuable in order named.)

Black walnut.	Soft maple.
White ash.	White elm.
Black cherry.	Box elder.
Butternut.	Cotton wood.
European larch.	White willow.

In commencing to plant on a prairie farm, reverse the order of this list.

For timber of fifty to one hundred years' growth.

White oak.	Red oak.
Burr oak.	Hickory.

For street trees. (Valuable in order named.)

White elm.	Green ash.
Hard maple.	Box elder.
Basswood (linden.)	Soft maple.
White ash.	

For lawn planting. (Valuable in order named.)

Cut-leaf weeping birch.	European larch.
Norway maple.	European alder.
Linden.	Weeping poplar.
Green ash.	Weeping mountain ash.
Horse chestnut.	Weeping golden bark ash.
American mountain ash.	Kilmarnock weeping willow.
European mountain ash.	

Society adjourned to 2 P. M.

February 1 — 2 P. M.

Summer Meetings.— At the opening of the afternoon session, Mr. Stickney moved that the invitations extended to the State Society by the Grand Chute and Northwestern Horticultural societies, to hold June meetings in connection with them, be accepted. This motion prevailed, conditioned, however, upon the passage of the bill before the Legislature granting the Society an appropriation as heretofore. In case this aid was given, the President was authorized to pay fifty dollars to each of those societies, provided they would raise a like sum, to be offered in premiums for fruits and flowers at an exhibition to be held in connection with the meetings. The duty of making the necessary arrangements for the attendance and presentation of papers by members, on the part of the State Society, was also assigned to the President and Secretary. The President stated that the local societies were anxious to have our Society well represented at their meetings, and would be disappointed if there were but few present. He knew that it was a very busy season of the year with them, and it seemed almost impossible for many of them to leave home, but he hoped they would make special efforts to attend.

Delegates.— President Smith said that it had been thought best to appoint special delegates to represent the Society at the annual meeting of the Illinois State Horticultural Society, to be held in Chicago, in December next. That Society were making preparations to have a large gathering of the leading horticulturists on that occasion, and it would doubtless be a very interesting meeting. He would appoint as special delegates, Messrs. J. C. Plumb and A. J. Philips, and would also give certificates to all members who could attend.

As the hour assigned for the report of the Secretary had arrived, it was now read:

SECRETARY'S REPORT.

Gentlemen of the State Horticultural Society: — The routine of our work has been much the same the past as in former years, but there is good reason to believe that the results attained and the influence exerted have been as great as, if not much greater than in

any former year of its history. The interest felt by the public in the society's work is increasing. The sympathy and co-operation between the local and state societies is much more evident, and by uniting our labors with theirs we have been able to reach a much larger number; we trust to their benefit, surely to our own encouragement.

The change in regard to taking part as a society in the exhibition at the state fair, seemed, at the time, a little strange, but has not been attended with any very remarkable results. Many of our members contributed largely to the display of fruits and flowers, and received their proportion of the premiums as a reward for their labors, and those of us who were not exhibitors found greater enjoyment in the occasion on account of the exemption from care and responsibility.

SUMMER MEETINGS.— Two meetings were held in June, in accordance with the resolution passed at our last annual meeting; one at Baraboo, the other at Green Bay. Unfortunately the one at Baraboo was held at the same time the American Nurserymen's Association was in session at Chicago. This prevented the attendance of some of the members of the society who would otherwise have been present. Quite a large number of the members were at the Green Bay meeting, larger, even, than a year ago. The local attendance was good, and the proceedings were of more than usual interest. It was proposed at our annual meeting to hold six of these joint conventions, if local societies would respond, but the season's experience tends to prove that the labor attendant upon such meetings, at this busy season of the year with nurserymen, fruit growers and those interested in horticulture, makes it difficult for the local societies to give the necessary time and labor to getting up and conducting the exhibition, and providing for the literary part of the entertainment, unless largely aided by the members of the State Society, but most of our members are so situated that it is difficult to leave their business to attend even one meeting, and two or more are entirely out of the question. If this plan is to be carried out, it seems to be necessary that the president or a special committee should arrange with or assign it as the duty of certain members to attend each meeting to be held,

and to be prepared to take active part in carrying on the literary part of the labor; paying their expenses and compensating them for their time, if attendance cannot be secured otherwise. But is there not a good deal of force in the remark made by a lady secretary of one of the local societies, on hearing of the proposed plan to hold so many meetings, "that would be spreading out the State Society rather thin?" It would seem to be the wiser course to hold one or two live meetings, rather than to excite expectations in five or six local societies, of large attendance and a regular broadside of horticultural wisdom, and disappoint them all, or all but one.

While there were two responses to the proposition for a summer exhibition, there were none at all to the one made in the fall for winter meetings. I wrote to all, either to the secretary or some member of the society, and to some of them a number of times, giving notice of the offer by the State Society; from some there was no reply; others said "it would be difficult to get up sufficient interest to make a successful exhibition; there would be little to show, and if the weather was cold, it would be impossible to bring out plants and flowers." I think, that had the proposition not been burdened with an exhibition, involving an expense of fifty dollars besides much labor, at a time of the year when the weather is liable to be unfavorable, and the material for getting up an exhibition very limited, a number of the societies would have been glad to have held meetings for discussion and reading of papers, and would have welcomed the State Society to meet with them. I think we will have to admit the wisdom of their decision, for looking at the financial side of the question the prospect for any returns for the fifty dollars invested is not very brilliant, not much, if any, better than for so much put into "French pear stock" or "peach pie-plant," which we do not encourage. We cannot expect these societies to be willing or to be in a condition to lose fifty dollars, because we are willing to put as much more with it, for the chances are at least very great that this would be the pecuniary result. It is very important that we should co-operate with the local societies, and do all we can to aid and encourage them in creating an interest in, and a love for hor-

ticulture, wherever we can throughout the state. This should be our special mission. One June meeting, two, perhaps (but I think one better than the two), can be made very important aid in this work, and at the same time be a cheerful, pleasant re-union of our members, but instead of trying to hold winter exhibitions, I would suggest, as much more likely to accomplish the object we have in view, the plan of announcing to local societies, and to the citizens of the towns in various parts of the state where special interest is taken in horticultural matters, and where it will be possible to get a good audience, that two or more members of the State Society will come and read papers, deliver addresses or join in discussions on such horticultural subjects as may be of special interest throughout that locality, at an afternoon or evening meeting, or both, as the interest manifested and other circumstances may warrant. In this way we would reach a much larger number of people, at a much smaller expenditure of time, labor and money than on the exhibition plan. The fifty dollars proposed to be spent by the State Society at each one of these exhibitions, would cover all the expenses of four or five meetings of this kind, and give little, if any trouble or expense to the local societies or citizens.

Rules and Instructions for Judges.— As the society, in connection with these June meetings, has an interest in the exhibitions made there, and also has inaugurated the plan of having competitive exhibitions at its winter meetings, it seems to be important that it should adopt a system of rules governing these exhibitions as far as under its control, and also to establish a scale of points, or at least specify the points to be taken into consideration by the judges in passing on the merits of the exhibits. Nearly every similar society has definite rules governing these things, and some go into minute details in describing the special points to be considered in each variety of fruits and flowers.

Excessive Yield.— Each year seems to have its own peculiarities, its special difficulties to dishearten those engaged in fruit culture, and the past season has not been an exception in this respect, though its experience has been, in most localities, in striking contrast with that of other years; a surfeit instead of scarcity;

over-production in place of barrenness. This has been especially the case in regard to the apple crop. In very many places, even where the orchards are moderate in size and few in number, much fruit has gone to waste. Fameuse and other good fall and winter apples have been freely offered for twenty and twenty-five cents a bushel, with but a moderate demand at that. Some complain that it has been impossible to give it away and that the greater portion of the season's crop has rotted on the ground. Though the production has been so great, the prices have been so very low as to reduce the returns even below those of years where the yield has been moderate and even meager. The remarks were often heard, "when you have fruit it is not worth anything." "There is no profit in an orchard any way;" "there are ten chances to one that you get any fruit at all, and when you do, it won't bring enough to pay for picking." Yet it is to be hoped that we shall be blessed with such a misfortune frequently, for it is a kind of burden that is easy to bear and which can readily be turned to profit. But is it true that there has been an over production of fruit? Have we raised enough to any where near supply the home demand? The amount raised has been large, very large, but not near as great as the amount consumed. The season has been a remarkable one for fruit throughout the whole country. Never have the markets of our large cities been so crowded with it the season through. The cash value of the green fruit sold in Chicago alone has been over $10,000,000, and that, too, not including the foreign, extreme southern or California fruit. It is regarded as a liberal estimate to set off one-quarter of this for local consumption, and that at least three-quarters was shipped to the country, and largely to Wisconsin, Iowa and Minnesota.

Our own state has been a heavy consumer of strawberries and blackberries from Illinois and Michigan, and also of apples from these states, and some from Ohio and New York. With all this mass of fresh fruit there has also been a large trade in dried fruit. The cash value of the sales in Chicago reaches $1,301,000, and of this $820,000 is for dried apples alone. Why is it that when so much fruit is brought into the state from abroad, our own goes to waste for want of purchasers? There are various reasons.

One is we have too large an amount of early and fall fruit; the early market is mainly stocked from the south before it ripens with us, and ours finds but few purchasers and soon decays. Another reason is, because the reputation of our home fruit, both early and late, has been greatly injured by the careless, slovenly manner in which it has been handled, and the inferior condition in which it is usually sent to market. The common method is to let it hang on the tree until the hurry of fall work is over, then shake the trees, and put the apples into bags, or throw them loose into the wagon, and jolt along to town to market them; or to pile them, when thus gathered, up in bins or barrels in the still warm and close cellars. Our falls are usually warm and dry, and if the apples are allowed to hang until freezing weather comes, and makes it necessary to gather them, they become over-ripe and soon decay; the season even of the later winter varieties is thus far advanced before gathered. If the same care were taken to pick early, sort out and pack with care and to keep the fruit cool until taken to market, as is done in Michigan, Ohio and New York, our fruit would keep as well and even better than theirs, as we would save the injury that must necessarily result from long shipments; for there is nothing peculiar to our soil, climate or trees that should lead to early decay. The wonder is, that with the treatment it receives it keeps so well. In October last I saw the finest, largest and fairest Fameuse ever grown, brought to town like potatoes or turnips and sold for twenty-five cents a bushel, over-ripe, and so bruised that there was not an uninjured one in the pile, and it was necessary to use them up within two weeks in order to save them, whereas if they had been handled properly they could have been kept up to March and April, and this is but a specimen of what is done all over our state.

Another thing which detracts from the market value of our home fruit, and in consequence from its demand, is the inferior condition in which it is sent to market on account of not being properly sorted and packed. It is no exaggeration to say that if this were done, and only half of the fruit sent to market now shipped, the returns would be as great if not greater than those now received. Its market value would be increased, its keeping quality

would be improved, and added to this, half the shipping expenses would be saved. This is where the Michigan, Ohio and New York fruit growers gain the advantage over us. By close sorting and careful handling they get better returns from their shipments, keep up the reputation of their fruit, and not only save expense on their inferior fruit by keeping it at home, but in many cases they utilize it and make more from it than we do on our best. As an illustration of this, notwithstanding the abundance of fruit the past season, it is said that the Alden fruit-drying factories in Michigan have paid on an average twenty and twenty-three cents per bushel for windfalls, culls and second class apples. These factories are located in nearly all the large towns in the fruit region, and work up large quantities of fruit at a profit to their owners and to the fruit growers. Can we not in this way utilize much of the fruit which goes to waste or is sold at very low rates in years of abundance, and thus turn what we term over production, to good account? The fruit now raised may not be sufficient to warrant the building of large factories, but small ones can be put up at a moderate expense, and even portable home dryers might be used to advantage, working a large amount with a small outlay.

FRUIT STATISTICS.— It may be of interest and also valuable as a matter of record, to state here, briefly, some of the statistics gathered by the Chamber of Commerce, showing approximately the transactions in the leading varieties of fruit in the Chicago markets the past season:

	Value.
Peaches, 2,000,000 packages	$1,000,000
Apples, 1,000,000 barrels	2,250,000
Pears, 200,000 packages	150,000
Strawberries, 20,000,000 quarts	2,000,000
Raspberries, 3,500,000 quarts	467,500
Blackberries, 12,000,000 quarts	1,500,000
Whortleberries, 3,200,000 quarts	320,000
Grapes, 10,000,000 pounds	400,000
Cherries, 100,000 bushels	250,000
Cranberries, 60,000 barrels	420,000
Apples, evaporated, 1,000,000 pounds	100,000
Apples, dried, 12,000,000 pounds	720,000
Fruit of other kinds, dried, 6,420,000 pounds	421,000
Canned fruits of various kinds	1,752,500
Foreign fruit of various kinds	2,803,300
California fruit of various kinds	813,500

These with the minor kinds of fresh fruit which have been omitted, foot up a total value of $16,692,800.

The statistics obtained the past season from the returns of the town assessors to the secretary of state are very interesting. They show a greater area in orchards, a larger number of trees of bearing age, and an increased production. In considering this last point it should be borne in mind that the yield given is for the season of 1879, the off year in our apple crop; yet there is quite a gain over that of the previous year. Comparison with the statistics taken last year not only indicates progress, an increased yield, and area of fruit, but goes to confirm the reliability of what seemed then to some an exaggeration, and too good to be true. The secretary of state, in his report, says that "these statistics are much more satisfactory than they have ever been before, but are not yet complete," and he recommends that measures be taken to make them fuller and more accurate, and also, to increase the number of the items to be reported on. It would be especially gratifying if a few of our most important small fruits could be added to the list.

The number of bushels of apples reported as raised the season of 1879, is 718,687; the number reported the preceding year is 650,463, an increase of 68,224 bushels, even in the off year. The number of trees of bearing age is given as 2,140,629, against 1,901,424 in 1879. The number of acres in orchards is given as 67,192, while the previous year was 58,481. Returns of fruit were made by all the counties but four, Ashland, Bayfield, Price and Taylor. Trees of bearing age are reported in all the counties but Price, and that returns one acre in orchard. The following table gives the yield in all the counties reporting over 10,000 bushels, arranged in the order of their amount, and also gives their gain or loss and their respective standing in productiveness for the years 1879 and 1878. The statistics in full will be given at the close of this volume.

The greatest gains will be seen to have been in Waukesha, Kenosha, Dane, Iowa, Milwaukee and Sauk counties. The greatest losses in Winnebago, Green Lake and Fond du Lac.

I had hoped to have obtained a large number of statistics in regard to the horticultural products of the state from the United States census returns, but it has been impossible to get them from

Washington, of the census commissioner, and the duplicate copies of the returns, instead of being deposited with the secretary of state, as heretofore, have been left with the county or district clerks and are hence inaccessible.

COMPARATIVE YIELD OF APPLES — CROP 1879 AND 1878.

COUNTIES.	Bushels — 1879.	Bushels — Gain or loss.	Standing — 1879.	Standing — 1878.
Walworth	61,342	gain 2,000	1	1
Rock	57,383	gain 8,000	2	2
Waukesha	56,919	gain 22,000	3	6
Grant	44,108	gain 6,000	4	4
Dane	42,416	gain 13,000	5	9
Jefferson	38,404	loss 3,000	6	3
Kenosha	35,623	gain 15,000	7	13
Dodge	27,295	loss 6,000	8	8
Racine	26,284	gain 8,000	9	15
Milwaukee	25,810	gain 10,000	10	16
Fond du Lac	25,447	loss 12,000	11	5
Green	25,400	gain 5,000	12	14
Iowa	25,053	gain 11,000	13	19
Washington	23,460	loss 5,000	13	11
Columbia	20,919	gain 6,000	15	18
Sheboygan	19,876	loss 4,000	16	12
Sauk	19,866	gain 10,000	17	23
La Fayette	15,600	gain 1,000	18	17
Green Lake	12,179	loss 17,000	19	10
Winnebago	11,125	loss 22,000	20	7
Crawford	10,100	gain 1,000	21	22

INSECT DEPREDATIONS have been fully as extensive, and with one exception as injurious as in past years. The codling moth has not attracted as much notice as usual because there were apples enough for all and to spare. The curculio has been faithful to his mission and harvested the crop of plums throughout the state. The tent caterpillar and canker worm have maintained their foothold in most of their old colonies, and have extended into new fields. In some localities the Cecropia moth, one of the finest of the moth family and usually regarded as ornamental and harmless, has been so numerous as to completely strip large trees of their foliage, causing much loss. The cabbage worm, the exception noted above, has been much less destructive in many places than last year, but still has done a vast amount of damage. The partial exemption from the total loss of the crop is attrib-

uted by some, to remedies used and also to early and thorough culture, and to compactness of the head of the varieties of cabbage raised, but is doubtless mainly due to the rapid development of the natural enemies of the worm. The phyloxera are reported as very prevalent in different parts of the state, and as rapidly increasing in numbers and in destructiveness. Those who were early settlers here cannot but be impressed with the increase in number, variety, extent and destructiveness of our insect foes. The flea beetle, cabbage worm, leaf roller, the curculio, caterpillers, canker worm and codling moth were then very rarely seen and almost unknown. Now they are everywhere, and seem to be increasing rapidly from year to year, and it has come to be a serious question how to stay their ravages. The evil has become so great, so wide spread, that it seems to be beyond the reach, the ability of the individual citizen to control. Unless there is general, united action it is useless to try to check the evil, and to compel such unity of action legislation alone will serve. It must come to this sooner or later or the evil will become so great as to seriously burden all the productive interests of the country. The Academy of Arts and Sciences, at their annual meeting in December last, decided to make an effort to secure from the legislature the appointment of a state entomologist, with the means necessary to make the department efficient and thorough in its work, and they ask our aid, which surely will be given.

As stated at our meeting held during fair week, Governor Smith has authorized the state carpenter to make a case for an entomological collection, at the expense of the state. The plan presented was on a much more extensive scale, and involved more labor and material than he at first anticipated, but he consented to its being made, stipulating that it should be done at times when the regular state work was not pressing. The form selected is that of a double bureau, with three rows of drawers on each side, eleven drawers in each row, ten of them shallow, and covered with glass, and one, the bottom one, of the usual depth and form.

Blight has been quite prevalent in many places the past season. A number of peculiar forms of it have been noticed, which, when

the full data are ascertained, will be interesting at least, and may serve to throw light on the causes of this disease. I was in hope to have had some of the facts to present to you, but cannot, through failure of the parties to respond to inquiries made. It is alleged that discoveries have been recently made, which, some claim, will forever settle the vexed question as to its origin, and thus remove a prolific cause of contention and dispute. Prof. Burrill, of Champaign, Illinois, announces that "the cause of this dreaded disease is a minute organism belonging to a group of the lowest fungi, best known as *bacteria*." It is perhaps presumptuous to doubt this solution of the vexed question, and wrong to say anything which will serve to prolong the warfare over this "bone of contention," but I would call attention to some points bearing on this subject, in order to have members note more closely the coming season all the conditions attendant upon the cases of blight that may come under their observation.

There is no doubt but that minute forms of life are found in connection with blight, but the question is, are they *the cause*, or *the result* of it? If the cause, their power to produce the given effect should apply to and cover all manifestations of the different forms in which blight is seen. It should be an adequate cause. So far as it is possible to judge from the facts given, it not only fails to apply to all cases of blight, but does not even seem to be a sufficient cause in any case. Take, for instance, the fact that every experiment to inoculate the tree failed, where the virus containing the bacteria was applied to the young bark and the tender leaves, the places of all others where the opportunity of working themselves into the cellular structure of the tree is the most favorable, if it depended alone on the vital force of their own organism. Could they produce the necessary conditions for their development, they would seem to have a good chance for it here, and failure to do it would go to indicate that they were dependent for these conditions on causes outside of themselves.

Neither does it seem to us a conclusive demonstration that they are the cause of blight because the disease can be communicated to other trees by inoculation. All are familiar with the pungent odor coming from blighted bark and wood, and the black and

poisonous fluid that oozes out of the diseased part, so deadly that, as it runs down the tree, it turns bark and wood as black as a coal, completely destroying the cellular structure of every part it touches. This virus is found in the fluid containing the bacteria which is used to inoculate with. It cannot be separated from them, and though diluted in its form, it must retain more or less of its deadly power. It seems much more reasonable to suppose that the result produced comes from the poison thus brought into contact with the starch germs of the inoculated tree, developing the same acid fermentation as in the tree from which it was taken, and thus the bacteria have the conditions favoring their rapid development.

To adjust the magnitude and rapidity of the results often seen to the cause, the Professor attributes it to the gradual weakening of the vigor of the trees by the slow but long continued destruction of the starch germs by the bacteria. The disease is there, but the effect is not seen, until a trying climatic change occurs, when it is suddenly produced. Then it would seem that trees weakened from other causes would be the most subject to blight, instead of trees of the greatest constitutional vigor (as our crabs), and at a time too, when their growth is the most rapid and vigorous. On the other hand, if it is a disease of the circulation, induced mainly by climatic conditions, as some think, it would seem most natural and most reasonable that this class of trees would be most affected, and at this very time, for in no other trees and at no other time is there so great a disturbance or disarrangement of natural conditions. Blight is sometimes seen under other circumstances, but is much the most prevalent when the wood-growth is very rapid, where the heat and moisture are oppressive. The cells are then crowded with sap, the excessive moisture in the atmosphere checks evaporation, the diluted sap remains stagnant in leaf and limb, and fermentation sets in, which soon destroys the starch germs in the cells — a condition of things which is seen in other forms of vegetable and animal life to attract and favor the development of parasites and minute forms of lower organic life.

It may be objected that this is simply a theory, lacking proof,

demonstration; well, granted, yet it is one that fits the facts; accounts for the different forms of phenomena under consideration; relieves from most of the puzzles and perplexities connected with this subject. A plausible theory may not be correct, but it is more likely to be near the mark than a faulty demonstration.

Society Finances.— The appropriation granted to the society by the legislature for the two past years has been a great aid in carrying on its work. We trust that the manner in which the money has been expended will meet the approval of the members of the present legislature, and that they will be disposed to grant us further aid in the promotion of the horticultural interests of the state. A bill has been introduced for this purpose. It is to be hoped that the society, by the economical and judicious use of its means and faithfulness in the performance of its work, will ever retain the confidence of the public, and continue to receive the needed aid from the state. But public favor is fickle and uncertain, and it would seem to be wise to provide a fund to help where other means fail. A number of state societies have made provision for such fund by a system of life memberships, making a permanent investment of the fees and of the interest from them, where not needed for expenses. The Massachusetts Horticultural Society has a life membership of 588, with a fee of thirty dollars each. The Michigan Pomological Society has 150 members with ten dollar fees. It has been urged that this would diminish the number of annual members and hence cut off receipts from this source; but where tried, the annual membership has remained about the same, and, by a judicious investment, the life members' fees each year bring in an income equal to the same number of annual dues. At first the receipts from this source would be small, too small to be properly appreciated perhaps; but once started, the amount would gradually increase and at last become a valuable aid in carrying out the mission of the society. Unfortunately most of the members of such organizations think they are not able to make investments of this kind, but it may be an inducement to some to make the necessary sacrifice, that in this way their annual dues will continue to come in, and their life's work be carried on years after their active labors have ended.

There are a number of other subjects I had intended to mention, but this report is already too long, and lest I weary you to excess, will omit them, but feel impelled, in closing, to allude to a thought suggested by the subject last mentioned, that is, what an incentive it should be to earnest, faithful work, that we know not where or when the results of our labors will end. We are too apt to estimate what we accomplish by present results. Active toil will soon cease for us all, but our life's influence will not then be at an end. Its impress will be stamped on those about us, and by them will be given to those beyond. Like the ripple caused by the pebble thrown in the placid lake, its visible effect may seem to end, when the widening circles break on the shore at our feet, but on the other side they are ever extending and will only cease when they reach the other shore. Will they, then?

TREASURER'S REPORT.

The following report of the treasurer was read by the secretary:

Members of the Wisconsin State Horticultural Society: — Your treasurer has to report the following as the business transactions of the past year:

RECEIPTS.

February 2, 1880.	Balance on hand	$162 19
February 9, 1880.	By cash for membership from the secretary	36 00
February 17, 1880.	By membership of V. Lowe	2 00
June 21, 1880.	By cash from state treasurer	300 00
July 2, 1880.	By cash for membership from the secretary	3 00
September 8, 1880.	By cash for membership from the secretary	2 00
February 1, 1881.	By cash from state treasurer	300 00
February 3, 1881.	By cash returned by the president	2 22
February 3, 1881.	By cash for membership from the secretary	22 00
		$849 41

DISBURSEMENTS.

February 4, 1880, voucher, 118.	Postage for the president	$10 00
February 5, 1880, voucher, 119.	Expenses of delegates	6 00
February 6, 1880, voucher, 120.	Balance salary of secretary, 1879	25 00
March 12, 1880, voucher, 121.	Express and postage	5 00
April 2, 1880, voucher, 122.	On salary secretary	25 00
June 24, 1880, voucher, 123.	Premiums at Green Bay exhibition	50 00
June 24, 1880, voucher, 124.	Expenses at Green Bay meeting	41 70
June 24, 1880, voucher, 125.	Premiums at Baraboo exhibition	50 00
June 24, 1880, voucher, 126.	Expenses of president at Baraboo	8 30
July 2, 1880, voucher, 127.	On secretary's salary	50 00
July 2, 1880, voucher, 128.	Stationery and printing	3 00
September 10, 1880, voucher, 129.	Postage	7 00
December 24, 1880, voucher, 130.	Postage	5 00
February 3, 1881, voucher, 131.	Printing	5 00

February 3, 1881, voucher, 132.	Express and stationery	3 85
February 3, 1881, voucher, 134.	Secretary's salary	25 00
February 3, 1881, voucher, 135.	Premiums and expenses at annual meeting	100 00
February 3, 1881, voucher, 136.	Incidental expenses of president	25 00
February 3, 1881, voucher, 139.	Attendant for fruit exhibition	8 00
February 3, 1881, voucher, 140.	Expenses of president at La Crosse meeting	16 00
February 3, 1881, voucher, 141.	George P. Peffer. Premium on Seedling apple	10 00
February 3, 1881, voucher, 142.	Traveling expenses of speakers at annual meeting	8 00
February 4, 1881.	Balance in treasury	342 56
		$849 41

All of which is respectfully submitted.

M. ANDERSON,
Treasurer.

The report was referred to the Finance Committee for the usual examination.

ELECTION OF OFFICERS.— As the hour appointed for the election of officers had arrived, the society proceeded to ballot for officers for the ensuing year, which resulted as follows:

President — J. M. Smith, of Green Bay.

Vice President — J. C. Plumb, of Milton.

Recording Secretary — F. W. Case, of Madison.

Corresponding Secretary — A. J. Philips, of West Salem.

Treasurer — Hon. M. Anderson, of Pine Bluff.

Superintendent — B. F. Adams, of Madison.

The following persons were chosen as additional members of the Executive Commitee, as provided by the constitution of the society:

1st Congressional District — Geo. J. Kellogg, of Janesville.

2d Congressional District — J. W. Wood, of Baraboo.

3d Congressional District — S. J. Freeborn, of Ithaca.

4th Congressional District — J. S. Stickney, of Wauwatosa.

5th Congressional District — Geo. C. Hill, of Fond du Lac.

6th Congressional District — D. Huntley, of Appleton.

7th Congressional District — Hon. A. A. Arnold, of Galesville.

8th Congressional District — Augustus Cole, of Oconto.

Mr. Stickney said that our work, in connection with the local societies, had greatly increased the amount of work to be done by our president. It had been quite a tax on his time and required

quite an outlay to meet the expenses of correspondence, etc., and he would move that an appropriation of twenty-five dollars be made to cover these incidental expenses.

Carried.

A number of written and verbal reports from local societies were presented, which will be given at length in the latter part of the volume.

Reports of Committees.—The reports made by the Committee of Observation, so far as received, were read and briefly discussed. A number of them were made verbally and consequently were short and general in their character. This is to be regretted, as it is important to the horticultural interests of the state that these reports should be largely statistical and definite in character, giving the facts and practical experience of each season, both for consideration at the time and for record. A number of reports came to hand too late to be read at this time, but all are given here for convenience of reference.

FIRST DISTRICT — GEORGE JEFFREY, WAUWATOSA.

Counties — *Kenosha, Racine, Waukesha, Milwaukee, Ozaukee and Washington.* The summer of 1880 will be long remembered by the people of Wisconsin, as the best fruit year the inhabitants have ever seen. Apples were in great abundance, and one peculiarity is that the kinds considered tender, such as Northern Spy, Esopus Spitzenburg, Greening, Bellflower, Baldwin, Early Harvest, etc., were very fine. Golden Russet fruited well ; also Haas, Plumb's Cider, Dumelow's Seedling, Pewaukee, Rambo, Red Astrachan, Sops of Wine, Vandervere Pippin, Twenty Ounce, Keswick Codling, Peck's Pleasant, Talman Sweet, Ben Davis, Autumn Strawberry, Jonathan, Fameuse, Fall Pippin, Alexander, Duchess, Seek-no-further, Willow Twig, Utter, Winter Wine Sap, and many others seemed to vie with each other as to which should give us the best crop. The apple production was simply immense, they were fed to cows, horses, sheep, pigs, chickens, etc., they were carted to the cider mill and made into cider, they rotted upon the ground. Some of the best were taken to market and sold for twenty cents per bushel, in early autumn.

The cherry crop was a good one, Early Richmond doing as well as the common pie cherry. Currants were a plentiful crop, but hardly a paying one, they were sold in Milwaukee market as low as thirty-five cents per bushel. Grapes were an abundant crop in this vicinity. Pears and plums were not so plentiful as last year. Among the pears that produced an average crop were Sugar, Buffum, Seckel, Bartlett, Flemish Beauty, Vicar of Winkfield, Ananas d' Ete, Clapp's Favorite, Louise Bonne, etc.; Beurre Hardy made fine wood growth, and gives promise of being a fine pear, ripens in September and October. Beurre d' Anjou made vigorous wood growth, but my trees are too young for fruiting. Howell and Sheldon, both of American origin, gave a few fine specimens and made nearly three feet of wood growth. Beurre Easter, Lawrence, Bell Lucrative, Emile d' Heyst, Rostiezer, Manning's Elizabeth, Brandywine, Bloodgood, Beurre Giffard, Tyson, and Swan's Orange, are all delightful to the eye, which, to the lover of horticulture, is better than dollars and cents.

Raspberries were a full crop. The Gregg bore off the palm for size, hardiness and productiveness. Strawberries were a good crop. Among those doing well and deserving special mention are Crescent Seedling, Sharpless, Cumberland Triumph, Capt. Jack, Wilson, Ida, Prouty's Seedling. Charles Downing and Monarch of the West made but indifferent vine growth, berries too scattering to make a paying crop. Green's Prolific, on clay soil, did not seem to thrive well. Black Defiance the same. President Lincoln produced some fine berries, but I think they will do better with a little more sand than my soil contains.

Mr. Stickney said the apple yield was so great that it was impossible to utilize the crop, and full one quarter of it went to waste. Most of this might have been saved, and better returns could have been obtained for much that was sold, if we had had fruit-drying factories to work it up. A factory suitable for such a yield would be quite expensive, and would be remunerative if it could have steady employment, but where they would have to lie idle for three or four years at a time, or have but a small amount of fruit

to work up, it would not pay to invest in them. There were a number of portable dryers in the market that would work up a large amount of fruit during the season, and he had no doubt that they could be used to great profit in drying apples when plenty, and small fruits and other things, earlier in the season and years when apples were scarce. Much more of the crop could have been saved if we only knew how to market, both how to prepare the packages and where to ship. Much of the fruit that went to waste could have been sold at fair rates had it been packed in barrels in good shape and sent to common merchants near home. If put up in an attractive manner and in a shape in which it could be handled without injury, and so that it would keep for a reasonable time, many of our citizens who raise little or no fruit would buy freely for present and future use; but where shipped loose in bags there was no inducement to buy. It is in a poor condition to keep, and must be sold at low prices, if at all. It is true that currants had been very cheap, but they had sold their whole crop at $1.50 profit on a bushel, while the market price had been one dollar and less, simply because they were packed, shipped and put on the market in good shape.

Mr. Hoxie, of Cookville, inquired if it would not have paid to have made the apples up into cider and wine. It is true that there is a moral question about it, but for certain uses there is no doubt but that these articles could be used properly and to advantage. The sweet apples were undoubtedly good for stock, and would be used freely by them.

SECOND DISTRICT — J. C. PLUMB, MILTON.

Counties — *Rock, Walworth, Green, Dane, La Fayette and Iowa.*— The year 1880 will be remembered as "the great apple year." If our town assessors are faithful in securing statistics of this crop, the next annual report of our secretary of state will show a yield beyond all precedent in all southern Wisconsin. Not only was the yield large, but remarkable for size and perfection of specimens. The home market was, of course, soon glutted; and prices run from one dollar per bushel for best early, to ten cents per bushel for the mass of fall apples, which neither the cider mills or domestic use could conserve, and as few were sup-

plied with facilities for exporting, it is safe to say that one-half the crop was fed to stock or left to decay upon the ground and in temporary storage. Not one-fifth of the bulk of this great crop were long-keeping varieties, and even those connot be expected to keep as well as usual. The lessons coming from this year's experience are, first, to plant winter varieties, and second, to provide advanced facilities for using or keeping any possible amount of fall and winter apples.

Of other fruits, pears were not as good a crop as usual. Cherries were very abundant; grapes below average. Raspberries were generally injured the previous winter and gave but a small crop. Strawberries were a great crop, and the season was prolonged by rains. Snyder blackberry a great success, also Stone's Hardy. Both varieties show themselves hardy enough to do without winter protection on high, dry, light-colored soils.

Our record of current events shows that we commenced lifting trees April 5 and had four weeks for nursery trade; June 8 to July 1 picked strawberries; July 5 to 20 picked raspberries; July 16 to 30 picked blackberries; July 26 commenced picking Tetofsky apples, two-thirds grown, for market, which brought twice the money they would at full maturity four weeks later; September 1st commenced picking Utter for winter keeping, nearly full size, following up with Plumb's Cider, Fameuse, etc., through the month. These all promise to keep well through winter; all in bushel cases; September 27 commenced lifting trees for fall delivery; November 9, last day of fall work; November 12 ground froze up; November 29, twelve inches of ice on the pond; ground froze up dry, and great danger to the roots of all delicate trees and plants from spring killing. Blight was not prevalent except in rich grounds and with high culture. Our experiments show that an excessive flow of sap, under favorable conditions of atmosphere, will develop blight in some of its many forms, at will. Fruit growers are more and more coming to the conclusion that the bearing orchard should be seeded down and moderately pastured, as a means of promoting health and longevity.

Mr. Lawrence was called upon to give an account of his grapes

the past season. In response he said that they had been a failure. Many of his varieties had died out or been dug up. He had neglected them from want of time to trim and train them properly, and on this account they were much more subject to mildew, from want of a free circulation of air. There had been more mildew the past season than usual. Thrips had injured the leaves so that the fruit did not ripen well. In addition to these difficulties, the birds had become so troublesome that it was impossible to secure any of the fruit. They would attack the bunches before they were fit to eat and completely strip the vines. To get any fruit at all, it was necessary to exterminate the birds or to enclose each bunch with netting or paper sacks. On account of these things he had given up trying to raise grapes.

THIRD DISTRICT.— GEORGE C. HILL, ROSENDALE.

COUNTIES — *Jefferson, Dodge, Columbia and Fond du Lac.* I have had no opportunity for observation outside of my own county the past season. In this vicinity, the season was noted for the great abundance and fine quality of the apple crop. Having had three successive mild winters, and only moderate crops for the past two years, the fruit trees of all kinds were prepared to do their best. Trees had made a good growth of well-ripened wood in 1879. In 1880 they bloomed full. There were no late frosts, no tent caterpillar, no codling moth, few hard winds, the season was moist and the fall favorable. All these combined to produce an enormous crop of large, fair and finely flavored fruit. Many carloads were shipped north and west. Thousands of bushels were made into cider. Many were left ungathered or fed to stock, while all have had an abundance of this useful and health-giving fruit.

The only drawback so far known is the loss of a good many trees from splitting apart and breaking down, occasioned by being overloaded. The Golden Russet suffered most from this cause. Many of our apple trees have this defect, owing to improper pruning, or the failure to prune properly when young. The Westfield Seek-no-Further outdid all other varieties in the abundance and fairness of its fruit. The Duchess, Tetofsky and Red

Astrachan were magnificent. Fall Orange, Tallman Sweet, Fameuse and Golden Russet were also very fine.

Another season's observation and experience has convinced me more than ever before, that bearing orchards, in this climate, should not be in cultivation. Of course, we have had several moist seasons in succession, lately, and it is perhaps true that in a dry season, followed by a very cold winter, trees standing in uncultivated ground, would suffer more than when cultivated; but this would be more than counterbalanced by a less liability to injury from overbearing, and from late growth in the fall. It is feared in this region that the heavy crop of the past season, followed by the extreme cold of this winter, will result in injury to bearing trees.

Fewer young trees are being planted, and less attention is given to orcharding on a large scale, than fifteen or twenty years ago; still people generally are trying to provide for home use, and are cultivating garden and small fruits much more abundantly. Cherries were very plenty. The Early Richmond trees presented a beautiful appearance as the fruit ripened. Not more than an average crop of small fruits was raised. Some varieties of the grape showed signs of mildew, in this vicinity. The Concord and Delaware still maintain their reputation. It is estimated that over one-half of the currant bushes are already dead. Others were saved by a little care, and continue to furnish a plentiful supply of this old stand-by. The Ancient Briton blackberry continues to do well and is being planted in many of the farmers' gardens, and will do well if the canes are protected in the winter.

Here and there a farmer has set shade trees by the roadside. This is a subject which should receive more attention, and which it would be well for the Society to discuss, not only to encourage their planting, but to secure the planting of the varieties best for this purpose. Many of the kinds now used have been injured by high winds, and do not seem well calculated to stand in such exposed locations.

The rage for crowding the dooryards with evergreens is passing away, and a more judicious planting of these beautiful and necessary trees is noticed. A few are cultivating belts of forest trees,

while others are preserving groves of the native young timber, and are thus becoming benefactors to the race, for which their children will call them blessed.

FOURTH DISTRICT — A. L. HATCH, ITHACA.

COUNTIES — *Richland, Sauk, Vernon and Crawford.*— The apple crop of 1880 was very large, prices low, and the home market abundantly supplied with home-grown fruit until late in the fall. Too much of early and perishable fruits are grown, overstocking the home markets and reducing prices to an unprofitable degree. No wholesale plan of saving such fruit has been introduced yet, and the general tendency of all interested seems to be to cider-making only for this purpose. Should stability of crops be established, an early introduction of fruit evaporators, adapted to general farmers' use, would be very desirable. We respectfully commend this subject in all its features to your consideration.

One of the worst troubles with apples this season was black scab, apparently a fungus. Fameuse was very badly affected. As suggested by discussion last winter, we top-grafted several apple trees before the sap flowed, and, as far as time of operation is concerned, consider it quite successful.

Canker worms, so destructive and plenty for several years, appeared here early in the season, and then suddenly disappeared about the 1st of July, we think. Why did they go so suddenly? Was it the birds that took them? Good bye! to them anyhow, and good riddance! Many early maturing apples were of unusually poor flavor, notably the Haas apple. Why? Ben Davis in tree and fruit very fine. Wish we had more, if they are *not* superlatively good in quality. Had all the fire blight we wanted, especially on Golden Russet.

Grapes were very plenty of home fruitage, and very cheap. This is the third or fourth good crop in succession here, and we begin to look on grape culture as solidly fixed with us. The rascally gall louse (phylloxera), we are now satisfied, is one of the prime causes of loss of foliage on many vines, especially Agawam and Delaware. What do the grape growers think of it? The much talked of paper bag experiment we tried, and did not think

the bunches of grapes enclosed in them enough, if any, better to pay for the trouble.

We should be ungrateful to the Wisconsin Horticultural Society if we did not acknowledge our success with the mulching of strawberry plants as advocated and acquiesced in at the last winter meeting. The plan was to leave the winter mulching undisturbed until the fruit was grown. This would keep the fruit clean from the dirt usually spattered on the fruit by the rains. It would keep the ground moist and furnish the plants with moisture when so much needed. It would maintain fertility of the right sort. Lastly, and happily, it would save labor by keeping down weeds, and, withal, it would be much easier to let it alone than to remove it. I frankly acknowledge that this saving of labor was the consideration that warmly commended it to my judgment. I did not think, however, that "as for me and my house," the labor saving would go one degree farther and relieve us of all trouble in picking the fruit as it really did last season.

Our experiment was so complete that we had no berries to pick on beds where we left the mulching. Why? Because the weather was very wet and cool, and on our clay soil the mulching held too much water and kept the beds too cool. We saved the labor anyway, so we are grateful. The greatest degree of cold here this winter so far is — 29°, against — 40° in the vallies.

FIFTH DISTRICT — E. W. DANIELS, AURORAVILLE.

COUNTIES — *Green Lake, Waushara, Marquette and Winnebago.*— In physical geography of our fifth district, the east half of Waushara, all of Winnebago and Green Lake, are mostly good grain and fruit growing soils; some stiff clay, but mostly clay and sandy loams, gravelly knolls, with hay and cranberry marshes; but Marquette and the west half of Waushara are diversified with light sand and fertile bottom lands, susceptible of producing the hardier varieties of apples, and any amount of the crab.

There would have been an abundant crop of fruit in the last named counties the last season, but for one or two powerful wind and hail storms which swept over them, destroying trees and fruit. But the east half of Waushara, Winnebago and Green

Lake had the largest crop of apples ever produced, by probably one-third. The cause of it was, as I believe, a heavy spring frost, and the late spring of 1878, which was the bearing year about here, killing the embryo fruit. The plums, tame and wild, suffered more than any other fruit from this frost. It not only killed the fruit sets, but the trees of the Winnebago, Wild Goose and Hinkley, but wild ones also, so that they did not produce a plum till the last season, when the fruit was very abundant and nice, as the curculio did not propagate its species during the two or three years of no crops.

This heavy crop of apples has deterred some from buying trees, saying, "it does not pay to raise apples, as it costs nearly all we get to gather and market or make into cider," which I found to be true. The net profit over care and expenses has been less than in any year since I have raised apples for sale, for fifteen or sixteen years. But, on the other hand, those having no fruit are stimulated to make a commencement on a larger scale than formerly, as money is more lax than before.

Varieties of Apples.— Duchess of Oldenburg holds its own as to hardiness and productiveness, but its popularity has over stocked the country with it, and its immense crops have been in part consigned to the waste basket, or fed to hogs or cider mills. I find the Ben Davis a good tree here, and north as far as Green Bay. Fall Orange, Fameuse, Walbridge, Utter's Large Red, Haas, Talman Sweet, Astrachan and Sweet Pear are all doing well. I have five or six new seedlings. One I have had for fourteen years, the Aurora Belle. The tree did not kill as much as Duchess in the winters of 1874 and 1875. Apple, large and fine, and keeps with the Fameuse, but I regard the Northwestern Greening as the best. Apple, size of Utter's Large Red, as good as Rhode Island Greening; keeps till June; tree grows one-fourth faster than any other in nursery or orchard. The other seedlings I cannot say anything about at present.

The amount of tree planting in this county has been more than usual the past year and a half, but not of the fruit producing kind, to which I may allude hereafter. Blight, the past season, has been more extensive than for many years past — four or

more. I have had but little of it, except one Flemish Beauty pear tree killed, and some branches on others. Some very rapid growing crab and apple trees, one and two years old, have been killed to the ground, and others part way, and many branches on larger trees of the fast growing varieties. Some of our farmers west of here told me in early summer they had lost most of their trees, but I think they mainly recovered.

Grapes are a fruit of which the millions should partake, and every farmer should raise. The quality has been much improved by the introduction of the Rogers' Hybrids and the Worden. These varieties are rampant growers, and profuse bearers of large fruit. The Worden is eight or ten days earlier than the Concord; but the Janesville is much earlier than any other, and is preferable for market in this high latitude, as it always ripens in autumn and is seldom harmed by frost in spring. I have no trouble with blight, mildew, birds or any insects. This year, for the first time, I had a scalding or sun-blight on most of my No. 15, a little on Delaware, Janesville, Salem, No. 9 and Iona, and they shed their foliage early, causing the fruit to ripen unevenly, and in some cases not at all.

The Ancient Briton blackberry, since I have learned how to treat it, far surpasses any other berry for profit. Its yield is from 150 to 175 bushels to the acre, and will, in our small markets, sell for one shilling per quart (Smith's standard, forty quarts to the bushel), making five dollars per bushel, $750 per acre. I have not the data of expenses per acre for culture and gathering, but think seventy-five or ninety dollars would be enough. They require laying down in winter. This we formerly thought impracticable, but now find it to be easily done, as they have but two large or main roots opposite each other, with few small ones. We take a manure fork (potato fork is better), stick under the crown, pry up and down and move it sideways a few times, then you can bend in the root every time without fear of breaking, put on a few inches of earth and it is done. When planting, put the roots at about thirty degrees from a right angle in the rows, then they can be bent without touching the next hill or row.

Tent caterpillars, or, as some call them, army worms, flourished

here and north in 1877 and 1878, but their ravages were mostly confined to forest trees; the linden or basswood suffered most. I hear the tops are all dead, supposed to be from this cause. Since those years our bees have gathered little or nothing from this most prolific source of our best honey. But fruit trees have suffered none as far as I can learn. Some of my fruit trees were covered late in the season with these worms in a dormant state, but I never saw any marks of depredations. The last two years they have nearly or quite disappeared. These worms are very unlike the same variety in the New England states. They are smaller, darker colored, and feed entirely on the young foliage of the apple, and denude every tree in an orchard of every vestige of a leaf by the first or tenth of June.

Another subject I must mention before closing this report, one which I think needs legislation as much as the adulteration of food, and by which this district has suffered great loss, and that is the work of a herd of unprincipled, irresponsible vagabonds, who come here from other states with exaggerated cuts of showy fruit and bottles containing magnified specimens by which to entrap and mislead the unwary and inexperienced would-be-fruit-grower. Were a full account of their tricks and swindling operations in this section given, it would weary your patience and seem almost beyond belief. A few sample cases will suffice: A man in Nepeuskin, Green Lake county, bought $800 worth of their stock, and after bestowing a great deal of care on it, in planting and cultivation, what remains to day is not worth ten dollars. A resident of Waushara county, who is well acquainted with the extent of their operations, estimates the amount of their swindles in the middle and western part of that poor county at $8,000. Its results are worse to the public than stealing so much money, for in addition to the loss, it disheartens the purchaser, and others who witness the result, so that they will not make any further attempts to raise fruit. At a recent meeting in Green Bay this subject was discussed, and an instance was related where a wealthy man had spent a large amount of money in the preparation of his land for an orchard, and had stocked it with these high priced and wonderful fine varieties of fruit, only to find after years of wait-

ing that instead of an extra orchard, he had nothing better than crabs, and the commonest varieties of seedlings. Can nothing be done to stop this fraud in selling worthless trash for such high prices and as fruit of extra quality? It is nothing but wholesale robbery which costs the citizens of this state thousands of dollars every year, and for which some redress should be devised.

SIXTH DISTRICT — C. W. POTTER, MAUSTON.

Counties — *Adams, Juneau and Monroe.* — The past season has been one of unusual encouragement to fruit growers of this district. The winter of 1879–80 was comparatively mild, and no serious damage was done to apple trees, grape vines or small fruits of any kind. They all blossomed full, and as there were no late frosts to destroy them, nearly every blossom produced fruit. Many varieties of apple trees were so heavily loaded that the high winds during the summer nearly destroyed them. As far as my experience can judge, the most productive standard varieties are as follows, in the order named: Duchess, Fameuse, Utter's Red and Pewaukee. Our orchards are all young or nearly so, and the above estimate is for young trees. Old orchards might show a different result. I think Pewaukee and Walbridge deserve especial mention. The trees seem to be just as hardy as the Transcendant crab; the fruit is of good quality, keeps well, and is smooth and clear from specks.

There were fully as many trees planted in this district last year as the year previous, and with better results. Nearly all the trees planted last spring made a good start, owing to frequent rains through April and May, which kept the ground moist. They still looked well in the fall, and bid fair to go through the winter all right. As to destructive insects, there has been but little complaint. The blight showed itself in nearly all parts of the district, although much more in some places than in others. It seems to be worse on the sandy soil than on the higher ridges of clay soil, that is, on apple and crab trees. But pear trees blighted badly. I saw one in Judge Winsor's orchard, Mauston, four inches in diameter, loaded with pears, killed to the ground. Tame plums blossomed full, but nearly all blighted. The native plums

bore in abundance, both in forest and orchard. The Early Richmond cherry was a fair crop. Grapes were a good crop, and no early frosts to injure them. Concord and Delaware are the varieties mostly planted here. Raspberries, goooseberries and currants were a fair crop, although the currant worm injured them some. Strawberries were not a satisfactory crop; the fruit was inferior and the season short.

SEVENTH DISTRICT — D. HUNTLEY, APPLETON.

COUNTIES — *Outagamie, Shawano and Waupaca.*— The past season has been very good for apples, pears, grapes and all small fruits except strawberries; they were not a full crop, owing, I think, to the dry fall of 1879. There has been some complaint that apples have not kept well this winter. The principal reason, I believe, is not so much in the season as in the time and manner of gathering and packing. Three-quarters of the apples were on the ground in many of the orchards before picking for winter commenced at all.

The Jonathan, Minkler, Pewaukee, Walbridge and Willow Twig were fruited for the first time in this locality, to any extent, and at present writing, January 30, are all, except the Pewaukee, in good condition. The Jonathan is especially fine, both in tree and fruit, and if this winter does not injure it, I think there will be more set the coming spring. The Minkler and Red Romanite are still as hard as bullets. The trees of the two last named are also looking nicely. The Pewaukee and Walbridge not as nice. I have a barrel of picked Fameuse that are in fine condition (January 30), and look as if they would keep a couple of months longer. They have been good to eat for three months past. I think this variety more profitable than any other grown here, with, perhaps, the exception of the Talman Sweet.

Our local society are willing and anxious to test anything that promises to be an acquisition, and will set the coming spring the Wealthy apple, the Crescent strawberry, the Gregg raspberry and Stone's Hardy blackberry. Some growing the Philadelphia raspberry think it more profitable than the black caps for our market.

There has been little or no blight either on apple or pear trees

the past season, not even enough to test the truth of Prof. Burrill's theory. The tent caterpillar was not as destructive this year as the last, or the year previous. The best thing yet found for their destruction is soap suds; it kills every time and is a benefit to the trees. Cherries were a good crop. Very few try to grow plums, or any but wild ones. The Concord and Delaware grapes, and some of Rogers' Hybrids are bearing fine crops, and there is an increasing interest in grape culture.

NINTH DISTRICT.— A. J. PHILIPS, WEST SALEM.

Counties — *La Crosse, Trempealeau, Jackson, Buffalo, and the valleys of the Chippewa and St. Croix.* The winter of 1879 and 1880 being favorable to fruit growing, there was a large number of fruit trees set in the spring of 1880, and I think they were cared for better than those set previous years, owing to the fact that farmers are beginning to learn that trees will not grow and bear without proper care. Everything being favorable, trees blossomed full, and, as was the case almost everywhere, bore an abundant crop; apples especially. The result was the market was glutted. Apples in the fall were brought up the Mississippi river to La Crosse and other points and sold as low as one dollar per barrel, which made the price paid the farmer unusually low. I had a fine crop of Wealthies for young trees, which sold readily at one dollar per bushel when Fameuse sold from sixty to seventy-five cents. Crabs were so plenty that pigs or cattle would hardly eat them, though the No. 20 sold readily at a fair price. I had fifteen bushels of them, which was as many as the rest of La Crosse county produced, as I set the first trees in this locality.

From what I can learn, grapes and strawberries were not a very satisfactory crop. Personally I am not posted on them. The Wilson, I think, is still the leading strawberry for general planting, and I have heard of no grape that leads the Concord for all purposes. Some very fine fruit was exhibited at the La Crosse county fair, samples of Haas, Utter, Wealthy, Golden Russet and Pewaukee being very fine. I took the premium on Wealthy at Wisconsin and Minnesota state fairs, but was fairly beaten here on a single plate by a townsman of mine to whom I sold trees in 1875

Ben Davis trees bore full crops, and though not first class apples, owing to their excellent keeping qualities, they are coming into favor. I saw one Flemish Beauty pear tree in my town on which I counted over ninety as fine pears as I ever saw exhibited. The man never bought and set but that one pear tree. It bore over forty pears in 1879 and over ninety in 1880, for which he received premiums both years at the county fair. This is one case where pears have cost less than five dollars each. We have in this district much bluff and rough land, that, when varieties hardy enough are found, will raise large quantities of fruit. I saw Fameuse trees last fall in this county that looked very thrifty, and the man who planted them said they had borne fair crops for eighteen years. I visited Mr. Jordan's orchard in Minnesota last summer, and could plainly see the effects of the previous winter, both on Duchess and Wealthy trees, while Haas and some tenderer varieties seemed to be less hurt. I will not give you any report of the present winter here, only to say that trees made a fine growth last summer and went into winter in splendid shape. Ground wet and wood well ripened, but it has been cold, yes, very cold, the thermometer marking forty to forty-two below zero in the valleys, and thirty-four to thirty-six on the hills. We can tell much better about the effect, next winter or fall. The aggregate thermometer for the month so far is 276 degrees below; the coldest on record, as given by Bro. Kellogg in 1875, being 223 degrees below, making this the coldest January for thirty years nearly. A man who had a nice crop of apples last fall told me yesterday that he would be willing to bet that not one apple tree in thirty thousand in Wisconsin will survive the present winter. Of course I don't believe him, because I don't want to believe that story. If this winter had been mild, a large number of apple trees would have been set in 1881, but as it now looks the number will be limited. Duchess, Wealthy and Fameuse stand at the head of standards. No. 20, Transcendent and Orange at the head of crabs. The Northwestern Horticultural Society, organized at La Crosse in 1879, held a meeting in December, 1880, at La Crosse, our worthy president being present and giving them a talk on strawberries. Quite a growing interest was manifested

although the attendance was not large. Officers for the next year are J. S. Harris, of La Crescent, president; A. J. Philips, vice president; L. W. Brigham, of La Crosse, secretary, and L. H. Pammell, treasurer. They reported a membership of about forty for the past year. Mr. Wilcox gives favorable reports of his young nursery at La Crosse. He showed fine specimens of fruit and trees. He is still firm in the belief that it needs hardy stocks to make trees stand in this climate. I have not seen him since the very cold weather, but I am satisfied he has not changed his mind.

TWELFTH DISTICT — J. M. SMITH, GREEN BAY.

Counties — *Brown, Kewaunee, Door and Oconto.*— My report for this district for the year past will be very short. The apple crop has been the largest ever known. All things considered, the Duchess is the most certain of any of our varieties to give the owner a fair return for his investment and labor, unless it is the Fameuse. If I were going to set an orchard of any size in this district, I should certainly make it up largely of these two varieties. Some trees of the Walbridge variety have been set within a few years past, and as far as my knowledge of them extends, they are doing well, and promise well for the future.

The grape crop has been a fair one. In one instance I have known the Delaware to drop its leaves to so great an extent as to nearly ruin the crop. Agawam was in some instances injured by mildew.

Strawberry crop only a moderate one. Wilson still keeps the lead as a market berry. Last summer my Crescents bore a heavier crop in proportion to the area they covered than the Wilson. I found them too soft to ship any considerable distance. I shall try them still farther and give them as fair a test next season as I know how, and will report the result.

The crop of wild blackberries has been very large, many more than could be used in our home market. They are shipped to points farther south.

The crop of wild raspberries was also fair. The crop of plums was the largest that I have ever known in this portion of the state. The Miners bore for the first time about here. I do not

know of a tree of them that was not loaded. Some of mine had to be braced up to keep them from being ruined. The fruit ripened well, and was of good quality.

The pear crop was only moderate in quantity, but very fine in quality. Flemish Beauty does the best. Altogether the look for fruit growing in this district is slowly but surely improving.

The following communications were presented by the secretary, from two of the oldest members of the society, and most earnest, zealous workers in promoting the interests of horticulture, both still at work in this mission, one in Limona, Florida, and the other at La Crosse.

COMMUNICATION FROM J. G. KNAPP.

LIMONA, HILLSBORO COUNTY, FLORIDA.

Members of the Wisconsin State Horticultural Society:

Your meetings knew me once, and I have given in them some thought to Wisconsin's resources, in its fruits and other products. For nine years I have been absent, but, it would seem, not entirely forgotten. No companion has afforded more pleasure than, when in your state, I sat at the feet of nature holding converse and listening to her counsels. The rocks of the north, the sand belts of the middle, and rich soils of the south have been my teachers. The striæ bowlder-cut in the surface of the ledges of Dane are scarcely more tenacious than the lessons then traced on my memory. The long sermons there preached by trees, shrubs and plants, to me, will never be forgotten. The cold and hot winds had messages. Some of these I have clad in weak words for the benefit of fruit-growers and farmers of your state. Other sermons have been heard, other lessons listened to, on the plains, as one looks towards the Rocky Mountains, in those mountains, in the valleys and along the streams that flow from snow-clad peaks; and now for the past five years the Great Teacher has been instructing me under the evergreen trees, the unfailing flowers and fruits of South Florida. No lessons have been more pleasant than these last, and listening to them, I expect to close my work.

Since the day when want drove me from the face of Wisconsin, a geological survey of that state has taken place. Men versed in the mysteries of rocks and minerals, geological commotions and periods, fossils and crystals, seams and ore veins in rocks, in argillaceous and aluminous earths, have traversed that state, and have made volumes finely illustrated, full of fat things for other men equally learned, and with choice pictures for children, young and old. Large sums of money have been expended, and as one of the tax payers of Wisconsin, I have asked myself, has it been well spent? Or must some other man of less learning and more practical common sense, strain out of this flood of learning grains of practical knowledge for the use of common men? My friend, J. C. Plumb, has done considerable such straining, but many more golden grains are left behind. The United States has also placed a very few of her enlisted men to observe the variations of the thermometer and barometer, the variations and velocity of the winds and the rainfalls. From these, "Old Probabilities" has been forecasting the character of the climate for to-morrow, but how few of the people even know the meaning of the vague language in which it is couched, if, indeed, they even see the papers which each morning print the predictions. These do great good, and have developed an idea I had long before advanced; but how much more could have been done for the people. Fruit-growers and farmers most desire knowledge of the character of the outer six feet of the earth's surface, the rainfall on that surface and the seasons of its fall; of the heat and sunshine necessary to produce their crops and the cold that will destroy those crops. Here is where the student of nature gets in his work, and the philanthropist gives his advice to man. Prudent is he who gives heed to that advice.

Well do I remember the first time, perhaps, you met, as you do to-day, in the capitol of Wisconsin. You were weak then, and you had no speaker, with a learned address for the public ear. Your secretary, then as now my friend, found me at work in the basement of the old capitol, and, with malice in his heart, drew out of me some thoughts, and finally seduced me into writing some foolish things, which I was unable to defend under cross-

examination. Thank fortune, you printed no "Transactions" in those days, and the foolish remarks, hastily penned, have failed to see the light. Still, if it did no good to others, it did much for me. It gave inspiration to the Report on the Destruction of the Forest Trees of Wisconsin; to the several papers I have read before your meetings in aftertimes, and to the paper on the "Isothermal Lines of Wisconsin," with which your Report for 1871 is closed; also to the framing of the acts of Wisconsin, concerning Tree Culture. That same inspiration has followed me still. In the lead of the times, I have made now and then a blaze on a tree in the untraveled ways; and now I have the pleasure of seeing myself passed in the race for knowledge. Go on, horticulturists; you have a great work before you — a nation to instruct. Remember it is not the geologist, the superintendents of the signal service, you are to teach, but the common minds; some call them "Clod-hoppers." No matter, so they hop ahead. You are teaching men to learn to supply themselves with comforts, health, some with wealth. Your enemy is no less powerful than the elements, and you must call in the assistance of nature if you would conquer. That all-powerful ally aids those who know how to use her. Your reports tell me of the strides you have made, the redoubts you have overcome, the assaults you have made on those which remain. I see that one and another have been seduced, like myself, to other regions; but we all look back with delight at every victory you win. Most have selected regions of climatic conditions similar to Wisconsin; myself, perhaps alone, the most dissimilar. But even here, the lessons I learned in Wisconsin are of immense service. Trees and shrubs, rainfalls and droughts, heat and cold, sunshine and shade, and currents of wind are my teachers still. The soil on which I tread gives its faithful lessons of truth and knowledge. All trees and shrubs, with a few rare exceptions, are strangers to Northern eyes; many old friends do not show their faces, and one asks fearfully, will they ever do so? The black oak dwarfed, the wild cherry and basswood here and there, and Cherokee plum, and we have called the roll. All the rest are strangers, and teach strange lessons. The rains, too, often four times as great as in Wisconsin, falling in seasons, with a heat

sufficient for almost continuous growth, often scald the exotic plants we try to rear, and so limit our old varieties of vegetables on the farm, in the garden and flower bed, but impart to some others and to strangers a magnificence unknown, even in the Northern greenhouse. From this cause the winter garden comes. The summer sun pours its rays almost vertically, and requires a hat whose brim is broad as the Mexican *Sombrero*, or the Chinese bamboo umbrella. This gives life and strength to the banana, pineapple, yam and sweet potato, and perfects fruits like the sugar and other custard apples, guavas, mangoes, sapodillas, and all the citric tribes, ripening these last, and especially the orange, as it ripens nowhere else. Here one listens to the winds soughing through the tops of the "long-strawed" pines, and asks whence they come and whither they go. The answer is unmistakable in terms, like this: "We belong neither to the great whirl of the north, which sweeps over the plains of Manitoba and freezes the great lakes; nor to the hot currents that sweep and whirl along the base of the rocky ranges and over the plains where grasshoppers luxuriate, and in Iowa and Wisconsin scorch the leaves like a sirocco, and at other times tear fences and buildings from their foundations, uproot trees and devastate farms; nor do we come from that other parabolic whirl which creates the gulf stream and so often engulfs navies in tornadoes; but we hold the neutral ground between them all, not unlike the little republic of Switzerland, bending before the one and the other, yet holding the position." To drop metaphor, along the west coast of this peninsula is a tract of sea and land nearly two hundred miles in diameter, having this county as its center, over which tornadoes never roll and frosts seldom fall to injure the most tender plants. Though we promptly receive from every side a *climati-graph* of heat and cold, winds and storms, a thousand miles distant, yet it comes modified in all respects till only close observers see the sign. The cold winds reach us over sea o gulf, warmed from their bosoms. The heat is always moderated by constant breezes, and the shade of tree or house is always pleasant. The thermometer ranges between freezing and blood heat, with an average of 73° Fahrenheit, seldom touching the

extremes. One fact is unaccountable to me. This same region, away from the banks of the gulf, bays and rivers, is almost free from the pest of mosquetoes and gnats. So, all in all, if I were asked to locate an Eden in the United States, I should be tempted to name Limona. Here we tremble not from fear of the pestilence of the yellow fever, diphtheria, small-pox and its allies, and laugh at malaria.

But enough! I only desired to direct attention, as I am rejoiced to see your minds are already directed, to a study of the soils, winds, heats and colds, and the plants adapted to each and every climatic condition, and how man may correct or modify the acerbities of nature. You have done much; you can do much more. To your efforts Wisconsin owes more than to all the geological surveys, the signal service and the chemical analyses of the entire learned men of the age. They have done good; but you are the school teachers of the age, and the pittance allowed for printing your reports is the best expended money from the state treasury. God speed your work.

HARDY ROOTS AND HARDY STOCKS.

(E. Wilcox, La Crosse.)

For years friend Stickney has had the monopoly of a little drive at me, and as I want you all to enjoy all you can out of it, for I mean to have my time with you, I now give the particulars. A number of years ago he and I were at the Minnesota state fair, and put up at the same house. In the course of conversation I got off some of my fanaticism (probably on temperance). When I went out, our landlord remarked that if that man found a mountain in his way he was not going round it, but over it, and I am sometimes reminded by brother Stickney in this way, "I see you are still climbing that mountain." Now, perhaps mountain is a proper term to express the discouragements, losses and difficulties which have met the tree-planter in the northwest. Well, for years I followed my illustrious predecessor in a flank movement around this mountain, which has been as devious and crooked as Grant's line to Richmond. The first flank movement was to get hardy roots for our trees. To do this it was recommended to use a long

cion when grafting, and set deep so as to get roots from the cion. Another flanker would slit the bark near the ground when transplanting, thus aiding the cion to put out roots, the tree to be set deep. Another would take up his trees when one or two years old and transplant again in the nursery, setting six inches deeper than before. All the army of flankers would mulch or water their trees in the fall if the winter was likely to set in with the ground dry. Now, it seems their faith was not very strong as to their long cion and set deep theory; hence they fall back on mulch and water. Let us examine this a little. J. J. Thomas, when at state farm, Michigan, found roots belonging to a tree fourteen feet high, to extend fourteen feet from the trunk. Supposing they spread as far the other way, you would have a spread of roots twenty-eight feet, and the extremities of these roots need the mulch or water more than the large roots near the tree, where the mulch and water are always applied. Now, I will leave it to others to figure out the amount of water needed to water the whole orchard with a sufficient quantity to properly wet the roots. I only know that every one would need an inexhaustible supply, with a windmill, elevated tank and street sprinkler. And hereafter I suggest that the mulch and water advocates, when selling trees, inform the purchaser that he must procure the above named articles to insure success. Now this horticultural mountain is not a local affair; it is found to extend from New York to Illinois. At South Haven, Michigan, in May, 1875, a committee appointed for that purpose, sent circulars far and wide inquiring as to root killing, especially for the winter preceding. Responses were received and published, extending from Geneva, New York, to Warsaw, Illinois. There was nothing new or interesting to me except, perhaps, that misery likes company. I found that our losses and experience of 1872–3 had extended two hundred miles south. The committee in summing up say that there is but little difference as to varieties in killing. So it would seem long cion and roots from it did not save them. P. Barry reported instances rare of this kind — one winter, some twenty years ago, and last winter the only instances in thirty-five years. This is often enough for an old man who has pretty much his all in an orchard. I will give

you a part of the report of D. K. Waters, Spring Lake, Mich. He says his neighbor, Thos. Petty, had imposed upon him fifty almond trees for peach, and although the peach all around these fifty trees had been root killed, not one of these almond trees has suffered. He asks, as a remedy against root killing, does not this experience suggest to nurserymen that it might be valuable to bud the peach on the almond stock?

A few words in regard to root killing in Wisconsin, Northern Illinois and Minnesota, in 1872–3, will close the root question at present. The Galena *Advertiser*, in speaking of the nurserymen, said the severe winter of 1872–3 wiped out a large percentage of their stock. C. H. Greenman said large numbers of fruit trees and vines were entirely killed during the winter of 1872–3. The list of Ironclads were no exception to the wholesale destruction. Chas. M. Hambright said, "I might add that, side by side in our yearling seedling block, the common apple seedlings were ninety-five per cent. killed, but not one of the crab, with about the same proportion of loss in our three and four year old grafts." My own experience agrees fully with Mr. Hambright's statement. And I will add that we had about one hundred Tetofski grafted on apple roots; not more than six survived, while twenty-five of that kind budded in the tops of seedling crabs, came through all right. My mind is settled that the crab root is hardy. But our flankers say it dwarfs the standard, and Mr. Kellogg has put it in his Chapter of Humbugs.

Now, let us go back a little to the record. At the winter meeting, 1875, I think, I exhibited two Price's Sweet trees, one of them grown from a graft made for us by J. S. Stickney, and among the best; the other grafted by us on crab root, this last equal or superior. Then Mr. Stickney said he was surprised at the samples of growth, and he hoped it would continue to develop. He thought it was worthy of extended trial. His experience had been that it tended to dwarf growth. Now, this extended trial that Mr. Stickney thought it worthy of, is just what we are making, and the encouragement we are getting from the society is nothing but condemnation. This has gone so far that we are met by some of those who read your transactions, with

the statement, other nurserymen do not agree with you. I can only reply, some of them do not agree with themselves; sometimes they have recommended crab roots and then condemned them. Now, notwithstanding I was too poor and old to spend money or strength merely to take the conceit out of the heads of these wise ones, still I concluded to take a few trees from our nursery at "Mount Hope," near La Crosse, grafted on crab roots, to the state fair, at Madison, last September.

These trees were more than twice as large as those of the same age exhibited by my competitor, Mr. Plumb, and this is about the way he went for me then: "I should think you were old enough to know better than to grow trees as fast as you have those. They will not stand the winter; the wood is immature, it is yellow." My reply was, "I think not." After the committee had awarded me the premium, I found a limb of one of my trees had been cut off, to the preceding year's growth. I asked Mr. Plumb if he did it? He said, "Yes." "Well, how did you find the wood?" "It is all right," was the reply.

I will say I find it extremely difficult to suit you. First, it is dwarfing; next, the trees are too large. Perhaps the medium I may find to suit. Now, gentlemen, one of your own number has told the whole story about this crab theory, and Mr. Plumb deserves the credit.

In the report for 1872, Mr. Tuttle recommended the Transcendent crab for a stock to top work the standard apple on, and said: "I have full faith that this method of top grafting on a hardy stock will insure us a hardier class of trees than those grown in the ordinary way. I believe it from the fact that wherever the experiment has been tried, it has worked well. I believe it is common for every tree propagator to have some pet scheme, some hobby to ride. I confess I am mounted on this and intend riding until I am unhorsed by future experiments." Have you been unhorsed, Mr. Tuttle? If so, tell the public how, when and where. We want to hear from you. This is the object of our society. Mr. Plumb said, "This is an interesting theme. The only true way is as often as possible to top work, congeniality of stock and cion always in view."

Now this is what we have spent years of time and lost many trees in trying to learn. And yet our success is not satisfactory with all kinds we wish to propagate. Still our motto is "Excelsior." We are climbing the mountain, and have a good foundation to start from — *Crab roots.* And if we find none of the crabs grafted on crab roots are congenial (thanks, Mr. Plumb, for the term), then we will try the common apple seedling, when we find such which has stood our climate, uninjured, twenty or more years. The fact is, it is nonsense to talk about growing trees successfully, except in very favorable localities, in our section of the state, in the common way, of the following kinds: Fameuse, Golden and Perry Russets, Red Astrachan, Plumb's Cider, etc. If the roots survive, the prostrate trees, almost everywhere broken off at the trunk or at the forks, tell the whole story. We must have hardier roots, bodies and forks. There it is in few words. I had hoped to meet with you this winter; but, financially, I am desperately short (this is not original); then I am old, having nearly reached man's allotted time. I hope you will have a pleasant and profitable meeting.

Mr. Stickney remarked that theoretically Father Wilcox is a little hard on us "flankers," but practically he is illustrating his faith by his works, and has really climbed to the top of the highest mountain within his reach, and on the top thereof he has planted his nursery. He will doubtless extend to all of us who attend the June convention at La Crosse the cordial invitation to "come up higher, that seeing ye may be converted." For one, I shall accept such invitation with great pleasure.

Mr. Plumb was glad that Brother Wilcox had at last followed his advice, given these twenty years, and had located on the top of the bluff, and that he was meeting with success, but he thought that under similar circumstances others would be equally successful and that it was not safe to pronounce the test a thorough one and sufficient on the experience of one season.

Society adjourned, to meet at the call of the President at such times during the joint convention as there might be an opportunity for holding business sessions.

Thursday, February 3, 7 P. M.

A business session was called to hear reports of committees.

Fruit on Exhibition.—The committee appointed to examine and report on the fruit exhibited presented the following:

Members of the State Horticultural Society: Your committee have endeavored to perform the various duties assigned them, and now present the following as the result of their labors. The display of fruit is very large and fine, much the largest and best ever seen at a winter exhibition in the state. The list here given embraces most of the varieties represented, but among such a large number of plates some were necessarily overlooked. Beside these, there were a large number of seedlings and varieties to be named.

Jonathan, Wealthy, Fall Sweet, Alexander, Autumn Strawberry, Colvert, Flower of Genesee, White Pippin, Peck's Pleasant, Fall Spitzenberg, Twenty Ounce, Victuals and Drink, Smoke House, Belle Pippin, Belleflower, Northern Sweet, Fallawater, Paradise, Gray Vandervere, Weaver Sweet, Bailey Sweet, Sweet Pear, Hartford Sweet, Clyde's Beauty, Green Sweet, Hightop Sweet, Platt's Favorite, Belmont, Vandervere, Mammoth Pippin, Gillflower, Lawver, May Seek-No-Further, Black, Pomme Grise, Perry Russet, Smith's Cider, Minckler, Red Romanite, Clark's Orange, Greening, Clark's Winter, Westfield Seek-no-further, Fameuse, Pewaukee, Willow Twig, Green-Everlasting, Walbridge, Golden Russet, Drap d'Or, Haas, Plumb's Cider, Northern Spy, Ben Davis, Herfordshire Pearmain, Rawle's Janet, White Winter Pearmain, Stark, Swaar, Gloria Mundi, Wagner, Red Romanite, Red Detroit, Ruddock's Northern Blush, Thomas', Winter Pippin, Schockly, Leitch, Hill's Seedlings, Barrett Russet, Limber Twig, Pennock and Winesap.

Not to discriminate, your committee would mention the exhibits of Messrs. Hunt, Jeffrey, Philips, Kellogg, Olds, Plumb, Peffer and Hirschinger, as large in the number of varieties and fine in quality of fruit.

There are on exhibition quite a large number of seedlings and new varieties, some of which seem to possess much merit and may prove valuable acquisitions to our list of fruits. Among these we

would mention ten varieties of apples presented by Mr. Samuel Hunt, which were raised by Mr. J. B. Hall, of Evansville. He has an orchard of nearly one thousand bearing trees, all seedlings. The ten varieties exhibited seem to possess much merit; some of them are fine in quality and very showy in appearance. That seedling orchard should be carefully examined, as some of the promising varieties there may prove to be just what we need.

Mr. Hunt also exhibited a seedling raised by Mr. Chamberlin, very handsome in form, good size and color, of excellent quality and in very fine condition.

Mr. G. N. Smith, of Berlin, presented two seedling apples of very promising appearance, one called Ruddock's Northern Blush, a seedling of the Transcendant, raised by A. D. Ruddock, of Berlin. The apple is very showy, small in size, mild, pleasant flavor, and of a fine texture. The tree is said to be nine years old, of vigorous growth and handsome top. It commenced to bear when four years old, has borne five years, and yielded two barrels of fruit the past season.

The other is a seedling raised by Mr. Henry Thomas, of Berlin, from seed brought from Indiana twenty years ago. The apple is named Thomas' Winter Pippin. It is above medium size; very smooth and uniform and evidently a good keeper, said to be in its prime in April and May, and of good quality. Mr. Smith describes the tree as a vigorous grower, with a large spreading top, perfectly sound, and an annual bearer. His account of both varities would indicate that they are worthy of extended trial on account of their promise of being extra hardy, productive and for keeping qualities.

Mr. Thomas Crane, of Fort Atkinson, sends a seedling apple of his own raising. The tree is now sixteen years old, and came from seeds of the Spitzenberg. It is perfectly hardy, as hardy to all appearance as a crab, has not a scar or blemish on it and has never been affected by the winter. It commenced to bear in 1874 and has borne some each season since. The specimens exhibited are very uniform and showy, and the flavor and condition are very good, and indicate long keeping qualities. It seems to be worthy of dissemination and trial in other locations.

Mr. N. Haight, of Syene, shows nine new varieties in good condition and quality. Mr. H. J. Sutherland, of the same place, exhibits five new varieties. Among them is a sweet apple, name not known; the cion was brought from Vermont. The apple is large and uniform, and of most excellent quality, very firm and crisp, and will evidently keep well into the spring. If the quality of the tree is good, it will prove a valuable variety.

Mr. S. D. Libby, of Madison, also had on exhibition a large, fair, long keeping and excellent sweet apple, said to have been brought from Vermont fifteen years ago. If the tree is sufficiently hardy to endure our climate this variety will also prove an acquisition.

POINTS TO BE CONSIDERED IN MAKING AWARDS. Your committee were also instructed to fix upon a scale of points to be considered by judges in making awards at horticultural exhibitions, and they have agreed on the following, and place them in their relative order of importance.

Fruits.	*Flowers.*
1. Adaptation.	1. Variety.
2. Productiveness.	2. Perfection.
3. Quality, condition, form, size.	3. Arrangement.
	4. Condition.

The judges to agree among themselves upon some scale or uniform rule by which to record their decision on each of these points.

PREMIUM LIST FOR WINTER EXHIBITION. In the further discharge of our commission we would recommend the following list of premiums to be offered for the exhibition of fruit at our winter meeting.

Best ten varieties winter apples adapted to Wisconsin	$5 00
Second best	3 00
Third best	2 00
Best ten varieties winter apples without regard to adaptation	5 00
Second best	3 00
Third best	2 00
Best five varieties of winter apples adapted to Wisconsin	3 00
Second best	2 00
Third best	1 00
Best five varieties of winter apples for market purposes	3 00
Second best	2 00
Third best	1 00
Best five varieties long keeping winter apples	3 00
Second best	2 00
Third best	1 00

Best five varieties of fall apples, with written statement of manner of keeping	3 00
Second best	2 00
Third best	1 00
Best plate of Plumb's Cider	1 00
Second best	50
Best plate Haas	1 00
Second best	50
Best plate Fameuse	1 00
Second best	50
Best plate Walbridge	1 00
Second best	50
Best plate Westfield Seek-No-Further	1 00
Second best	50
Best plate Talman Sweet	1 00
Second best	50
Best plate Golden Russet	1 00
Second best	50
Best plate Willow Twig	1 00
Second best	50
Best plate Wealthy	1 00
Second best	50
Best plate Pewaukee	1 00
Second best	50
Best plate Utter	1 00
Second best	50
Best plate Ben Davis	1 00
Second best	50
Best display of showy apples, not to exceed ten varieties	3 00
Second best	2 00
Third best	1 00
Best exhibition of new varieties, not to exceed ten	3 00
Second best	2 00
Third best	1 00
Best new variety	2 00
Best single winter variety, seedling	3 00
Second best	2 00
Third best	1 00
Best and greatest display of Crab apples	2 00
Second best	1 00
Best and greatest display of Pears	2 00
Second best	1 00
Best and greatest display of Grapes	5 00
Second best	3 00
Third best	2 00
Best plate, single variety	1 00
Second best	50
Grapes to be in good condition for use, with written statement of manner of keeping.	
Largest and best display of fruit of all kinds	$7 00
Second best	5 00
Third best	3 00
Best show Cranberries, not less than one peck	2 00
Second best	1 00
Best exhibition of Flowers	3 00
Second best	2 00
Third best	1 00

Your committee would also recommend that a premium be offered at our June meeting for

Best exhibition of five varieties of long keeping apples.

Best plate Willow Twig.

Best plate Golden Russet.
Best plate Walbridge.
Best plate Rawle's Janet.
Best plate Stark.
Best plate Red Romanite.
Best plate long keeping Seedling.

Which is respectfully submitted.

GEO. J. KELLOGG,
GEO. P. PEFFER,
B. B. OLDS,
Committee.

The report of the committee was taken into consideration, and after a brief discussion was accepted and adopted.

PREMIUMS AWARDED. The committee chosen by the exhibitors to make the awards of the premiums offered for fruit on exhibition report their decisions as follows:

Best display winter apples, adapted to Wisconsin, Chas. Hirschinger,	$5 00
Baraboo	3 00
Second best, B. B. Olds, Clinton	2 00
Third best, Geo. Jeffrey, Milwaukee	
Best and greatest display winter apples without regard to adaptation,	5 00
Chas. Hirschinger	3 00
Second best, Geo. P. Peffer, Pewaukee	2 00
Third best, B. B. Olds	3 00
Best five varieties, winter, A. J. Philips, West Salem	2 00
Second best, Chas. Hirschinger	1 00
Third best, Geo. J. Kellogg, Janesville	3 00
Best five varieties, fall, Chas. Hirschinger	2 00
Second best, Geo. P. Peffer	1 00
Best plate of Plumb's Cider, Geo. P. Peffer	50
Second best, Chas. Hirschinger	1 00
Best plate Haas, Chas. Hirschinger	1 00
Best plate Fameuse, A. J. Philips	50
Second best, Chas. Hirschinger	1 00
Best plate Walbridge, Geo. J. Kellogg	50
Second best, A. J. Philips	1 00
Best plate Westfield Seek-No-Further, Levi Chase, Madison	50
Second best, J. C. Plumb, Milton	1 00
Best plate Talman Sweet, Geo. Jeffrey	50
Second best, Geo. P. Peffer	1 00
Best plate Golden Russet, B. B. Olds	50
Second best, Chas. Hirschinger	1 00
Best plate Willow Twig, Geo. J. Kellogg	50
Second best, B. S. Hoxie, Cookville	1 00
Best plate Wealthy, A. J. Philips	50
Second best, Geo. P. Peffer	1 00
Best plate Pewaukee, A. J. Philips	50
Second best, Chas. Hirschinger	1 00
Best plate Utter, J. C. Plumb	50
Second best, A. J. Philips	1 00
Best plate Ben Davis, B. F. Adams, Madison	50
Second best, Geo. J. Kellogg	

Best show of apples, Geo. Jeffrey	3 00
Second best, Chas. Hirschinger	2 00
Third best, A. J. Philips	1 00
Best display crab apples, J. C. Plumb	2 00
Second best, Chas. Hirschinger	50
Best display of Pears, Geo. P. Peffer	2 00
Second best, Geo. Jeffrey	1 00
Best display of fruit of all kinds, Chas. Hirschinger	7 00
Second best, Geo. P. Peffer	5 00
Third best, Geo. Jeffrey	3 00

Your committee would recommend a premium of $1.00 on the plate of Jonathan, exhibited by B. S. Hoxie, of Cookville.

J. S. Stickney,
S. Hunt,
A. G. Tuttle,
Committee.

By vote of the society it was decided to close the exhibition at 12 M. on Friday.

Mr. Philips moved that Peter M. Gideon, of Excelsior, Minnesota, the originator of the Wealthy, be made an honorary life-member of our society. In the propagation of the Wealthy he had conferred a great benefit on the whole northwest, and it was fitting that some such expression should be given in acknowledgment of the benefit we have received. When Mr. Gideon was at our annual meeting two years since, as a delegate from the Minnesota Horticultural Society, he was elected an honorary annual member, but there was no mention made of it in the list of honorary members. This was doubtless due to an oversight, but he very much regretted it, for it was due to him on the ground of courtesy, as a delegate, and also as to one who had conferred a special benefit on fruit growers of our State.

The Secretary said he regretted the omission, but it was the result of oversight alone.

Mr. Tuttle was in favor of making Mr. Gideon an honorary life member, for he richly deserved it. The Wealthy was not only a blessing to fruit growers of Minnesota, but it was equally so to us, and to all the northwest. Wherever it has been cultivated it does well and is continually growing in favor. With the exception of the Duchess it is the only standard apple that can be raised with any success in the northern counties of this state.

The motion to elect Peter M. Gideon honorary life member was carried without a dissenting voice.

Report of Finance Committee. The finance committee, who were appointed to examine the treasurer's report, have performed the duty assigned them, and find the same to be correct.

J. S. Stickney,
J. W. Wood,
A. A. Arnold,
Committee.

Seedling Premium. At the last annual meeting a committee was appointed to examine the records to ascertain what premiums, if any, had been awarded and paid on seedling apples. That committee made their report as follows:

Your committee, who were instructed to examine the records in reference to the premiums awarded and paid for seedling apples, have performed the work assigned them, and find that two premiums only have been awarded, where the conditions under which the premiums were offered have been fully complied with.

The first of these was awarded to the Clark's Orange, in 1876, and this premium was paid to Mr. Peffer the same year.

The second premium was also awarded to Mr. Peffer in the winter of 1878, on Peffer's Winter, as it had then completed the five years' test and exhibition prescribed. This premium of ten dollars has not yet been paid.

Respectfully submitted,
F. W. Case, *Chairman.*

The report of the committee was accepted and adopted, and the secretary was instructed to draw an order for the premium due.

Society adjourned.

Friday, February 4, 7. P. M.

The society was called together by the president for the completion of the business of the session.

The following committee of observation was chosen:

First District — George Jeffrey, of Milwaukee.

Second District — J. C. Plumb, of Milton.

Third District — Geo. C. Hill, of Rosendale.
Fourth District — G. W. Putnam, of Ash Ridge.
Fifth District — H. Floyd, of Berlin.
Sixth District — C. W. Potter, of Mauston.
Seventh District — D. Huntley, of Appleton.
Eighth District — A. B. Balch, of Wayauwega.
Ninth District — A. J. Philips, of West Salem.
Tenth District — G. W. Perry, of Superior.
Eleventh District — A. R. McDonald, of Sheboygan.
Twelfth District — J. M. Smith, of Green Bay.

The usual appropriation was made to the secretary. Also a vote of thanks was passed to the railroad companies for their courtesy in granting reduced rates to those in attendance.

Wm. A. Henry, Professor of Agriculture in the University, T. C. Arthur and J. W. Larkin, editor of the Wisconsin *Farmer*, were elected honorary annual members of the society.

Entry Fee. The subject of charging an entry fee at the competitive exhibitions of the society was discussed at some length, and resulted in the adoption of a motion, declaring that "an entry fee of one dollar shall be charged to those competing for premiums offered at the society exhibitions, and that such entry fee shall constitute the exhibitor an annual member of the society for that year."

The society adjourned without day.

HORTICULTURAL

ADDRESSES, PAPERS AND DISCUSSIONS

IN THE JOINT CONVENTION,

AT THE ANNUAL MEETING,

HELD AT MADISON, FEB. 1–4, 1881.

THE MAINTENANCE OF OUR WOODLANDS.

By FRANKLIN B. HOUGH, U. S. Commissioner of Forestry, Washington, D. C. [1].

The thoughts we are to present have reference to a subject that more especially concerns the owners of land, and artisans working in wood. We might properly extend the lists by including those who depend upon the land and its increase for their subsistence, and those supplied by the artisans above named, with the structures that they build, and the commodities that they deliver for our use and comfort, and thus embrace, to greater or less extent, every person in the country — for we can think of no class whatever, among our whole population, both in city and country, that is not interested in the maintenance of an adequate supply of forest products, in some of the varied forms in which they are delivered to commerce, and that would not feel the inconvenience that would ensue from a failure of these supplies.

In the common affairs of life, we judge of a man's success, when informed of the amount of his capital, and the excess of his income above expenses, and speak of one who is living much beyond his receipts, as a man who will sooner or later come to grief;

[1] Read by the secretary in the absence of the author.

the time of his calamity depending upon the amount of his surplus, and the rate of its exhaustion from accidents and use. Now, what is true of an individual in this respect, is true of families, of communities, and of nations; and the principle is exactly the same, whether the resources be in money, or in commodities that supply our wants: for money is only a measure of values, and the amount of it needed to secure a given object depends, not on the intrinsic worth of the coin we pay, but on the abundance or scarcity, or in other words the market value of what we buy. Applying this rule to the woodlands of the country, let us seriously inquire as to what is the amount of our capital; what is our income, and what are our expenses? If we find this capital much impaired, and the rate of our expenditure far above our income, would it not be wise in us to consider the important question: "*What shall we do to prevent the impending danger?*"

We are to notice in the outset, that in any event that may happen, we can never look beyond our own limits for forest supplies, because, with the exception of Canada, no foreign country has ever furnished us with any lumber, excepting some of the finer cabinet woods, *or ever will.* While importing nothing ourselves from abroad, we have for a century or more been largely supplying the wants of other people less provided than ourselves, and are, at the present time, sending many millions of dollars worth annually to countries that have no adequate supplies of their own. It is to be noticed that this foreign demand is steadily increasing from year to year, partly from the opening of new marts of commerce, where none existed before, and partly from the increasing demand from diminishing supplies, in countries that have formerly provided for their own wants from their own resources, and that have even exported a considerable surplus of their own production, to countries less favored than themselves. We now send lumber of certain kinds to Norway and Sweden, and some even to Russia, while from our Pacific coast, immense quantities of our forest products are shipped annually to Australia, Polynesia and South American ports, regions which but a few years ago afforded no market for these products, and some of which had no name on our maps, and no name in the list of nations.

Turning from this aspect of our foreign commerce in forest products, we find within our borders, a steadily growing demand, for uses that no other material can well supply; and although mineral coal has taken the place of wood to an extent that our woodlands alone could not long supply, were this coal no longer used, and iron, and stone, and brick are now employed to a much greater extent for structures once commonly made of wood, the general, aggregate consumption of forest products, in their various forms, was never greater than at present, and is steadily increasing from year to year.

With this brief statement of expenditures, let us next consider the extent of our capital, and the amount of our income. These data will enable us to strike the balance of accounts, and to form an estimate of the tendencies, and the probabilities before us.

Our forest capital at first consisted of a country covered with a heavy growth of native timber, which, with the exception of the prairies of the northwest, extended over nearly the whole region eastward from the Mississippi river, and at some points to a considerable distance beyond. It was, in fact, greater than could be retained in connection with agriculture, and an immense amount was for many years withdrawn annually from existence, with no returns but the price of wood ashes. This cutting simply to destroy and to make vacant the land wanted for cultivation has probably cancelled fully half of the native timber of the country, and the land vacated in the cutting of wood for a useful purpose, and in forest fires can scarcely be less, taking the whole country into the estimate, than half of the remainder, that once existed within the limits above mentioned. The loss from fires alone has in some years amounted to many millions of dollars.

It is to be borne in mind, that although woodlands, when removed, will, if left undisturbed, renew themselves in time, this opportunity has generally not been given, and when allowed, it has usually been only after the native fertility of the soil, derived mainly from the decay of forest vegetation, had been so far exhausted, that it could be tilled with profit no longer. The land has then, sometimes, when abandoned, re-clothed itself with a new growth of such kinds as happened to come in, and often with

the almost worthless kinds. The thickets of poplar, bird-cherry and brambles that spring up on our burned and wasted lands in the north, and the old-field pine and black-jack on the exhausted soil of the south, but poorly represent the majestic timber of the primeval forest and give a false idea when spoken of as "woodlands," or as a source of timber supply. It is sometimes said, and perhaps truly, that in many sections of the country, as in certain parts of the New England states, and in what were called "oak openings" or "barrens," in some of the western states, there is now as much "woodland" (in a qualified sense), as there was thirty years ago. This may be true as to acreage, but it is exceedingly less in value. This young growth has indeed its value, for its presence is gradually restoring fertility to the soil, and in time it will produce valuable material for future use, but it must be many years before it can be profitably sawn into lumber, or hewn into timbers, and it would require centuries to produce the enormous dimensions of the timber we have seen disappear. Were this restoration that we see occasionally going on from our neglect, and without our thought or care, controlled and aided with intelligence, the prospect before us would be much better than at present, and this might be done without great time or expense.

I was lately in a piece of woodland which, seventeen years before, was a thicket of young oak trees, so small that a wagon could be driven over them anywhere, and so close together that none of them could grow to profitable size until many had died. The owner caused them to be thinned out, and had kept them from injury by cattle, until now, some of these trees are large enough for railroad ties and fence posts, and would sell for more per acre without the land than some of the best adjoining fields that have been kept under cultivation. As a general rule, it costs no more to grow a tree that will be valuable when mature, than it does one of little value. With some attention the first year or two, and protection from injury by stock until it has grown beyond the reach of danger, it will generally take care of itself, and a grove will need no further attention than occasional thinning, as the growth becomes dense, the material thus taken out being often worth more than the cost of this attendance.

An error in the cultivation of a field crop may be remedied the next year, and in the worst event that can happen, a total failure, we can profit by the experience and may not be ruined by the result. But a crop of timber requires a lifetime and sometimes longer, to come to full maturity, and it becomes a matter of great importance that we make it worth as much as possible, which can only be done by close attention in the beginning, and can scarcely be remedied afterwards. The first attention should therefore be given to the securing of a growth of most profit, and this implies a knowledge of the adaptation of soil and climate to the requirements of the kinds we would grow, and of the management that these kinds require to insure greatest success.

In the northern part of Wisconsin, there are immense forests still remaining, which in density and dimensions are only surpassed by those of the Pacific coast. If the owners of these forests could but see their own interest, they would not hasten to destroy these noble supplies of timber, which, if reserved and managed with due intelligence, would yield a much greater revenue than at present, and might be maintained much longer than there is present prospect. They owe their existence in part to the climatic conditions that result from their proximity to the great lakes, and from the rugged nature of the surface, the soil in that region is worth more for the growth of timber than for anything else. It remains to be known as to how far the heavy rainfall that is now annually received in the region bordering the southern shore of Lake Superior is due to the presence of these forests, and whether it might not happen to fail, or change to other regions, were these forests removed. Many times in the earth's history it has been found when too late, that great bodies of woodlands, or groves interspersed among cultivated lands, have operated to cause abundant precipitations of rain, and that these rains have become irregular in their occurrence, and insufficient to maintain fertility to the country when these woodlands had been cut away. Heavy rains are experienced whenever an atmosphere laden with moisture is brought over a surface that tends to cool it down below the dew point or degree at which the moisture can be suspended no longer. In a cool climate, but a slight change of temperature

may produce this result, so nicely balanced is this point of change, and it has often happened that the air heated by reflection from rocks exposed to the sun in summer, has been found to pass over still dry, instead of yielding, as when these rocks were shaded, an abundant supply of rain.

But aside from the climatic probabilities connected with the forest question, as presented in this state, which were very strongly presented in the report made to your legislature by Messrs. Lapham, Knapp and Crocker, some fourteen years ago, there are questions of direct and certain profit involved in forest-planting that should arrest the attention of farmers in every section of the country, and lead to measures that would secure these benefits. There can be no doubt but that the yield of farm land would be increased and secured against injuries from drouth and insect ravages, if a due proportion of the surface was protected by woodland growth, and their influence in screening the soil from injurious winds, and in moderating the solar heat, is too obvious to need proof. From the best estimates that have been made from careful observation, it has been shown that fully as much profit can be secured from three-fourths of the surface, where the remaining fourth part is covered with groves, as from the whole of the land without them. Pasture grounds retain their freshness in such a region, when they would become parched and dry without shelter; streams and rivulets do not dry up in summer where their sources are shaded, and there is no wholesale destruction from insect ravages in a country interspersed with woods. This latter exemption is partly due to the abundance of insectiverous birds that find a home in the groves, and partly to the fact that the more destructive kinds of insects, as for example the grasshoppers, will not breed in, nor will they fly over a wooded country to any noticable extent, although they may have been frequent and dreaded visitors in the same region before the groves were planted.

In every section of the country there are tracts of land that cannot be cultivated, or even pastured with profit, and that are lying almost idle and unprofitable upon their owner's hands. It will often be found that such lands are exceedingly well adapted to tree growing, and if they are broken and rocky, the opportunity

for planting may be even better than on smooth and level ground. Trees of valuable kinds can be grown anywhere in the state, and if properly started, they will need no care but protection against fire and cattle, and will, in a few years, yield a profit in wood, that would be greater than is realized from their present use, aside from the incidental benefits that their presence confers.

It is, therefore, the part of wisdom to seek by every means within our power to promote the increase of this element of our wealth, as well as to economize the native supplies, remembering that although our present resources may be sufficient to supply our own personal wants, those who are to come after us will have just occasion to accuse our memories of reckless improvidence, if we leave them unprovided.

FORESTS AND FORESTY IN WISCONSIN.

By Hon. John A. Warder, North Bend, Ohio.[1]

To my Good Friends of Wisconsin:

Though unable to respond personally to the call of your worthy secretary, a willing answer is rendered by an ardent admirer of your beautiful land, and of its noble sons, of so many among whom it may be said, "to know them is to love them." This response is the more promptly rendered, because of the common interest which brings us near to each other. Horticulture is the bond; yes! and agriculture, too, for it is hard to draw a dividing line between these interests; so that it is altogether right and proper that you should hold joint meetings as you do, of both classes of terra-culturists. This is the more praiseworthy when, as now, it is proposed to include the consideration of the care, planting and preservation of that noble class of vegetables, *the trees*, which, over large tracts of our land, constituted the primeval crop of our country's soil, and which are still so valuable and so necessary a crop for the use of the artisan and farmer, and whose supply for the renewal of the forests is now so largely dependent upon the efforts of those who are classed as horticulturalists, the nurserymen.

[1] Read by the Secretary in the absence of the Author.

Your society was among the first to direct attention to the influence of the forests upon agricultural conditions, and to warn the people against their destruction, and you thus enlisted many on the side of the trees. From the perusal of a very imperfect set of your valuable reports at my disposal, it appears that as early as 1867 you were already considering the ruinous results of clearing away the forests, as shown by climatic effects upon the farm and orchard products. At the same meeting of your society you proposed offering premiums on artificial plantations of trees, and suggested also the necessity for protecting, and caring for the natural woodlands; recognizing the importance of that branch of the subject, called the *conservation* of our forests. At the same session you even ventured to furnish a list of trees to be planted, and, better than all, you appealed to the legislature for the appointment of a commission to report upon the general subject, and, happily, you were successful in your appeal. The commissioners were Messrs. I. A. Lapham, J. G. Knapp, and H. Crocker. Their report, now before me, has been a favorite text-book ever since its receipt from the hands of my good friend Plumb, of Milton. This copy is now sent to a special committee of our own legislature to whom has been assigned the consideration of the Foresty-question for Ohio. It will furnish them many strong arguments, and thus you may see the wisdom and benefits arising, even now, from your own action so long ago.

But you did not stop there, for in 1871, you heard and printed valuable papers by the lamented McAfee, who was a self-taught devotee to the subject, and by W. Fisher, who, it is hoped, continues to plant trees for their shelter, and who, having wisely begun with the cotton-wood, as the pioneer of the prairie plantation, has, before this time, been able to supplement his groves with many other more valuable species, to which the cotton-wood has rendered the much needed shelter and protection as avant-courier and nurse. A similar course has been persistently urged upon the tree planters upon the exposed plains of Kansas and Nebraska. "Cheap trees" first, such as poplars, box-elder, water-maples, etc., followed by oaks, hickories, ash, hard maples, wild cherry, walnuts, birches, et cetera, as hard-woods, the everlasting

catalpa, in suitable latitudes, and the beautiful native and foreign evergreens, and larches, that were declared wholly unsuited to the open prairie regions, but which needed only the protection from the winds, that was furnished so rapidly by the pervading cottonwoods that had already naturally belted the plains to the very foot of the Rocky Mountains. In later years, notably in 1878, others entered your field in this labor of love for the trees, with what effect, you must be allowed to judge, but you could not help learning valuable lessons from the venerable Bryant's communications.

One of the most valuable and suggestive papers in your reports is that of Mr. Knapp, on "The vegetable belts of Wisconsin," which he names as follows:

The *Canadian* belt, of the north, and covering nearly one-half of the state, the pine forest region, a land abounding in swamps, the source of the rivers and the natural reserve of timber, to which it should chiefly be devoted, for all time.

The *Ontario* belt comes next, with alternating swamps and sandy ridges with quite similar vegetation, only that on the sands are found forests of the valuable yellow pine (*pinus resinosa*), and in the marshes comes the larch, which supplants the arbor-vitæ and the spruces of the north. The deciduous timbers of the north continue, with the addition of oaks, ash and hickories, with maples and elms, and some beach near Lake Michigan.

Next comes the *Michigan* belt, or that of the "openings." The clay lands produce white oak, maples, elms and hickories. Here the white and yellow birch, hemlock, spruce, fir and cedars of the north do not appear, but red birch is found along the rivers. The sands produce scrub pines (P. Banksiana) and scrubby oaks, while burr-oaks are found in the swales. Grasses abound in the prairies, and this is the land where a contest has long existed between the herbs and the trees.

The southern or *Wisconsin* belt, he calls the region of alternate woods and prairies. The vegetation here is in marked contrast with that in the northern belt; few evergreens remain, and the box-elder and honey locust appear. Mr. Knapp points out that these belts correspond almost exactly with the isothermal and rain

lines of the state. In all this we have food for thought and guides for planting trees in these several regions; what might succeed in one belt would be likely to suffer in another. But, as the writer well suggests, here is study and work for the horticulturist, who may be able to supply the conditions necessary for success, when he attempts bringing the northern sylva to the southern regions; a problem, his knowledge will enable him very readily to solve, as suggested above in the reference to Mr. Fisher's favorite pioneer cotton-wood. When attempting sylviculture in the open, windy prairie regions, plant the cotton-woods and whatever will endure the exposure, and follow with other kinds that need shelter.

According to the valuable statistical tables of Mr. Dodge, in the United States Agricultural Report for 1875, Wisconsin had but a little more than twenty-nine per cent. of her surface covered by woodland, which is but a moderate proportion when we consider the broad extent of her northern border which Mr. Knapp styles the Canadian belt, and which he describes as being admirably fitted for a timber reserve, and illy adapted to general agriculture. So that here we should look for a constant succession of this important crop in the coming ages. In a tier of counties across the north part of the state, Mr. Dodge reports none with less than sixty per cent. and some more than eighty per cent. of woodland, while in the southern and central portions, some are as low as three, seven, nine, ten and thirteen, and none have more than thirty-nine per cent., except Crawford county, sixty-six, Richland and Calumet, fifty-eight and Pepin fifty-seven per cent. The former group have not timber land enough for their own protection against the cold and dry winds from the west.

In view of these facts it becomes incumbent upon you of Wisconsin to plant timber, especially in the open sections of the state, if only as a means of protection. Every farm may have and should have shelter belts for this purpose, at least on the western and southern borders of each tract of eighty acres, and groves of greater or less area on all waste places and near the farmsteads.

In the region of the openings in the Michigan belt, we need have no fear for the natural reproduction of abundant timber

supplies, if simple protection from cattle depredations and fire destruction can be provided; and with such protection, the new growth will be better than the old, of such kinds as are natural to the land, but even here, plantations of the more valuable evergreens should be made, particularly of the native pines, the resinosa and the strobus, with a goodly share of those valuable foreign conifers, the Scotch Pine, the Norway Spruce and the Alpine Larch. Nor should you neglect the very promising conifers of Colorado, and at once put some of them on trial pretty extensively: Young plants are already offered at your very door for moderate prices.

Again let us turn to the great northern extent of your state, your Canadian belt, and consider what is needed in the way of an enlightened Forestry to continue, to perpetuate, and also to improve this invaluable timber reserve, instead of allowing it to be destroyed. We need have no mawkish sentimentalism respecting the destruction of a single tree in the forest, qua tree. That may be well enough in the park or beside the old homestead, in regard to some familiar object that has especial associations with our childhood or youth, our trysting tree, or to some venerable oak or elm that has grown hoary with centuries and has become historical as the silent witness of great events; but not so in the forest; there the idea of utility alone must be our guide, and we should not disdain the consideration of mercenary calculations. The forest vegetables are a crop, they are grown for profit, just as a field of corn or wheat; nor should we hesitate to reap the harvest when it is ripe in one case more than in the other. But just here we may well admit our ignorance and acknowledge that we have much to learn.

For certain purposes and with certain species, the tree may be most advantageously felled at twenty or thirty years, while another species will require from one to two, or even three centuries to reach the condition of its greatest usefulness and value. So in your noble timber reserves, cut your mature trees without any hesitation, but at the same time carefully look after the succession. Take care that the new growth be of valuable species, remove all others, and where necessary, plant the desirable kinds;

this is a very simple kind of forest management, but it should be carefully attended to. In felling the mature trees, exercise great care to avoid injury to those of smaller size; be most careful to prevent the ravages of fire, and most rigorously exclude all cattle of every kind from ranging among the young trees. Encourage the multiplication of the truly valuable kinds, and destroy all of the inferior species, except where they may prove useful as nurses, and even then watch them closely lest they trench upon the rights of their superiors.

No one should longer doubt the profitable results of timber plantations when they are properly managed. Of this we have had so many examples set before us that it is no longer a question; but the timber plantation differs from the grainfield in the greater length of time required, during which there is little or no money return, though the final result is always reliable and large enough to please the most grasping. Forty years ago the bluffs of the Mississippi near Muscatine, Iowa, were bare prairies; parts were inclosed and cultivated, while other parts were neglected, left to the open common, and even exposed to the tramping of cattle, they have, nevertheless, grown up into woodlands, and such portions as are now being cleared yield a net return fully equal to that of the adjoining lands that have been all that time in cultivation. Badly managed plantations may have failed to be remunerative, so have neglected farms. And it must ever be borne in mind that forestry is with us a new industry, in which we have everything to learn. Let us rejoice that the general government is about to provide the land endowment of a school of forestry at St. Paul, Minnesota, where we may all learn the art of growing timber.

Mr. Huyck, of Sun Prairie, stated that he had a small grove on his farm, mostly composed of what is called black oak; these trees were gradually dying out, a few every year. The oldest died first and then the younger ones commenced to die also. He did not know the cause, but wanted to keep the land in timber, and would like to have some one tell him the best trees to replace them with.

Mr. Peffer was inclined to believe that the trees suffered from

drouth. Either the ground was very dry, or a thick growth of grass under the trees robbed them of needed moisture.

Mr. Scholzka thought the soil did not furnish the needed nourishment. As soon as the tap root reached the poor soil beneath, the tree began to die from starvation.

Mr. Huyck: I would not have it understood that this trouble is confined to the black oak alone; the poplars also are dying out, but the burr oaks standing in the same lot are not affected. If the gentleman says that the poplars which have no tap root die out for the same reason and can explain why the burr oaks which have a tap root escape, then we can believe that this starvation is the cause.

Senator M. Anderson: I would like to know if the grove had been used as a pasture; if so, the earth has been tramped down so as to smother the roots.

Mr. Huyck: Yes, the lot was pastured, but this would not seem to be a sufficient cause, for other groves which had not been pastured were affected in the same way. One corner, or a small spot, would be first attacked and then the trouble seemed to extend in all directions.

Mr. Scholzka said different kinds of trees do not always thrive in the same kind of soil, and there should be an adaptation of the soil to the wants of the trees. When anything is the matter of the trees it is often necessary to examine the soil before we can find out definitely the cause of the trouble. In such cases we often find that the soil is not suitable for the trees.

Mr. J. N. Ames, of Oregon, said he had taken pains to save the young timber growing upon his farm. Many of his neighbors had expressed surprise that he had not cut off the trees and carried them to market, but they were young and growing thriftily and he thought it would be much better to let them stand, and the result is, that he has now about seventy-five acres of the nicest young timber in that section. He had not used these groves for pasture, and had no trouble with any of the trees dying out, except the poplars, and he regarded these as short-lived any way. He had noticed, both on his own place and through that section, that the black oak seemed to be taking the place of the burr oak, and to

be the next growth of timber in natural rotation. Farmers are altogether too careless and negligent in the preservation of timber, and in protecting that which is growing up naturally. They will get together and talk over the subject, and reason about it, but there it ends; when they go home, it seems to be forgotten, at least they do nothing. Any one who has seen the groves on his place cannot but be convinced that it is profitable at least to protect and encourage the natural growth. A great many say that they do not care to provide for the wants of the next generation, but he would like to leave an inheritance to his boys which would be valuable to them, and would lead them to appreciate and be thankful for his care and forethought.

Mr. Peffer said that in his section, where nearly all the timber is second growth, he had noticed two seasons when the black oaks had died out much more than usual. Part of the land had been pastured and part had not, but the places where the trees suffered the most were on the south and southwest side and where the wind had blown off the natural mulch of forest leaves. In both of these seasons there had been little or no snow; when winter set in the ground had been very dry, and when it thawed out in the spring was still dry, and the roots had been injured or killed by the frost, so that they could not furnish moisture and nourishment enough for the trees, and they either died out or were killed back in the top, and continued to grow feebly for a year or two and then died out. Where the trees died and others were wanted in their places, he would recommend setting box-elder, maple or white ash. Black walnut is also good.

Mr. Babbett, of Beloit, thought it was possible to save these native trees, and that it was better to do so than to fill their places with something else. They are beautiful trees. They have come down to us from former generations, and were the associates of the Indian race. Some think, that with that race they must pass away, but he did not believe this was necessary. Their lives can be prolonged by care. He had quite a number of these native trees in his door yard which he thought a good deal of; one black oak standing near the house commenced to die at the top some fifteen years ago; he valued the tree highly for shade, and tried

to save it; he cut back the top, put ashes, leaf mould, and manure under it, and it is alive to-day and growing thrifty as the others. He believed we could save them in this way.

Mr. Scholzka: There is no economy in sparing the old trees. When they have become old they are deteriorating in value, and had better be cut down and others put in their places; then you will always have thrifty, rapid-growing trees, that are continually increasing in value. The proper place for groves and forests is on the hills and mountains. Much of this land is unaccessible to the plow or is unfit for cultivation. No other crop will grow there but trees. If these places are left bare, they will become drier and drier, and more worthless every year, and the heavy rainfalls will wash off what little soil there is and leave nothing but rocks, and so the land will be lost for centuries. Covered with trees, it will not only yield an income in the timber, but will give fresh, pure air and health to the country all around and will increase the area and the productiveness of the tillable land.

Mr. Wood, of Baraboo, said that coming from a country where the question was not how to preserve our trees, but how to get them out of the way, he could not appreciate the feelings of those who advocated the planting of forests. In all heavily timbered regions the country is slow of settlement. It requires a long time, much hard labor and many privations on the part of the settlers to bring the land into good tillable condition. Where the timber is nearly all cut off, the few patches left have some value, but where the most of it remains, it has no particular value, but is rather an incumbrance. In a prairie country, true, it would be different. Notwithstanding all that is said in regard to raising timber for economical purposes, he did not believe it could be done to any advantage except for firewood. He had seen a great many trees that had been planted and had grown to be of good size, but had never seen one that would make a good saw-log. Nature in the native forests gives straight, smooth and long bodies to the trees, but those that are cultivated are not usually long enough for one decent log. He said the black walnut is easy to raise and grows rapidly. When a boy he gathered nuts from trees in the forest and planted them, and they had grown into fine large trees, which

have borne nuts for many years. A few years ago he went back to where these trees were standing and gathered nuts and planted them, and now the second generation is bearing. They make fine ornamental and nut bearing trees, but will not make much timber. Parts of them would do for veneering or something of that kind, but are nothing like the old original trees, which would cut four and five saw-logs. The gentleman says plant timber on the poor land, but his experience had been that the best timber grew on the best land. Sandy land will bear pine that can be used for lumber, but the better the land the better the pine. Living as he did in the thickly timbered region, the paradise for farming seemed to him to be the prairie, where the land can be easily tilled, and settled in a short time, and where groves for shelter and for firewood can be easily raised in a few years.

Mr. Theobold, of Iowa county, said his experience corresponded with that of Mr. Wood. When he was a small boy, his father commenced on a farm in the thick woods; there he spent his boyhood days in clearing up a farm, but when he grew up, he started out for the prairies of the west, and never had had occasion to regret the change. In those early days, settlers were afraid to locate out on the open prairies, away from wood and water, so he settled in the openings, but believed he would have done better to have located out on the open prairie, as is proved by the experience of those who came later and settled there. These openings have grown up, or are rapidly growing up, with fine oaks and poplars, so that there is now a much larger amount of wood and timber in that section than when the country was first settled. It is surprising how rapidly the young timber has come in and grown, since the fires have been kept from running over the openings and prairies. He believed as firmly as anyone, that we should protect this young timber, both for our own use and for those that come after us. If this was done, he did not believe there would be any scarcity of timber. To show the rapidity of its growth when thus protected, he said that he now owned forty acres which thirty-three years ago was heavy timbered land, and he and his neighbors cut it off entirely, but it now had at least fifty cords of wood on every acre of it.

Mr. Plumb, of Milton, was not surprised that the farmers who had worn themselves out in their younger days in clearing farms in the timber lands did not want to keep at it; neither do we expect them to feel the importance of this question, yet there is a practical side to it, and one of great importance, both to us and to the future interests of our State. From the examination he had given the subject, he was convinced that within the next ten years there would be a great scarcity of good, first-class timber here. Our native trees are dying out. The best of the timber, especially the pine, is being cut off. A year ago he traveled through Kewaunee and Door counties, once covered with the densest and most beautiful timber of any portion of the State, and now the greater part of these counties is as bare of trees as the prairies themselves, and still they are cutting down the few trees that are left.

This winter he had seen in Southwestern Missouri large yards of Wisconsin lumber for sale, and it was scattered all through Iowa, Missouri, and Illinois. In Southern Kansas, lumber from our state is selling at two and three dollars a thousand in advance of rates in Southern Wisconsin, and all over the prairies of the west and southwest they are using up the products of our pineries in their buildings, fences, etc. This shows an immense drain on our timber resources, which must sooner or later completely exhaust our forests. Many have an idea that Wisconsin is a very large state, and that the northern portion is covered with heavy timber, whereas the heavy timber belt is at the most less than a hundred miles in width, and narrows down as you go east and west. When you get fifty miles north of the center of the state, you leave the thick timber. From there to Lake Superior what there is, is of an inferior character. The northwestern part is but lightly timbered, and while there is more in the northeastern portion, it is becoming very thin. The result seems inevitable that our supply of first class timber must be exhausted, and that too at no distant day, and, if we are to have enough to supply our own demands, we must resort to planting.

In regard to the black oaks, he believed that they were bound to go. Twenty-five years ago the capitol park was thickly cov-

ered with the native trees of the forest, a large portion of them, these black oaks. Most of these trees have passed away, and to-day nine-tenths of the trees here are those that have been planted here. It seemed to him that the cause was starvation. The blowing off of the leaves from the soil, packing of the earth about the roots by tramping, and the thickening of the turf under the trees had exhausted the moisture and nourishment necessary to the healthy growth of the trees, and they are gradually starved out. Cutting off the top, mulching and feeding may save them for a time, but the better way is to replant. Save all the burr oaks, but where the black oaks die, fill in with other trees. He would recommend for this purpose our native white ash; it transplants easily, grows rapidly, and is one of our most useful and valuable trees.

Mr. H. Robbins, of Platteville, said that on the prairies of Southern Wisconsin, and where we have cut off our timber, we want to plant trees for wind-brakes and for timber, and the question is, what shall we plant; what kinds will be the most profitable, and what will grow the fastest. He had tried various kinds, among others the soft maple, but he did not like it altogether; he would not recommend it for others to plant, though it made a good wind-brake. He had imported some 60,000 evergreens from Scotland, of various kinds. Of these the one he would select as the most valuable was the European Larch. His trees when set, ten years ago, were small, but he could cut trees to-day that would make two and three fence posts, not all as large as our posts generally, but yet large enough for a wire fence. Another variety is what is called in Scotland the Weymouth Pine. Some of these trees are now twenty and thirty feet high, and have been set less than ten years Some were set out in nursery rows, quite closely together, and left unthinned, and the rows are now fifteen and twenty feet high and are very thick and compact, making the best of wind-breakers; better than a tight fence. Scattered through this evergreen forest he set out some two hundred apple trees, and had let them stand without any attention, taking care of themselves. Some of them he had not seen for two or three years until this last fall, and was surprised to find many of the

trees loaded with apples. Trees in his regular orchard, where exposed to sun and wind, were affected more or less with blight and scald, but not a leaf was touched where standing among the evergreens.

Mr. George A. Austin, of Neillsville, wanted to defend the lumbermen from some of the charges made against them in regard to the needless slaughtering of the pine; wantonly cutting it to destroy it. It is true that in the thick timber much is destroyed in cutting and getting out the large trees; this is unavoidable. Much of the timber that is cut is past its prime, and if left standing longer would depreciate in value, and then in many instances they are compelled to cut it to save it. Where fires have run through the woods, the trees would in a year or two become wormeaten and worthless, if not cut and worked up at once. Estimates made by the best judges in the pine districts place the amount of timber destroyed by fire running through the woods, as much greater than what has been cut and run into the market.

In regard to the generally received opinion that forests exert a beneficial influence by increasing the yield of the cereals, especially wheat, he would like to call attention to the fact that in the counties west of them where you can ride all day and not see a forest and hardly a forest tree, they raise large crops of wheat, while in their section where you are hardly ever a stone's throw from heavy timber, wheat-culture is a failure.

Mr. W. W. Field said he had not been a close observer in regard to this subject, but he was satisfied, from what he had seen, that there was more timber in Southern Wisconsin to-day than there was thirty years ago, and that, as you may say, not an acre of it had been planted. There was no doubt but that in the northern portion of the state, the timber was being cut faster than it was growing, but if the fires are kept out, in thirty years, every acre of this land will be covered with a beautiful growth of timber again, and, if the fires are not to be kept out, it will be of no use to set it out to timber. As to the effect of timber on the growth of cereals he would say that the past season he had seen thousands of acres of wheat and other grain, the best he had ever seen anywhere, growing where there was not a stick of timber in sight.

If anybody was interested in growing timber, it should be the great prairie states; he did not believe that Wisconsin ever need be concerned about this question.

TIMBER CULTURE.

By J. S. Stickney, Wauwatosa.

With lumber for all mechanical uses so abundant and so cheap, we are perhaps justified in using sixty to one hundred thousand feet for buildings, and half or quite as much more for fences on a quarter section farm. Almost the only motive for economy in the use of fuel is to save the labor of preparing it. Seventy to eighty thousand feet of lumber lay under each mile of our railroads to be renewed every ten or twelve years. Hundreds of mills are diligently gathering in the choicest oak, shaping it into staves and hurrying it away to distant markets. Much of this oak is the accumulation of three or four hundred years, yet no one counts the little rings that record its age, or stops for a moment to consider where the next four hundred years' supply is coming from. Even the young oaks and hickory are not spared, but cut down in their infancy, and by hundreds of car loads are sent after the staves. Thousands of cords of poplar are ground into pulp, and are shipped to paper and book making New England. A friction match is a little thing, yet one match factory in our state uses annually in its business about four million feet of lumber.

In three months more I shall have completed the destruction of one hundred and ten acres of timber; many of the oaks three hundred years old; and what are the results? Staves enough to furnish a medium sized cooper shop perhaps four months. Ties for perhaps a mile of railroad. Coarse wood to burn two moderate kilns of brick, and wood of a better quality sufficient for the wants of perhaps a hundred farmers for a single year: only this and for this brief time! yet, for the next three hundred years railroads must be kept in repair, bricks must be made, dwellings must be warmed and food cooked. Thus the ball rolls on, and we freely use the good things of to-day troubling ourselves with very little thought of the future.

I am not greatly disturbed by all this, nor do I see in the near future any reason to apprehend suffering for the want of fuel, or any great inconvenience from scarcity of building material. While considering this wholesale consumption in our large centers and most accessible sources of supply, we must remember that in most of the states there are vast tracts of timber yet untouched because more or less remote from present lines of transportation, yet all accessible when increasing demand shall require it. Also, that on our prairies spontaneous timber growth springs up as soon as the annual fires are suppressed, needing but slight protection and moderate time to produce a large timber crop. Thomas Meehan, in a recent report as Botanist to the Pennsylvania State Board of Agriculture, says: "After two months spent in examining the forests of Pennsylvania, Virginia, North Carolina and Tennessee, the result of my investigation is, the knowledge that there is very much more timber in the country than people generally believe; also that when there shall be a real scarcity of lumber, so as to affect the market price seriously, it will pay to plant timber, and forests so planted will come into use when properly cared for in much less time than people have been led to believe. In going through the Shenandoah Valley, of Virginia, we were furnished proof entirely satisfactory that when the white man settled in that valley it was wholly clear of timber, and that most of the immense quantity growing there now has grown in the past one or two hundred years. In like manner the probability is that in all the large valleys of Pennsylvania there was no wood at the early settlement of the state. We have cut away a great deal, but then, we have gained some and the fact is worth remembering."

Fifty years ago New England was exercised with the same fear of a timber scarcity that troubles us now. To-day hundreds of her hill farms are gradually passing back from grazing and tillage to wild and neglected woodlands, and scarcity of timber is hardly thought of. We very much enjoy our present abundance and our reckless extravagance, yet we can, when necessity compels it, become models of economy and frugality. In proof of this, go to-day to western Minnesota and you will find the people warming

their toes and cracking their jokes around stoves invented and manufactured by the "universal Yankee" expressly to burn little hard pressed cubes of hay or straw. Move on to Manitoba and in latitude fifty degrees north you will see the Russian emigrants in colonies, going boldly out onto the vast plains, asking for very little fuel besides the hay and straw they can grow, and burning the same in rude structures, half stove, half oven, made of sun dried bricks. With these simple fixtures all their food is cooked and all needed warmth obtained. If further illustration is needed, it is furnished by the Icelander with his house of snow and lamp of seal oil.

From our standpoint this other extreme is not particularly inviting, therefore, while there is no immediate cause for alarm, it is very proper that we should at once consider ways and means of keeping a reasonable supply of fuel and building material within our reach. To dwellers in and immediately around the large commercial centers, those things will always be accessible, perhaps at rather large prices, yet land in such localities will also command a large price or a large rental, so that it would hardly pay to grow timber. Take for instance, the land I am now clearing six miles from Milwaukee; it has been held by one owner for thirty-five years idle, except for the growth of its wood. There has been no time in the last twenty years when the wood on an average acre would not have sold for seventy-five dollars, and the same acre put under good tillage would have given a net income of five dollars per year. The seventy-five dollars put at six per cent interest would have given four and a half dollars, thus making the annual net income nine and a half dollars per acre; this multiplied by 110, shows conclusively that to that owner it was not a paying investment.

The annual growth of at least twenty acres is needed to supply an average family with fuel; twenty acres of such land gives us one hundred and ninety dollars annually with which to buy fuel. The conclusion is, that it will not pay to use such land for timber growing. Of course there are other considerations besides dollars and cents that would lead us to plant and cultivate more or less timber in all localities.

Let us next consider an average farming community, with its little villages and hamlets, all in what is usually termed a timber country. The original forest is perhaps three-fourths gone, and the question of future supply frequently suggests itself to the thoughtful land owner. Here timber culture in belts or solid fields will doubtless pay, but it is rather a long-winded investment, with the pay all on the far end, while we are an impulsive people, very energetic and active, but anxious to see the dollar we work for very soon after our work is done; so the timber planting on any extended scale is likely to move a little slow.

In many instances, the timber that remains has attained its largest value, and is annually losing rather than gaining, and it seems just as important and just as good management to harvest such a crop as a well matured crop of hay or grain, but if it is to be harvested speedily, speedy and earnest measures must be taken for a new supply. In this direction, much may frequently be done by simply protecting what is already growing. On almost every farm there are neglected corners, parts of a remote pasture, knolls too barren or ravines too broken for cultivation, on which we may find thickets, groups or scattered plants of all our leading timber trees. Mingled with them are plum and hazel bush and brambles. Remove the worthless growth; cut out the weak and poor where too thick; plant a few trees when too thin. If small, exclude farm stock, but if above the reach of cattle, use the land for pasture, and in ten, fifteen or twenty years you, or those coming after you, will have something valuable for immediate use, or that will go on for ten or twenty years more at a greatly increased rate of gain.

The first few years of young timber growth seems small and slow, but as the rootlets reach out into broader feeding grounds, and the annual rings gain a larger circumference, the rate of increase is something like that of the rolling snowball. Nor is the early growth so very small. Six years ago I took a little bundle of fifteen Scotch Pine, weighing altogether perhaps ten pounds, and planted them in pasture sod on a steep, gravelly knoll, almost worthless for any other purpose. The planting cost, perhaps, two hours' labor; they have been spaded around just once since, cost-

ing another two hours' labor; to-day the lot average ten feet high and three inches in diameter. I was recently crossing a very poor, sandy farm; so poor that in places the sand drifted. Across this farm ran a belt of oaks twenty to thirty feet in breadth, which had sprung up in the line of an old fence. Choppers were at work cutting these into fire-wood, and the yield did not vary much from a cord on every two rods in length of the belt. Counting the grains showed the time of production to be about twenty-five years; certainly not a bad crop for such land. Where fences have remained for a long time undisturbed, we frequently see lines of young trees, ten or twenty feet high. Very energetic and tidy farmers count these as blemishes; evidence of slip-shod farming. On their farms the fences are frequently moved, and the young trees grubbed out. Yet it is possible that such tree lines, in a thirty years' run, might compare favorably with the average value of other crops, and if such lines are on the west or north side of the farm, where shelter is needed, it is more than possible that we might profitably add to them by planting and culture, until they grow into close and thrifty timber belts from ten to twenty rods in breadth.

"We cannot spare the land," is a common excuse for not planting. If every acre of the farm is highly cultivated and made to produce up to its full capacity, then this excuse may be valid, but if only the half of this be true, then we may thoughtfully consider the policy of *fewer acres* and *better culture*, thus releasing a part from annual cropping, and placing it under tree growth, which may, with very little labor, at some future time, yield a rich and abundant harvest.

To the dweller on the broad, open prairie, there can be no two sides to this timber question. Abundant and cheap lands; scarce and dear fuel and lumber; burning straw and hay, and even the golden corn, all of which could be more profitably utilized; hauling his scant supply of lumber twenty or forty miles; parched and dried by summer winds, and pelted by winter storms, that strike him with the accumulated force of five hundred miles' unbroken sweep; if alive to his best interests, he will hasten to plant broad acres with trees, and to place dense timber belts between his buildings and the prevailing winds.

This work is most surely and rapidly begun with the native cottonwood, whose young seedlings are found by millions in the valleys of most large streams. Seedlings of one season's growth are gathered at twenty-five to fifty cents per thousand, and handled and planted with reasonable care, ninety-five per cent. will grow. With three seasons of good culture, they will make an inch diameter, and six to seven feet height. After this they need little attention, except to thin them out as they increase in size, and for this the clippings more than pay — they should be planted on ground that has been cultivated one or more years. Four feet each way is a suitable distance to plant these and all other deciduous trees, for timber growth; wider planting may give stronger growth, but it will be branchy and straggling, a poor foundation for the tall, straight trees we aim to grow.

The first cost of close planting is a little more, but it is paid for ten-fold by what is from time to time thinned out; on a ten or twenty acre plantation, after five years, such thinning will nearly or quite furnish the year's fuel, and after six or eight years, light poles for various useful purposes can be freely used. At five years, the shelter from prevailing winds is quite apparent, and from ten years onward becomes almost invaluable.

Having a good beginning of Cottonwood, Black Walnut, White and Green Ash, Butternut, Black Cherry, Oaks in variety, Box Elder, Soft Maple and Elm are all good trees to plant, and, with the exception of the oaks, are all easily started, and free growers. All should be started from seeds or one year old plants, and should have thorough cultivation until such time as they so shade and occupy the ground as to keep down other vegetation.

Poplars and Willow may also find a place, when something better is for the time being beyond our control. These grow readily from cuttings, as does also the Cottonwood.

If to be had of small size, and at moderate prices, evergreens must also have a place, especially about our buildings. Of these, Norway Spruce, White Pine and Scotch Pine, as strong growers, will be most successful. Siberian and American Arbor Vitæ and Red Cedar are all valuable for small, single specimens, and for nicely sheared hedges.

In essays and sermons it is customary to set a high standard and write and speak of things as they should be, whether in general practice we might hope to reach the full standard or not, but such treatment of this subject would fill a volume, and would probably do less good than this brief mention of facts as they exist. As a rule men will do promptly and cheerfully only those things which seem most sure to *pay*. Applying this to our subject, we do not hesitate to say that on all prairie farms, it will richly pay to plant trees, and to plant so abundantly that there may be a full supply of fuel at an early day, and in the future a large share of what may be needed for buildings and fences. On lands with more or less timber now growing, it will certainly pay to plant enough to keep that supply good.

On any broken or waste land not well adapted to tillage, may it not be a good investment to plant with the slower growing but more valuable trees, that shall go on with very little cost or trouble to us, laying safely aside an accumulating value that may come in thirty or forty years hence as a very acceptable dividend or life insurance fund to ourselves or our children?

In comfort gained and in gratification of our love of the beautiful, it will surely pay to plant these living and improving wind barriers in all exposed positions, and to plant well arranged groups and single trees about our homes, and lines of trees along our highways to afford grateful shade, and beautify the landscape. At the request of the Wisconsin State Horticultural Society I have prepared lists of the varieties best adapted for these purposes, which I will present here:

For timber of rapid growth and easy culture. (Valuable in order named.)

Black Walnut.	Soft Maple.
White Ash.	White Elm.
Black Cherry.	Box Elder.
Butternut.	Cotton Wood.
European Larch.	White Willow.

In commencing to plant on a prairie farm, reverse the order of this list.

For timber of fifty to one hundred years' growth.

White Oak.	Red Oak.
Burr Oak.	Hickory.

For street trees. (Valuable in order named.)

White Elm.	Green Ash.
Hard Maple.	Box Elder.
Basswood (Linden.)	Soft Maple.
White Ash.	

For lawn planting. (Valuable in order named.)

Cut-leaf Weeping Birch.
Norway Maple.
Linden.
Green Ash.
Horse Chestnut.
American Mountain Ash.
European Mountain Ash.
European Larch.
European Alder.
Weeping Poplar.
Weeping Mountain Ash.
Weeping Golden Bark Ash.
Kilmarnock Weeping Willow.

At the conclusion of his paper Mr. Stickney said in further explanation of the list and the subject that, in the first list the varieties for winter planting are given in the order in which I would rank them as to their value when grown, but in planting, I would reverse the order completely; commencing with the White Willow and Cottonwoods, leaving the willow out entirely, if I could have the Cottonwood, simply because the Cottonwood is so very hardy, takes root so readily and grows so rapidly that it soon furnishes a shelter for the others and gives some return in timber and fuel sooner than any of the others, though not of very good quality. I am aware that there are many trees recommended for ornamental purposes not mentioned here. I have only given the most valuable for use. The Locust is not mentioned because in the southern and central parts of the state it has proved almost worthless on account of the depredations of the borer. It is quite valuable for some timber purposes. The common Yellow Locust of our country I regard as nearly equal to the Red Cedar for fence posts, and it would be almost invaluable for this and other purposes were it not for the injury done to it by these borers. As a rule, all that are planted are either destroyed or so much injured as to be useless. It has other disagreeable qualities; as its thorny character, its propensity to spread all over the ground; shoots will keep springing up from the roots all around where the tree stood for years after it is cut down. For these reasons it has been thrown out of all lists of trees for general planting. The variety called the Black Locust, with a smooth, dark colored bark, is a much hardier tree, but its timber has not the enduring qualities of the other, at least not to any such degree.

I agree with Mr. Wood in what he said yesterday about the advisability of cutting timber when it has reached its growth. It is as important to harvest it when it has reached perfect maturity as it is to harvest grain when it is ripe. The timber has

then attained to its best estate, and, if left standing longer, it will depreciate in value. I gave the age of some of the oaks in this piece of timber land I am clearing as three hundred years, but I counted the rings in tree after tree there that were over four hundred years old; I gave the smaller number so as to be within the limits of possibility of believing. There is little doubt but that those trees, in an equally favorable market, would have brought more and been more valuable one hundred years ago than to-day. I think they have been diminishing in real value for that length of time. Some of the finest looking trees, nearly three feet through at the butt, had decayed and showed brackish places in them near the top where large limbs had died or been broken off, which spoiled them for timber purposes.

When timber has reached maturity, it is true economy to cut it and get the greatest value possible for it; but we must not lose sight of the fact that it takes a long time to replace it. We are not taking as energetic measures as we should to renew our forests, but with the urgent necessity there will come a remedy. In Germany and other European countries the farmers are required by law to cultivate timber; such a portion of the soil is to be set out with trees, and a certain amount is required to be cut and replaced each year. Does anyone doubt but that when the pressure comes on us, as it came upon them, when fuel and lumber become so scarce as to make it an object, this intelligent, wide-awake and thoroughly alive people will do what is needed and enact laws that will secure what is needed? This time may be in the remote future, and I am led to believe it is, from the fact that we have thousands of acres of young native timber that is growing up and also thousands of acres of heavy timber lands that are not now accessible; but when the demand sharpens, new lines of transportation will be opened to them, and they will be brought to market, but when the time does come, we shall not be so stupid as to sit idly by and freeze to death.

There is one statement made by Mr. Wood that I do not agree with, and I wish to correct, viz.: "That it is not possible, in his opinion, to raise good timber from planted trees." This cannot be true. If Mr. Wood will count the rings in those large trees he

is now cutting he will find it has taken one and even two hundred years to make them what they are. Then if he will go into any of the thick groves of young timber that have sprung up wild, and have grown to be twenty feet or more in height, he will find that the thickness of the setting has so crowded up the growth of those trees as to give them the straight, trim and handsome little bodies that will make, in a hundred years or so, large, straight trunks like those of the trees he is now cutting down. What is needed is simply to follow nature, and where we want a growth of forty feet or more, set the trees close together, say four feet apart, so that the growth developed by nature and cultivation will crowd the trees up in straight rows and bodies, and not allow them to branch out in every direction. This was the mistake that was made in tree planting in many parts of the country at first. They thought better to give plenty of room and to give the desired shape by pruning, but they soon found that the pruning was expensive and that they could not secure a straight, upward growth in this way, and were driven to close setting to accomplish this.

J. W. Wood — I agree with President Fratt, that we should not be held responsible for the ideas we advance here, but I think that if any remarks I may have made called out this animated discussion from friend Stickney they must have been well said. The timber in which I am located is not the Burr Oak, or the White or Black Oak of the clay ridges, but the heavy timber of the Baraboo Valley, tall, straight, thrifty Maples, Elms and Oaks. In clearing off my building site, I left quite a number of these Maples, as ornaments for the dooryard and around the house. They were nice, thrifty trees, in good condition. They were beautiful trees and I was very glad to have them there, but they soon commenced to die in the top, the limbs died away and the bodies commenced to decay, and I have been compelled every year to cut down some of them because they were unsafe in the yard. This native timber will not bear civilization. If you leave patches in the field for groves or for timber purposes, when the supports around are cut away the trees will commence to blow down, rot and die out. The timber has got its age, it is

ripe, and the exposure hastens its decay. Were I to prepare for ornamenting a building site again, I would cut off all the native wild growth and then go to the woods and get young trees to set out around the house to grow up with top and form suited to the conditions in which they are placed.

J. C. Ford, of Madison — I would like to ask Mr. Stickney why he does not include the Black Walnut in his list of trees to be planted on the line of roads and farms. He has it in the first list of rapidly growing trees. It is certainly a very fine ornamental tree, bears nuts abundantly, and, when grown, makes valuable lumber. The branches are sturdy, and the tree is not apt to be broken down by the winds, and I should think it would be a valuable tree to set along the line of the streets in the country.

Mr. Stickney — The gentleman will notice that, by reversing the list as I recommend in planting, the Black Walnut comes last. This was done mainly because it is not the most rapid growing of those trees. All he says about the quality of the tree is true, but by observing it carefully you will discover various little objectionable things in it as a street tree. It would do better for this purpose in the country than in the city or village.

Mr. Ford — It is mainly with reference to country planting that I speak. Until within a few years I had no idea that it would grow in the open country. My brother has a few young trees along the street in this city. They are about twenty years old, ten or twelve inches in diameter, perhaps, and bear two or three bushels of nuts apiece. They are certainly a very handsome tree in the grounds.

Mr. Stickney — I have had them on my grounds for thirty-two years, and now have the third generation in bearing. If you will notice a Black Walnut standing singly, you will observe that the vegetation under it is very scant compared with that under the Linden or almost any other tree. No crop will grow under it, or very near it, with the same thrift as under other trees. Whether this is caused by the drip of the tree, or because the tree is such a gross feeder, exhausting the soil, remains a question. It leaves out a little late in the spring, which is rather against it as

a street tree. It is also frequently partially or entirely stripped of its foliage in midsummer by certain caterpillars which may be often seen gathered in rather uninviting masses on the body of the trees, going through the moulting process. The drip of the tree is apt to disfigure the fences and vegetation or ground under it. It is apt to shed its foliage freely, and is not a real cleanly, nice, inviting tree for shade or ornament. It grows rapidly, and its timber qualities are excellent; but I do not think we can recommend it generally as a street tree in the city or village. In the country, where there are three or four rods of unoccupied land along the road, it may be well to plant it.

Mr. Ames — It is said that orchard trees standing near the Black Walnut do not bear.

Mr. Ford — It might be well to find out if this is a fact. I know that fruit trees standing near the trees I have spoken of bear abundantly.

Mr. Stickney — If it has this effect at all, I should attribute it to its being a gross feeder.

President Smith — In father's orchard, in New Jersey, Black Walnut trees stood among the apple trees, and I saw no difference in their bearing on this account.

Dr. P. R. Hoy — The main reason why vegetation does not thrive under these trees is the poisonous character of the drip. The juice of the leaf is poisonous, and a decoction made of it and applied to a horse with a sponge will keep off flies, and is offensive to almost all insects.

Mr. Plumb — In relation to prolonging the life of our native forest trees, I would say that some time ago I saw a Maple orchard of old trees, as old as any in the country, standing in the cleared land in the northern part of Waupaca county. It was owned by a German farmer. On clearing off the timber around, he had cut away about one-third of the tops of the maple trees he wanted to save, and he continued to cut away a portion of the tops for a number of years. In this way he had saved the trees. I have no doubt the same treatment would work favorably with other forest trees.

A short time since I was in De Pere, and the manager of the

largest wooden-ware manufactory in the state made inquiries in regard to the cost and the best manner of raising hoop-poles. He said the company had one hundred and sixty acres they were intending to use for this purpose. On being informed as to the probable cost, he said, "We buy them for less than that now, but it is not a question of present cost at all, but of supply." If used at the present rate the supply would soon be exhausted, and he feared that, too, before they could raise them. Those engaged in other branches of manufactures fear a like result with regard to other kinds of timber.

Mr. Kellogg, Janesville — Yankee ingenuity will find a way of supplying the deficiency when the emergency comes, but the great trouble is with our pine. That is being cut off very rapidly, and we cannot grow pines for lumber purposes. Unless something is done, our lumber supply will soon be exhausted. We have firewood enough; more than thirty years ago, and in the southern part of the state the supply is increasing continually.

I think the nut-bearing trees are especially adapted to street and line trees. The Hickory is the best nut, and bears abundantly, but it is hard to transplant and propagate. I regard the Butternut as better than the Black Walnut. It grows rapidly; it is easily transplanted, bears when quite young, and abundantly, and is a handsome shade tree.

Geo. A. Austin, Neillsville — I do not see what can be done to protect the pine forests. The legislature cannot stop the cutting, and if they prevent other use being made of the land when the pine is cut off, it will not reproduce pine. In some places, hard wood comes in after the pine; if nothing else, it grows up to poplar. In Clark county, maple takes the place of the pine.

A. G. Tuttle — The same thing is true in Michigan. Where the pine is cut off, other timber comes in. In many of the pine forests in our state there is an abundance of small pines coming in. In some places I have seen them very thick from one to two feet high, and more than enough to replace the old trees, and stock the country, if they could be preserved. The way the pine is being used up, especially in such winters as this, it will soon be gone; still, I believe that more is being destroyed by the fire than by the axe.

THE APPLE CROP AND ITS MANAGEMENT.

By J. C. Plumb, Milton.

The apple crop of 1880 will not be scon forgotten by the fruit growers of the west. In many sections of southern Wisconsin, tens of thousands of good fall apples could have been bought, delivered at ten cents a bushel. At this price they were fed to stock, left to decay or a more wasteful use of feeding the cider barrel and fostering the appetite for a stronger beverage. Even this resource failed, as barrels could not be had for either fruit or cider, and so from cellar to garret piles of apples in all stages of decomposition were to be seen in many a farm house; the barn floor was used as a temporary storage until crowded out by the corn pile. All sorts of temporary expedients were resorted to, to carry the bountiful supply over to a better market and winter use.

For want of the proper storage and fixtures, this unusual crop was half of it lost to the grower by actual decay or a bottomless market. Good winter varieties were allowed to hang on the trees until over-ripe and were put into the market in competition with short lived sorts for cooking apples. On the 28th day of October last I saw beautiful Northern Spy on sale in this city, at the store of Mr. Huntley at twenty-five cents per bushel retail, while to-day no better are sold at one dollar per bushel. Utters, Plumb's Cider and Fameuse were ranked only as fall apples and sold at current rates. Unfortunately the larger part of our bearing trees are not long keepers and in seasons like the past, when all ripened fifteen to thirty days before their usual time, the overplus was the more apparent. The result was an over supplied market, prices unprecedentedly low, and a large portion of the crop as good as wasted, in hundred of cases. Enough wasted to have given a a winter supply to ten thousand families now destitute.

The idea has largely prevailed that Wisconsin was not, nor could ever be, an apple growing region. But this illusion is now dispelled. We have profited by the lessons of the past, and now plant and grow varieties found equal to the vicissitudes of our climate, and planters are calling for good keeping apples. Nor is

orchard planting on the decline, but increases yearly, and it is a fact well known by some of our tree growers, that there are not enough trees of this class of winter apples growing in the state to supply the ordinary demand. In a paper on this subject two years ago, published in our volume IX, I endeavored to show that the export trade of apples fresh and dried was assuming grand proportion. In 1877, over three millions worth were sold, and probably more than double that the last year. I then used these words: "But any possible figures on foreign demand are feeble to express the amount of fruit consumed in American households." This home demand is increasing vastly beyond the ratio of increase of population, and yet do we not waste enormous quantities of fruit in years of abundance? A full crop finds us with no adequate facilities or preparation for its most economic disposal. This condition of things meets us every year of abundance, and it is time the fruit growers of the west were prepared to save the entire crop for its best uses, and the main object of this paper is to show *how to utilize the apple.*

The usual processes of picking, handling, storing, drying, canning, keeping and marketing the apple are too well known to require words here; suffice to say that as ordinarily practiced they fail of giving best return to the grower. Apples, designed for any but immediate use, should be hand-picked and handled as carefully as if each were an egg. Both their beauty and keeping quality depend largely upon this care. Decay commences at once with the bruised portion, and no after care can remedy the evil.

To facilitate hand-picking, the trees should branch low, and be kept somewhat open by judicious summer pruning; thinning the crop thereby will generally give more value to the fruit. A convenient step-ladder should be ready, with plenty of small hand-baskets, and a letter S wire for each to hang to a limb or a belt at the waist of the picker. Another useful tool is a wire hook fastened to the end of a light pole, six feet long, to bring limbs within reach of the picker. The best form of step-ladder we have used, is one made of a stout twelve-foot pole, split at butt, and rungs or strips put in sixteen to twenty inches apart, in the form of a

ladder with a wide base, but with the top end firmly bound together, forming a point to shove up into the tree for support.

It is well with early apples to go over the tree two or more times and remove the finer and early specimens first; the lesser and later growth will increase in size rapidly after this thinning out. The fruit should be emptied from the picker on the ground or assorting tables, and carefully assorted *at once*, in the orchard. No second sorting should be allowed. Those for market or storing should be put at once into barrels or cases, and be got into some cool place, where they can remain with least change of temperature possible. No "sweating" is needed; indeed there is no such thing. Evaporation will not improve the apple, but rather injure it, and condensation of moisture, called sweating, shows a change of temperature not conducive to the keeping of the fruit. If the store room be of an even, low temperature of 45° or less, the fruit will require very little ventilation.

Storage. An ordinary house cellar, if plastered over head and well ventilated, will do very well for winter storage in a small way; but for commercial purposes we require storage room which, from September 1st until the next June, will hold a temperature of 45° or less, down to 30°. This may be accomplished at considerable expense by the use of ice. The fruit dealers of northern New York are now using houses of 10,000 to 20,000 barrel capacity, which are designed to preserve apples and pears for the eastern and southern cities, as well as for foreign exportation. The proportionate expense of a house of one hundred barrel capacity would be much greater, and but few even of our city dealers will venture the expense, unless in connection with a meat and poultry business.

A comparatively inexpensive fruit house may be constructed by any farmer, which will enable him to keep all varieties of fall and winter fruit until spring. My plan is as follows: Excavate as for a barn cellar, four feet deep and of the desired size to get the capacity wanted; build good stone or concrete walls eight feet high and one foot thick, and use the earth taken from the excavation to bank up to the top of the wall on three sides. The north end to be protected by a lean-to shed, and have here the

one entrance door. Use eight or ten inch joists, which should be set down level with the wall, ceil overhead with good seasoned, hard pine fencing, and fill in with saw dust or chaff, well packed, and floor over to suit convenience. Every ten feet of extension should have a foot square ventilator, which should communicate with an opening in the ridge of the building. The roof and upper structure may be made to suit the further use which may be required of the same, provided it affords ventilation at all times, and keeps off the rain and snow. This basement or underground room may be partitioned to suit the wants ot the farmer; but there should be at the entrance end a work room, lighted from the end windows and the door, and separated from the main storeroom by a stuffed partition and double door. The only access of air to the fruit room should be through registers at the end or sides of the room and at the bottom, communicating with deep earth passages running at least two ways for one hundred feet before opening to the outside air. This air passage should be of stone or tile, and be made so it will be free from rats, or rubbish of any kind. The object of this deep earth ventilation is to secure air *from without and of low* temperature, summer or winter, day and night.

The cost of such a store house will vary according to local circumstances, but at best need not be very expensive, and will prove valuable for keeping surplus fruits and vegetables to a time of greater need. Any builder can estimate the cost for his locality when he knows the size desired. Upon the same principles of construction the farmer can build temporary storage with plenty of poles and straw, so that he may have uniform low temperature and protection from frost.

With our fruit house constructed, we may commence picking our fall apples ten days before they are ripe, which last fall was September 1st to 15th for Utters', Plumb's Cider, Fameuse, Fall Orange and others of that class, in Southern Wisconsin. This was some ten to fifteen days earlier than their usual time of ripening. These fall apples put into our fruit house will ripen slowly, and, when winter fairly sets in, will not be too far along to keep on till spring. Later ripening varieties will not need to be picked until nearly matured.

For home use and near market we find the bushel crate to be both convenient and cheap, which we construct as follows: twenty pieces lath two feet long constitute the sides, top and bottom; we use ten-inch boards cut eleven inches long. To these the lath strips are nailed about one inch apart, using six-penny nails for bottom and four-penny for the rest. These hold a full bushel. We pack and nail up in the field, when they are ready for the wagon and store-room. These crates cost us about six cents each, fifteen cents per barrel. They are at all times easily unpacked and of good size for retailing, especially for early fruit, either in one bushel or one-half bushel, free cases.

What constitutes a winter apple? One that does not mature its juices until winter. "Ripening" or maturing is a natural process which requires a high temperature, and if allowed to be completed upon the tree, the fruit will soon decay. If arrested at the right stage of maturity by cold storage, the fruit will keep indefinitely and ripen according to the degree of temperature it has in the store-room. Most fruits are of best quality ripened upon the tree, but the russety apples and pears are always best when ripened in close quarters in our dry climate, as they lose their juices by evaporation, and become tough and leathery if exposed.

This brings us to the important fact that not all varieties will ripen and be their best under the same conditions of heat and moisture. For example, we have some excellent summer and autumn apples, which, if ripened in the heat of their seasons are of fair quality, but which would not mature their juices in cold weather and be of good flavor and texture. On the other hand, we have those which hold their own and are vastly improved by this prolonged ripening period. Of the two classes we will name the Duchess, Tetofsky, Colvert and Ben Davis, all of which are coarse in texture, and have diffuse juices, which can never become good winter apples, even though they may not mature until cold weather. For the other class I will name Summer Pearmain, Talman Sweet, Golden Russet, Blue Pearmain, Baldwin, Walbridge, all of which are best when ripened at a low temperarure and in close quarters. Almost any little, fine grained seedling

with rich juices is better than the class first named for winter and long keeping. Our choice of winter fruit must then be with due regard to its essential quality. A first class apple will be better, and a poor apple will be poorer for keeping and ripening its juices in mid winter.

With all possible provision for keeping the larger part of our fall and early winter apples into full winter and spring, we will have a surplus of excellent fruit which should be used in drying and canning. For the first, we have the old time methods of paring, coring and stringing, and hanging to the ceiling of the kitchen, and we have the improved machinery which pares, cores and slices at two or three turns of the crank; enabling one person to work up twenty-five bushels per day. We have also the automatic driers, which receive the sliced apple fresh from the machine, and pass it out in twenty minutes, ready for the barrel without fly specks or eggs which often spiced our mother's apple bag, within and without. One of these improved factories run in connection with a fruit house at Spencerport, New York, worked up nearly 20,000 bushels of apples the past autumn, all by this plan, and the product is mostly now in foreign markets at remunerative prices. The Siberian family have many of them so thin a skin that with the core slipped out they may be dried by stringing or after slicing, and will be found of the richest of dried apples and no way inferior to the best in the market. For canning, the improved Siberians thus prepared are superior to all other fruit for ordinary family consumption.

Canning need not be an expensive process for the apple. We use good stone ware, sizes from five gallons down to one. The stone churn is most convenient, sealing the small plate cover with a cement made of rosin, three parts, tallow, one part. The addition of a little whiting or pulverized chalk will give a desirable stiffness to it. *Use no sugar in the canning*, but flavor when used to suit the taste. It is found by the tests of science, that a large part of the sugar used in canning is wasted, the contact with the acid of the fruit in cooking converting it into glucose. These large packages of fruit can be opened in winter and re-canned or kept open until used up.

I have been assured that fresh picked apples barreled with sweet cider would hold their flavor perfectly for months. Having never tried it I can only say that my opinion is that the flavor of apples so kept would be that of cider, hard or soft, sweet or sour. If the cider was boiled two-thirds down I think the result would be more satisfactory. If by any or all the modes I have named for utilizing our home-grown apples, we may save the surplus of our annual crop for its best uses, we will be the gainers by tens of thousands of dollars now paid for imported fruit.

KEEPING FRUIT.

By Chas. Hersinger, Baraboo.

This subject has been assigned me for a paper on this occasion. It is a little out of the line of the subjects to which I have usually directed my attention, as all my previous efforts have been to show, or try to show, that fruit can be raised in Wisconsin. But here I am, like the preacher who kept preaching to the same congregation, "repent and be converted," till one day one of his devoted hearers stepped up to him, and, tapping him on the shoulder, said, "Parson, what makes you keep preaching 'repent and be converted' all the time? Why not preach on some other subject?" "Oh," said the parson, "if you will just repent and get converted, then I will show you how to grow in grace." Now, as the growing of fruit has been a success in so far that some, if not all of us, have some fruit to take care of, it is but natural that we turn our attention to the best method of keeping it till we have a market for our surplus stock. In taking up this subject I am aware that the ground has been well trodden, and older heads than mine have let their light shine upon it, until it seems almost useless for me to attempt to add anything to what has already been said on the subject; but as it is the fashion to obey the orders of our superiors, I, too, must obey. But here let me say in starting out that I will simply give my experience from a practical standpoint, and let others treat of the theoretical part.

In order to keep apples, there are some things that it will not do to forget, and therefore I shall be compelled to go back to the

picking of apples, as so much depends upon the condition apples are in when picked, that the picking must be well and carefully done. Without going into detail as to picking, I will only say that, first, apples must be ripe when picked; second, they must be hand-picked, and, third, they must be carefully handled. Do not drop them into the basket, but gently lay them in; and right here I will say, it is best to dispose of all the summer and some of the fall apples at once, without any attempt to keep them longer than is necessary to put them into barrels. See that you press them in well, and ship them to some market at once, and be contented with the market price, which they will surely bring if they are properly assorted.

This brings me down to the subject of how to keep apples, and right here I will add that my experience teaches me better than to give one rule only, and to attempt to keep all kinds of even winter apples under the same conditions and treatment, as I find that some varieties should go into the cellar at once, when picked, whilst others should remain in the fruit-house or some out-house for a period of time, according to the variety.

It would be impossible for me in a short paper to show what treatment to give to each variety in the long list of varieties we have, and yet it will be impossible to make myself understood without telling you just how I go to work; and for the purpose of shortening this paper I will drop out most of the varieties and commence with the Fameuse. Pick the apples when fully ripe, and pick all on the tree at the same time, so that it will not be necessary to look after that tree again. Then they are to be taken to the cellar and assorted, and the first-class apples immediately put into the cellar on shelves or bins, and the balance sent to the cider-mill to be worked up. I give the same treatment to the Haas and Pewaukee, and many other varieties, and pick the Pewaukee and Haas about the same time. The Plumb's Cider is left in the fruit house one week, then assorted and put into the cellar in bins or boxes.

The sweet apples are taken to the cellar at once and placed in bins or boxes. Two bushel boxes are the most convenient, yet I am using mostly three bushel boxes. I place the first box a few

inches from the cellar floor and put 2x2 scantling across the top of the box to set the next box on, and so on. I usually have my boxes three deep.

Golden Russets are placed in new barrels. The barrels are filled even full and placed in the fruit house ten days; then they are put into the cellar, the barrels are set on end, the head is placed on the top of the barrel, so that another barrel can be set on top. No ventilation is given them, except such as our apple barrels furnish. Other winter apples of the sour varieties are allowed to remain in the fruit-house from ten days to two weeks before moving them into the cellar. The doors and windows are left open day and night, except those on the south side, to allow a free circulation of the air. I will now describe the bins in which I keep apples. I make them by using 2x2 scantling for posts. The posts reach from the cellar floor to the joists, and are set three feet apart. The bins are three feet wide and from eight to nine feet long. The first bin is placed eight inches above the ground or floor of the cellar; the next bin is twenty-four inches above the first, and the third still higher up. All the bins are eight inches deep, and are filled heaping full. This is a convenient way to get at the apples; besides no room is lost, as more apples can be stored in the same amount of space in this way than in barrels, and it is also more convenient than the swing bin or shelves, as well as safer. The bins will need to be made quite permanent, and can be moved readily when empty.

Now the apples are in the cellar, and it would seem that I have done my part, but such is not the case; now comes the tug of war, which, however, would be easy enough if I had a refrigerator, but I have not. I have only a cellar. I am not to enlighten the professionals, but simply to give my experience to the amateur, and this paper is only calculated to benefit him if anyone.

But I am digressing; and to come back to the cellar. The doors and windows are now opened and allowed to remain so day and night, except in case there is a spell of very damp weather; then the cellar is closed on the side towards the wind till the weather changes, when the windows are again opened. This year they were open when nine degrees below zero was reached,

but were soon closed in the morning when I discovered that there had been a slight change in the weather during the night. And now to go on and tell you just what I did from that morning till this would take up too much of your valuable time, but to sum up, I will say that I have managed to keep my cellar from two to five degrees above freezing; it only reached eight degrees above once. During this time the cellar has had ventilation by means of windows and doors on all sides, and has also ventilation through the top of the roof by means of a flue in the chimney which starts in the bottom of the cellar. The cellar is naturally dry, which is essential to the keeping of apples, as apples kept in a damp cellar will not keep well, even at a low temperature. This cellar is used for fruit only, which enables me to keep it very near freezing point.

The following are the few important rules that I observe: First, never pick apples to keep when wet, but should I have no dry time in which to pick them, I am compelled to do it. When they are wet, I spread them out in the fruit house till dry. Second, I never put apples in the cellar unless perfectly dry. Third, in December all my apples were sorted over, and have been left undisturbed since then. Fourth, apples are not put in the barrel till a ready market is had, and then they are all sound when they leave my hands, and I know just what customers get, which would not be the case were apples placed in barrels at once, when put in the cellar, and headed up, as has been recommended by some. Fifth, I see that apples are well pressed in the barrel. And now a word to those who may say that I have simply told them what I did, and described my cellar, and said nothing as to the result. I will add that my apples are now in splendid condition, with but very few rotten ones in the cellar. The fruit which I have on exhibition below was kept in this simple manner, and is a fair sample of what I have left at home.

Mr. Wood — This question of the proper temperature of our cellars is a very important one, as we often have fruit and other things of much value stored in them. I have had considerable experience in this matter, but the results have not been very favorable until the present winter, and I think the reason has been,

because I did not know what the temperature actually was. One cannot judge correctly by the feelings, for, coming from a warm room into the cellar, it seems quite cool, and you are satisfied that it is about right. This winter I determined to regulate it more carefully, and bought three or four thermometers, and hung them up in different parts of the cellar. It was soon evident that the tendency had been to keep it too warm. By these thermometers I could tell what the temperature was, and, if too high, could easily reduce it by opening the ventilators. It has been very near the freezing point all winter; in fact one of the thermometers has stood a little below it for six weeks, without any perceptible variation. Everything has kept well. I am satisfied that it is not wise to attempt to keep fruit or vegetables in our cellars without thermometers.

B. S. Hoxie — It may be easy to keep the cellar at a low and even temperature in such a winter as the present, but how would you do in such a season as the one last year?

Mr. Wood — You can regulate it by the weather outside. If it is cold outside, and you want to reduce the temperature of the cellar, open the door or windows. If the weather turns warm outside, shut the cellar up tight. There are days in every season when you can reduce the temperature within by exposure, and then, when cool enough, you can shut it up and retain a low temperature for some time.

G. J. Kellogg — There is no trouble in keeping the temperature low enough this winter, but the main trouble has been to keep it from getting too low. Many cellars have frozen up, notwithstanding all efforts to keep the frost out. Some of us are anxious to know how to raise the temperature when too cold, and how to keep our fruit from freezing. A slight covering over apples will protect them from injury, even where the temperature remains two or three degrees below freezing for a number of weeks, and they will keep all the better for it, but if it goes much below this they are not safe. Most cellars have no place for setting up a stove. I would like to know if any have used oil stoves successfully. I have been fighting frost for the past six weeks, and have succeeded in keeping the cellar at two degrees below freezing, by kettles of coals from a wood fire.

Charles Herschinger — Where the chimneys run to the bottom of the cellar the best way is to put in a stove and keep the temperature from getting too low.

J. C. Plumb — The experience of every one who has tried these methods is that they are not satisfactory. They all require a good deal of attention and labor and at the best, you cannot get an even temperature; part of the time it will be too warm and then again, too cold. I have been satisfied for years that we must have a different system for the ventilation of our cellars, both in winter and summer. The most feasible plan, I think, is sub-earth or earth ventilation, passing a current of the outside air through an under-ground channel a sufficient distance to have it modified by the earth temperature. Then winter or summer there will be but little variation in the temperature of your cellar from that of the earth, which averages from forty-five to fifty degrees. The water in shallow wells if covered so as to protect them from the influence of the outside air will remain about at this point the year through. By means of large bodies of ice an even temperature can be secured in fruit houses built for this purpose, but the plan I have mentioned seems to be the only one that can be brought into general use.

I wish to criticise one point in Mr. Herschinger's paper, that is that apples will not keep well in a damp atmosphere; just the reverse is true, as has been proved by many experiments of late. I would ask him what the condition of the air is in his barrels of Golden Russets, headed up tight? Is not the moisture all retained? Is it not very damp? Damp air is essential to the well keeping of fruit, provided it is of a low temperature. But a moist and high temperature causes apples to decay at once. If it must be high, then it is better to be dry, but where low, the dampness is beneficial.

Mr. Herschinger — The Golden Russet requires more moisture to keep it well than other varieties. Ventilate your cellars all you can and the air will be damp enough for apples of other kinds, but not for the Russet, and hence I give them different treatment I once had a cellar with a stream of water running through it, but the fruit did not keep as well in it as in the one I now have, which

is very dry. Where the cellars are shut up tight, with no ventilation except through the roof, the air will be sufficiently damp and often too damp to keep fruit well, and hence I claim that the fruit should be kept dry, as dry as you can get your cellar, and then there will be dampness enough.

B. B. Olds, of Clinton — I can say from my own experience that different varieties need different treatment. As stated, the Golden Russet needs a greater degree of moisture to keep it well. This is a point of a good deal of importance. The plan of securing an even temperature by sub-earth ventilation looks rational and should be tested, as can easily be done.

Senator Arnold — There are a good many fruit men here, and I would like to get their opinion on what will be the effect of the severe weather this winter on the fruit crop.

Mr. Kellogg — That question can be answered better next June than now, but I fear we shall have some orchard funerals then. The trees bore heavily last season, and went into winter quarters in rather a feeble condition. The weather was very cold last month, but I think that very little damage has been done so far; it is from warm weather, which will probably come, that danger is to be apprehended. The weather so far has been steady cold but not so severe as in some other years. In 1875, the aggregate number of degrees below zero in this month was 325, while this year it was 281.

Wm. Gill — If this warm weather is to come, is there any way in which we can protect our trees from injury by it?

Mr. Kellogg — It would be well to shield the bodies on the south and southwest sides by boards, lath or paper.

A. G. Tuttle, Baraboo — I have observed the winters very carefully for twenty-five years, and have made repeated examinations of the trees in each season. A year ago, about this time, I examined the trees and found little or no signs of injury. The wood was not colored in the least, but was as bright as in the fall. Last Saturday I examined the trees and found them in as good a condition as a year ago. These two years, this and last, have been the only seasons when I did not find more or less damage had been done in the orchard, more or less coloring of the wood. I

have observed that when the trees have been injured, it has been done by the extreme cold, rather than the sun. It is the cold that does the mischief in the winter and the sun in the summer, and they have precisely the same effect on the tree. There has been a good deal of cold weather this winter, but the season of extreme cold has been very short. In 1864 we had quite a number of days of extreme cold weather. On the 1st of January the thermometer stood at 34° below zero, and for a number of days it stood at 20° at noon. The result was, a great many trees were killed. I have found that it is these extremes, long continued that do the mischief. In such weather the branches of the tree are very closely compacted and shriveled up as though dried by a stove, and where it remains in this state and the winds dry out the remaining moisture, the tree is seriously injured; unless extremely hardy it must die. Twenty-five years ago, peaches raised out of doors were exhibited at the fair at Baraboo, notwithstanding the thermometer went down to — 20° the winter before, but this was only for one day and did no harm. I was very sure before examining the trees last week that I should not find any injury. I examined those that bore heavy crops last season as well as those that gave but little fruit. There has been no injury yet; what may come remains to be seen. If we should have a week or two of very cold weather, and the thermometer should be very low for any length of time, I fear that injury will result.

Mr. Plumb — I agree with Mr. Tuttle that thus far the trees have not been damaged at all. In our examinations we could not find the first sign of injury. I do not believe that cold weather will kill a tree, if it is prepared for it. If it is properly grown and the wood is well ripened it will endure cold without harm. The trouble is in these extreme changes. But there is another source from which injury may come, which I fear far more than all the cold weather. It is the fact that when our winter came on, the ground was exceedingly dry, and froze up dry and is dry yet. The ground was bare the fore part of the winter, and froze very deep, and if the snow goes off and there is a succession of freezing and thawing, such as we usually have in February and March, there is great danger of injury to the

roots and that many trees will be killed. I would advise farmers to mulch their choicest trees, putting it on before the snow goes off and the ground thaws out. This mulch will doubtless prevent root-killing, the thing we have the most to fear to-day.

SMALL FRUITS.

I. N. Stone, Fort Atkinson.

The subject of small fruits has been so widely discussed that it is not expected much will be offered that is new, nor is it necessary to dwell on the importance of growing them in abundance, as the increasing demand for all kinds is sufficient on this. It is my aim in this paper to present a practical method, which I have tested, in field culture and marketing strawberries, raspberries and blackberries, which can easily be adapted to garden culture, with slight variations.

As growers of small fruit, we need to originate, or select from the many methods, one which will enable us to produce and place before the consumer fruit that will not only arrive in a satisfactory, but in an attractive condition. As farmers and tillers of even one-half acre, we should never rest satisfied until we succeed in producing a succession of berries for family use, from strawberries to grapes.

After thirteen years' experience in fruit growing, and a longer time in general farming, I claim every tiller of the soil can produce an abundant supply of berries for his family, with as much certainty, and as little expense for labor, as it would cost to produce a supply of potatoes for the same family; provided, varieties and a method for cultivation adapted to the locality be selected.

We read in the horticultural journals, published mostly in the east, that fall is the best time to transplant; but every practical small fruit grower in Wisconsin knows that early spring is much the best time to transplant nearly, if not all kinds of small fruit roots in this state. While fall planting may be best in certain localities, it will not do as well here.

For small fruits, select land that is free from sod and coarse

manure, but fertile enough to produce a good crop of corn. Much damage is frequently done to newly set plants by the white grub and cut worm. I have tested some of the published remedies to head off these pests, but with only partial success. Seven years ago last fall, I had one acre of ground which I wished to set to strawberries the following spring, and knowing that there were a great many grubs in every foot of it, I concluded to plow it deep just before winter set in. I commenced one afternoon and plowed one-fourth of it. A hard freeze at night kept me from plowing the balance until spring, when I finished plowing the piece, and set it all to strawberries. The plants on the fall plowing were not disturbed at all by the grubs, while those on each side were nearly all destroyed by them. Since then I have adopted the plan of plowing fruit ground just before it freezes up for winter, and have not had any loss from grubs or cut worms. Strawberry ground should be made level and free from lumps.

Roots that have been shipped should be unpacked on arrival and kept moist until planted. Set the roots straight down, spread out fan-shaped. If set in the spring do not allow them to fruit the first year. Use a cultivator that will work deep and not ridge the rows, and do not allow the weeds to get large at any time. In the fall, about the time the ground freezes up, cover the whole surface of the bed with coarse marsh hay, straw, or leaves, thick enough to hide the plants. In the spring leave as much mulching on the bed as the plants will come up through, having a good healthy color.

In preparing a bed for the second year, it is very desirable to grow enough new plants on newly worked soil between the rows, to produce a good crop. To accomplish this it is very important that we prepare the bed immediately after the berries are gathered, by removing the mulching — if it is not fine enough to work into the soil — and cutting the rows down so that they will be about ten inches wide, using a horse and small, sharp steel plow, throwing the furrow from the row. This will leave a ridge between the rows which can be leveled with an ordinary cultivator.

Instead of taking a narrow strip from each side of the row, take *all* from one side. By this plan nearly all of the plants left

in the row are only one year old. Cultivate well until the new plants are ready to root, then allow them to fill the space between the rows, not too thick, however. In the spring cut out the old row if there are enough new plants for a crop, and use the place occupied by it for the pickers to pass through while picking. Should the row left to renew the bed, fail to furnish enough new plants for a crop of fruit, save it with a strip of the new plants on each side. Unless the soil is very fertile, fine manure, free from grass seed, should be scattered on the bed freely after it has been well cultivated the first time, or early in the fall.

To prepare the ground for black-raspberries, mark the rows seven feet apart one way, with a small plow; the other, three and a half feet with a marker. Brush the dry dirt from the place where the plant is to be set, spread the roots, and cover three inches deep with good, mellow soil, being careful not to break the germ of the plant if started. Cultivate both ways the first year, after that once or twice a year, the widest way only, and mulch heavy in the row. The first year pinch off the tips of the new canes when about one foot high, after the first year, when from two to two and a half feet. In the fall or spring cut out old canes and do not leave over four new canes in a hill; cut the branches back within twelve to eighteen inches of the main cane. If a bed should get sodded over and partly run out, it can be renewed by allowing the grass to grow ten or fifteen inches high in the spring, then apply a heavy mulch, enough to bend the grass over.

Red raspberries should be set four by five feet apart. Furrow one way, and set the plants four to five inches deep, and when the new growth is in sight, cut away the old cane, if inclined to grow. Cultivate shallow, and if roots are not needed to transplant, treat suckers as weeds. If kept in hills, allow only four canes in a hill; if in hedges, only one or two in a place. The first year pinch off the tips of the new canes when about one foot high; after the first year, from two to two and one-half feet. In the fall or spring, cut out canes and the branches back within ten to fifteen inches of the main cane; mulch second or third year with mulching that is free from grass seed. Do not dig roots for trans

planting near the canes you want to fruit, or cultivate later than the first of August.

Blackberry ground should be marked seven or eight feet one way with a small plow, the other way three and one-half or four feet with a marker. Set the roots from four to six inches deep, and when the new canes come up, cut the old canes off, if inclined to grow. Cultivate shallow, until about the first of August. If cultivated later than this, it will incite a late growth of wood, which will not mature. The first year pinch the tips off from the new canes when from one to two feet high; after the first year, from two to three feet. In the fall or spring, cut out old canes, and cut the branches back within twelve to twenty inches of the main cane. If kept in hills, do not allow over four canes to a hill. If in hedges, only one or two in a place. Mulch heavy after the first or second year. Keep the suckers down with a hoe or by shallow cultivation. Do not dig roots from a plantation, if fruit is wanted.

It is not uncommon for fruit-growers to succeed in growing a fine crop of fruit, and fail to realize a profit on it, because of the haphazard way they gather and market it. That this may be done without loss, a good supply of packages should be made up ready for use before the berries are ripe. The ground should be divided, so as to pick half of the fruit every day, except Saturdays, when all that is ripe should be gathered, in order to get over Sunday without having overripe berries for Monday. Take cases filled with empty boxes into the field, also hand-racks made so that about eight-quart boxes can be carried in each. Give each picker an empty box, or a hand-rack filled with boxes, and a row, if strawberries; if raspberries or blackberries, place one on each side of the row, with instructions to pick strawberries by pinching off the stem of the berry about one-third of an inch from the hull, using great care not to loosen the hull, or bruise the berry, and in gathering all kinds of berries that they *must* not put overripe or too green berries in the box.

As soon as the pickers are at work, take two hand racks filled with empty boxes, and tickets that cannot be duplicated by the pickers, and when they get their boxes full take the full ones and

give empties, and tickets. This enables the pickers to keep their places and saves a great deal of careless moving around on the bed. The overseer should pass around frequently among the pickers, and see that they are doing their work right, examining their partly filled boxes often, and looking after their rows to see if picked clean.

If the pickers get scattered so as to make it inconvenient to wait upon them, those whose rows are ahead should be placed on the row or rows that are behind, right opposite where they are, and work back until they meet, then each should take his own row again. The overseer will find time to case the berries ready for market, and have them put in a cool place as soon as full cases are gathered. When through picking for the day, count the tickets of each picker, and place the number, with the price paid per quart for picking, in pickers' account book, to his credit.

If berries are picked in the middle of the day they should be cooled through before forwarding, if possible, by placing in a cool, dry cellar. They should be carried on springs, handled with care, and forwarded to fruit dealers that have a good retail trade. After we have been to the expense, and succeeded in growing fine fruit, and placing it in the express office in good condition, we are often surprised to hear from our dealers that it arrived in poor condition; we know that our local express agents are usually interested in our business, and handle our fruit with care; but if we are at the train when it is put aboard, we may often see the messenger on the train throw it about the car as though it were so much cord wood. You will not wonder then that your fruit does not arrive at destination in good condition. If we politely suggest to the messenger that we have an interest in the fruit he is handling, and request him to handle it with care, we usually make matters worse, and return to our homes discouraged in the business; but if a plain statement of the facts be addressed to the superintendent of the company, the reckless messenger will be instructed to attend to his business in a proper manner, or lose his position.

I find it the fairer way, both for the grower and dealer, to send the berries regularly through the season, giving the dealer the power to fix the price from day to day, with the understanding

that he is to sell at the top of the market in his locality, and that he is to receive a certain per cent. on the selling price. He must also send weekly statements of his sales. If the market should get over-stocked at any time, at some of the places shipped to, most dealers will gladly release a grower, for a few days, on a part or the whole of the regular shipment, if wished, and the surplus can be sent to those that are not overstocked. A home market should not be overlooked, and the grower should use his own judgment, as he will know the condition of the market.

TEN YEARS IN HORTICULTURE.

A. J. Philips, West Salem.

I believe it was Patrick Henry who said we have no way of judging of the future but by the past. I am reminded that commencing the year A. D. 1881, while we are contemplating the advancements, improvements, profits, losses, failures and disappointments that may characterize this, our chosen pursuit, during the next ten years or longer, that it is fitting and proper that we review some of these during the ten years that have passed since 1870. It would, of course, take volumes and tire your patience to refer to all our experiences, proceedings, experiments, etc., during these years. So the purpose of this paper will be to give some instances in the writer's experience, more particularly in apple-growing in Northwestern Wisconsin, than in horticulture generally, together with some items from our Transactions by way of a review, which may benefit us all. 'Tis true in reviewing in this as in other pursuits in life, it serves to recall many mistakes, blunders, unpleasant and unprofitable investments, while on the other hand it recalls very many pleasant recollections, acquaintances and associations, that we would be loth to forget. The fact is we hardly realize how often we change our minds on certain subjects until we look back and recall things that we have done or recommended in years gone by. I will give some instances before I close this paper, not only of my own changes, but also of the changes and difference in views of other fruit men, which, no doubt, are generally the result of our own experience.

In the beginning I will say that I was a firm unbeliever in apple-growing in Northwestern Wisconsin up to the year 1871, that is, so as to be profitable, and I sometimes wish I had remained firm in that belief. Still, as I always was a lover of fruit and had a desire to raise it, and when I attended our state fair in the fall of 1871 and looked over the large collection of beautiful apples and other fruit, and found that it was raised not only in the lake shore region and southern parts of the state, but also in the central, western and northern portions, as the fruit from Baraboo and Trempealeau bore testimony, being as far north as I lived, I confess I began to change my mind; and when I saw the handsome trees exhibited by Uncle Wilcox that were grown near me, I resolved to set some trees in my garden at least. Of course my enjoyment at the fair was limited compared with what it now is, as I was not acquainted with a single fruit grower or nurseryman. But I asked some questions and listened to answers, when others not so bashful as I was, were asking for information. I looked over the growers to satisfy myself about the style of a man that was needed for a fruit grower. I confess I was somewhat discouraged, as I could never expect to attain the size of Peffer, nor possess the flow of language of Kellogg, nor secure a location that would grow such Fameuse apples as Tuttle had there, or grow such grapes as Reid; so I went home never expecting to be an exhibitor at even a county fair. But that fall after my return I went into the country on business, and my attention was called to some very thrifty and smooth apple trees on the top of the ridge where my orchard now is. The thought at once suggested itself that here would be a good place to grow fruit, especially apples. So while the fever for fruit-growing was high, and visions of beautiful apples had possession of my brain, and constituted most of my dreams at night, without stopping to count the cost sufficiently, or considering that I did not know a Fameuse apple tree from a Soulard Crab, or that I knew less than the ordinary school boy about suitable varieties for this climate, I immediately bought a piece of wild land adjoining where the aforesaid trees were growing, and supposing all I needed to do was to clear and break the land, and set out such trees as agents had to sell me, I went

at it in earnest in the spring of 1872, and broke about seven acres, which I set to Fameuse, Ben Davis, Yellow Bell Flower, Golden Russet, Jonathan, Rawle's Janet, and many others, that the winter following fixed in such a shape that I never had a chance to know what they were. These trees came from Rochester, New York.

That winter convinced me, as well as others, that we needed something hardier, so I began to look for information. I read and reread the Transactions of 1870 and 1871. I found that in this as in other pursuits, great minds differed. Mr. I. Gould of Beaver Dam, recommended Crab roots for hardy trees, and Messrs. Stickney and Plumb seemed to be very cautious about recommending them. I had read Mr. Andrews' article on crabs written in 1871, and as my faith in standards was somewhat shaken, to use a vulgar expression, I was ready to catch onto anything. When he said they were the best selling apple in Chicago; that canned they were superior to peaches; that the Soulard was equal in value to the Quince, that they could be raised cheaper than common apples, and that their cultivation promised immense blessings which I'm fearful have resulted in cursings, especially when a man after years of tender care tasted his first Soulard Crab, or when after picking, purchasing barrels, packing and shipping to Chicago, and after waiting days for returns, they were called on as my friend Ringrose, of Milwaukee, was, for cash to pay freight; and when he further said, that as a canning fruit there was millions in crabs, as millions one or more was what I was after, I was just a subject to be misled, as many beginners are, notwithstanding the fact that my friend Wilcox had written an article, page 189, of 1872, where he said the crab apple is over-done, and has become nauseous, and is unprofitable to grow. Though that was written ten years ago, it is true to day. Mr. Tuttle also said in 1872, that to grow crab apples for market would be unprofitable. I say, notwithstanding this testimony from experienced men, I still followed the advice of Andrews and Felch, who said he sold Siberians as high as four dollars per bushel and crabs in Chicago at five dollars a barrel when winter apples sold for two dollars and fifty cents. If you doubt this statement look at page

47, of 1873. You need not wonder that in the spring of 1873, I set a promiscuous lot, mostly crabs, and wonderful poor crabs too. I also set more Fameuse, but went slow on Duchess, as Mr. Wilcox said in 1871 that they would rot before they were ripe. I bought crabs of the same man that President Grimes of the Minnesota State Society complains of, but I cannot condemn a tree-pedlar as he does, for with all their faults the country owes half the trees we now have to them, and their persisting in selling. My crabs grew well.

About the time I bought the orchard I first spoke of, Mr. Jewell was at our annual meeting in the winter of 1874, and in his remarks said that of all the Minnesota seedlings, the Wealthy was the only one left of any value, and that it was as hardy as the Duchess. I felt the truth of Mr. Tuttle's remark, when he said a man is foolish to raise crabs if he can raise standards. So I began to have a desire to know something of the Wealthy. In the winter of 1875, in answer to a letter of inquiry, Mr. Jewell called and spent the night with me, and at that time I bought of him my first hundred Wealthy trees, they being two years old, and no marble tablet erected to his memory could bring such recollection of him and his persistent efforts to grow and disseminate hardy trees, as the sight of those trees, after they began bearing, which was in 1878. That year in recommending it as worthy of a place in our list of Iron-clads, I said that I considered the Wealthy, as a tree, better than the fruit, but now I take that back, as I consider the fruit as good as the tree, and taken together, it is hard to duplicate for the northwest, or for any other nothern locality. It is highly spoken of in different places where it has been fruited in Canada. I do think to-day, that the inhabitants of Minnesota, as well as other northern states are under greater obligations to our friend Peter M. Gideon, for originating this valuable variety than to the originator of any other one variety, the statement of the President of the Minnesota State Society, to the contrary notwithstanding. He says, that "we are under no obligations to Mr. Gideon, as the Wealthy is the gift of Almighty God, brought out by the bigotry of Mr. Gideon," which I consider a very thankless and uncalled for expression. I was very

glad that Wyman Elliot and others came to Mr. Gideon's rescue and he was retained in his position another year, which I consider he richly deserves to hold as long as he is able to continue his experiments, and then he should be retired on a pension for life, to be paid by the fruit growers of Minnesota, and the northwest. These are my views and I wish to have them put on record. In 1875, I, for the first time, attended the winter meeting of this society and have not missed a meeting since. I have gained much valuable knowledge and formed many cherished acquaintances in these gatherings. In 1876, I attended the meeting of the Minnesota State Society and the next spring set more crabs, including the peer of that fruit, Whitneys No. 20. I also set more Wealthy, Pewaukee, Utter and some Walbridge. In 1877, I set more No. 20, Wealthy, Fall Spitzenberg, Pewaukee and Walbridge, also a few Carolina Red June and Rawle's Janet. The spring of 1878, I let up on crabs and set standards only, of such varieties as I had found to be hardy. That fall Mr. Stickney made me a visit, and the only fear he expressed was, that I would be overstocked with No. 20 Crabs; but to-day, I would gladly trade five hundred other crab trees for them, for I consider it a good crab to be overstocked with. I had about fifteen bushels of this fruit in 1880, and find it sells well. In the fall of 1878, I made my first exhibition at the state fair and the first premiums I received tended to encourage me, and also to impress me with my former opinion that my location was good for one so far north. In 1879, I again exhibited, but not with as good success, not owing to the fact that my fruit was inferior but that the fruit in the eastern and southern portions of the State was much better than the previous year. I had about one hundred and fifty bushels of apples this year and one hundred bushels in 1878.

In the spring of 1879, I set five hundred more trees, one hundred of the number being Norway Spruce, which are now growing finely. The balance were apple trees of the following varieties: Wealthy, Willow Twig, Fameuse, Utter, McMahon's White, Fall Orange, and a few of the new Russians. This brought me to the winter of 1880, when, with my mistakes in fruit growing, paying interest, helping others and other things beyond my con-

trol, I found myself like the man who went to Pike's Peak to seek his fortune: I had saved myself, but came near losing all I had. Urged by my friends to continue and see the outcome of my enterprise, I arranged my business, and set more trees in spring of 1880. I found among my list of friends one nurseryman who still had faith in my undertaking; that was A. G. Tuttle. He sent me nearly two hundred fine trees, told me to set them and pay for them when I made it out of the trees. They all grew nicely last summer. I exhibited apples at our state fair and at the Minnesota state fair in the fall of 1880, and received my share of the premiums.

I think I am about two hundred miles too far north, still I have faith that my undertaking will be a success. When Judge Knapp exhorted us last fall, if we wished to raise fruit, to emigrate to Florida, I almost wished I was there. But now comes the sad ntelligence that even in the sunny south, that favored spot, the cold of the present winter has frozen their orange trees. This winter an old neighbor of mine gave me such a glowing account of farming and stock-raising in the mild climate of Texas, that I almost wished I was there, and that some one else had my orchard. But recently I read of one ranchman who had lost four hundred cattle and twenty five horses, frozen to death in that state, so I feel contented to stay in Wisconsin. In our Transactions, where friend Plumb and others have repeatedly said that the best location for an apple orchard was high land, clay soil underlaid with limestone, it encouraged me, as that describes my location exactly. Mr. Wilcox has moved to La Crosse from Trempealeau, and has selected a location for a nursery and an orchard, similar to mine this satisfies me that he considers mine good, as he had made me several visits and looked my orchard over.

I have, as I said before, formed many pleasant acquaintances during these ten years. I have visited Mr. Peffer and his orchard and seen the Pewaukee at home. Have visited Whitney and seen the original No. 20 tree; have visited Tuttle, Wilcox, Freeborn & Hatch, Sabin, Sumner and Mathews, in Wisconsin, and Messrs. Sias, Jordon and Cook of Minnesota, and have been cordially received in every instance; have gained valuable informa-

tion by attending the meetings of the Minnesota State Society, for our wants and inquiries are similar to theirs.

I feel a deep interest in our state society. I find that in 1870 we had ninety-eight members; in 1880 only fifty-eight. Of the fifty-eight in 1880 only fifteen were members in 1870. Some have moved away, and some have gone over the river of death; their labors are ended. In 1870 we had $326 in the treasury, in 1880, $45; plainly showing that we are receiving less money, or expending more. Our fruit list has changed some in ten years, Duchess and Fameuse only holding the position now that they did then, in the first and hardiest list for all localities. They now have for companions, Wealthy, Tetofsky, Haas and Plumb's Cider, instead of Astrachan, Talman Sweet and Golden Russet. Plumb's Cider has advanced from second to first list.; Tetofsky and Haas from third to first list, and Wealthy, then almost unknown, has advanced to the first list, where I think it rightly belongs. But it is a question with me whether we are advancing in horticulture by crowding the Tetofsky into and keeping it in our first list. This much I do know, that a man who had Tetofsky in his list of five varieties adapted to the northwest has failed to get a premium for two years, and a man with St. Lawrence in its place took first. Ten years ago Ben Davis was in our third list; now it is stricken out entirely, and as no tree has had such a varied career, and will better show the fact that great minds do differ, I will give a brief history of it. In 1873, Mr. Kellogg moved that it be placed on the list for general cultivation. In 1874, Tuttle, Wilcox, Jewell, Greenman, Butler and others wanted it stricken from the list, but P. S. Bennett and Kellogg came to its rescue, and it was retained. J. C. Plumb placed it in the list of iron clads in 1871. Felch, of Stevens Point, placed it at the head of list of hardiest apples in 1873. That same year, Peffer said it was not discolored at the terminal buds. Mygatt spoke highly of it in 1874, the same year that N. H. Topping, of Brown county, said he saw one man that had four trees, fourteen years planted, who said: "Had I planted one thousand Ben Davis, I could by this time have bought a good farm with the proceeds." Judge Cate discarded it that year, but he also discarded the

Fameuse and others. Roundsville stuck by it in 1875. J. C. Plumb recommended it in 1877. B. B. Olds placed it in his list of six in 1878. Huntley spoke of it favorably that year, and the same year, on motion of A. G. Tuttle, it was stricken from the list, no one rising to say a word in its favor. B. F. Adams said, in 1880, that after fruiting it three years, he was in favor of it. Suel Foster, of Iowa, said, after fall of 1880, that Ben Davis and Willow Twig were his two best paying varieties. I am not sure that we acted wisely in dropping it entirely, as with all its shortcomings, faults and failures, trees that were set in 1872, in this town, yielded five bushels to the tree of nice fruit; and to-day, notwithstanding its poor quality, it will outsell any apple in my cellar, excepting Pewaukee and Jonathan. I will set twenty-five more next spring, if I can get them.

In 1874, Judge Cate wrote an able article and gave us many valuable suggestions. Crab roots for grafting stand in 1880 about where they did in 1870, having lost rather than gained friends and advocates. Pears are weaker on account of blight. Flemish Beauty stood first, then, and still holds its own. Kellogg took premiums on pears in 1872, and in 1871 said he had a pear growing on Mountain Ash, doing finely, which is about his last evidence in favor of pear-growing in Wisconsin. The Pewaukee and Walbridge run quite low in the estimation of planters from 1873 to 1876, since which time they both have been gaining ground, especially Pewaukee, which grows better and hardier as it grows older. It bore heavy crops of fine fruit, last fall, and is entitled to all that brother Peffer ever said in its favor.

The Concord, in grapes, and the Wilson, in strawberries, stand now at the head of their respective lists, as they did ten years ago, although many rivals have tried to dethrone them. S. D. Carpenter urged the growing of grapes, in 1871, and advised making them into wine. S. D. Hastings, the same year, read an able paper against wine drinking. Salt was then recommended for blight, and I hardly think we know of anything better now. Branches and buds of peach trees from open ground were shown in 1872, in good condition, but the like has not occurred since, for good and sufficient reasons, to wit: too cold.

Tuttle, Peffer and Woodward spoke in favor of pear-culture, in 1873, and Felch, Kellogg and others against it; so, to average it, I set one dozen trees, and have gathered a few five-dollar specimens. Your secretary said, in 1872, that he preserved the Duchess until the winter meeting by packing in saw dust; so, in 1875, I tried that plan with some seedlings, but when I exhibited them at the annual meeting of that year, they tasted so strong of the saw dust that even President Stickney made up a crooked face when tasting them. Mr. J. B. Richardson said, in 1871, "The more I am engaged in horticulture, the better I like it," which are exactly my feelings in 1881. George Pinney wrote an article, in 1872, on forest trees, that is as applicable to day as it was then. Mr. Tuttle favored low heads in 1872, and in 1880 he favors high heads, I mean on apple trees; and I have advocated the same thing, and fully agree with him on that subject now, as I find that three-fourths of our trees, when they begin to bear heavy, are too near the ground. Felch placed Golden Russet at the head of his list in 1873, and at the same time rejected Willow Twig.

But after years of experience, without saying one word against the good qualities of Golden Russet, I find I can raise three barrels of Willow as easily as one of Russet. Location or soil no doubt makes the difference. Notwithstanding there have been failures, and we have had much to contend with that was discouraging, I think the fact is plain that we can produce good fruit in Wisconsin in paying quantities. My object and desire now is, less crabs and fall apples and more winter varieties. I hoped years ago that we should get something in the shape of a winter apple among the Russians that would be safe to tie to. But my hopes, I fear, are not likely to be realized. I still hope for something among our seedlings that will be to us, as a winter fruit, what my friend Gideon's Wealthy has proved as a fall variety. Most of my crab trees, that once I expected millions from, will either be dug out or top-worked next spring with winter fruit, as, using Mr. Tuttle's language, "Who can afford to grow a crab when he can grow Wealthy or Utter just as well?" I intend to set three hundred trees next spring, as follows: Fifty Wealthy,

fifty Fameuse, twenty-five Jonathan, twenty-five Willow-Twig, twenty-five Pewaukee, twenty-five Walbridge, twenty-five Ben Davis; the balance will be a winter seedling I have, McMahon's White, and a few new varieties. So you can see how my mind runs now. Years ago, I said that No. 20 would not blight. I find that a man should be careful about saying anything positive. I now say, it is not liable to blight, but plant it near a Price's Sweet, or other tree that blights badly, and it will blight some. In 1880, I had about three hundred bushels of apples, mostly on young trees.

Now, after hearing this imperfect review of a wild and reckless adventure, I leave it with you, fellow horticulturists, to judge whether I have made any progress in ten years or not. I do know this: I hardly knew a single variety of apples ten years ago, but now I can carry a few to the fairs without labels. I was not acquainted with any trees or tree-growers then, but during these years have become acquainted with most of the leading fruit men of this state and some in other states. I am working into the wool and mutton business by raising a good large flock of sheep, so that if the present winter, or some succeeding one, wipes out the trees entirely, I will have something to fall back upon. In this event, I should be loth to give up these winter meetings, but at present I want to be numbered with the men referred to by B. R. Bones, in 1880, who are bound by persistent effort to succeed in fruit growing; and right here I will give some items, by way of an inventory, so that anyone who contemplates engaging in the business I have been reviewing, can form some idea of what he needs aside from soil suited, etc. When I started in 1871, as near as I can remember, the stock in trade was about as follows: Wild land, worth $500; experience and observation, $10; cash on hand, $500; trees, bought and paid for, $50; grit, $100; making a total of $1,160, for engaging in a business I knew but little about. Now, to continue the same business ten years later, I invoice as follows: Cultivated land in orchard, $3,000; experience and observation, $2,000; cash on hand, $10; trees on hand and in nursery, aside from orchard, $500; grit, $1,990, making a total of $7,500. Parties here who are adepts

in railroad corporations may say this stock is heavily watered, but of this you can judge.

I hardly think the present winter as hard on trees as 1872 and 1873, but it is hard to tell. It has certainly been cold enough. We thought after that winter, also 1874 and 1875, that trees were nearly used up, but the statistics of 1879 report that Wisconsin produced that year six hundred and fifty thousand bushels of apples. With all my blunders, one thing I have found out is, that a short paper read before any society gives the best satisfaction, especially if the subject be a dry one, therefore I ask your indulgence and pardon for the length of this paper; for had I comprehended the fact that the more a man wrote on it the more he wanted to write, I certainly would not have chosen it. But I hope at some future time to give you a review that will be more flattering, and if in this, I have said one word or advanced one idea, that will benefit the future fruit grower of Wisconsin or any other state by way of inducing him to post himself thoroughly before he starts in, thereby saving him much trouble and disappointment, then I shall feel amply repaid for giving this general but imperfect review. A few words more. I cannot close without speaking of one special feature of the proceedings of this society for the past ten years. You may read the reports of Maine, Michigan, Canada, Minnesota, Iowa, Illinois, and in fact all others that I have seen, and in none of them have they such interesting and valuable papers as we have annually received from and had read by our lady friends — papers on flowers, home influences and adornments, that are treasures worthy of a place on the tables or in the libraries of every home in our state. Enough instruction and sound advice is given in those papers to better the condition of many, yes, very many homes in our land, if read and practiced by the members thereof.

J. C. Arthur, of Madison, remarked that the nature of the fungoids and their habits of growth are not fully understood; and there are many erroneous views prevalent in regard to them. Now Fungus is a plant, with habits and individuality peculiar to itself, as much so as any plant, tree or animal. There are many kinds; some of them feed on inorganic matter the same as plants

growing in the soil; others, and by far the larger part, live on organized vegetable matter, and yet others live on organized animal matter. Decay is not a necessary condition for their growth, for they can disorganize the organic matter and take it up as they need it. Where they disorganize it faster than they use it up, decay results; it may be in the form of dry rot, or a wet rot or putrifaction. Where dry rot takes place, other forms of fungoid growth are developed; but where the disorganization is rapid and wet rot results, another form of organism accompanies it, as the bacteria or lower form of animal life.

The fungi peculiar to the wheat plant does not disorganize the vegetable tissues faster than it uses them, and the plant may live on with slightly imposed vitality. If there is a rapid growth of the fungi, the result is the exhaustion of nourishment needed by the wheat, and it dies from starvation.

J. C. Plumb regarded the subject of fungoid growth as a very important one, and one that was but very little understood. We have seen and felt the evil results, but know little in relation to their different forms, habits of growth and conditions. We are not only ignorant of the first principles of the science pertaining to them, but we have not even learned the a. b. c. of their history, and cannot talk about or investigate them understandingly. We must come back, and begin with the rudiments and first principles of the science in order to get any definite knowledge of the subject.

THE BIRDS OF THE GARDEN.

By Mrs. H. M. Lewis, Madison.

"Know ye not that he who hath had his life according to God's will, to him the wild beasts and wild birds draw most near."—St. Guthlac.

One evening not many months ago, I received a letter from the worthy president of the horticultural society, asking me for a paper for the coming meeting. I cast about for a subject, but nothing that suited me came to mind. At last, I went into the mystical dream land, and was transported over land and sea to an island. On this wonderful island everything 'grew in great

beauty and perfection. Here was bright sunshine, refreshing shade, green hills and placid waters, making such lovely landscapes as were never seen before. Here every want of man was perfectly supplied and he lived the perfect godlike life. "Ah!" said my companion, "we have at last found our true home upon earth, our heaven, our perpetual June; here we will rest contentedly forever." In the words of Tacitus I replied, "Let the sweet muses lead me to their soft retreats; their living fountains, the melodious groves, where I may dwell remote from care, master of myself, under no necessity of doing every day what my heart condemns."

We enjoyed this paradise of sense for a few days, but at last began to feel oppressed with a feeling of loneliness and longing for something more. Inquiry was made of our friends and companions why it was that such unbroken silence prevailed both day and night; we told them of our singing birds, our buzzing bees, chirping crickets, and bright winged butterflies. They pressed eagerly about us, urging us to tell them more about these strange, bright colored, singing animals that had wings like fins, that could swim in the air, for such a strange story had never been told them before. The charm for us now was broken forever; we could be happy in no home, however beautiful, where the song of the Robin and Bluebird was not heard, and we implored our good Genie to take us back again to our dear Wisconsin home of summer's heat and winter's cold. He waved his magic wand over us and we were soon homeward bound. As we approached our own land, we discerned spring approaching, and in the far distance, on the Pacific slope, on Alaska's borders, over the western prairies and eastern meadows and mountain tops, we heard millions of well known voices which we recognized as Robins. The same dear old Robin Redbreast song that delighted us so much in childhood — that will delight us ever while we live. It is the same sweet old song that has been sung for ages, and perhaps will be sung for all time; who can tell? Possibly we may hear it at the very gates of Heaven; I hope so. Thoreau says: "I heard a Robin in the distance, the first I had heard for many a thousand years, methought, whose notes I shall not forget

for many a thousand more." When I awoke from this eventful dream I could but exclaim, what indeed would summer be without birds! How much we are indebted to them for the brightness, freshness and gladness of summer.

We ought to be on more familiar and friendly terms with our neighbors, the birds; to know more of their habits and language, for their language is as easily learned as that of the little child; for every want is expressed by song, cry or chirp, which, to them, is language.

We do not, as yet, understand by what reason or instinct the bird is guided in its pilgrimage north and south, and perhaps never will, but we are positively assured that birds frequent the same spot year after year. Perhaps the range of mountains, course of rivers, the lay of towns and cities, marks their course. Who shall tell? We only know that they leave us at night, and when the warm south wind blows, come to us again at night in the spring. They take no reporters with them, therefore their secrets are their own.

One of the earliest, sweetest, and most familiar birds of the garden is the Bluebird, that, Thoreau says, "carries the sky on its back." The first breath of spring brings him among us. His song is a sweet melodious warble, all harmony, for his notes are so pure that he is incapable of making a discord. He sits under the window, on the fence, stone or bush, and sings away in perfect content, even though the cold be severe and the sky dark, and his song is, "I love you, I love you." This song is continuous through the summer, and wherever we go, in town or country, this bit of blue cloud, with crimson lining, cheers us with a merry song. The Bluebird is attached to his home, for he comes year after year to the same hollow box, or fence post to rear his young.

The Robin's song has not a great variety of notes, therefore naturalists do not regard him as a first-class minstrel. He ranks about as third rate; but for a song that wears like the old home melodies, give us first and last the Robin's song, with its sweet, simple melody, that always cheers and refreshes, but never tires. No bird sings at dawn like the Robin. The Robin is truly the favorite bird of our land. He has ever been regarded as the bird

having a soul, perhaps from the many tales and legends that have been told of his wonderful deeds in past ages. The Robin comes soon after the Bluebird, and remains usually until the last of October. During the warm winter of 1877 they did not leave us for the south until the last of December, and returned the 1st of February.

The Blackbird is probably not a favorite with any of us, but we should not wholly condemn him, for he has a mission to perform and he does it well. He destroys myriads of insects during the summer season. I have seen a Blackbird catch more than a hundred spiders in five minutes. He is a social bird, in fact, keeps up a constant chatter with his companions. He is, I believe, the only polygamist among our northern birds. The golden black plumage is often most beautiful. The Blackbird comes early in the spring, and leaves in immense flocks about the middle of October.

Of sparrows we have several varieties; they are among our earliest visitants. The Chipping Sparrow or Hair Bird is well known to us all. Its only song is chip, chip, which it repeats from morning until night. It is so familiar that we can nearly approach it when on the ground. But if we venture near enough to the shrub or tree to view the beautiful speckled eggs when the old ones are near, the nest is deserted and the eggs destroyed. It gives us plainly to understand that its domestic affairs must not be interfered with. It is a courageous little bird, and will fight sometimes to its death.

No bird is more closely associated with my early childhood than the little Song Sparrow. How well I remember that sweet, religious song, as I heard it on the banks of a river those years ago; and I never hear it now without having aroused within me the deepest feelings of exultation and delight. The notes are clear, liquid and sweet; sometimes the song will be exactly the same for hundreds of times; then will begin variations so numerous that we can with difficulty believe the small bird capable of such changes. The male and female dress alike, in plain russet and gray, which does not change during the season.

The White-Throated Sparrow calls upon us for two or three

weeks in the early spring, and again in the autumn, as it passes north and south. They are said to nest in the far north. They resemble in appearance the Song Sparrow. The song is also similar and quite as musical. They appear in small flocks. Other varieties of sparrows I cannot mention in one short paper. The discussion of the merits and demerits of the English Sparrow I will leave to others. My private judgment is that it is doing us more good than harm.

The Golden Robin, commonly called Baltimore Oriole, comes to us about the 15th of May. The name Baltimore was given it because of the resemblance of its coat to that of Lord Baltimore of Maryland. It is a well-known summer visitor, both for the brilliant orange color of its livery, and for its strange, sweet and powerful song that it continues to sing more or less during the summer. It inhabits North America, from Canada to Mexico. The Oriole is capable of singing an exhaustive melody of great variety and beauty, but it is apt to confine itself to but few notes. It usually suspends its long, hanging nest from the top of a high tree or limb. In the town it selects any material most handy, like cord, bits of cloth, yarn, cotton and wool for the outer covering; the lining is made soft with hair. The city nests are not as beautiful and symmetrical as the country ones, as the nests of the latter are made of a strong fibre, not unlike hemp, lined with hair. It exhibits in this nest workmanship most rare and wonderful. In the south the nests differ from the northern ones. They are made of Spanish moss, which is attached at both ends to the forks in a branch, then weaving the moss in opposite directions until a hammock like nest is produced.

The Orchard Oriole is not as large as the Baltimore. Its color is a dingy yellow and olive. It seems to prefer a home near the water's edge. The song is various and most musical. Its nest is not a true hanging nest. It is deep, cup-shaped, too shallow to conceal its occupant.

The Rose-breasted Grosbeak comes with the Cat-bird and Oriole. The head is black, tail dark, breast rose colored. In some parts of Minnesota this is the bird most commonly seen; but with us it is comparatively rare. Perhaps in the future we shall see more of

it, as it is said to be changing its location. Audubon places this bird very high in his list of minstrels. The song begins like the Cat-bird's, then rushes into a flood of melody, falls into warblings, echos and trills that are indescribable. It is highly prized as a cage bird. Philip Deihl, a German naturalist of Madison, cages many of the wild birds of this species, for which he finds ready sale at ten dollars each. He has also succeeded in raising young ones in captivity. These birds show remarkable skill and intelligence in nest building, for they bend twigs by biting the inner side from end to end.

The Cat bird or Northern Mocking Bird frequents town as well as country. It is a dark colored bird, always in motion. It comes the middle of May. He is at first shy, but should you desire it, you can be on delightfully intimate terms with him before the summer is over, for he will hover near you, sing to you, and bathe with the Robin in the wooden bowl almost at your feet. A pair of Cat-birds have built nests in our garden for several years. One year while the nest was being constructed, we watched the little house builders with silent wonder and delight. They twittered and sung in most perfect happiness all day long. On moonlight nights we could hear sweet whispers and murmurs from one to another, at times during the entire night. We assisted the enterprising little pair in their work by dropping bits of string, cloth, paper, etc., on the ground. They eagerly seized everything when the colors were dark or light; if we left bits of color like red, yellow or blue, they were not picked up, for reason or instinct taught them that in display there was danger. One dead limb on the upper part of the tree has been the chosen spot for the evening vesper song for several years. When our minstrel returns in the spring and sings again from his favorite branch, we feel indeed that the absent one is home again. He often sings with such rapture and abandon that the song continues as he takes flight from one tree to another. One year when the female was sitting upon the nest, the cat stole in upon her and killed her. The mate came home, called and sung most sweetly, but could get no response. He continued his song and cries for several days, then flew away and returned with a new mate, and all went

well again. The Cat-birds are greatly attached to their young, and will fight desperately for them if danger approaches. Many parts of the Cat-bird's song is wonderfully sweet and melodious. For he imitates the Oriole, Bluebird, Bobolink and other birds, besides singing his own sweet, powerful lay. But alas! alas! for the imperfect life of bird and flower; the thorn must appear with the rose, and discord with melody. The Cat-bird often gives in place of his sunny song only the cry of the cat and the filing of the saw, when the love making is over.

The Brown Thrush or Mavis is a bird occasionally seen in our gardens, but he takes most naturally to fields and woods. He is related to the Robin. His color is light brown, with a tinge of cinnamon. He is a shy bird, and if you get sight of him, it is as he dodges from bush to fence in such a stealthy manner that you fancy he has been in mischief. When he sings, he flies upon the highest limb of the tree, and there pours forth a strong, rich, intricate warble, that not uncommonly lasts an hour. His notes

"They melt upon the ear, they float away,
They rise, they sink, they hasten thy delay,
And hold the listener with bewitching song,
Like sounds from heaven."

For he ranks, as singer, first among our northern birds.

The Bobolink is the great song bird of the east, where it is heard constantly in orchard and meadow. In this vicinity it is not a common bird, although his song is not infrequently heard. With us he seems to take naturally to low lands. He comes in a coat of black and white, that changes, before the season is over, to dark gray. His song is very musical and merry. He is the great solo singer among the birds. Washington Irving gives a beautiful description of the Bobolink, and addresses him in the words of Logan:

"Sweet bird! thy bower is ever green,
Thy sky is ever clear;
Thou hast no sorrow in thy note,
No winter in thy year.

"Oh! could I fly, I'd fly with thee;
We'd make, on joyful wing,
Our annual visit round the globe—
Companions of the spring."

The Red-eyed Vireo and Warbling Vireo are small, brown, interesting little birds, that frequent our towns and villages. Their sweet little warbling songs begin with the dawn, and are continued during the day. I scarcely remember an hour of the past summer that I did not hear the song of "Brigadier, brigadier, bring it," under my window. Many times they would pursue flies so eagerly, and so near us, that we would feel the rustle of their wings as they passed by. The nests are beautifully constructed, of fine materials. The White-eyed Vireo is called the Politician, because in the texture of its nest it uses pieces of newspaper. A nest in my possession has on one side a blue postage stamp, and on the other a scrap of newspaper, with the word "picnic," in capital letters, woven into it.

The Scarlet Tanager is the most beautiful bird of the north. His body is of the most brilliant and glowing scarlet, wings and tail jet black. His preference is for woods and fields, but sometimes he remains in our towns and cities, or so near them that we get occasionally a glimpse of him, and hear his whistle, which is strong, plaintive, and musical.

The Summer Yellow Birds, or American Goldfinch, are true wood warblers, known from the Arctic to the Gulf. The plumage is a pale canary color, darkened with orange and black. If the young are caged, they take kindly to imprisonment, and often make valuable cage birds, for the song is one of great sweetness.

The Wren frequents both country and town, but seems to prefer the latter. It is a favorite everywhere. Very little is known of its habits. It is a restless bird, always in motion; even when singing it has to flit about. It is a courageous fighting bird. A small box or hollow is a chosen place for its nest. The song is sweet and wonderfully strong for a bird of its size. It begins on a high, sharp key, then suddenly falls to a sweet murmuring song, that ascends again and ends with a rapid trill.

The song of the Pewee, or Phebe, is well known to us all. It is a small, brown bird that seems to prefer solitude or dark shady retreats, where it repeats its only song of "phebe," "phebe," from dawn to dark. "So plainly expressive of sadness is this peculiar note that it is difficult to believe that the little being that utters it can be free from sorrow."

The voiceless Humming birds always come among us as welcome visitors. We have but two varieties in this state, as they properly belong to the sunny south. The one most frequently seen is the ruby throated. They are shy, and when startled fly as swift, or swifter, than the wind.

The American Shrike, or Butcher Bird, ought to be better known throughout the length and breadth of the land. Horticultural people should mark it and make a special effort to destroy it, for it is the great destroyer of our birds. "It is said to possess the faculty of imitating the notes of other birds, especially such as are indicative of distress, which it does no doubt for the purpose of decoying them within its reach, then dart suddenly into the thicket and bear off the body of some deluded victim." They appear in small flocks, many remaining, others going north. They are birds of good size, color mostly gray or maltese, with wings and head coal black, breast maltese color and white.

The Blue Jay is one of our best known garden birds. It belongs exclusively to North America. It is a beautiful bird of azure blue, relieved by black, white and cinnamon color. Its brilliant plumage, large size, attractive form, shrill cry and restless activity renders it prominent over the northern states. The Blue Jay is not usually a sweet singer, but during June and July some of its notes are delightfully sweet. The song that it most delights in is a sharp, shrill cry, which it utters from morning until night both summer and winter. We admire the beauty of the Blue Jay and love to see it in the garden in winter when the other birds are away, for it gives a bit of color and life to the winter landscape that is refreshing; but we must with candor say that he ought to be nearly or wholly exterminated, for he, like his cousin, the Butcher Bird, is a pirate and marauder. He breaks the eggs of other birds, and destroys all the young ones he can find. I have often seen him on the trees picking the bones of young sparrows and other birds. In summer we often hear a great clamor among the birds as they defend themselves and young ones from the murderous claws of the Blue Jay. He often hovers near his victims for several days, when at last he springs upon them unawares. The severity of our winters seem to be but little felt by

the Blue Jay, for he is seldom found frozen. The suffering for food would be great in winter did not nature prompt this bird to provide for his winter wants. In autumn he deposits in hollows, thickets, fence corners, barns, and other convenient places, food for winter.

Winter Birds — Even winter with its desolate ice and snow is made more pleasant and endurable by the bright and merry birds. Troops of Cedar birds, Titmice, Wood-peckers, Snow birds, Cross-bills, Blue-jays, Snow Buntings, Pine Finches, Red Polls, etc., come among us at different times during the season. Several varieties of Wood-peckers winter in this latitude. They are most curious and interesting birds. When Wilson, the ornithologist, arrived in this country, he saw for the first time the Red headed Wood-pecker, which he shot and considered it the most beautiful bird that he had ever beheld.

The Chickadee, or Titmice, are well known winter birds, that come in flocks. A pair of small brown Wood-peckers, called Brown Creepers, always accompany them. The little Chickadee chatters, chirrups and sings in the most happy manner, even though the cold be biting, and zero reigns around him. The Titmouse, like its cousin the Wren, is an active, brave, intelligent bird. The one with which we are most familiar, is the Black-capped Titmouse. I had one of those black throated, black-capped little visitors in my parlor last winter that delighted and entertained us with his cunning little ways from morning until night. When I wrote he walked over my paper and perched upon my inkstand, cracked his seed upon the arm of my chair, and whistled most merrily. This dear little creature was a stranger from an unknown land. I knew nothing of his haunts and but little of his habits. Although he weighed no more than an ounce, he had as much individuality as the mammoth elephant. Reason, can it be called instinct, had taught him to husband his food, for winter consumes rather than produces, and in the folds of a curtain, behind a leaf, or in a book, a choice bit of food was preserved for the future. He held the hemp seed between his feet, and pounded away until the shell was broken. He ate no sweets, preferred butter, tallow and rich nuts; cracked a hazel

nut with his bill, bathed in a dish of snow, sang four songs, not strong but sweet, and whistles divinely, and when evening came, his reason directed him to creep into a chosen corner under a leaf, for warmth and shelter, where he hid his head under his wing until morning.

In the spring with much sorrow and sadness we decided to let our Arctic bird follow his instincts and inclinations and fly away with companions north if he desired to do so; therefore the window was opened and liberty was his. He flew from bush to tree, bathed in a little bank of snow and sang and whistled to his heart's content. But when the shades of night began to gather, the home feeling came over him and he flew through the window to his chosen place in the bay window. Again he was given his liberty; this time he lingered for a couple of days in the garden, coming in and out of the house at our call. At last he sang us a parting song, and then took flight into the great world. We are confidently expecting his return in the winter; should he come again he will be welcomed with rejoicing; but should he never come again, our hearts will ever go out in gratitude to the little stranger of the winter, that brought nothing but joy, grace and harmony into a household. The Titmice are exclusively northern birds; they range from the Arctic sea to Maryland; never further south I believe.

It has been estimated by ornithologists that not one in ten of the young birds hatched come to maturity. Let us who love birds be guardians of them, and do what we can to protect them. If it be necessary to make laws to do so, let that be done; and if heedless men and boys slaughter and bag tens of thousands of Robins, as they did at the great Robin roost in Kentucky last winter, bring them to an account for it, and imprison or otherwise punish them, for the loss to the whole country is irreparable. Let us teach the boys that to kill the birds with a sling shot, or in sport, is a sin; rather teach them to love, protect and study them, and if specimens of eggs are desired, to take a part of the eggs without robbing the nest. A few years ago our beautiful capitol park was alive with the rarest of songsters; but now, alas! the

squirrels are fast superseding them, for the squirrel is the bird's enemy, and they cannot thrive together.

No study is more delightfully interesting than that of our native birds. In the spring, every day brings with it rare strangers from the south, some only for a few days, others to remain during the season, and to be able to know and name them as they come is a pleasure most rare and sweet. Maurice de Guirin says: "The birds come and go and make nests around our habitations; they are fellow citizens of our farms and hamlets with us; but they take their flight in a heaven which is boundless. The hand of God alone measures to them their daily food, but they build their nests in the heart of the thick bushes, or hang them on the height of the trees. So would I too live, hovering around society, and having always at my back a field of liberty vast as the sky."

THE LITTLE FOLKS OF HOUSE AND FARM.

By Mrs. C. F. Brown, Appleton.

Nature is a great economist. Unwilling that any of her million spaces should remain unpeopled, or her vast resources unused, she has filled every nook and corner of her broad domain with her marvelous creations. Science, the angel of her apocalypse, has loosed the seal, and the divine volume lies open, so that almost he who runs may read; nay, better than this, he who earns his bread by the sweat of his brow, whether on the low lands of common toil, or, as a quarry man, breaking the granite boulders on the rugged hillsides of Scotland, may find, "The Footprints of the Creator." The mere novice adjusts his microscope and looks down to the very rudiments of protoplasmic life, learns to trace the gradations of existence from the infusoria up to the close, fine fiber of highly organized animal life. He pauses wonderingly before the higher orders of animals, admires the swift-footed hero of the race-course, as he stands with quivering flanks and thin, sensitive nostrils, and eyes deep and human as the eyes that love him. His small head is poised on the arched neck, that spreads broad and glossy into the powerful breast, and shoulders which taper into the strong arms, and slender, sinewy

shanks tipped with the polished hoof that spurns the ground as "he paweth in the valley and rejoiceth in his strength." Curve and motion and trembling outline, are but the outward flashes of the fire and haughty spirit drawn from a hundred royal sires. Ah, Middy Morgan, no wonder you forgot to love the master in your worship of his steed!

The higher organisms of animal life seem almost to touch the human; and though instinct and reason may not quite clasp hands, they stand near enough to hear each other's call, and reach out to meet each other's needs. All along our pathway, dumb, patient creatures look up to us with eyes that have in them much that our wisdom can comprehend. There are sightless beings that crawl at our feet, and their very writhing suggests to the reverent soul the infinite spirit which is only lightly veiled by "the things that are seen." To more than one "philosopher of the breakfast table" has the "Divine order" been revealed by the tints of the beetles, or the mailed wings of the coleoptera, and Count de Charney, of French prison story, was neither the first nor the last to whom Picciola, the simple flower, has revealed a faith in the immortal and eternal. The demons of selfishness and unbelief and hate have been exorcised by the fulfillment of the prophecy, "A little child shall lead them." Ah, nature is divine! She knows just where to place every one of her multifold creations. She is never obliged to adjust and fit and trim, for all her works are correlated. She understands the needs of human hearts as well as the power of human hands, giving to the former that which makes them brave and tender, to the latter, that which renders them helpful and strong. Her plans may be thwarted, but not through her own mistakes; sometimes through human ignorance and sin; and the little ones of house and farm, whether they wear fur or feathers, or the coat of many colors which affection weaves for its dearest born, are just as much a part of the divine order as the revolution of the planets or the circuit of the sun. Nature knows just what the little ones of house and farm will do for us, and herself the teacher of that sweet theology, "He prayeth best who loveth best all things, both great and small," she gives us every spring a new bequest of life and innocence, in

the soft white lambs of the meadow, the pretty, large eyed young of the kine, and the fluffy broods of the farm yard, to say nothing of the gentle race of flower folk that breathe their fragrance upon our pathway and lift their lovely faces to gladden and refine our homes. Nature reveals herself to the pure in heart, and often imparts a second sight to the lowly, who have never learned the alphabet of science. In some silent, mysterious way, they seem to comprehend the language of her poor, dumb creatures. Who has not seen the living personification of the poet's fancy?

"A still old man, with grizzled beard,
Grey eye, bent shape, and rugged features,
His quiet footstep is not feared
By shyest woodland creatures.

"He hides within his simple brain
All instincts innocent and holy,
The music of the wood-bird's strain,
Not blithe nor melancholy.

"He knows the moods of woodland things,
He holds in his own speechless fashion
For help'ess forms of fur and wings,
A mild paternal passion.

"Within his horny hands he holds
The warm brood of the ruddy squirrel;
The bushy mother storms and scolds,
But knows no sense of peril.

"The dormouse shares his crumb of cheese,
His homeward trudge the rabbits follow;
He finds in angles of the trees
The cup-nest of the swallow.

"Our science and our empty pride,
Our busy dream of introspection,
To God seem poor and vain beside
This dumb, sincere reflection."

Nature is a patient teacher, and if out of her great story-book we learn so many beautiful things about her four-footed children and our little neighbors with fur and feathers, that make our woods and fields jubilant with clatter and with song, what sacred lessons will she not teach us of the little ones who are flesh of our flesh and

soul of our soul. The question, how to rear and educate these small men and women that come welcome or unwelcome, as well to the palatial city home as to the most humble and remote farm house, is one of absorbing interest. One writer says, if you would educate a man, you must begin with his grandmother. While this may be somewhat discouraging to the literary hopes of those who are not so fortunate as to have had educated grandmothers, it ought to rouse every woman who has prospective grandchildren in the near or remote future, to send down through its legitimate avenues all the culture — intellectual, moral and spiritual — that she can acquire. "But," say some, "we are grown women already; we are farmers', or mechanics', or merchants', or lawyers' wives; we are mothers; our school days are ended; we finished our somewhat limited education years ago." Dear sister, there is an education that is never finished, the only true education that hungers for its daily food and thirsts for its daily drink. Education is not acquired in the schools — only a larger capacity for education; and one may have all that the schools can give him, and if he failed to build on this foundation the beautiful structure of after-culture, he will never be educated. We need the firm foundation and broader outlook that the schools and colleges give us, but he who has neither by nature or acquisition that something *higher* than these, will find himself outstripped in the race by his less favored brother, who has fresh and warm within him the real love of knowledge. Give this priceless jewel to every mother in the land, and we may say: "Rest the ashes of our grandmothers. Our sons and daughters will grow up pure, and wise, and good." Even the weary mother of the farm children will find that where there is a determined will there is a way, and by using, little by little, the opportunities of improvement that come to her, will acquire to herself the power of reaching and appropriating greater ones. It is scarcely reasonable to expect our children to grow up models of excellence unless we ourselves are, in some sense, exponents of the beautiful precepts we strive to inculcate. A very young mother once said of her child, "I want him to grow up wise and intellectual and good. How shall I accomplish my desire?" "Be so yourself," said a gentle, white-haired woman

by her side; and judging from what we have read of that mother and son we think the advice was followed.

If we would have our children love their homes and desire to stay in them until age and the necessity of making a way in the world draws their reluctant steps from the sacred fireside, we must make ourselves and our homes attractive for their sakes. We must keep our hearts young enough to sympathize with their pursuits, understand their sorrows and enjoy their recreations, and our heads wise enough to preserve their respect. It is not wealth alone that makes the most attractive homes. Many sons go out nightly from homes of elegance and beauty into scenes of debauchery and death; but some of us look back, perhaps, to a low farm-house in the heart of New England, at the foot of the Pennsylvania mountains, or on an Ohio hillside, and our hearts grow tender and our eyes grow moist as the old, sweet influence holds us still. There were no rich carpets on the floors perhaps; no costly pictures on the wall, but the mother of the household had an innate sense of harmony and the fitness of things, and her magic touch seemed to transform hard, common things into comfort and beauty; and the low walls were glorified by something that wealth cannot give. One earnest, refined soul can do more to make a *home* than all that wealth can command without it.

Physical habit and moral character are so closely allied that they cannot be considered separately, and both are largely in the hands of the mother. Children should be taught early to respect their bodies; they should be taught physiological law and the habits of right living, and that "he who sins willfully against his body, as truly sins against God as he who breaks one of the ten commandments," and yet many otherwise good parents are marvelously ignorant of the physical habits of their children, after they are old enough to take care of themselves. Are not some mothers greatly responsible for the debauched and unholy lives their children lead, as a result of wrong habits early formed? There should be such an intimacy between every mother and her child that she should know what his physical habits are until such time as, fortified by principle, he can be depended upon to act purely and honorably in all the details of living.

Another point, and one which has hitherto been touched lightly lest the modest public should hold up its hands in holy horror, is this: There should be that mutual confidence in mother and child, that when he is old enough to question and comprehend them, he should have nature's sacred mysteries of life from the pure lips of his own mother, and not be left to receive them from vulgar and unholy lips, so distorted with demoralizing ideas that his whole life may be soiled and poisoned thereby. What a heritage of shame and sorrow we may spare to our beloved, if we act sensibly and truthfully, trusting in the guidance of Him who in the morning of the years, pronounced all his works "very good."

Let us teach the little folks of house and farm that temperance is corporeal piety, "the preservation of the divine order in the body, the harmony of all the members thereof, the true symmetry of part with part, or as one has said, 'the worship of God with every limb of the body.'" Temperance is of two kinds: moderation in the use of right things, and total abstinence in the use of wrong things. Temperance in the use of bread is moderation; temperance in the use of strong drink is total abstinence. If we were discussing stimulants, we might say something about one in very common use, and we are sure we should not offend even those who indulge in the same, for we never remember to have heard an honest user of the "weed" discuss the habit, but he advised all who had not commenced this indulgence never to do so. We want the little folks of house and farm taught to keep the body and the soul clean. We like St. Paul. We believe he was a clean, neat man. He wasn't satisfied with advising us to have our hearts sprinkled from an evil conscience, but added "and our bodies washed with pure water." If he had lived after Sir Walter Raleigh, we feel sure he would have said something about sweet breaths and clean mouths. Strange that he did not anticipate the weed. One writer says: "I never see a boy beginning to smoke or chew without trembling for his future. I see that the highest possibilities of that boy's manhood may be lost, and though he may have the native strength to resist further evil, I know not a vice to which he is not rendering himself more susceptible." It is urged that there are many good and upright men

who use tobacco, and this is doubtless true, but the fact that there are few drunkards and scoundrels who do not use it, bears its own comment.

Next to tobacco as an evil, and one reaching a larger class, stands the use of condiments and highly seasoned foods. Only plain and natural food is demanded by a natural appetite, and such alone promotes health of body and mind in the highest degree. What we eat has much to do with what we think and do, and a man partakes of the nature of his food. We have not yet arrived at that stage of accuracy at which we can reduce Joseph Cook's Byology to so many pounds of well broiled beefsteak, or Huxley's Lay Sermons to so many dinners of salmon, or Longfellow's tender, heartsome rhymes to the small fruits of the Cambridge garden; yet it is nevertheless true that none of the above mentioned intellects subsist largely on side pork and sauer kraut. Gross food and over-eating are enemies to the health, beauty and activity of body, soul and spirit. Be temperate in all things, is the first great commandment in the decalogue of virtue and talent.

The mother who has fortified her children by simple tastes and pure habits of living, has prepared them for infinitely higher enjoyments, even at the table, than the Roman Vitellius ever found in his thirty thousand varieties of game, and she has done more; she has given to the world its highest ornaments in intellectual and spiritual strength. The sweet, pure bodies of such children will hold souls like unto them; and when, from city home and country farm house, a generation shall arise that has learned to keep the body and the soul clean, the nation will be well governed, because, "putting away all filthiness of the flesh and spirit," men have learned to govern themselves.

"FLORICULTURE; ITS INFLUENCE IN THE HOME."

By Mrs. Dr. Ayres, of Green Bay.

What is the use of flowers? Probably there is no one who is accustomed to the cultivation of plants, watching them as they leave, and bud, and bloom, with as deep an interest as if we not only watched, but made them grow. Who has not been asked this question, and that, too, in a variety of tones, with great diversity of expression. The answer is not always given with decision. It seems to us so strange that every one does not know, that we hesitate, say they are equally useful with other beautiful things, and urged to particularize, at last, perhaps give no reason but that of, why we like them.

Now, I wish to assert most uncompromisingly, that flowers have a value; and that not only to look pretty. We thoroughly enjoy a beautiful sunset, but it fades away, and save for the momentary raising of our thoughts in adoration of Him to whom "the clouds are as dust under his feet," the sky might still wear its winter gray and our lives would suffer no loss.

Flowers are an essential part of nature's economy. From the tiny flowerets joining the red snow of the Alps, feeding the still tinier insect life which waited for their coming, to the brilliant, gorgeous bloom of tropical plants, each has its own individual duty to perform. Clothed in robes of delicacy, fragrance and beauty, they do the work for which they were created, eagerly drinking up from the soil the moisture received there, through the roots; they throw it off again by the leaves, thus giving freshness and dewiness to the air, gathering up the carbonic acid necessary to their own life, and giving out the oxygen needed by ours, while the close proximity of trees to our dwellings is carefully to be avoided, by reason of their throwing more dampness into the atmosphere than is needed. The more flowers around our houses the better, both indoors and out, always provided that they are in a thoroughly healthy state; and for this reason any one passing at least an hour a day in the open air, in suitable weather, etc., among the house-plants in the cold season, may have a reasonable hope of enjoying better health than those who have no such resource. It has been suggested as one means of securing pure air in city homes, that a small conservatory should have pipes leading to each room, thus

carrying oxygen where needed. I am afraid the inventor is in the plumbing interest, as a few plants, where light and heat could reach them, would answer the purpose. The very crying out of nature for her own life-laden treasures proves her dependence on them; the eager delight of the sick, aged and children, deprived, to some extent, of flowers, on receiving them as gifts, prove them to be not only pleasing to the eye, but an actual physical want. Surely they are needed for the perfect health of our bodies.

True refinement is generally accompanied by a love of the beautiful; in fact it is one of its proofs and vouchers. It is not necessary to be rich or idle to be refined; neither can it proceed from cultivation of mind or manner alone. It is certain that a degree of civilization has reached the paganism of Japan, and the love and cultivation of plant life is one of its surest evidences. Who that visited the Japanese gardens at the Centennial, but will remember the primness of the little trees, the extreme neatness of the edgings, and the retiring gentleness, if I may so speak, of the flowers, as if apologizing for being on foreign soil.

Our German population bring with them flower seeds and bulbs. They are a lifelong love to them. Twin-born with their devotion to music, they have helped to make the national character. Whether in their homes, their grounds or in "God's acre," they cultivate and hold dear the bright flowers of their fatherland.

Bonnie England, too, speaks through her own peculiar plants to the hearts of her absent children — violets, daisies, primroses, honeysuckles, roses — an innumerable throng, gather themselves to heart and memory. England's greatest poet puts into words the sad, mournful notes which a flower can sing: "There's a daisy; I would give you some violets, but they withered all when my father died."

France has her lilies and her magnificent provinces of roses, while Scotia and Erin point to heath and shamrock, and show each with pride.

Our home flowers are as fair as those of any clime. From the beautiful woods of the north to the orange groves and magnolias of the south, the trailing arbutus (sweet herald of spring) and the green lily of California, rare specimens, and common winsome buttercups, an endless variety, meeting the wants of the most enthusiastic lover of floriculture and the simple taste which revels in the

"love of the woods." They come to us, the God-given messengers of cheerfulness, in our homes, setting us the bright example of doing the very best we can, under the most adverse circumstances. They teach of him who bade us "consider the lilies, how they grow," and are an ever-varying source of interest and enjoyment.

On some fair spring morning, just after a rain, carefully draw within your little girl's flower bed the letters of her name, plant them with candy tuft, mignonette, or any other sure-growing seed; wait until some day she sees it come up, green and fresh. You will give her a lesson on the improbability of chance which will never be forgotten.

It is often said that the time needed for the care of house plants might be used to better purpose; that the daily watchfulness required by them, if given to some other object, might be productive of nobler results. Perhaps it is so in some cases, but as every person requires some recreation, some interest, apart from and superior to the petty cares and trials of every day life, the cultivation of what adds cheerfulness and brightness to our homes fills this need to many; and floriculture should not tend to selfishness. There are always those to whom a boquet, a plant or cutting given, will bring pleasure. Our floral treasures will be doubly precious to us if shared with others. A wreath of lovely but home cultivated flowers, laid on the coffin of a poor, neglected child, called forth from the mother a cry, "I will never forget those." Her mind, roused to action, saw as in a vision when she too loved flowers. She felt her present state of degradation, and resolved to be once more a respected woman. She influenced her husband to change their mode of life, and when I last heard of her she was respectable. I trust these societies will continue their educational and refining work, until every farmer will see the need of a flower garden; will have a few pennies for seeds to brighten his home, and cheer the tired eyes of those that dwell therein, when the floweret shall open the door for music, and all innocent pleasures which shall tend to refine his family and himself. I would fain believe that those who have been favored with the means to obtain all which shall gratify their taste in floriculture will gladly share and give of their abundance to those who have not, so that no home shall be without the ornaments of nature's own producing, which have been given to our keeping. Interest once raised on the subject, magazines on

flower culture, newspaper columns devoted to the theme, the florist catalogues which come to us so freely, will become sources of information. Some seed of a flower hitherto unknown to us will bring a degree of excited watching for the bloom, positively amusing to a disinterested looker on. Let these things win for themselves a place in the home, and they will gradually weed out the trashy reading which is doing so much to educate for the reform school and the penitentiary, and make our girls silly, discontented and idle, instead of the noble, disinterested, useful women which our homes and our country need.

May each one of us, giving influence and interest according to our opportunities, be enabled to do something towards bringing into every home the sweet lessons and enjoyment of flower life.

> For He who made the violet, and every floweret fair,
> Thinks not unworthy His great power to give His holy care;
> Protect the life from year to year which blooms and blossoms there.

Mr. Field said he had been very much interested in the papers just read by the ladies, and wished they could be heard by a much larger number of our farmers, for he was confident they would be benefited by them. He very much regretted that we had so small an attendance of ladies at our meetings, except at the session set apart for their papers. At our meetings below, the number present was very small, from one to five at the most, and often none at all. Can we not, in some way, induce them to come? The Grange is the only organization where the ladies are in the habit of attending regularly. They may not be excluded from others, but they do not seem inclined to attend. Every Grange in the state should be represented at these meetings by delegates of husbands and their wives. Other industrial organizations make special efforts, and are at a good deal of expense to secure a representation of their local societies, at conventions held to advance the interests of their special business, and there is no reason why farmers and all who are engaged in tilling the soil should not meet in the same way, and consult for their own interests. The Agricultural Societies and Granges should see that this was done, even if they had to pay the expenses of the delegates.

Mr. Philips had been very much pleased with the papers; he thought they grew better from year to year. They were not only interesting and instructive, but were of great value, and we would all do well to carry home the truths here expressed, and practice them; it would tend not only to make ourselves and families more happy, but would add to our usefulness and prosperity in many ways. He had of late years attended similar conventions held in other states, but had not heard a paper read by a lady, or seen a lady present at any meeting except our own. He could heartily indorse all that has been said in commendation of the papers, and was sure that all would join in thanking the ladies for the kind interest they had taken in our work, and for the aid they had given us. He for one would like to have these papers distributed through the session so as to secure the attendance of the ladies at all of our meetings, but was very glad to have them even here.

Senator Arnold moved that the thanks of the convention be given to the ladies for the interesting papers they had presented to us. Carried.

On motion of Mr. Kellogg, they were also made honorary annual members of the State Horticultural Society.

THE IDEAL AND THE REAL IN HORTICULTURE.

By B. F. Adams, Madison.

A garden is supposed to be a beautiful place where grow the choicest flowers, vegetables and fruits, laid out with regularity and cultivated with the greatest care and skill. Poets, when they view such a spot, feel inspired; the lovers of the beautiful in nature and art go into ecstasies over the scene, and express a desire to possess such a charming place. The more studious and thoughtful man of business or professional expert, speculates on such sordid matters as cost, and makes an estimate of the extent to which clean cultivation may be profitably carried. He is the man who, though susceptible to the poetry of a garden, is also imbued with that of practical matters, and when he visits an acquaintance who has cultivated a garden for ten years or more,

and does not see any signs of wealth, only evidences of toil and perhaps a comfortable living, he easily concludes not to serve an apprenticeship at the business in exchange for his present lucrative occupation.

Some of our horticultural literature of the times is the production of men who have had very limited experience in practical gardening, but they write well and give the public some useful information. It is not absolutely essential that a man toil himself, if he has the education and culture, to write vigorous editorials on the delightful occupation of horticulture, duly mentioning the old settlers, Adam and Eve, in the garden of Eden, and especially portraying the charms of the modern garden so admirably that many, poorly fitted by nature to make gardens look charming, feel an irresistible desire to engage in such a delightful pursuit. The greatest fault of such productions is the rosy tint that is given to every phase of the business. Enthusiastic converts to the science of horticulture are often men who read and believe more than is profitable, and with heads crammed with the ideal of the same, feel prepared to begin a garden that will rival others from the outset. The choicest fruits, the earliest and best vegetables, the greatest novelties, are all wanted so eagerly that they sometimes become credulous victims of sharp dealers.

The love of the marvelous often overlooks common practical expedients in horticulture, and to illustrate this I will mention the experiment of two neighbors, whose moral ideas had been elevated and strengthened by reading "My Summer in a Garden;" those of profit, by "Ten Acres Enough," and seeing some illustrated advertisements of rare and wonderful fruits, secretly concluded each to buy one plant of a famous foreign variety of fruit, which, whatever merit it possessed in its native soil, was worthless here. The price was extravagant, but they reasoned that a garden should have the best in the world. Being together one day, one of them, unable longer to hold his secret venture, told his neighbor what he had done, and that after four weeks of the best care, his wonderful plant, to use his expression, "had winked out." Judge of his surprise when told by the other that he had also

bought and lost a plant of the same kind, but he had beaten him two weeks as to time. A few such trials have a tendency to modify ideas of an ideal garden more in accordance with climate and conditions, but the ideal man generally must be humored in contemplating a garden in its broadest sense, and take in about all the fruits, vegetables and trees of a zone until the great majority are eliminated by heat, cold, drouth or soil unadapted to their growth. He reasons also, that his broad views and the labor expended in a garden should bring an ample return; but while cultivating the soil, perhaps some detail, absolutely essential to produce satisfactory results, is not attended to at the proper time. Trimming, pruning and thinning may be wholly neglected, the fruit trees become bushy, the vines too tangled, the vegetables too crowded in the rows; watchfulness may be lax, and before suspected, the worms may be on the currant bushes, the birds among the cherries, the grubworm and leaf-roller in the strawberry plantation, bugs on the potato vines, mildew on the grapes, canker worm and codling moth in the apple trees, curculios on the plums, and the blight on the pear trees. When this state of things exists in a plantation, business distracts the owner; profoundly impressed with the idea that something must be done quickly, he puts hellebore on his currant bushes after the worms have had a prolonged feast; Paris green on the potato vines after they are mostly eaten; cotton bands five inches wide around his apple trees after the moths are up in the branches; takes them off to hunt these insects, but does not find any, and logically concludes that they have jumped over the bands and loses faith in that remedy; jars his plum trees until the green plums drop freely, but not seeing any curculios, doubts the utility of this operation; empties a barrel of salt around the roots of his pear trees and daubs the trunks and limbs with linseed oil, but the blight progresses. Later he overhauls his agricultural newspaper to read Prof. Burrill on pear blight, looks in his dictionary for the definition of bacteria, mentioned by him as the cause, and begins to doubt whether he has given his pear trees the right treatment. The leaf roller and grub worm have made havoc with the strawberry crop, and put him to his wits' end to stop it; again he con-

sults authorities, and when he finds fire recommended, wonders how he can burn his plantation and save it. To protect his ripening cherries he spends a day in putting several elaborate scarecrows in the trees to frighten the birds away, but gets angry next morning while observing a flock of sweet voiced robins perched on those same fixtures eating cherries. It is proper to state that after having spent two weeks in dosing his plants and trees with various treatments, his ideal of a perfect garden is all torn in pieces. To add to his discomfiture, while he has been fighting insect enemies, rains have been frequent, and the weeds have multiplied among the onions, beets, carrots and cabbages, and on the latter a mean worm is visible, another plague; these weeds loom up in formidable numbers, cover the alleys and hide the flower beds from view. In despair he concludes that either the season is very unfavorable for gardening or else he has mistaken his calling; certainly horticulture covers more ground and has more variety than he supposed; thinks that somebody is to blame for suffering so many pests to get a foothold in the country.

In this idea he may be partially correct. Co-operative efforts by neighborhoods are the best means of warring against the pests that destroy our fruits and vegetables. A single individual of untiring industry and vigilance can do much on his own ground in holding them in check; but could a like combined effort be made by a community, the labor, losses and disappointment from such sources would be diminished a hundred fold. What permanent relief does a man gain who works and watches his garden, if his neighbor over the fence suffers his to be a central depot of all the pests in the country? Potatoes are regarded by the masses as one of the essentials for food — all other vegetables and fruit are not so considered, though greatly relished by multitudes; hence the whole population can easily be induced to use a simple remedy to destroy the vermin that prey on this crop, but not one person in a hundred will devote much thought or energy to kill the pests that ruin other vegetables and fruit. It remains then for a small class of horticulturists to devise the best means they can to protect their own, and interest the public in this matter, and awaken more general activity in staying the ravages of our insect foes.

The ideal results of horticultural occupation are often in advance of facts. The labor of years in this pursuit, if well directed, may reasonably be expected to yield some return; but the drawbacks are so numerous that, especially here in the northwest, disaster frequently overtakes success even in our most fruitful seasons. An immense apple crop was grown last season, but how few, comparatively, have realized any profit therefrom, especially in Wisconsin. The best fall apples were sold for ten cents per bushel, and many given away freely. Some people complained of these prices, they always do when products are abundant. It was often remarked we have too many fall apples, too few cider mills and fruit driers. Only the expert, whose orchard had a good percentage of winter fruit, has the chance of realizing from last year's crop, and his profits may be small. Speaking of profit, I am inclined to think that in years of general failure in fruit crops the fruit grower realizes his greatest returns; certainly he often has choice fruit when others have none. The exercise of sound judgment in determining the vegetable crops of a garden, and the quantity of each it is desirable to produce in a season, in view of the probable market value, is of the greatest importance. Successful operations in horticulture are more frequently chronicled than failures, and beginners do not often see mistakes until reminded by disastrous experience.

Some years ago a novice embarked quite extensively in market gardening where the local market was not extensive. His garden was well cultivated and his crops good. His estimate was that his onions, three acres, would certainly pay all expenses of the garden, leaving his immense crop of beets, carrots, cabbages, and some strawberries, for margins. Onions had for several years previous been tending downward in price, but he paid no attention to that fact. They were a drug in market that season, and, after much tribulation, the bulk of the crop was shipped to a southern city, with the confident expectation that when the freedmen began to nibble those onions a quick sale would be the result; but after a long delay returns came in the shape of a request for a remittance of forty dollars to cover expenses of transportation, commission, etc. This result struck our friend as forcibly as a sudden

kick of a mild tempered cow, sprawling the milker on the ground and spilling all the milk, and put him in much the same exasperated frame of mind. If he had been compelled to write a treatise at that time, it would have contained warnings against raising onions, with the suggestive title "Three Acres Enough." But this was not the only mishap. Cabbages were plenty and the price low. A part of that crop was made into sauerkraut, on the supposition that somewhere in this broad land the Germans would become purchasers; but the universal reply to correspondence on this subject was, "no demand." Finally it was offered to his cows, but they refused to eat cabbage in this form. His margins were all swept away, and a balance of several hundred dollars appeared on the wrong side of the ledger. Probably he did better the next season, unlike some who buy experience at great cost, and are then no wiser for the outlay.

It is a very common idea with people engaged in other business, living in the vicinity of cities and large villages, that if they were employed in our pursuits as tillers of the soil, they would weave into their practice such business principles that they would become at once shining examples for others to imitate, but we have seen some such men after having really undertaken the job, almost as much embarrassed and disappointed in their operations before they got through their first season's work as a young man who thought he had a call to preach; without preparation he entered the pulpit, in accordance with an old-time notion of some of his brethren relying on inspiration as a motive power to carry him through his first sermon. Opening the bible hap-hazard, he selected a text with considerable confidence, but then becoming greatly embarrassed, he paused until drops of sweat stood thickly on his forehead. Finally, unable to proceed, he closed the book, with the sage remark: "My brethren, if any of you have got a call to preach, I wish you would come up into this pulpit and try it."

Northwestern experience in fruit culture was more dearly purchased in early times than later. Nearly forty years ago a farmer from New York, living near Fort Atkinson, Wis., raised quite a crop of peaches and invited his widely scattered neighbors to a feast of

the fruit. They came and enjoyed it. They went home and planted peach stones from that orchard, but the young trees that grew were soon after killed and the original orchard never bore fruit again. The experiment was repeated, again and again, years afterward. Twenty-eight years ago I saw a few peach trees loaded with peaches, in the town of Cottage Grove, Dane county, but have not seen a peach growing in Wisconsin since. People in that neighborhood planted peach stones from this orchard, and some even sent to Rochester, New York, for trees. All were killed. Our early apple orchards perished as rapidly. We plant now with greater care in selection, and some give better culture, but the public generally is prone to forget, during a period of mild seasons, the great fickleness of this climate, and plant half-hardy varieties of fruit. In the long catalogue of fruits, how few here can be considered reliable. Some will say a half dozen, others a dozen, apple trees, two or three pear trees, one or two cherry trees, a few plum trees, a half dozen kinds of strawberries among a thousand; of black raspberries the Doolittle, and that sometimes kills badly; one or two kinds of red raspberries, and the same number, perhaps of blackberries; a few varieties of grapes if well protected in winter, generally furnish good crops. But we are slowly making advances in fruit growing, in spite of climate and other adverse influences; probably a few realize some profit, but they have invariably worked long and persistently against many discouragements to secure this result.

I would that every farmer in the land had taste and enterprise enough to take proper care of what plants and trees he buys and sets out, but I believe that one-half of all the orchards planted in Wisconsin are permitted to grow without special care or attention. For this condition of things farmers can render excuses. I am well aware of the multiplicity of cases, perplexities, anxieties and frequent disappointments that have beset many farmers' lives in this yet comparatively newly-settled region, but we are now entering that period of more stable prosperity and growth in material wealth, that requires more diversified wants, and demands more extended intercourse, greater emulation, more cultivated tastes. The ideal of horticulture will be more fully realized when

the well-directed toil that works from the soil the means to procure the essentials of life, its luxuries and embellishments shall also be applied more generally, not only in planting flowers, fruit and ornamental trees, shrubbery and a vegetable garden, but caring yearly for each with that watchfulness and zeal that will secure satisfactory results, and make a homestead in the country what it should be—a place indicative of comfort, culture and refinement, a place where kindred can revel in enjoyment and on which a passing stranger can look with admiration.

RUST OR MILDEW, ITS EFFECT ON FRUIT AND GRAIN.

By Geo. P. Peffer, Pewaukee.

This is a subject in which we are all more or less interested, for our crops of fruit, grain, and even grapes, are exposed to injury from its attacks. On account of this general interest, I would present here a few facts in relation to it, mainly the result of my observations the past season. In the first place, what is it? I would briefly answer, that it is a fungoid growth, a development of masses of spores, springing from and feeding upon decaying vegetable tissues. We see that this growth or development increases in rapidity, as decay is accelerated by a high temperature and a humid condition of the atmosphere. This decaying substance is to rust, what the soil is to seeds and roots, the source from which it draws its nourishment, its vitality.

The past season has been a remarkable one in our state for the abundant crop of fruit raised; all admit that it was the finest crop of fruit ever seen in Wisconsin. The crop was not only large, but for the most part fair in quality and perfect in form, but there were many orchards where the fruit (apples especially) and the leaves had dark, rusty looking patches or specks on them. In some instances whole orchards were affected the same; in others part of the varieties were affected and others not, and again the same varieties were not always affected alike in all parts of the same orchard. This shows that the cause is not wholly in the variety, though some kinds are doubtless more subject to it

than others. Is it in the location, exposure, soil or climate? Each of these may have a tendency to promote it in different seasons and under certain conditions.

The facts bearing on this subject, as drawn from observations the past season are, that up to the 11th of June everything was favorable for a healthy growth of tree and a large and fine crop of fruit. Up to this date the weather had been moderately warm, clear and dry, but at this time a change came, showers were frequent, the air was hot, and a hot wind set in from the south and southwest and blew hard all night, raising the thermometer to 90° in the day and keeping it up high during the night, and in the morning the bright, fresh look of vegetation had disappeared; everything was wilted and drooping; then came a rather cold rain, which was in turn followed by a few days of moderately cool weather, when these spots first made their appearance on the leaves and fruit. In addition to this, the hot, dry air, before the rain came, had so exhausted the moisture in the leaves, that they shriveled up, so that the edges and the tops of the tender twigs were turned black or brown. In some instances the effect was so great that they were wholly dried up and dead, and when favorable weather returned, growth was checked until new buds and leaves were developed. As the principles and manner of vegetable growth are similar in the different forms of plant life, the result was about the same in trees, grains and grasses.

The way in which this injury was done will be more clearly seen, if we briefly consider how plants feed and their growth is made. The sap taken up from the earth by the roots passes upward from cell to cell, mainly in the new wood growth, depositing in them in its passage more or less of starch and other earthy elements, until it reaches the cellular structure of the leaf in a diluted and weakened condition. In passing through the cellular structure of the leaf, it gives off the excess of moisture and absorbs oxygen, carbonic acid and ammonia from the atmosphere, through myriads of mouths, situated both on the upper and under sides of the leaf. The sap thus vitalized passes down between the sap-wood and bark, perfecting the auxiliary buds and developing a new growth of woody fibre from the leaf to the root.

Now, what makes the sap rise? Is it heat? We see that heat and moisture are necessary to promote the sprouting of the seed and the early development of the plant, and whether these are the causes of the upward flow of the sap or not, we see that the flow is greater when heat and moisture are in excess. If the flow is too great for proper circulation in the leaf, whether it comes from injury to the leaf, as stated before, or from a natural insufficiency of foliage to meet extra circulation, the sap stagnates in the leaf cells, and decay or loss of vitality sets in, which in turn induces rust, mildew, fungoid growth or blight. Here is the starting point of the trouble; a diseased or insufficient foliage impairs the vitality of fruit, leaf, stalk or tree, and favors parasitic growth.

Some claim that blight is contagious. Rust, mildew and fungoid growth may be, where they have once gained a foothold, but blight cannot be. It is generated in every pore, cell or globule of the single leaf, or of all the leaves on the twig, or part affected, at the same time, and thus gives the conditions necessary to the development of fungoid growth or rust.

But why are not all varieties of vegetation attacked with rust alike? Why are not all the leaves and parts of the plant attacked affected alike? It must be evident to all who have observed carefully, that this trouble begins with the tenderest parts, with the leaves just starting out and yet undeveloped, and that after they get to be mature, and the buds are perfected, the danger is over. It is only while the plants are growing and tender, when they are developing rapidly and the flow of sap is greatest and the heat up to and over ninety degrees, that they seem to be seriously affected. This is the tender period, the crisis in their development, and once past it, they are safe. Slow growing varieties and varieties with thick leaves, also those trees and plants that reach maturity early, are less affected than the others. This would suggest as a preventive remedy the cultivation of these varieties, and such culture as would tend to produce a steady, slow growth and early maturity, and the checking of excessive and rank growth. The necessity of the last point is proved by the results often seen to follow the stimulation to rapid growth of slow growing trees that have been healthy and fruitful for years,

where early development was slow and moderate. Change these conditions, and the first hot, muggy day that comes usually produces mildew or blight.

When trees or plants are struck with rust or mildew, if left unchecked, all growth is stopped for the season. Should a favorable change of weather occur, and this fungoid growth be checked by natural causes, or if it is destroyed by the application of sulphur, charcoal and salt, a new and healthy growth will start out. The articles mentioned are all good, but I think the benefit comes mainly from the sulphur. The past season, one of my apple trees, the Fall Cranberry, was badly affected; the whole top was affected, fruit, twigs and leaves; growth was entirely checked on the 20th of July; the 1st of August this mildew disappeared, new buds started out, and from the 15th to the 25th of August the tree was as full of blossoms as it had been early in the spring. The weather was hot and unfavorable, and this growth was struck with mildew again. I applied sulphur and air slacked lime, and prevented further injury, and I think the tree will come out right in the spring, as it perfected the second set of fruit buds.

Grain and vegetables were also much affected with rust the past season, and our experience with them serves to substantiate the cause given and prove the efficiency of the remedy. On the 20th of May I planted a patch of corn and peas, which got a good start and did finely; three weeks later, I planted a few rows along the side of the first, thinking that the difference in time would make but little difference in the crop; it came up well and grew rapidly for a time, but soon blighted so as to be of no value, while the early planting was not touched. I had a piece of Amber cane, self sown, that started early and I let it grow. On the 25th of May I planted a piece alongside this; it came up well but was struck with blight, and for weeks barely lived and only really commenced to grow about the middle of August, when the self sown was fully ripe. The result was, the frost took it just as it was topping out.

Wheat in our section was much injured by rust. The greater part of it was sown rather late, on account of unfavorable

weather. There was a very heavy stand of straw and would have been a heavy yield but for the rust. What was sown early, ripened before the rust had a chance to injure it much, but the later sown ripened at the time the rust was the worst, and did not yield half a crop. All varieties seemed to be affected about alike, but besides the early sown, that which was sown on fall plowing and on old land, also the pieces that were on elevated locations were injured less than the others. We found that sowing salt on the land, about two bushels to the acre, tended to prevent injury from rust. Some who tried it got from thirty to thirty-five bushels to the acre, on the salted ground, while the yield on that which was not salted did not average over seventeen. Barley was also much benefited by the application of salt. It nearly doubled the yield, and made a great difference in the quality. Oats were also much improved by it, apparently more than any other variety of grain.

There are many points in this subject on which we need more light, many things that we do not fully understand. By study, experiments and careful observation, these points may be cleared up so that we will be able by active and preventive remedies to control, in a measure, this disease.

HORTICULTURE AS AN EDUCATING INFLUENCE.

By President J. M. Smith, Green Bay.

That man or woman who relies upon books alone for his or her education will never become a truly educated person, I care not how long or how faithfully they may study them, or how many of them they may read and study. Such an one may, and doubtless will, have a great deal of book learning. The history of the world, the philosophy of both ancient and modern days, the mythologies of all ages, from Zoroaster down to modern spiritualism, the science of astronomy, from the days when the Phœnician shepherds watched the stars on the plains, while tending their flocks, down to the discovery of the last asteroid they may have at their command; they may be familiar with the theories of statesmen, orators, poets and heroes; they may have all of these, and much

more than these, and yet not have that practical education that is so essential to success as well as usefulness in life. Indeed, some of the most learned men, so far as book education is concerned, that I have ever known, were among the most helpless in the practical work of every day life. It may be asked right here, would you exclude books from us and our children? By no means. I care not how many books you have, nor how diligently you use them, provided they are used as a means or assistance in getting an education, and not as an education in themselves.

He would be a bold man who would assert that Abraham Lincoln was not well educated. Still if we should estimate him simply by his book learning, he would fall far behind Edward Everett, Charles Sumner, and others who might be named. But look at him; making his way from the humble log cabin, without papers, with almost no books at his command, or within his reach; yet he is constantly getting his education while clearing away the forest, while working upon a flat boat, while serving as a private soldier, and then as captain of his company, while studying law, while practicing at the bar, while serving his neighbors in the legislature, and then in congress, and finally serving the nation and the world so honestly, so truly and so well, that not only to-day, but in the centuries to come, he will stand forth as one of the noblest as well as one of the grandest specimens of manhood that the civilized world has ever produced.

I have mentioned this to show that large libraries are not an absolute necessity in forming good, intelligent and useful men and women. In states and territories comparatively new, like our own, but few large, elegant libraries are to be found; and among thinking persons the question often comes up, what course shall we pursue in order that we may not only not retrograde, but go forward in knowledge and in influences that go far toward elevating and refining not only our own families, but those of other families about us. I have no hesitation in saying that I believe the study and the practice of horticulture in its influences to be one of the best that can be adapted to farm life. Its every influence is for good, and not evil. It is elevating and refining. You have all read, time and again, of the thief, the burglar, the

highwayman and the murderer, who each and all prepared themselves for their deeds of wickedness at some low, vile rum-shop. I have read of the Italian brigands, who were very devout in their prayers, even while committing deeds of cold-blooded murder. But who ever read or heard of one going to a lady and asking for a beautiful bouquet of flowers to give him courage for deeds of evil? Such a request would be considered proof that the applicant was either an idiot or a lunatic. I hardly know why it is that so many sensible persons will persist in declaring that they know nothing of growing either small fruits or flowers, and that they cannot learn. If you should tell one of them that he did not know how to raise a crop of corn, he would consider it an insult. Yet my own experience tells me that I may rely upon a large crop of strawberries with full as much certainty as upon a crop of corn, and with much more certainty than upon a crop of potatoes.

My wife takes care of the flowers. The roses never refuse to bloom. Her flower-beds never fail to be marvels of beauty in their season, although neither of us ever took the first lesson in landscape gardening. In fact, I am inclined to the belief that the pursuit of practical horticulture requires no more skill than it does to become a good practical farmer. It does require more thorough, as well as more careful, cultivation.

But there are those, who are at least fair farmers, who are in reality ignorant of almost every principle of horticulture. They would gladly know something of it, and enjoy its pleasures and its profits. What can they do? Let them form themselves into a horticultural society, and meet regularly, as often as once per month. But do not attempt to make it a complete success without your wives and children. Bring them in, and make your wives full members, with the right to vote.

In a farming community, it will, as a general thing, be better to move about with your meetings. This will almost certainly be true during the summer season. Appoint your meeting at or near the home of some one of your interested members. Ask him to fit up an arrangement for some hot water. Have your subject for discussion selected in advance, and your leading

speakers chosen. Upon the appointed day take your team, your wife and friends, with a well-prepared lunch, not only sufficient for your own family, but to divide with others who may not have a full supply; go to the appointed place, and meet your friends and neighbors. Have a nice picnic dinner. If you can add some music to your entertainment, all the better.

After dinner is over, have your meeting called to order, and a regular business meeting conducted with good order, but without being too strict in enforcing all the technicalities of parliamentary rule. Make it pleasant and agreeable to all. We will suppose that the subject of your meeting is planting the family garden. We will also suppose that you have not a practical gardener among your whole number. What is to be done? Simply this. Let each one study up some branch of it as best he can, and relate his knowledge and experience with regard to it. For instance, one of your speakers tells how he has either made or known made an excellent asparagus bed; and does it in the following manner. "Select a piece of rich land that is well drained,— and in fact, no land should be used for a garden that is not well drained,— manure it heavily, plow it under as deep as you can. After harrowing or raking it down level, make trenches with a plow or otherwise, about three feet apart. Make them not less than six inches deep, seven still better. Get good strong roots, either one or two years old, and put them in your furrows or trenches, about eighteen inches apart, spreading out the roots in as near their natural position as possible. If you can have more manure to put on the roots before covering with earth, all the better, always remembering that this is one of the crops, for which the land cannot be made too rich. After the manure is put on, fill the furrows, level off the bed, and the great bugbear, to a great many, of making an asparagus bed is complete." All that is necessary the first year is to cultivate it sufficiently to keep down the weeds. The following spring cut off the tops and burn them, and then put on more manure, and dig it under, being careful not to dig so deep as to disturb the roots of the plants. The second year you may cut a little from your bed. In reality it should be cut only a few times the second season, for fear of

injuring it for the years to come. Remember to keep it cut clean as long as you continue to cut. The third year you may cut a supply, although if manured each spring as above directed, and cultivated sufficiently to keep the weeds from growing, it will continue to improve until it is five years old; and then it will, if properly cared for, hold its own for from twenty-five to fifty years. A bed twelve feet wide, and twenty-five to thirty feet long, will give a large family a full supply for the season."

Let another tell how to make a small hot-bed for a farmer's garden; bring out the points in about the following manner: Prepare a couple of sash about three by six feet. Select some sunny spot on the south side of the barn or some board fence and dig about twelve inches deep and about the size of your sash. Board it about three feet high on the north side and about two feet on the south, making the slope gradual and regular, in order that the sash may fit closely upon the top of it. Put in about two feet of fresh stable manure and pack it closely. If it is not thoroughly wet, pour on hot water until it is. Now for your earth. It must be rich and fine. If it is not already prepared, no matter; go and break up and throw the frozen lumps upon the manure. Put on sufficient to make it not less than four or more than six inches deep after it is fine and dry. Put on the sash, bank up closely around it with snow, if you have nothing else, though coarse manure is better. Cold nights it will need a covering over the sash. For this purpose take a piece of sheeting and put on six or eight pounds of cotton; lay another piece of sheeting on this, and quilt it like a coarse comfortable. Make it large enough to cover the entire frame. Put it on nights and you have a hot-bed that will be safe, even if the thermometer outside goes below zero. Take it off every day in which the sun shines and you will be surprised to find how soon the lumps of frozen earth are not only thawed, but the bed becomes in good condition to plant. As regards the time of planting hot-beds, it is a good rule to allow six weeks from the time of planting it, to the time that you will probably want to set the plants in the garden. One bed of this size will hold a sufficient quantity of cabbage, cauliflower, tomato, lettuce, pepper, egg plants, etc., to give a large family a

nice supply of early plants. It is better to put a division in the bed, and put the cabbage, lettuce and cauliflower upon one side, and such as require more heat upon the other side. You can then regulate the heat by raising or taking one sash entirely off and leaving the other on.

Let another tell how some successful strawberry grower of his acquaintance sets his beds as follows: Land that will raise a large crop of corn, will, with a coat of manure and good cultivation, raise a good crop of Wilson's Albany Seedling strawberries. Manure well, and put the land in first rate order. Then get plants of Wilson's Albany Seedling, and be sure that you get plants of some reliable parties, who have them in their purity. If they are to be set in any place where they can be cultivated with a horse, make the rows three feet apart, and set the plants eighteen to twenty-four inches apart in the rows. If you expect to cultivate with a hand cultivator, set them two feet apart each way. In setting the plants be sure to set them well in the ground, yet being careful not to allow the earth to cover the center or crown of the plant. Press the earth firmly about the roots, and if the weather is dry, put a little water upon it. Cultivate well, and allow the runners to grow. Grow the Wilson for the main crop, and then experiment just as much and as long as you choose with other varieties. Among those that promise best at the present time, are the Crescent seedling (pistilate), the Sharpless, Seth Boyden's No. 30, Charles Downing (pistilate) and Kentucky. The last named is valuable more on account of its being very late than for any other quality. There are hundreds of varieties upon which you may use both skill and patience as well as money, but with a strong probability that you will never realize any reasonable return for either. If you wish something very choice in quality, without much regard to its bearing qualities, get Burr's New Pine and Lennig's White. Downer's Prolific is also of excellent quality, and a moderately fair bearer.

A fourth member tells how he has grown a fine crop of early peas of the Early Kent or the Extra Early Dan O'Rourke varieties, and then supplemented them with a bountiful supply of that queen of table peas, the Champion of England.

Still another gives his experience in growing a crop of early potatoes. That he has found the Alpha some days earlier than the Early Rose, and of a very fair quality, but so very indifferent in its yield as to make it an undesirable variety, even for early potatoes. In this manner the time of the meeting is spent, until the time comes for them to adjourn to meet on another day, a month hence. At another meeting, the ladies tell of their success in raising flowers. Some may tell of failures, and ask for advice, which is given, and very likely may prove of great benefit.

At one meeting after another, the different crops of fruit and of vegetables are thus discussed, the best methods of cultivating them, the best methods of preserving them during winter, the varieties best adapted to the different soils and climate, until each active, thinking member of such a society has a better practical knowledge of horticulture as adapted to his own soil, climate and location, than he would have had by reading every volume that has been printed on the subject of horticulture during the nineteenth century, provided he had depended on them only.

But it is by no means necessary that you should confine yourselves strictly to horticulture. If you prefer to devote a portion of your time to agricultural subjects, do so. At times, call upon some outside friends to visit and address you. How long think you such a society, consisting of wide awake, active members, could hold together without being of great use, not only to each other, but to those about them? I speak with the more confidence in this, from the fact that for years past I have been connected with such a society in Brown county.

Not long since, one of the educated and refined ladies of the city of Green Bay said to me, in speaking of the influence of that society: "I can see a great difference in the ladies now, as compared with the time when they first began to meet together, and it is all in their favor. They prepare their food more nicely; they set and prepare their tables with more taste and care; they treat each other more politely and kindly. In short, I have noticed a steady and rapid improvement in all these and other things, ever since I began to attend the meetings." And this was from one of the highly cultivated ladies of our city.

Last summer our society was invited to meet in a grove near the village of Depere. The lady friends in the village took it upon themselves to prepare and furnish most of the tables, and in fact consider the other members of the society as their guests. When we were invited to seat ourselves at the tables we found them, as we had often done on previous occasions, bountifully laden with food, nicely prepared and beautifully arranged. In addition to all this, each member or friend found a nice button-hole bouquet upon his or her plate, with a pin lying by its side with which to fasten it on. I mention this, not as a thing of cash value, but as something that great wealth oftentimes fails to purchase or obtain, viz.: an evidence of true kindness of heart, a cultivated and refined taste, such as is only found among truly polite and educated people. Said a friend, who had left his farm work during the busy season of the year, and traveled a long distance with his wife to meet with us, "These meetings are green spots in the journey of life. They are not to be forgotten, but cherished and remembered as days of happier cheer and brighter sunshine than often falls to our lot."

With a very large proportion of our farmers, and more particularly with their wives, there is altogether too much hard work, and too little recreation. The same is true of the children. I do not wonder that many of them become disgusted with the farm at an early age and leave it for some other employment. If they are to remain upon our farms, fill our places when we are gone, and fill them better than we have done, they must be educated; the farms must be made pleasant homes for them, not simply shelter from the summer's heat and winter's cold. Shade trees must be set about our homes. Fruit trees and the fruits suitable to our soil and climate should be grown upon every farm. Flowers should adorn every home. It may be said that all these things take time and some money; that is true, but is money all that we are upon our farms for? Suppose that you do have to raise one or two acres less of wheat and two or three acres less of corn, but have fruits, flowers, shade trees, lawns, etc., in the place of the lonely, bleak, barren house, with nothing about it to make it inviting to the sight, and little but bread, potatoes, pork and beans to live on

inside. It was a most bitter sarcasm, as well as a sad commentary upon some farmers' homes, that was uttered by the wife of one of our large western farmers, and a very fine stock-grower. His stock of all kinds was noted far and wide as being the best in the portion of the state in which he resided. His sons were noted as far and wide for their inclination for drinking, gambling and other traits of character of the same low order. His wife led a life of almost unbroken toil, and was, in fact, but little better than a slave in the house where she should have presided as the queen of a beautiful home. Some persons called one day, during the absence of her husband, to look at the stock. She went with them and showed them the beautiful herds of cattle, stalls filled with noble horses, and pens of the finest breeds of swine.

The visitors were enthusiastic, as well they might be, over such fine specimens of stock. In reply to some of their remarks she said in a very bitter tone, "Yes! the stock is very fine indeed, but if my husband had paid one-half the attention to rearing his sons that he has to rearing his horses, cattle and hogs, we should have had a very different family from our present one." I do not wish to under-estimate our fine stock, nor the great value that has been added to the wealth and happiness of our country by their production, but I do protest most earnestly, against this complete substitution of body for soul; this devotion to any one branch of agriculture to such an extent as to ignore or forget the comforts of home, the higher life of this world, or the still higher one of the spirit land. Then, friends, let us work on in a path that will surely lead to a pure and happy life. Year after year as I stand amid my growing plants, and think of the laws of the Father of the Universe, how they hold the planets in their course; how thousands of other suns and worlds are moving on in their appointed way, without jar or confusion, each one perfect in its own orbit; and then think that the same Father of all has made laws just as perfect, governing the most feeble of my plants, as well as the largest of the planets. The modest little strawberry plant never turns into a rose bush, nor the rosebush into a pansy, nor the pansy into a pink. Each and every one retains its own individuality and its own peculiar features of life. And when

we examine any one of them, how wondrous and how perfect their beauty. We no longer wonder at the words of the Divine Teacher, when he said, "Behold the lilies of the field, how they grow. They toil not, neither do they spin, and yet I say unto you that even Solomon in all his glory, was not arrayed like one of these." If we thus work and make our homes what they can and may be, we shall no longer hear the complaint that the sons are leaving the farm, and the daughters declare that they will never marry farmers, but on the contrary they will learn to look upon the home of their childhood as the dearest and happiest spot on earth, the spot they will ever leave with regret, and to which they will return with heartfelt gladness. To them, as well as to ourselves, it should ever be the most perfect type of the bright beyond, that our earth affords.

RASPBERRY CULTURE.

By A. L. Hatch, Ithaca.

The two best market sorts are Gregg, Black Cap and Brandywine, Red. Caution should be taken in planting all tip or bowcane varieties. The tip of the old bush, left on the plant, must not be regarded as the top of the plant. Beware of planting so as to cover the buds in the crown of the plant too deeply.

When new bushes are one foot high pinch off the tips so they will branch low down. Don't wait until bushes are two feet or more in height before nipping them off. When branched low down they will stand up better, the branches will mature and endure the winter better than they would if branched higher or left unpinched. After bushes are two feet high they will not sustain themselves, if they are pinched off, and form two or three branches near the top, as they always do. Better not pinch them at all if it cannot be done low down, say at one foot or less from the ground. When the branches have grown six inches, pinch their tips off, so they will rebranch. This second pinching is not always necessary on weak or young plants, and often not on the red sorts; but is very necessary on the vigorous Black Caps. This pinching and consequent branching of the bushes makes them

self-supporting when closely planted in the row (say one and a half to two feet apart) as they should be. It is far cheaper and better than stakes or trellis, besides insuring plants less liability to injury with cold winters. Also it makes a plantation more easily managed with horse culture than any other plan.

In the fall give a good top dressing of barn-yard manure around each plant, to assist in protecting the roots from the effects of severe cold, freezing and thawing. If it cannot be done in the fall, then try to do it in the winter or spring before growth begins. At any rate do it liberally.

In the spring, when buds have started a little, or before, shorten in the bushes quite severely, if yearlings, and leave only such amount of bush as will be well supported. If two or more years old, more bush may be left, but all should be shortened. By no means allow a yearling plantation to bear a full crop. If it does, it will be at the expense of future ones, and also injure the plants permanently. If trained properly, the horse cultivator can be run quite closely to the plants, and should be frequently used.

When fruit is off, cut out old bushes at once. They add nothing to the strength of the bush if left, and are a decided injury, if the soil is poor or weather is dry. Sprouts or suckers from the red sorts should be hoed off and thinned out, so that only as many grow as are needed to fruit the next season. When it is determined to abandon a plantation, all new canes may be taken off as fast as they appear. This would throw all the strength of growth into the fruiting bushes. Plant in long rows, away from wind, or at least so prevailing winds will blow lengthwise of the rows.

REPORTS

OF

COUNTY AND LOCAL HORTICULTURAL SOCIETIES.

BROWN COUNTY HORTICULTURAL SOCIETY.

This society has held, during the year, ten regular monthly meetings, that for the month of March having been intermitted on account of the weather, and that for July on account of the convention held June 24th. These meetings have been held at different places, as follows: January 17, at the residence of Vice-President Abrams, Green Bay; February 14, at the residence of President Smith, Green Bay; April 2, at Dr. D. C. Ayres, Green Bay; May 1, at Wm. Rowbotham's, Preble; June 5, at C. J Lawrence, Town of Howard; August 14, on board steamer Brooklyn, between Depere and Appleton; September 4, on the grounds of the Driving Park Association, Depere; October 16, at J. W. Woodruff's Town of Bellevue; November 6, in the Common Council Room, Green Bay; December 4, at Klaus' Hall, Green Bay. Also one special meeting, September 24, in the Exposition Building, Depere.

Formal addresses were delivered at the regular meetings by Judge Ryan, of Appleton, Judge Howe and Rev. Mr. Richardson, of Green Bay; and by the Hon. A. A. Arnold, of Galesville, at the special meeting of September 24th. The meetings, with the exception of one or two, have been well attended by the members, and some of them also by visitors.

The second annual convention of the State Horticultural and the Brown County Horticultural and Agricultural Society was held at Klaus' Hall, and the second floral exhibition of the latter society at the Armory, June 24th and 25th.

The first annual fair of the Brown County Horticultural and Agricultural Society was held on the fair grounds of the Fox River Driving Park Association, at West Depere, on the 21st, 22d, 23d and 24th days of September. The weather was fine during the whole time, and the fair was an eminent success in all points and respects. As the financial results of the fair have not yet been formally reported to the society, the secretary will here enter the statement prepared for him by his assistant, M. P. Persons, the acting secretary during fair time :

RECEIPTS.

For advertisements in premium lists	$169 00
For sale of privileges on ground (booths)	376 10
For box horse stal. rent	9 50
For entry fees for horse trotting for purses	108 50
For sale of tickets	1,457 69
Total receipts	$2,120 79

DISBURSEMENTS.

Purses for trotting horses	$ 68 33
Premiums, all told	254 00
Cornet band, four days	100 00
Alex. McDonald's chariot racing	255 00
Hay for cattle and horses on ground	31 10
Meals for help employed	33 50
Watchman and police service	65 98
Ticket sellers and gate keepers	26 00
Portable engine for running machinery	24 00
Printing posters, dodgers and premium lists	198 15
Total	$1,356 06

Excess of receipts over disbursements, $764.73.

In addition to the preceding statement of financial results, the secretary here reports the whole number of entries of all classes in the Fair proper, as appears in the assistant secretary's entry book, to be six hundred and eighty-nine, and the whole number of entries for horse racing for purses to be twenty.

One hundred volumes of the transactions of the State Horticultural Society for 1879, 1880, fifty volumes of the transactions of the State Agricultural Society for 1879, 1880, and twenty-five of the State Dairymans' Association, 1879, 1880, have been received and nearly all distributed among the membership and given to other persons interested in the general cause.

At the date of the last annual report the membership consisted

of two active life members, sixty-seven active annual members and four honorary male members; total, seventy-three male members; together with sixty-eight honorary female members, making in all one hundred and forty-one.

During the year thirty-one male members have been added to the active membership, and two have been removed from all the scenes of earth life. This gives for the present male membership of the society: Life members, two; active members, ninety-six; honorary members, four; total, one hundred and two.

By a standing rule, all married ladies become honorary members of the society on the admission of their husbands, and all unmarried adult daughters of members in good standing shall, on handing their names to the secretary, be accepted as honorary members and their names entered upon the record as such.

The secretary is not able to give the exact number of ladies who are to be regarded as honorary members of this society, their names having not all been reported and enrolled. Probably the female numerically equals the male membership, which would make the total number of all classes two hundred and four.

It should be here stated that four members, namely, W. R. Bourne, Theo. Arter, J. T. Wright and Alfred Thomas, reckoned in the active list, have moved from the country, and their names should either be stricken from the roll entirely or transferred to that of honorary membership.

The society made an excursion to Appleton, August 14, on board the steamer Brooklyn, under an invitation of the Outagamie County Association. The excursion was a success financially and otherwise, being a highly pleasurable reunion of the two associations, and an occasion of large addition to the membership of our own.

One of the most important events connected with the society which has occurred during the past year, is its reorganization under the state law for the promotion of agriculture, as recorded in chapter 60, section 1460, of the Revised Statutes. This incorporation was effected on the 9th day of September, 1880, by filing in the office of the register of deeds of Brown county a copy of a duly executed certificate of our original organization,

a copy of our constitution, and a copy of the preamble and resolution authorizing the registry of the same.

In this review of the past year of the society, it is our duty to recall the mournful event of the sudden decease of two distinguished members, Stephen Burdon and Edson Sherwood, whose deaths occurred in quick succession soon after the first meeting of the year. Appropriate action was taken by the society on official announcement of the decease of these gentlemen at the meeting of February 14.

It must appear from the preceding cursory review of the work of the past year, that Brown County Horticultural and Agricultural Society has neither retrograded nor remained *in statu quo* during that time. She has steadily gone forward in her appropriate work of promoting the interests of horticulture and agriculture in Brown county. And if the retrospect of the preceding year disclosed large ground of encouragement, surely that of the year ending with the decade just completed must reveal still more cheering prospects and promises of usefulness and success.

Respectfully submitted,

Werden Reynolds, *Secretary.*

FREEDOM HORTICULTURAL SOCIETY.

At the annual meeting of the Freedom Horticultural Society, held January 15, 1881, the following officers were chosen for the ensuing year:

President — Charles Hirschinger, Baraboo.

Vice President — J. L. Garton, North Freedom.

Treasurer — George Armbruster, Baraboo.

Secretary — George Fuller, Baraboo.

Executive Committee — J. M. Haines, Eugene Dwinnell and James Blachley.

Delegate to the State Convention — Charles Hirschinger.

Charles Clark, *Secretary.*

EVERLASTING FLOWERS.

(By Wm. Toole, North Freedom, read before the Freedom Horticultural Society.)

Of the kinds of everlastings which we can grow successfully, the Helichrysum may be considered the most useful, because it gives the greatest variety of color and form, while none bloom more freely or are more beautiful, these with Xeranthemum, Ammobium and Acroclinium may be considered hardy, and the seeds should be planted early in the season, as like those of the pansy, petunia and many other plants, the seeds germinate better in the cool, moist weather of early spring than if sown later. A rich sandy soil seems best for their most perfect development, but like many other flowers they will repay careful cultivation in almost any soil. It is better as a precaution, to shade all fine seeds with some cotton fabric, stretched on a frame of laths, that they may be protected from drying winds. The Acroclinium is the prettiest in the garden, of the four mentioned, and should be in every collection of flowering plants, because it comes up so readily, flowers freely, and is useful as well in the green as the dried state.

The flowers, of which there are two shades, white and rose, should be gathered as soon as fully expanded, and dried rapidly in the shade. If the weather is damp, suspend small bunches from the kitchen stove pipe, and as soon as dried pack away in shallow paper boxes to keep from light and dust until needed for use, handling them carefully, as the flowers are easily crushed. These remarks about drying quickly in the shade, and keeping from dust, apply equally to all dried flowers.

The Ammobium is a coarse, weedy looking plant, but the pretty white flowers are produced in abundance, especially if the soil is rich and the plants are not allowed to produce seed. The flowers should be gathered before they are fully developed, otherwise the blackened centers will show when dried. Ammobium means growing in sand, and the plants will produce seed more freely if grown in a sandy soil. Helichrysums are of many shades, from

light yellow or creamy white to dark red, with intermingling shades of orange, maroon, brown, etc.

The mixed varieties are classified by florists as Monstrosum, Maximum, Minimum and Nanum, and it is well to procure seeds of the different classes to insure a good variety of colors; but they are not very distinct in their differences from each other. The first buds are often eaten, like those of the Aster and Dahlia, by an insect, and the plants should, when they first show signs of injury, be sprinkled with white helibore tea. The buds of Helichrysum should, by all means, be gathered before they are fully developed; otherwise, when they are dried, they will have lost their beauty. They will open while drying, and by gathering buds in different stages of development a variety may be had from the same plant.

Xeranthemums are useful for variety, and because they furnish good stems of their own; but they are not showy, unless some of the newer, high-priced varieties are equal to the florists' descriptions.

Helipterum Sandfordi is a very bright and pretty yellow everlasting, with the flowers in clusters. Although not tender, they should not be planted quite so early as the preceding; in other respects the treatment should be the same, but the flowers may be allowed to fully open before they are gathered. Helipterum Anthemoides white is not worth growing.

Waitzia I have never grown. The seeds are always dear, and the catalogues give it but equivocal praise.

The Rhodanthe should be treated as tender in the early stages of its growth. The seeds are delicate, and should be started in a cold frame or in a box under a pane of glass. The buds and flowers are very pretty and suitable for "boutonaire" adornments. They are so dainty in appearance that they should be more generally grown as summer pot-plants.

Globe Amaranth, *Gomphrena globosa*, giving crimson, orange, pale-yellow, white and variegated flowers, is very susceptible to frost. It delights in a light, warm situation, and if started in the open air, the seeds should be planted when the weather is warm,

after danger of frost, and covered with a pane of glass. The plants will grow and bloom until cut down by frost; and, if possible, should be started in a hot-bed or sunny window, but the young plants should receive no check in their growth.

Belonging to the same family with the preceding and requiring like treatment are the Cockscombs, which, though not properly everlastings, may, with careful selection and drying, be made useful for the purpose. The smaller spikelets are the most suitable, and of the true Cockscombs, *Celosia cristata*, the variety known as Japan Cockscomb is the best. Still other species of Celosia, as Celosia spicata and Celosia plumosa, are very desirable for drying. All of the Celosias have thick, juicy stems, and should have gentle heat, with a free circulation of air while drying.

Gypsophila muralis and Gypsophila elegans are recommended for drying. The flowers when dried are almost inconspicuous, but the fine, spraylike branches give a more graceful outline to the decorations of which they form a part. They are quite pretty, used as basket or vase plants, and are easily grown. Double, annual Larkspurs, of the branching varieties, look very bright, when carefully dried, as do also some of the perennial species. Some kinds of scarlet Geraniums, when dried, retain their brilliant color, and almost their form, and are very effective for variety. Even wild rosebuds make a satisfactory addition to real everlastings. When flowers are dry, the stems of most kinds are not pliable, and are easily broken. They can be most easily arranged during damp weather, and quite often had better be supplied with artificial stems of broom corn, fastened with fine wire. The natural stems become tough and pliable for a short time, if they are dipped in hot water and quickly withdrawn.

FREMONT HORTICULTURAL SOCIETY.

This society was organized December 11, 1880. Those who are citizens of the town, and engaged in horticulture, may become members by subscribing to the constitution and paying all assessments, not to exceed twenty-five cents a year. The officers consist of a president, vice president, secretary, treasurer, and an

executive board of three. We hold semi-annual meetings, in September and January. The officers are chosen at the January meeting. The society now consists of twenty members.

The officers for the present year are:

President — T. P. Looker.

Vice President — James M. Brown.

Secretary — H. C. Isbell.

Treasurer — Jacob Siegar.

Executive Board — W. A. Springer, J. Wakefield, C. F. Eaton.

Our last meeting was held March 25, 1881, at the residence of C. F. Eaton. There was a good attendance, and some excellent fruit was on exhibition. W. A. Springer had thirty-one varieties, some in excellent condition, mainly seedlings. John Billington had several kinds, generally in good condition. A lot of scions were exhibited, several of them showing hard usage from the cold weather. It was the opinion of the society that our fruit trees are generally injured. After an excellent dinner, the society adjourned, resolving to hold another festival during the the strawberry season. At the present time, fruit trees are looking fair in this section, and bid fair for an average crop. Most kinds of grapes are all right. At our regular meeting, in January, Mr. T. P. Looker was chosen delegate to the county society.

H. C. ISBELL, *Recording and Corresponding Secretary.*

REPORT OF GRAND CHUTE HORTICULTURAL SOCIETY.

The meetings held by this society the past year have been more interesting than formerly. The discussions at the spring meeting were confined to tree planting and best trees for the orchard.

The summer meeting, held July 17, was well attended, and the exhibition of fruits and flowers the best ever made by the society. Specimens of the well known early varieties of apples were shown, also "The Fourth of July," a new variety in this locality, which promises to be valuable; several kinds of currants and raspberries filled the tables, and a handsome collection of cut flowers from the fields and the garden adorned the room.

At the fall meeting there was a fine display of apples; forty varieties were shown, some of them seedlings of excellent quality, the trees hardy and prolific. L. L Randall showed seven varieties of winter seedlings of his own propagation, from seeds of the Duchess of Oldenburg. He has high hopes that some of them will prove better adapted to the northwest than any variety grown here. Several varieties of choice house plants and specimens of cut flowers completed the exhibition.

The tent caterpillar came last season in less numbers than formerly, and disappeared much sooner than ever before. It is not known whether their disappearance was owing to natural causes or to the vigorous measures used to destroy them. Of all the methods used for their destruction, it is thought that showering with soapsuds is the easiest and most effectual remedy. Apparently our orchards were not seriously injured last season by this destructive pest.

The annual meeting of the society was held on the 15th of January. A fine collection of fruit was exhibited. "The Successes and the Failures in Horticulture the Past Year" was fully discussed by those present.

The following officers were elected for the ensuing year:

President — L. L. Randall.

Treasurer — A. H. Burch.

Secretary — Mrs. D. Huntley.

MRS. D. HUNTLEY, *Secretary.*

REPORT OF JANESVILLE HORTICULTURAL SOCIETY.

OFFICERS.

President — F. S. Lawrence.

Vice President — Geo. J. Kellogg.

Secretary — E. B. Heimstreet.

Treasurer — J. B. Whiting.

Executive Committee — E. G. Fifield, A. Hoskins, J. B. Whiting, G. H. Williston, E. L. Dimock.

Delegates to State Society — F. S. Lawrence, Geo. J. Kellogg.

Cash and notes on hand this date, ninety dollars.

Total number of members fifty-two. Fifteen new members added during the year

E. B. HEIMSTREET, *Secretary.*

REPORT OF THE NORTHWESTERN HORTICULTURAL SOCIETY.

The Northwestern Horticultural Society was organized at La Crosse, Wisconsin, December 19th, 1879. It includes La Crosse county and the southern part of Minnesota.

It held its first annual meeting December 7–8, electing the following officers for the year 1881 :

President — J. S. Harris, La Crescent, Minn.

First Vice President — A. J. Phillips, West Salem, Wis.

Second Vice President — S. S. Luce.

Third Vice President — Mrs. W. P. Powers, La Crosse, Wis.

Secretary — L. W. Brigham, La Crosse, Wis.

Treasurer — L. H. Pammel, La Crosse, Wis.

Executive Committee — E. Wilcox, John Salzer and L. W. Alger, M. D.

This meeting was well attended and very interesting essays were read on the following subjects, some of which are appended to this report:

"Grape Culture," by J. S. Harris, of La Crescent, Minn.

"Top Grafting on Crab Apple Trees," by Oliver Gibbs, Jr., Lake City, Minn.

"Roses and Herbaceous Plants," by John Salzer and Mrs. G. C. Hixon, La Crosse, Wis.

"Strawberry Culture," by J. M. Smith, Green Bay, Wis.

The Fruit Committee made a report regarding the fruit crop of last season in this vicinity.

Our Constitution provides for holding quarterly meetings, but only two have been held the last year, and no fair during the summer.

It is expected that the full number of meetings will be held the coming year and also a fair in connection with the June meeting, at which time we hope to have the State Society meet with us. During the warm season our meetings will be held among the farmers, and if the interest demands, extra meetings may be held.

In thus combining business and pleasure, we hope to make a greater interest and secure a much larger attendance. Our city

people do not seem to take much interest yet in the subject of horticulture. They have so many other things to absorb their attention that it is very hard to awaken their interest and secure their attendance upon these meetings. So far but few ladies attend or show any interest in horticultural subjects. This seems strange, when we consider how many attempt to cultivate home plants and fail, because of their ignorance of the nature and habits of flowering plants. We must be content to wait and educate the people to an appreciation of this subject.

Mrs. W. P. Powers, now one of our vice presidents, was the pioneer among the women of this county. She attended our first meetings without any other lady being present and contributed a very interesting letter. We now have forty-seven members, with the hope of securing a large accession of membership during the summer.

S. W. Brigham,
Secretary.

STRAWBERRY CULTURE.

Read by J. M. Smith, of Green Bay, before the La Crosse Horticultural Society.

In the list of small fruits the strawberry stands at the head. No other fruit is such a general favorite. None of the others will grow upon so large a portion of the earth's surface as the strawberry. It may be found in the almost tropical regions of Southern Florida, and on the shores of Lake Superior. In fact, in some places it is found even within the Arctic circle. Its favorite home is in the temperate zone, and in our northwest it probably does its best between 40 and 50 degrees of latitude. The different varieties are divided into three classes. The staminate, or male plant, which of course never bears fruit, the blossoms having the stamens fully developed, but having no pistils. The pistilate, or female plant, which has its pistils fully developed, but has no stamens, and must of course be fertilized by the stamens of some other blossom. The Russell's Prolific and the Crescent Seedling are samples of this class. The third class has both stamens and pistils fully developed in each flower, and is called the Perfect Blossom, or the Hermaphrodite, the latter being the more correct name. They have also the power of fertilizing pis-

tilates that happen to be near them, hence there is in reality no necessity for ever setting the purely staminate plants. In the third class may be found the Wilson, Seth Boyden's No. 30, the Duncan, Kentucky, and many others. I attribute much of the productiveness of the Wilson to the fact of its having, as I think, the most perfectly developed blossoms that I have ever noticed upon any variety.

Best soil for strawberries. If I could have just what I preferred above all others, I should select a loam, rather light than heavy, and rather damp than dry, naturally rich, and after having surface drained it and under drained it, if necessary, in short, put it in the best of order, manure it heavily with stable manure, and if it is well rotted, so much the better. If the manure is coarse, I should prefer to plow it under. If fine, put at least half of it on after plowing, and harrow or rake it in before setting the plants.

What and how to set. After about twenty years' experience with the Wilson, and in the meantime expending hundreds of dollars in time and money for new and supposed better varieties, I have no hesitation in saying, set the Wilson. If you wish to try a number of varieties, set this for your main crop, and then experiment with as many others as your time and money will allow. If you are growing only for your own use, you of course wish to extend the bearing season as long as possible. With me the Crescent has been some four or five days earlier than the Wilson. It is a good bearer, and a remarkably strong grower. The quality of the fruit is by most persons considered only indifferent. It has a bright color, is moderate in size, and not as firm for shipping as the Wilson. For a family supply, I should want a few of them, also some Kentuckys, to lengthen out the season. The last named is a fine, showy berry, of good quality, a fair bearer, but too soft to bear shipping. It will generally continue in bearing one week after the Wilson is done. Seth Boyden's No. 30 is a magnificent berry in size and general appearance, is of good quality, and if one wishes a variety, and a very showy fruit, it will fill the bill. It is a poor bearer. If you wish something very choice in quality, get a few of Burr's New Pine. It is a very bright red, quite moderate in size, an indifferent bearer, too soft

for shipping, but as above stated, very choice in quality. There are new varieties, and old ones by the hundreds. You can experiment with them to your heart's content, but stick to the Wilson as your main dependence, whether for home or for market, until you are sure of some hing better.

In setting upon a farm where a few rods of land more or less will make no difference, it would be well to set the rows three feet apart and the plants eighteen inches apart in the rows. By so doing you will be able to do nearly all the cultivating with a horse and cultivator. If you are setting in a garden where you have but little room and wish to make the most of it, make the rows about two feet apart, and set the plants about fifteen inches apart in the rows. In setting out the plants, set them well in the ground, at the same time being careful not to let the earth cover the crown or center of the plant. Press the earth firmly about it, and unless it is wet weather, it is better to put a little water about the roots of each one. After the plants are set, there is but little to do for some time except to cultivate sufficiently well to keep all weeds down, until the latter part of July or probably August when the runners are beginning to take root. This is supposing them to be set in early spring, which is undoubtedly the best time. As the runners begin to take root, it is well to go over the ground and spread them in different directions around the parent plant, and if necessary, place a little earth upon the runner to hold it in its place. By this method you will have the young plants about evenly distributed over the ground, instead of having them in some places too thick, and in others but few or perhaps none at all. In the fall when the ground is frozen, the plants should be covered with coarse hay or straw. The latter is excellent, provided you can get it free from foul seeds, and not have a summer's job the next season trying to destroy their products. Cover about one inch in depth, and leave it on in the spring until the danger of freezing nights and thawing day times is about over. Take the cover off the ground, and clean it of all weeds and grass of every kind. Put on a dressing of fine manure, say twelve or fifteen loads per acre, or wood ashes will do equally as well. If ashes are used, put on fifty bushels per acre if un-

leached, and twice the amount if leached. As a general rule, the plants when cultivated as has been directed will be so close together that they will support the fruit, without any mulching, from the ground. If they are not so, you can put back some of the cover in places where it is needed. It is better not to do it until the fruit is pretty well grown, as the mulching prevents cultivation of the ground. Do not forget that you cannot get a fine crop of fruit and a large crop of weeds or grass at the same time. You have now come to a very critical period in the care of your crop. The berry is almost all water and of course the plants must have moisture, or your efforts and labor will be nearly lost. If dry weather comes on, as it sometimes does at this season, do not fail to put on water, even if you have to haul it some distance. If watering becomes a necessity, it is better to water the plants thoroughly at one time, and then leave them for a few days without any, than to merely wet them once every day. If the weather is very hot and dry, they will need water twice a week during their heaviest bearing season. The fruit should be picked about three times per week unless the weather is very dry and hot, when it may be necessary to pick them almost every day.

At the close of the picking, if you have cultivated the Wilson, and have had as large a crop as I expect with the above cultivation, it will be about useless to attempt to get another crop, unless you have adopted the three feet rows. In that case you can cultivate the land between the rows and let the runners fill the space, putting on more manure and covering the following winter according to directions already given. If you have adopted the closer cultivation and the plants look exhausted at the close of the season, and do not readily throw out plenty of runners, it is better to turn them under, and put on a crop of late cabbage or other fall crop, than to go to the expense of cultivating them another year, and then only get a poor crop of very indifferent fruit. This will of course make it necessary to put out new beds every spring. If you have had such a crop as such cultivation ought to produce, you can well afford it. When growing the Wilson and setting as I usually do, in two feet rows, I am not satisfied with less than fifty quarts to the square rod, and have repeatedly had much more than that amount.

One thing more in regard to the Wilson. If you are picking to ship, you must pick about as soon as they are thoroughly colored, but if for your own use, leave them on the vines until they are a deep dull red, and you have a berry very far superior to any Wilson that you can get in the market. The general complaint is that it is too acid. The truth is, it is almost invariably picked before it is ripe. Try my plan, my friends, and see if I am not correct. I have thus given my view with regard to the culture of this most delicious of all small fruits. It is twenty years since I picked my first Wilson. Since that time I have but once failed to have a crop that would not, at least, pay expenses. A few times they have been what I termed moderate crops; but most of them have been large, and some of them simply enormous. Previous to the introduction of the Wilson, I had been more successful with the Early Scarlet than any other variety. As compared with the Wilson, I do not claim to have been really successful with any of the almost countless new varieties that have been thrown out upon the public for the last twenty years. If we can judge from the almost entire absence of almost every variety except the Wilson in our markets, both east and west, my experience will probably correspond with that of the great majority of the growers of the country. Some of the large varieties like Jacunda and others of that class, it is said, will do better upon a clay soil than upon any other. I have never tried the experiment. Upon my soil, with the best cultivation that I could give it, it was almost an entire failure.

Here let me say that while I decidedly prefer such a soil as I have mentioned, the Wilson will grow and yield good crops upon almost any soil except a very wet or very dry one; and perhaps I should add a very poor one. If I am correct in my views, it will readily be seen that there is scarcely a forty acre farm in this state where the owner might not have a full supply of this fruit for at least one month, and generally more than that in each year. Almost every owner of a little garden plot may have. They should be upon the table of every farmer during their season, and should be as abundant there as bread and potatoes; and as often as any of the family desire them. In my own family, I believe

it is not an overstatement to say, that during the berry picking season, two bushels of berries are used for every one of potatoes. They are on the table for each and every one to eat, just as many or as few as they choose. That seems to me to be the true plan to pursue with regard to them. I do not imagine that I shall live to see such a day, but if this paper shall be the means of awakening even a few of our farmers and other friends to the great value as well as the great comfort of making this delicious fruit one of our main articles of food during its season, instead of an occasional luxury, as is too often the case, I shall feel that I have been many times repaid for the time spent in its preparation.

TOP GRAFTING OF CRAB APPLE TREES.

Read by Oliver Gibbs, Jr., before the La Crosse Horticultural Society.

The improvement of fruit trees by grafting the limbs is as old as civilization, and the process is familiar to all residents of fruit regions. In the eastern and southern states, the best sorts of apples in the old orchards are called "grafted fruit," to distinguish them from the produce of the trees as they originally stood, which were all seedlings. It is no uncommon sight there to see several kinds of apples growing on the grafted limbs of the same tree, and when a new variety is to be tried, the first step is generally to graft it somewhere in the orchard. By this process a test can be made some years sooner than by growing the new trees from the root-graft, as the top grafts bear fruit in two or three years' time, while the root-graft is in the same period only got ready for transplanting from the nursery row, and must then have from two to five years' further growth before it will show its fruit. The grafting of common apples upon crab trees has had one general difficulty to contend with, and that was, in the beginning, the slenderer, weaker growth of the crab, their roots, bodies and limbs not being strong enough to carry the heavier growths of the common apple. But this trouble has been lessened and in respect to some varieties almost entirely removed by the improvement in the crab varieties, themselves. The Siberians grew stronger than the wild crabs, and then came the Transcendents and Hislops, stronger than the Siberians; so that now we find, by several years' trial in

grafting into these, that by using the cions of certain varieties we produce a good union and assimilation, and make a sound fruitful tree with crab bodies and forks and common apple tops.

The advantages of this method are very obvious in this northwestern country. First, it offers us an improvement of our fruits, with the trees we now have. The Siberians, Transcendents and Hislops have had their day, and are no longer wanted except in very small quantities. One or two trees of each for canning or preserving is all that any family will want to use when the hybrid or improved crabs, like the Early Strawberry, Whitney's No. 20, and Minnesota become known. Second, it suggests to us a means of getting rid of the summer blight, which in its serious phase is almost exclusively confined to the three sorts first named, as the sorts to be grafted in are not themselves bad blighters, and the crab growths are, by the process of grafting and pruning, entirely removed. Thirdly, the grafting bids fair to extend our varieties of apples in this severe climate by enabling us to use many tender sorts, that upon their own bodies and forks would winter kill too badly to make them profitable.

What would seem to be common sense on this point agrees perfectly with our observation of known facts. Here is a thrifty crab tree, sound at the root, sound in the body, and sound in the forks. This condition is what we generally find until the summer blight strikes the topmost limbs, and has had time to work down into the body. Now, we will suppose that we have worked the crab top all off by degrees, taking one, two or three years' time to do it, according to its size, and have in its place a top of limbs of the common apple, all joined to the crab above its forks. We have certainly got the three weakest points of a tree perfectly hardy and secured — namely, roots, body and forks. Now, what do we further need in order to have the whole tree hardy? It is obvious that nothing is needed except to have the top ripen up its new growth before winter sets in. Looking at the crab, we see that it stops growing, and hardens itself up for winter in good time. Something in its nature tells it that cold weather is coming, and it proceeds to make itself ready for it. Its sap slows up, or ceases in its flow, the cions and all parts of the season's growth

of wood or bark harden up, and the first blizzards find the tree ready for them, whether they come early or late. How are the grafted limbs to keep on growing after the crab parts call a halt? They cannot do it. They stop growing with the rest of the tree, and likewise harden up for winter. This, of course, is a theory. Now compare it with observed facts. Take the Walbridge variety of common or standard apples as an illustration. This is an apple about the size of the Jenniton, but of better quality and a much longer keeper. In fact, it keeps until apples come again, and is fit for use in March or April. As a tree upon its own body it is thrifty, but in some of our seasons too tender. In this section, it gets injured so as to produce under-sized apples some years, and yields in others but small crops. As a variety, it is perhaps a little hardier than the Haas — possibly not so hardy, and is unworthy of cultivation, except on a small scale, for the sake of variety. Well, we find this Walbridge growing upon the crab trees as grafts, and showing perfect hardiness after eight years' trial, extending through the two severest winters we ever had (1873 and 1880), bearing heavily, and its fruit twice as large this year as that of the same variety on the Walbridge tree, and much handsomer, because, being on the crab stock, it suffered less injury last winter than the Walbridge on its own stock. Examining other sorts, we find the same or similar facts to sustain the theory.

We come now to the consideration of other questions belonging to this subject. How are we to manage the tree during the process of transformation, so as to preserve its vigor, promote the proper growth of the grafts, subdue the crab growth and keep out the fire blight? Right here let it be understood, the grafting process does not guarantee success. It only makes it probable. It requires attention and care in behalf of the trees, and in some cases, like other good efforts, it may fail. The worst difficulty is to keep out the fire blight. The best authorities on the blight, while differing somewhat as to its cause, agree in some methods of treatment. Keep the temperature of the new wood as low as possible during the blighting season. The top must be kept open by pruning, to admit a free circulation of air, and the ground

protected from intense heats. In the orchard of the farm connected with the Iowa Agricultural College, buckwheat was grown for three years and no blight appeared. Ashes and salt separately or together, are cooling to the surface and have been known to stop the blight. But the preventive most effective is the pruning knife, or better still, the fingers on tender buds and sprouts. As soon as the graft gets fairly to growing, rub or cut off all the crab buds and sprouts of the limb a foot or so below the graft. It is presumed that the grafter has already cut off all the limbs not needed to make foliage the first season. The cutting off of so many old limbs, as has been done by the grafter, stimulates the vigorous growth of the sprouts from the remaining limbs, and they must all be destroyed as fast as they appear. After a while they will quit coming. The tree will learn that its crab character is played out and after a while will second your efforts by making no new buds on the crab wood. Perhaps once a week will be often enough to examine the tree and remove the sprouts. If after all these efforts, the blight begins to make its appearance on grafts or limbs, as it may in seasons like the past one, when it takes its most malignant form, use the pruning knife at once and be sure you cut off the end of the blighted sprout or graft not only below the external injury, but far enough down to make it certain that all the affected parts, both internal and external, are taken away. Here is where many people fail in pruning for the blight. They do not cut low enough. The writer had about six hundred grafts inserted in thirty-one crab trees last spring — all of the trees having blighted in the limbs and some in the bodies in previous years. Under the system of pruning herein described, no blight appeared on the grafted trees until nearly all of the same kind in his neighborhood had so far blighted as to look as if a fire had run through them, and afterwards, when it commenced in a few of the grafts and crab limbs, it was very slight and yielded at once to the knife. It will be seen from the foregoing that it is not worth while to graft into the crabs except with a view of making thorough work, and as fast as possible without injury to the tree, grafting it all over. The blight cannot be controlled and kept out on any other plan; and while it con-

tinues, as it works at present, the crab trees are useless, and are likely to die altogether.

It remains only to name the sorts that do best as grafts on the crabs. The Wealthy is a perfect success, and the most valuable for general top grafting. It makes a perfect union on Transcendents, growing no beetle at the point of union. The Walbridge makes a beetle, but it is sound and considering its long keeping quality and abundant bearing, is a good sort to use. The Fameuse, Haas, Ben. Davis, Talman Sweet and several other sorts have been tried with success in this neighborhood. The Duchess of Oldenburg is a familiar upon the crab, either grafted in roots or limbs. Unless one wishes to make experiments, we would restrict our grafting to sorts that are known to do well, using the Wealthy most freely, and then with good care of the trees we shall be likely to change our nearly useless crabs into trees that will be a good deal more satisfactory and in some cases as good orchard trees as can be grown anywhere.

SAUK COUNTY HORTICULTURAL SOCIETY.

The regular annual meeting of the Sauk County Horticultural Society was held January 11, 1881, at which time the following officers were chosen:

President — J. W. Wood, Baraboo.

Vice President — Wm. Toole, North Freedom.

Secretary — Mrs. R. H. Strong, Baraboo.

Treasurer — Wm. C. Warner, Baraboo.

Executive Committee — F. N. Peck, Isaac Green, Mrs. Henry Ryan, Mrs. Fanny Holy, Mrs. M. M. Davis.

Mrs. M. M. Davis, Mr. F. N. Peck and A. G. Tuttle were appointed as delegates to attend the State Horticultural Society's annual meeting.

Various meetings have been held during the season for the exhibition of fruits and flowers, and the reading of papers and discussions. These meetings have been interesting and well attended. One especial feature of these meetings lately adopted, has been to set apart some particular flower or plant for the sub-

ject of the papers read and discussion. Also for reading of selections relating to them. This has met with special favor. At these meetings interesting reports have been made by local observers.

Among the papers read at these meetings were Keeping Fruit, by Charles Hirschinger, of Freedom; Experience of a Novice in Fruit Growing, J. Hawes, Baraboo; Everlasting Flowers, Wm. Toole, Excelsior; A short paper on the Aesthetic side of Horticulture, by Mrs. F. Holy; Roses and their Culture, by Mrs. Lucy Case; Culture of Watermelons, by George W. Thayer, Fairfield; Adaptations, by James Stone, Reedsburg; A Poem on Perlagoniums, by J. W. Wood.

The society is in a good financial condition, and its prospects for usefulness the coming year are very promising. The annual membership fee is ninety-five cents, which secures season tickets to fairs of the society and also reports of the State Society.

Mrs. R. H. Strong, *Secretary.*

THE PELARGONIUM.

J. W. Wood, Baraboo. Read before the Sauk County Horticultural Society.

When idle poets rise to sing
The floral beauties of the spring,
They tune their throats o'er humble flowers
Which bloom in Nature's woodland bowers.

Perhaps some little primrose bright,
Or, heart's-ease struggling into light,
Will fill their souls with raptures fine,
And song will flow in strains divine.

A loftier theme commands my pen
Than primrose, pink or cyclamen,
Or any woodland nymph that blows
'Neath sunny banks or Alpine snows.

I sing of Pelargoniums,
Less learnedly, Geraniums,
A famous name which should inspire
E'en dullards with poetic fire.

These learned names, to put it plain,
Which rendered, mean but Stork and Crane,

Are given to these green-house wares
Because the seeds have beaks like theirs.

My beauties sit in unglazed jars,
In comely rows near window bars;
No glacial snows nor muddy braes,
While gathering treasures for bouquets.

No April showers, nor solar heat,
Nor balmy breeze, nor dewy feet,
Nor nice young man to carry fan
Or parasol, to keep off tan,

Are needed to perfect or bring
The brilliant gems of which I sing.
We need a slip, a pot of mould,
And room well guarded from the cold.

Plebeian Crane's bill peering out
From woodland copse, we'll quickly scout,
Nor let it for a moment cope
With green-house plant from Cape Good Hope.

The fancy kinds, all raised for show,
Must never to the border go;
Too highly bred by florist's care,
They will not thrive in open air.

The stork's bill, known as "inquinans,"
Which, touched, will leave upon the hands
A fishy smell, not very sweet,
As bedding plant is hard to beat.

With stocky growth and blossoms bright,
In scarlet, carmine, pink and white,
With soft leaves, kidney-shaped and zoned,
Its beauty must at once be owned.

The horse-shoe tribe, with leaves so rare,
Tricolored, still commands our care
As foliage plant, and adds the charm
Of carmine bloom, so bright and warm.

The ivy-leaved, with trailing grace,
In green-house has an honored place.
And who can live, and call it home,
Without a rose geranium?

The scented kinds are all so sweet,
That we would chase with willing feet

O'er rocks or bogs to gain such elves,
But lo! they stand upon our shelves.

When rubbed or pressed with gentle care,
What rich perfume will fill the air:
With balm, or spice, or lemon scent
Our senses rest in sweet content.

In purest white these flowers excel
For funeral wreath or wedding bell;
The scarlet shades a royal vase
Will ornament with queenly grace.

When happy maid would decorate
The young man standing at the gate;
Or loving wife, with generous soul,
Adorn her husband's button-hole,

They clip these flowers with scissors keen,
A rose geranium yields the green,
A smilax spray gives added grace,
And it is ready for its place.

What other plant in all this world
So many beauties has unfurled.
In fragrant leaf, and brilliant bloom,
The Pelargonium stands alone.

WAUPACA COUNTY HORTICULTURAL SOCIETY.

Our society is still flourishing. We have now about fifty members. Our discussions are interesting and prove very beneficial. Our meetings are generally well attended.

We have held two meetings during the year, one in September, and one in March. The one in September was held at the house of Royal Gibson, in Lind, for the exhibition of fruits, and an old-fashioned rural picnic, prepared by our wives and rural friends, whose presence at the feast added not a little to the social enjoyments of the occasion.

There is no better way of getting up, and keeping up, an interest in horticultural and floral affairs than by these social gatherings. A little relaxation from business and labor now and then does not hurt the average human very much. We learn from each other. No man is so very wise that he cannot be told some-

thing new. A mere simpleton may advance an idea that will set wiser heads thinking.

A kind Providence has placed many useful and loving things within our reach, and given us abundant leisure to admire and enjoy them. And, among them all, none are more welcome and attractive than fruits and flowers. Yet, how little are they appreciated by the "toiling millions." God's freest and richest gifts are wantonly thrown aside just because men are too lazy, or too stupid, to appreciate or properly enjoy them. The love of the beautiful in nature is, or ought to be, implanted in every human breast. Its proper cultivation tends to widen the distance between *Intellect* and *Instinct*, and brings us just so much nearer heaven.

A neighbor remarked the other day that he had so much work to do that he had no time to fool away in setting out fruit trees, and making flower beds, and such things. "Work!" Is work the "chief end of man?" Are we doomed to such slavish lives that we can find no time to admire and enjoy a few of the beauties and blessings which a kind Providence has so lavishly scattered along our paths? Perhaps; but it is not in the Christian's creed.

At our September exhibition we had the finest show of fruit ever seen in Waupaca county. The tables were literally loaded down with apples, and such grapes! Many of the apples were our county seedlings, that are being so highly praised, and which merit all the good things said of them. One, the Wolf River, exhibited by W. A. Springer, of Fremont, was the biggest apple we ever saw. It measured fifteen and three-fourths inches around the waist and weighed twenty-one ounces. We challenge the best to beat that.

Our show of grapes was splendid, many excellent varieties being in the collection, and nearly all so nice and of such fine flavor. Grapes do remarkably well in this county. Mr. Jacob Suhs, of Ogdensburg, has a small vineyard of one acre and a half. He has thirty different kinds, nearly all seedlings of his own raising; some of fine promise. He has raised six tons of fruit to the acre, yielding eight hundred gallons of excellent wine. He is proving grape-raising a success, even in this latitude. But few plums and pears were shown, neither being a very certain crop with us.

After an excellent picnic dinner, came the reading of papers, prepared for the occasion.

Treasurer Mathews told us what he knew about "Grape Raising." It was well written and contained many sensible hints.

He was followed by O. A. Rich, with a paper on "Small Fruits." Mr. R. has had some experience in raising small fruits. His suggestions were practical, and much that he told us might be remembered with advantage. But we should hardly deem it advisable to set out small fruit among apple trees, especially strawberries. That course has never been a success with us. He says: "We commenced to pick well-ripened fruit on the 15th of June, and since that time till the last day of August we have had fruits of the various kinds for our use, constantly, and we, with our friends that have called upon us, have enjoyed them very much." How delicious, and yet how cheaply procured. Speaking of the blackberry he says: "You all have noticed the large crowds that make long journeys in pursuit of this delicious berry, whenever there is a crop of wild ones, and you have noticed, too, the return of those pickers, and their fruit. Truly it is blackberry jam. Old meat barrels, musty wash tubs, wash boilers, water pails, milk pails, filled with sticks, dirt, dust, worms, leaves, fruit seeds and beautiful berries, all in a state of vinous fermentation; and the pickers! how can I well describe them, as they come from the berry bushes, with lacerated hands and limbs, with not only a 'thorn in the flesh,' but their flesh full of thorns, and their garments nearly destroyed, and precious time nearly as good as lost in pursuit of that which could be had at your own home, in your own garden, with less labor, inconvenience and expense." We think the foregoing not overdrawn, for we have seen just such things, and tried them.

Dr. Brainard next read a paper on raising cane, and making our own sugar—telling us how to do it and how not to do it.

The committee on list of grapes ripening before September 15, recommended Hartford Prolific, Janesville, Champion, Northern Muscadine, Delaware, Adirondack, Allen's Hybrid, Wilder, Worden, Delaware, Belvidere, Brighton.

By vote the executive committee were authorized to call a

"*strawberry festival*," in June, if they shall deem it proper, and, of course, they will. Also, that our next September meeting shall be held at the house of Wm. A. Springer, in Fremont.

With a vote of thanks to our host and family for their hospitality, the meeting adjourned, it being one of the pleasantest our society ever enjoyed.

At our March meeting, held in Weyauwega, quite a fine show of apples was had. Mr. Balch exhibited a nice cluster of Adirondack grapes, still in fair condition and not bad flavor. It had been preserved in saw-dust.

The constitution was amended, changing the time of our March meeting to January.

Report on success of different fruits — Apples, full average crop for bearing years. Fall fruit did better than winter. Injured some by canker worm, but slightly. Tent worm rather numerous. Society recommend for remedy London Purple, in solution with water. Codling Moth less troublesome than common. Society recommend sheep and hogs to remedy the evil.

Cabbage worm very destructive. Much discouragement in consequence.

Plums — Not many raised. Not much Curculio.

Strawberries — Society recommend for general cultivation Wilson first. For favored varieties, Crescent and Chas. Downing. Set in rows two and one-half and three feet, and fourteen inches in row. Time of setting, spring.

Blackberries gave a very large crop the past season. No insect enemies. Kind, Ancient Britain. Should be cut back; that allows wood to mature.

Raspberries bore a fine crop. Variety recommended, Philadelphia Red; does the best with us.

Grapes — More than average. Not much mildew nor insect depredation.

The following officers were elected for the coming year:

President — O. A. Rich, Weyauwega.

Vice-President — I. C. Alden, Weyauwega.

Secretary — J. Wakefield, Fremont.

Treasurer — J. A. Mathews, Weyauwega.

Executive Committee — W. A. Springer, chairman; A. V. Balch, E. W. Wrightman.

Delegate State Society — W. A. Springer, Fremont.

J. Wakefield, *Secretary.*

COMMUNICATIONS AND MISCELLANEOUS PAPERS.

SIBERIAN APPLES.

The progress made and the present condition of fruit growing in our state is truly a triumph of intelligence and perseverance over great natural obstacles. On the first settlement of the state the pioneer fruit grower soon found that in local conditions and climatic tendencies he had entered a new world. Old varieties soon proved worthless and old principles of culture failed; new methods had to be sought out, new varieties tried. The light of science and experience was employed to overcome the mountains of difficulty, and to stem the tide of failure and losses. Much was accomplished, but the progress was slow. A generation of earnest, zealous workers have given their lives, their energies, to the work. Some of them have fallen by the way, overcome by the burdens and losses incurred; others have reached mature years, and are enjoying the harvest, the result of their faithful labors. What has been the result? Forty years of most persevering effort has given us less than one-half our state for successful apple growing, and that with less than a score of varieties accepted for general culture, and a far smaller number for commercial orcharding.

The question is, what shall we do for the vast area of more than twenty-five thousand square miles unprovided for. Eighteen of our northern and central counties are practically not within the range of our recommended lists; for not one in a hundred of planters therein can safely follow our recommendations. For the southern half of the state the data for safe planting is assured in our most hardy natives and Russians, and the immense crop of 1880 showed the possibility of our growing, for our own use, at least in the southern counties. The northern half of our state in the permanent elements of civilization, is in the infancy of

development. Its agriculture, dairy and mineral industries are soon to surpass its now great lumber interests, and the demand for home grown fruit will be imperative. Importation will not satisfy the mass of domestic consumers, and the same persevering efforts will give all this region the family supply from the home garden and orchard, the same as now enjoyed in the southern part of the state. Just what this supply will ultimately be, no one can tell, but present indications point strongly to the Russians and Siberians and their hybrids as destined to fill the blank and give varieties well adapted to the most extreme and rugged portions of our state. The origin of these now recognized distinct species is quite obscure. The "Russians" are said to have come from northern China, and in their westward march to have come to be distinguished as *Pyrus Astrachanica*, from the great commercial sea-port town of southern Russia.

The "Siberians," *Pyrus bocata or P. prunifolia*, are natives of Siberia, and as there found, according to Pallas, grew only three or four feet high, with fruit the size of peas. Specimens of this original type are growing in the grounds of the agricultural department at Washington, which are not so diminutive in tree, but the fruit yet of the size of currants and borne in clusters.

The process of improvement from this original type has been carried on for many years, but our present choice varieties of this family are of recent origin. The Hislop is a native of Wisconsin, named after Thomas Hislop, who was a seedsman in Milwaukee in 1850-6. Mr. Chas. Gifford, nurseryman there, first introduced it to the public about that time. The Transcendent is of eastern origin — the oldest known in this state being brought from Montreal, Canada, about 1854. Hundreds of new varieties have been lauded as "best," but many of these are of little value, and it is safe to say that nearly all the really valuable varieties, after the Transcendent, are of northern origin. The following are some of those most prominent for real worth:

1. Whitney's No. 20 — Large size, often two and one-half inches in diameter, handsome striped and crimson on yellow; flesh tender, juicy, sub-acid to sweet; good dessert fruit. August and September. Tree vigorous, upright, stocky grower, and good bearer. Hybrid of the Russian type.

2. Sylvan Sweet — Tree slender, upright; light colored wood; fruit large, pale yellow, with rich blush; flesh white, tender, very sweet; good and very beautiful. August.

3. Brier's Sweet — Tree strong, irregular grower; dark wood; fruit large, round, pale yellow with stripes; showy; very good; sweet. September.

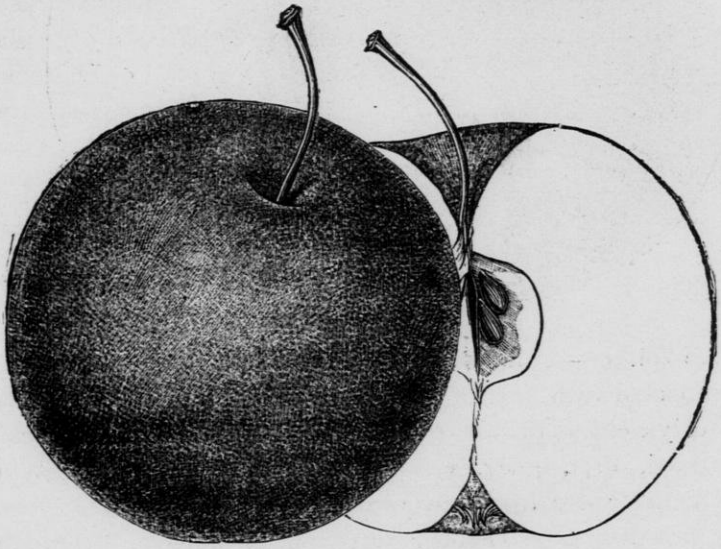

Fig. 1. Sweet Russet.

4. Sweet Russet; Siberian — Large, round and conical, green, russet and faint blush, very rich, sweet. August and September. One of the best for eating or cooking.

5. Peffer — Tree spreading, very productive; fruit very large, round, flattened, smooth, greenish yellow, with blush; tender, juicy, sub-acid, pleasant flavor. September.

6. Homestead; Siberian — A hybrid from Fall Stripe apple; tree very stout and straight; large foliage; bears very young and abundant; fruit very large, oval, striped and crimson blush; flesh firm; rich yellowish, sub-acid; good eating from September to December.

7. Telfer Sweet — Tree stocky, thrifty and a good grower; fruit seven and one-half inches in circumference, quality very melting and rich. October and December.

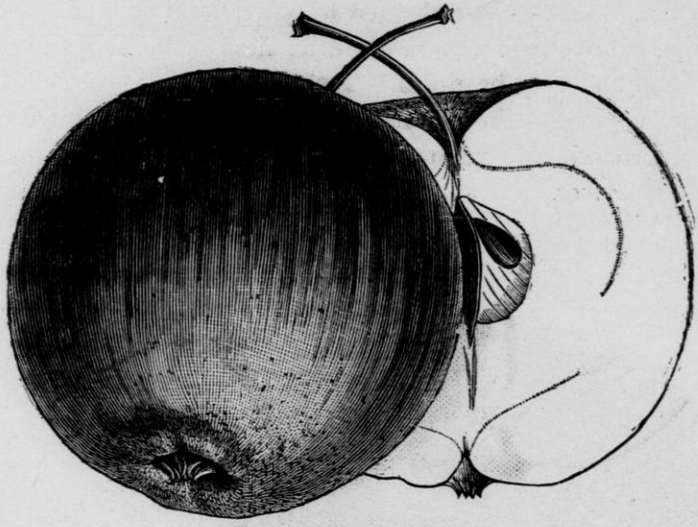

FIG. 2. HOMESTEAD.

8. Lake Winter—Full medium to large size; round, very smooth; mostly covered with bright red or stripes; stem slender, cavity small; calyx closed in shallow basin; core and seeds small; flesh fine grained, firm, juicy, sub-acid, becoming nearly sweet in spring; entirely free from astringency or "crab-taste:" excellent cooking or eating from October to March, keeping well through

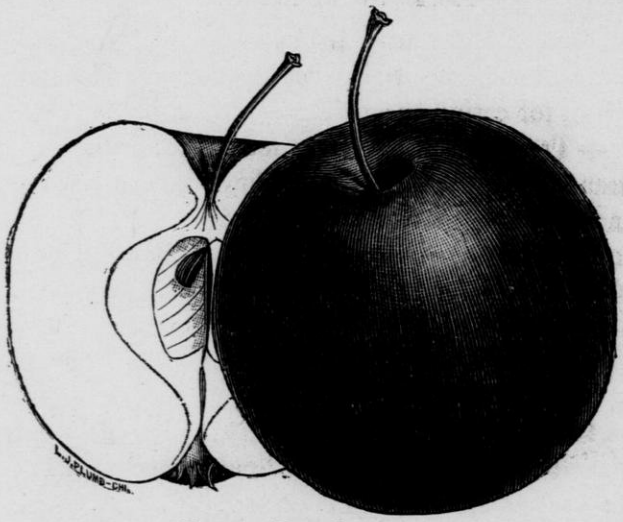

FIG. 3. RED LAKE.

winter. Tree beautiful, free grower, resembling the Fall Stripe or Saxton, of which it is a seedling, fertilized from the old, red crab. The seed was planted about 1855, in Jefferson county, Wisconsin, from fruit grown by J. C. Plumb.

9. Red Lake; Siberian — Large, round, dark red; flesh yellowish, firm, rich, sub-acid, good; January to May. Tree vigorous, handsome grower, and very productive.

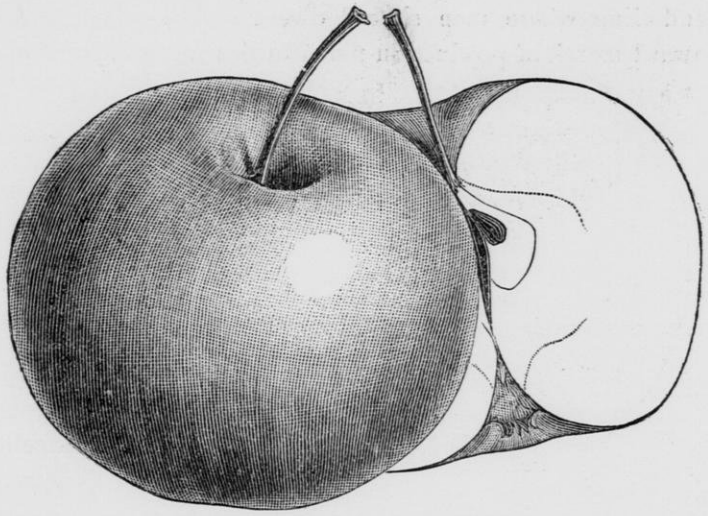

Fig. 4. Winter Golden Sweet.

10. Winter Golden Sweet; Siberian — Fruit large size, flattened, yellow; flesh firm, fine grained, juicy, brittle, rich sweet; a peculiar, condensed sweet seldom found in any apple; entirely free from astringency, "crabiness." Vigorous grower; great and early bearer; keeps well until spring.

After the Transcendent for sugared preserves, we want varieties to suit the ordinary purposes of eating out of hand, baking, and cooking without sugar, and for the season through. The above list fills that want, and is selected from over one hundred varieties tested. But the improvement of this species by hybridization is so rapid that we may, judging from present experience, say that in this species alone we will have adopted varieties for every purpose, and for all the great regions of our states to the north. Another important fact is, that most of the improved va-

rieties of Siberians prove more productive, and of higher quality and size grown in this northern region than when grown south; the trees being more healthy and free from blight. The same may be said of the Russians, that they are much more healthy and productive in their northern limit than south. Both these species in their hybrids are of great importance in our northern pomology, and both find their largest use and best development in the north. We believe in home grown fruits for every land and clime where men should dwell, and with pleasure see the onward march of production northward, through such worthy species.

ENTOMOLOGICAL NOTES.

HISTORY AND CULTIVATION OF PYRETHRUM.—As this plant is doubtless soon to come into general use as an insecticide, everything in relation to its history and cultivation will be of interest, and therefore we copy a very interesting article on this subject, written by Prof. Riley for the *American Naturalist:*

"There are very few data at hand concerning the discovery of the insecticide properties of Pyrethrum. The powder has been in use for many years, in Asiatic countries, south of the Caucasus mountains. It was sold at a high price by the inhabitants, who successfully kept its nature a secret, until the beginning of this century, when an American merchant, Mr. Jumtikoff, learned that the powder was obtained from the dried and pulverized flower-heads of certain species of Pyrethrum, growing abundantly in the mountain region of what is now known as the Russian province of Trans Caucasia. The son of Mr. Jumtikoff began the manufacture of the article on a large scale, in 1828, after which year the Pyrethrum industry steadily grew, until to-day the export of the dried flower-heads represents an important item in the revenue of those countries.

"Still less seems to be known of the discovery and history of the Dalmatian species of Pyrethrum *(P. cinerariæfolium)*, but it is probable that its history is very similar to that of the Asiatic species. At the present time, the Pyrethrum flowers are considered by far the most valuable product of the soil of Dalmatia.

"There is also very little information published regarding either the mode of growth or the cultivation of Pyrethrum plants in their native home. As to the Caucasian species, we have reason to believe that they are not cultivated, at least not at the present time, statements to the contrary notwithstanding. The well-known Dr. Gustav Radde, director of the Imperial Museum of

Natural History at Tiflis, Trans Caucasia, who is the highest living authority on everything pertaining to the natural history of that region, wrote us recently as follows: 'The only species of its genus, *Pyrethrum roseum*, which gives a good, effective insect powder, is nowhere cultivated, but grows wild in the basal-alpine zone of our mountains, at an altitude of from six to eight thousand feet.' From this it appears that this species, at least, is not cultivated in its native home, and Dr. Radde's statement is corroborated by a communication of Mr. S. M. Hutton, Vice-Consul General of the United States at Moscow, Russia, to whom we applied for seed of this species. He writes that his agents were not able to get more than about half a pound of the seed from any one person. From this statement it may be inferred that the seeds have to be gathered from the wild and not from the cultivated plants.

"As to the Dalmatian plant, it is also said to be cultivated in its native home, but we can get no definite information on this score, owing to the fact that the inhabitants are very unwilling to give any information regarding a plant the product of which they wish to monopolize. For similar reasons we have found great difficulty in obtaining even small quantities of seed of *P. cinerariæfolium* that was not baked or in other ways tampered with to prevent germination. Indeed, the people are so jealous of their plant that to send the seed out of the country becomes a serious matter, in which life is risked. The seed of *Pyrethrum roseum* is obtained with less difficulty, at least in small quantities, and it has even become an article of commerce, several nurserymen here, as well as in Europe, advertising it in their catalogues. The species has been successfully grown as a garden plant for its pale rose or bright pink flower-rays. Mr. Thomas Meehan, of Germantown, Pennsylvania, writes us: 'I have had a plant of *Pyrethrum roseum* in my herbaceous garden for many years past, and it holds its own without any care much better than many other things. I should say from this experience that it was a plant which will very easily accommodate itself to culture anywhere in the United States.' Peter Henderson, of New York, another well known and experienced nurseryman, writes: "I

have grown the plant and its varieties for ten years. It is of the easiest cultivation either by seeds or divisions. It now ramifies into a great variety of all shades, from white to deep crimson, double and single, perfectly hardy here, and I think likely to be nearly everywhere on this continent.' Dr. James C. Neal, of Archer, Florida, has also successfully grown *P. roseum* and many varieties thereof, and other correspondents report similar favorable experience. None of them have found a special mode of cultivation necessary. In 1856 Mr. C. Willemot made a serious attempt to introduce and cultivate the plant on a large scale in France. As his account of the cultivation of Pyrethrum is the best we know of, we quote here his experience in full, with but few slight omissions: 'The soil best adapted to its culture should be composed of a pure ground, somewhat silicious and dry. Moisture and the presence of clay is injurious, the plant being extremely sensitive to the excess of water, and would in such case immediately perish. A southern exposure is the most favorable. The best time for putting the seeds in the ground is from March to April. It can be done even in the month of February if the weather will permit it. After the soil has been prepared and the seeds are sown they are covered by a stratum of ground mixed with some vegetable mould, when the roller is slightly applied to it. Every five or six days the watering has to be renewed, in order to facilitate the germination. At the end of about thirty or forty days the young plants makes their appearance, and as soon as they have gained strength enough they are transplanted at a distance of about six inches from each other. Three months after this operation they are transplanted again at a distance of from fourteen to twenty inches, according to their strength. Each transplantation requires, of course, a new watering, which, however, should only be moderately applied. The blossoming of the Pyrethrum commences the second year, toward the end of May, and continues to the end of September.' Mr. Willemot also states that the plant is very little sensitive to cold, and needs no shelter, even during severe winters.

"The above quoted directions have reference to the climate of France, and as the cultivation of the plant in many parts of North

America is yet an experiment, a great deal of independent judgment must be used. The plants should be treated in the same manner as the ordinary Asters of the garden or other perennial Compositæ.

"As to the Dalmatian plant, it is well known that Mr. G. N. Milco, a native of Dalmatia, has of late years successfully cultivated *Pyrethrum cinerariæfolium* near Stockton, Cal., and the powder from the California-grown plants, to which Mr. Milco has given the name of 'Buhach,' retains all the insecticide qualities and is far superior to most of the imported powder, as we know from experience. Mr. Milco gives the following advice about planting — advice which applies more particularly to the Pacific coast: 'Prepare a small bed of fine, loose, sandy, loamy soil, slightly mixed with fine manure. Mix the seed with dry sand and sow carefully on top of the bed. Then with a common rake disturb the surface of the ground half an inch in depth. Sprinkle the bed every evening until sprouted; too much water will cause injury. After it is well sprouted, watering twice a week is sufficient. When about a month old, weed carefully. They should be transplanted to loamy soil during the rainy season of winter or spring.'

"Our own experience with *P. roseum*, as well as *P. cinerariæfolium*, in Washington, D. C., has been so far quite satisfactory. Some that we planted last year in the fall came up quite well in the spring, and will, perhaps, bloom the present year. The plants from sound seed which we planted this spring are also doing finely, and as the soil is a rather stiff clay, and the rains have been many and heavy, we conclude that Mr. Willemot has overstated the delicacy of the plants.

"In regard to manufacturing the powder, the flower heads should be gathered during fine weather, when they are about to open, or at the time when fertilization takes place, as the essential oil that gives the insecticide qualities reaches, at this time, its greatest development. When the blossoming has ceased, the stalks may be cut within about four inches from the ground and utilized, being ground and mixed with the flowers in the proportion of one-third of their weight. Great care must be taken not

to expose the flowers to moisture, or the rays of the sun, or, still less, to artificial heat. They should be dried under cover and hermetically closed up in sacks or other vessels to prevent untimely pulverization. The finer the flower heads are pulverized, the more effectually the powder acts and the more economical is its use. Proper pulverization in large quantities is best done by those who make a business of it and have special mill facilities. Leon & Fink, of New York, have furnished us with the most satisfactory powder. For his own use the farmer can pulverize smaller quantities by the simple method of pounding the flowers in a mortar. It is necessary that the mortar be closed, and a piece of leather through which the pestle moves, such as is generally used in pulverizing pharmaceutic substances in a laboratory, will answer. The quantity to be pulverized should not exceed one pound at a time, thus avoiding too high a degree of heat, which would be injurious to the quality of the powder. The pulverization being deemed sufficient, the substance is sifted through a silk sieve, and then the remainder, with a new addition of flowers, is put in the mortar and pulverized again.

"The best vessels for keeping the powder are fruit jars with patent covers, or any other perfectly tight glass vessel or tin box."

In a later article Prof. Riley treats of

Its use as an Insecticide.— Up to a comparatively recent period the powder was applied only to the destruction of those insects that are troublesome in dwellings, and Mr. C. Willemot seems to have been the first to point out its value, when used against insects injurious to agriculture and horticulture. He goes, however, too far in its praise, especially when claiming that sowed with wheat it will prevent the ravages of the weevil. During the last three years we have experimented with it on many species of injurious insects, and fully appreciate its value as a general insecticide, which value has been greatly enhanced by the discovery that it can be most economically used in liquid solution, but we are far from considering it a universal remedy for all insects. No such universal remedy exists, and Pyrethrum has its disadvantages, the same as all other insecticides now in use. The follow-

ing are the most serious ones: 1. The action of the powder, in whatever form it may be applied, is not a permanent one in the open air. If it is applied to a plant, it immediately affects the insects on that plant with which it comes in contact, but it will prove perfectly harmless to all insects which come on the plant half an hour, or even less, after the application. 2. The powder acts in the open air, unless applied in very large quantities, only upon actual contact with the insects. If it is applied to the upper side of the leaf, the worms that are on the under side are not affected by it. 3. It has no effect on insect eggs, nor on pupæ that are in any way protected or hardened. These disadvantages render Pyrethrum in some respects inferior to arsenical poisons; but, on the other hand, it has the one overshadowing advantage that it is perfectly harmless to plants or to higher animals; and if the cultivation of the plant in this country should prove a success, and the price of the powder become low enough, the disadvantages mentioned above can be overcome to a great degree, by copious and repeated applications.

In a closed room the effect of Pyrethrum on insects is by far more powerful than out-doors. Different species of insects are differently affected by the powder. Some resist its action most effectually, as very hairy caterpillars, and especially spiders of all kinds; while others, as all Hymenoptera, succumb most readily. In no case are the insects killed instantaneously. They are rendered perfectly helpless a few minutes after application, but do not die till sometime afterward, the period varying from several hours to two or three days, according to the species. Many insects that have been treated with Pyrethrum show signs of intense pain, while in others, the outward symptoms are much less marked. Differences in temperature and other meteorological changes do not appear to have any influence on the effect of Pyrethrum.

Pyrethrum may be applied in the dry powder, as a fume; as an alcoholic extract diluted; by simple solution of the powder in water, and as a tea or decoction. In applying it as a powder the method most familiar to housekeepers is by means of a small pair of bellows. It is then generally used without diluent, but

if it is unadulterated and fresh, which cannot be said in many instances of the powder sold at retail by our druggists, it may be considerably diluted with other pulverized material without losing its deadly effect, the use of the powder thus becoming much cheaper. Of the materials which can be used as diluents, common flour seems to be the best, but finely sifted ashes, sawdust of hard wood, or any other light and finely pulverized material that mixes well with the powder, will answer the purpose.

If the mixture is applied immediately after preparation, it is always less efficacious than when left in a perfectly tight vessel for about twenty-four hours, or longer, before use. This has been so far only with the mixture of Pyrethrum with flour, but doubtless holds true with other diluents. Mr. E. A. Schwarz experimented largely under our direction with the mixture of Pyrethrum and flour for the cotton worm, and he found that one part of the powder to eleven parts of the flour is sufficient to kill the worms (only a portion of the full-grown worms recovering from the effects of the powder), if the mixture is applied immediately after preparation; but if kept in a tight glass jar for about two days, one part of the powder to twenty-two parts of flour is sufficient to kill all averaged sized worms with which it comes in contact. For very young cotton worms, a mixture of one part of Pyrethrum to thirty parts of flour, and applied one day after preparation, proved most effective, scarcely any of the worms recovering.

An ordinary powder bellows will answer for insects infesting dwellings, or for plants kept in pots in rooms, or single plants in the garden, but it hardly answers on a large scale out of doors, for it works too slowly; the amount of powder discharged cannot be regulated, and there is difficulty in covering all parts of a large plant. Another method of applying dry powder is to sift it on to the plants by means of sieves. This method is no doubt excellent for insects that live on the upper side of the leaves; for large, shrub-like plants, and for insects that live or hide on the under side of the leaf, it will prove less serviceable. A very satisfactory way of applying the powder on large plants, in the absence of any suitable machinery or contrivance, is to throw it with the

hand, as in seed sowing. This method is more economical, more rapid, than those mentioned above, and has the advantage that, if the plants are high enough, the powder can be applied to the under side of the leaves.

Prof. W. A. Henry, in speaking at the joint convention of his experiments with Pyrethrum powder, or Bubach, as it is called by Mr. Milco, who is manufacturing it, said he believed it would soon become one of our most popular and most effective insecticides. It could be used to destroy household pests, in the hot-house, garden and field, or on our domestic animals, as it was perfectly harmless except to insect life. The plant from which the powder is made resembles the Wild Sunflower or Rosin Weed. Like it, it has a volatile oil which is the destructive principle. The flowers are picked when in full bloom, and when dried are ground up very fine. It is so harmless to men that it may be eaten in small quantities without injury. If drawn up the nostrils in applying it a slight irritation is produced, but soon is gone and no harm results. This enables it to be used in many places where the active poisons cannot be applied without danger. Most of this powder in the market is brought from Europe, and sold as Persian Insect Powder. This has not proved always satisfactory, as much of it has been adulterated, and from loss of strength by age. That manufactured in California is stronger and cheaper. The price was still high and serves to limit its use except on a small scale, but there was a good prospect of its cost being soon so reduced as to make it possible to use it largely. The company formed to raise and manufacture it have eight hundred acres devoted to its cultivation, and employ over three hundred men. They have expended $60,000 and have received but small returns, but they propose soon to reduce the cost of production so much that they can put it on the market in large quantities at low rates.

Prof. Cook, of Michigan, had used it with great success for the cabbage worm, and Prof. Henry himself had experimented with it quite largely, at Washington and other places, under the direction of Prof. Riley, and had not found an instance in which it

was not effective. There were no insects that it did not destroy. Spiders were quickly killed. House flies dusted with it, by a little insufflator discharging the powder in the air, would soon fall dead from the ceiling, or while on the wing. It may be applied in the powder state, mixed with flour or other light substance, or with water, and sprinkled over the plants in the form of a spray, or may be made into a tea or infusion, and be applied the same way. The two last methods are the most convenient, the cheapest and most effectual, especially on trees and out-door plants, but should be applied at a time when the evaporation would not be rapid. In making the infusion, the leaves and stalks as well as the flowers can be used, but the mixture will not have the strength as when made from flowers alone. In making, the water must not boil, as the volatile elements will thus be driven off. Briskly boiling water should be used, then cover lightly and steep slowly. From some experiments reported, there is reason to believe that where the plant is raised among other plants, it acts as a shield to them from the attacks of insect enemies. All insects avoid the plant itself.

Experiments with Pyrethrum.— The following are the experiments alluded to by Prof. Henry as performed with this powder by Prof. A. J. Cook of Michigan Agricultural College, taken from the American Naturalist.

September 27, 1880.

I placed ten cabbage caterpillars (*Pieris rapæ*, Schrank) in each of two small wooden boxes which were covered with wire gauze. In one box I dusted the least possible amount of Pyrethrum mixed with flour in the proportion of one part of the Pyrethrum to twenty parts of the flour. I sprayed those in the other box with a liquid mixture, using one tablespoonful of Pyrethrum (seven grammes, one-fiftieth pound) to two gallons of water. In five minutes all the larvæ were on their backs; nor did any of them recover. A large number of the caterpillars on the cabbage plants were sprinkled or dusted with the Pyrethrum, the proportion the same as given above. In one hour the plants were examined, and in every case the caterpillars were found dead.

The same experiments as those detailed above were tried with the potato beetle (*Doryphora ten lineata*). Those in the boxes were all down in fifteen minutes, both beetles and larvæ; nor did they recover. I watched those on the vines for twenty minutes, when several had fallen to the ground. These were some distance from my home, and I could not watch them longer. Whether all dropped or not I am not able to say, nor whether all or any recovered.

WEDNESDAY, September 29, 1880.

In the following experiments, the cabbages were simply dusted or sprinkled, with no effort to secure actual contact of the liquid or powder with the larvæ. The experiments were tried under my direction by a very trusty and careful assistant, with the following results:

First experiment — By use of a common sprinkler, nine cabbages were treated with the liquid mixture, composed of one tablespoonful of Pyrethrum (seven grammes) to a gallon of water. In one and a half hours after the application, a hasty examination discovered thirteen dead larvæ and three live ones.

Second experiment — Ten cabbages were treated the same as above, except that two applications of the liquid were made; nineteen dead larvæ and one live one were found.

Third experiment — Twenty-six cabbages were treated with a liquid mixture of one tablespoonful of the powder to two gallons of water. One application was made with Whitman's fountain pump. Eleven dead and four live larvæ were found.

Fourth experiment — The same as experiment three, on thirteen cabbages, except that two applications of the liquid were made. There were five dead caterpillars and two alive.

Fifth experiment — Twenty cabbages were dusted with a powder compound of one part of Pyrethrum to forty of flour. Five dead larvæ and one live one were found.

Sixth experiment — Twenty cabbages were treated the same as number five, except that the mixture was in the proportion of one to twenty. Three dead and three live caterpillars were found.

The examinations in all the above cases were made one and a half hours after the application of the liquid. The examination was too hasty to be thorough.

The next day all were again examined with great care, so that very few, if any larvæ, were omitted in the count.

Number one, cabbages, 9; larva dead, 17; stupefied, 39; alive, 3.
Number two, cabbages, 10; larva dead, 42; stupefied, 30; alive 1.
Number three, cabbages, 26; larva dead, 18; stupefied, 0; alive, 58.
Number four, cabbages, 13; larva dead, 25; stupefied, 3; alive, 1.
Number five, cabbages, 20; larva dead, 18; stupefied, 3; alive, 9.
Number six, cabbages, 20; larva dead, 9; stupefied, 0; alive, 1.

FRIDAY, October 1, 1880.

First experiment — Treated twelve cabbages; used one gallon of water and one-half spoonful of Pyrethrum. Careful examination revealed eleven dead and eleven alive.

Second experiment — Twelve cabbages; used one gallon of water to one-fourth spoonful (two grammes) of the powder. Eleven dead and four alive.

Third experiment — Twenty-six cabbages; used Pyrethrum and flour, one to forty. Three dead, five alive, and one stupefied.

Fourth experiment — Twelve cabbages; one gallon water to one spoonful of the powder. Result, thirteen dead, four alive and four stupefied.

The above experiments show conclusively that this powder is fatal to the caterpillars, and that, too, in very dilute liquid mixtures, as only one two-hundredths of a pound to the gallon of water was used in experiment two of October 1st, and eleven larvæ were killed. We have only to sprinkle it on the plants, though it may be necessary to make more than one application to insure complete success. The success was better with the liquid than with the flour mixture, and can be applied with greater speed and economy.

A twig of alder (*Alnus serrulata*), covered beneath with woolly Aphides (*Eriosoma tesselatum*, Fitch), was dipped into the liquid mixture of one-fiftieth of a pound to a gallon of water. The next morning all the lice had fallen to the ground, never to rise again.

Flies and mosquitoes in a room where the powdered Pyrethrum had been blown in not very large quantities, less than one one-hundredth of a pound to a room twelve feet square, were felled

to the floor, where nearly all remained till morning, though the application was made the night before. If not swept up some of the flies would recover. The flies commence to fall in ten minutes.

Squash bugs (*Coreus tristis*) were kept in the clear powder, in a close tin box, for three days, and were still alive. I also sprinkled and dusted these insects on the vine, and could see no signs of success in killing them.

The Chinch Bug — *Blissus leucopterus.* Of the many insect pests that abound in this country, there are none so insignificant in size, so generally well known in their habits and transformations, so much exposed to attack during the greater portion of their existence, and yet are so much beyond control as the chinch bug. This is mainly due to their immense numbers, the wide extent of territory over which they extend, the rapidity with which they multiply, and the fact that owing to their small size they usually escape notice until their myriad hosts have full possession of the fields and their work of destruction is well nigh accomplished. It is also doubtful whether there is any other foe that occasions so frequent, so extended and so great losses to the country.

In compiling the following history and description, much of the information has been taken from the report of Prof. C. Thomas, State Entomologist of Illinois, and member of the United States Entomological Commission, to the Department of the Interior, and from the authorities therein quoted.

In giving the history of the chinch bug in this country, he quotes as follows from the early reports of Dr. Fitch, State Entomologist of New York:

"It was just at the close of the Revolutionary War that the chinch bug was first noticed as a depredator on wheat in the interior of North Carolina. It was at first supposed to be identical with the Hessian fly, which, at this time, was making great havoc in wheat crops on Long Island and New Jersey. Two years before this the British army, accompanied by a detachment of its German auxiliaries, had marched through North Carolina, and the

battle of Guilford Court House was fought. Mr. J. W. Jeffreys states that an aged and highly respectable citizen of Orange county, North Carolina, informed him that it was 'immediately after this event that the Hessian fly or Hessian bug destroyed their crops of wheat; and they believed and do believe to this day (1839) that those soldiers left the flies or bugs as they passed through the country.' The insects continued to increase and spread through the Carolinas and Virginia for several years. In 1785 the fields in North Carolina were so overrun with them as to threaten a total destruction of the grain. And at length the crops were so destroyed in some districts that they were obliged to wholly abandon the sowing of wheat. It was four or five years that they continued so numerous at this time.

"The only particular account which was published of the insect and its habits at this period, of which we have any knowledge, appeared in London, in Young's Annals of Agriculture. It is from this notice of it Kirby and Spence state that 'America suffers also in its wheat and maize from the attack of an insect, which, for what reason I know not, is called the chintz bug fly. It appears to be apterous, and is said in scent and color to resemble the bed bug. They travel in immense columns from field to field, like locusts, destroying everything as they proceed; but their injuries are confined to the states south of the fortieth degree of north latitude. From this account the depredator here noticed should belong to the tribe *Geocorisæ* Latreille; but it seems very difficult to conceive how an insect that lives by suction and has no mandibles, could destroy these plants so totally.'

"About the year 1809, Mr. Jeffreys says that the chinch-bug again became so destructive in North Carolina that in Orange county the farmers had to abandon the sowing of wheat for two years, and according to this statement the insects were subdued thereby. At various other times, of which we have no record, it has undoubtedly been abundant in that and the adjacent states, that section of country appearing to be its headquarters.

"In 1839 we have accounts of its having again become excessively numerous and destructive in Virginia and the Carolinas.

"The bug had now become so numerous in Carolina and Vir-

ginia that, with its continued increase in 1840, the total destruction of their crops appeared inevitable. The prospect was so alarming that Sidney Weller, of Brinkleyville, Halifax county, North Carolina, and others in his neighborhood, united in the spring of 1840 in pledging a handsome sum as a prize for some feasible method to arrest the career of this depredator. But at this juncture providence interfered to accomplish what no human agency could have effected. Instead of being dry, like the two or three preceding years, the summer of 1840 proved to be of an opposite character, and the ravages of this insect were at once suppressed.

"It was about this period that the chinch-bug began to be noticed along the Upper Mississippi and through the northern parts of Illinois. It made its appearance there simultaneously with the establishment of the Mormons at Nauvoo (1840–1844), and many ignorant people firmly believed they were introduced there by these strange religionists, and 'Mormon lice' became the name by which they were currently designated through that district."

The first notice of their appearance in Wisconsin was given by David Williams, of Geneva, in 1854 and 1855. The first notice made of them in Illinois was in 1840, in the northwestern part of the state, near the Mississippi. In 1847 they were seen in Iowa, and in Indiana in 1848. In 1850 they were very abundant in many parts of the northwest. Mr. Walsh estimates the damage they caused that season in the state of Illinois alone at $4,000,000. In 1864 they appeared in much larger numbers and proved far more destructive. The loss incurred throughout the country is figured by Dr. Shimer and others at $100,000,000. The following spring they appeared again in great numbers and the complete annihilation of the crops was expected, but the season proved to be a wet one and the bugs soon disappeared. Again in 1871 they spread over the whole country. Dr. La Baron, at that time State Entomologist of Illinois, places the damage they occasioned in Illinois at $10,600,000, and at $30,000,000 in the northwest. But the year 1874 was perhaps the season when the greatest amount of damage was done by them. The losses even exceeded those of the year 1864. Prof. Riley places the losses of that year, in Missouri, at $19,000,000,

and Prof. Thomas those of Illinois at $30,000,000. From these and other data, Prof. Thomas computes the average annual loss they occasion the country at not less than $20,000,000.

Description.— "The chinch-bug is a small insect less than one-fourth of an inch long, its length usually not exceeding three-twentieths of an inch; its width something less than one-half its length; rounded on the under side and flat above; of a coal-black color, with white wings which have a triangular, black dot on their outer margins. It belongs to the order hemiptera and sub-order heteroptera, to which group also belong the common bed-bug, squash-bug, and other similar true bugs. This species like all the rest belonging to the order, has the mouth prolonged into a slender, horny, jointed beak, usually turned under the breast when not in use. With this instrument, and the slender needle-like setæ inclosed within it, they puncture the bark, leaves and stems of plants, and suck out their juices. It is in this way the chinch-bug obtains its food. As it has no means of gnawing plants, and is so diminutive in size, it would seem to be incapable of inflicting any very serious injury on vegetation; but as heretofore stated, what it lacks in individual capacity for inflicting injury is made up by the immense numbers which are occasionally developed. A myriad of tiny pumps incessantly drawing away the juices of a plant must in a short time cause it to decay and die."

The egg is at first of a pale dull whitish or testaceous color, bnt at length assumes a reddish color, from the changes transpiring within; the embryo can be seen as a red speck in the center through the transparent shell. When first hatched, the young bug is red, with a white stripe across it; afterwards it turns of a brownish or grayish-brown color. Soon after it is hatched, it inserts its tiny beak into the plant on which it is situated and commences pumping out the juices on which the vigor and life of the plant depend. As their growth is rapid, their moults are frequent; before reaching the perfect or winged state, it passes through four of these changes, varying in color and markings after each. According to Mr. Riley's observation, "it is bright red, with a pale band across the middle of the body after the first; somewhat darker, with the merest rudiments of wing-pads after the second;

and quite brown, with distinct wing-pads, but with the pale transverse band still visible after the third." The entire process requires from five to seven weeks; according to Dr. Shimer's observations, from the time the egg is deposited until the imago appears is usually from fifty-seven to sixty days.

FIG. 5.

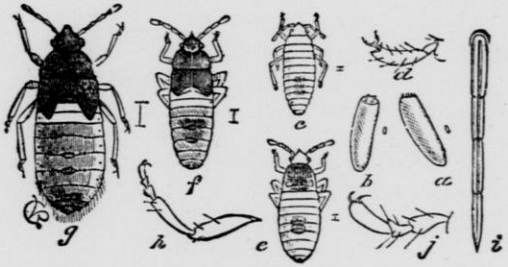

FIG. 6.

The accompanying cuts are taken from Prof. Riley's report on this insect, and are also used in the governmental report of Prof. Thomas, mentioned before. Figure 5 represents the full-grown larva, magnified. The natural size is represented by the line at the side. In figure 6, *a* and *b* are magnified views of the eggs, the small figures at the side denoting their natural size; *c*, the young larva, when first hatched; *d*, the tarsus of the same; *e*, the larva after the first moult; *f*, after the second moult. The pupa is represented by *g*; *h*, is the leg, magnified; *i*, the beak, with which the sap is drawn out of the plants, and *j*, the tarsus of the matured bug.

For a long time it was the general opinion that there were three or more broods a year, but careful observation has established the fact that there are but two. The adults of the fall brood, on the approach of cold weather, seek shelter, generally near at hand, under shocks of corn, straw piles, logs, fences or other rubbish in and around the field. Sometimes, though but seldom, they fly to the thick timber and take refuge on the ground under the leaves. They have been found in large numbers in such winter quarters in woods far from the cultivated fields. In these places they pass the winter in a torpid, or semi-torpid, state. Where sheltered

from sudden changes they can endure the cold with safety, even a number of degrees below zero. They have been found frozen in the solid ice, and on being thawed out became as active as ever. When not well sheltered a temperature of $-12°$ or $-15°$ generally proves fatal to them.

The time at which they make their first appearance in the spring depends somewhat on the latitude and character of the season. Hot, dry weather is very favorable to them and hastens their development; and on the other hand, wet and cool weather retards them and even keeps them back till late in the season. Their first appearance, usually made in May, but occasionally in April, seldom attracts attention, unless a special outlook is kept up, as they are comparatively few in number, small in size and are mainly on the wing at this time. Often the first that is known of their presence is when the second brood is hatching out in great numbers, and the work of destruction is well under way.

In a very few days after leaving their winter quarters, the females commence to deposit their eggs, laying them not in large clusters and all at one time, as is done by many of the insect foes, but a few at a time, and during a period of two or three weeks. It is to this fact that their destructiveness is largely due, for it insures their perpetuation in large numbers. In the egg and early larval stages, they are very tender, and much exposed to injury. A severe storm, or even a very heavy shower, often destroys them by myriads at this time, and if the eggs were all deposited at once, the whole brood would occasionally be nearly annihilated in this way. It is generally believed that the vitality of the females is much greater than the males, and that the great majority of those who survive the winter and the exposure of the breeding season, are females.

If the soil is loose and dry, and the weather warm and clear, the female usually works her way down to the roots of the plant and there deposits her eggs. When the soil is heavy or wet, and the weather is unfavorable, the eggs are laid on the stalk, near or even above the surface of the ground. Bright sunshine, a dry, sandy soil and hot weather are the most favorable conditions to their development; and where these conditions obtain early in the season, it

insures such an early, rapid and prolific development that nothing can withstand them. On the other hand, when the weather is cloudy and wet, and the soil heavy and filled with moisture, they propagate but slowly, and are sometimes kept back so that they do not become numerous enough to do any harm until the early grain is out of their way. Then, should the weather become favorable, they fall heavily upon the corn and oats. The effect that the season has on them is clearly seen in the fact that, notwithstanding the wonderful rapidity with which they propagate, each female reproducing her kind five hundred times, they seldom get numbers sufficient to do much harm except where two very dry seasons come together, and then the amount of harm done is proportionate to the heat and dryness of the seasons.

Spring wheat and barley are the cereals best adapted to their wants, and which suffer most from their attacks; in fact it is thought by many, that were it not for these two varieties of grain the bugs would not develop in such numbers, or have sufficient vitality to do much harm. It is true that they will thrive on oats and corn, but they will only feed upon them after the wheat and barley are gone and there is nothing else to devour. The most natural place and time for them to propagate is on the wheat and barley; when these are gone the egg depositing season is nearly over and the insects have attained their greatest numbers. It is at this time that they are often seen marching in compact masses great and little in search of new fields to devour.

REMEDIES — Many plans have been tried by which to destroy or at least so to reduce the numbers of this pest as to prevent the wholesale destruction they occasion, but none of them have proved very effectual. Notwithstanding their weakness, insignificance in size and power, they have carried the day by sheer force of numbers, and it is very doubtful whether the power or wisdom of men will ever be able to exterminate this insignificant, yet mighty foe. The most one can hope to do is to keep down their numbers and thus lessen their power to injure. Nature, aside from the storms and climatic conditions mentioned, will not afford much aid. Their natural enemies are very few and limited in numbers; a few of the Lady Birds and the Lace-wing Fly, are

the main ones, and they seem to have but little appetite for the work, but in their greatest force, they are not able to make any impression on the horde of the destroyers. Of parasites there are none. There is apparently not an insect parasite so vile, so depraved in taste as to prey on it or on its first cousin, the bed bug.

Among the remedies proposed is to stop sowing and planting the grains on which they feed. Objections have been raised to this method, that it would compel us to stop raising all the most essential grains needed to support life, and that, too, for a number of years, which would well nigh occasion a famine, and that it is better to have little than none at all. But this objection is not altogether sound, for in many sections of the country winter wheat could be raised, and this is seldom injured by the bug. Then, as remarked before, it is very doubtful whether they would develop in sufficient numbers to seriously injure other grains were it not for the more timely and better adapted cereals, spring wheat and barley. Neither would it be necessary to follow this practice for a number of seasons to receive any benefit. To the careful observer they always give some token of the coming danger. It is a well established fact that it is only in the second of two consecutive dry seasons that much damage is done, and if, when they are seen in larger numbers than usual at the close of one dry season, we sow no wheat and barley the next, we would escape the greater portion of the loss that would otherwise follow; and by raising other crops might dispense even with corn and oats on such seasons without great inconvenience, and to the great disgust of the hateful pest. If this course, even so far as the two first cereals are concerned, were generally followed, an effectual check, at least for a number of years, would doubtless result. But to be largely beneficial concurrent action by farmers generally would be required.

Another plan recommended is early seeding. This practice, it is true, has not in all instances been effectual, and will occasionally fail to secure exemption from loss, but the chances, or rather the probabilities, are in its favor. By all means sow as early as the ground and weather will permit with any hope of the germ-

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ination of the seed, and plow in the fall to secure an earlier start. It is impossible in a chinch bug year to secure a crop from late sown seed, and in many cases fair, and even good crops have been raised from early sowing in such seasons. In all years the chances are greatly in favor of the early sowing. In most cases the same conditions that favor the development of plant and fruit bring forward the foe that preys on them, but here it is different. After germination of the seed, cool, wet weather develops strength and vigor of root in the cereals, which leads to rapid and early maturity soon after the hot, dry weather comes, so favorable, in fact essential, to the development of this its enemy. Therefore it would seem to be wise policy to sow early, and especially in the seasons when the conditions are such as to indicate trouble from the chinch bug.

The application of salt is said by some to be of great benefit in hastening the maturity of the grain, and holding the bugs in check. Others, and scientific men too, say it is of no use whatever. Both doubtless judge from actual experience, either their own or that of others. While we know of no instances where it has been tried and did not prove beneficial, we do know of cases where great good resulted from its application. At the winter convention at Madison, two years since, Mr. Porter, of Waukesha county, gave the result of an experiment he tried in sowing refuse salt on a portion of a field of wheat on his farm. Where the salt had been sowed the growth of straw was much larger, the wheat ripened earlier, was plump and a very good yield, while the rest of the field was a very light crop and was badly shrunken. On running the reaper from one piece to the other, the table was black with bugs in the part unsalted, while very few were seen in the other. The conditions of the experiment were such as clearly to prove that the result was due to the salt applied, but whether it was produced by the stimulus to growth and early maturity, or to its causing unfavorable conditions in the soil for the breeding of the bugs, or to both, is a question which further experiments will only determine, but the probabilities are that the first is the real cause.

It is undoubtedly possible to do much to check their numbers

by making the soil less adapted for their breeding purposes; as to make it more compact by fall plowing and rolling; to sow clover, winter wheat or rye with the spring grain, and thus secure an undergrowth to shade the ground, and thus lessen the heat and increase the moisture, both of which would make the conditions more unfavorable for the propagation and development of the bug. Some have recommended sowing of rye with the grain, in order to draw the insects from the wheat to the greener growth underneath, but they do not feed on the leaves, but draw the sap from the ripening stalk, and would not leave it while there was any nourishment left in it.

There is no doubt but that irrigation, and drenching the eggs and young larvæ with water or some offensive liquids, would be effectual, but the conditions are such that they could be practiced only in a limited degree or at great expense.

Another plan, recommended by Prof. Thomas and others, is to destroy them in their winter quarters. With a little care, the numbers of those that survive the winter and stock the fields anew in the spring could be greatly lessened, and thus reduce by millions the summer horde. Their disposition to go into winter quarters near at hand can be turned to good account by providing little straw piles, shocks of corn stalks, and other combustible material for them to take shelter in, and then burn the piles in winter or early spring; also by burning the grass and rubbish along the fences, and the leaves in the woodland near at hand. Much would be accomplished by cleaning out the line of fences alone. When we adopt a more civilized style of farming, and do away with all fences except for stock, we shall not only save a great expenditure, improve the appearance and increase the productiveness of our farms, by enlarging their area, but we shall greatly lessen the losses occasioned by this and other insects now harbored there.

Plum Curculio.— *Conotrachelus nenuphar.* Herbst. Of all our insect enemies there is none that makes uniformly so thorough and so complete destruction of the crop on which it preys, as the Curculio. It is not in an occasional year or in here and there an

orchard that they sweep the whole crop before them, but each and every year, they are on hand early and in such numbers as to annihilate nearly every specimen of the plum, throughout the whole country, and then they go for the cherry, the apple or the peach. So regular has been their appearance and so complete the destruction they occasion, that the cultivation of the plum, one of the most delicious and hardy of our native fruits, has virtually been abandoned. Yet there is, perhaps, no insect that can be so easily met, and no crop of fruit that can be protected with greater certainty and less labor than this, except it be the currant worm and the currant. That productive, hardy old standby has also been given up to a relentless foe, without an effort to save it.

There is no crop in field or garden, excepting fruit, that we expect to secure any return from, without much care and labor, and with many of them, it is one continued war with weeds, enemies or adverse conditions from the time the seed is planted until the crop is harvested. This, farmers take for granted, and accept as one of the necessary conditions, but the great majority of them seem to think that the fruit crop needs no attention; if it don't take care of itself, it must go. It is a shame that two such hardy, productive and valuable varieties of fruit should be given up to certain annihilation, where an amount of labor, ten to one less than is required for an acre of wheat or corn, would usually secure a return ten times to one greater. Much has been said and written about the Curculio. It is a hackneyed subject. Everybody is acquainted with "The Little Turk," and many can tell just how to go to work to outwit him, and save their plums, but they don't do it, and it will, probably, be of little use to refresh their memories, or to try to get the masses to put their knowledge to practical use, but the hope that a few may be induced to give a little attention to saving a fruit so well adapted to our soil and climate, and which will yield so liberal returns for the care bestowed, and that the practical demonstration of what can be accomplished will lead others to do likewise, has induced us to give a brief discription of this well known enemy, and of the means by which he may be overcome.

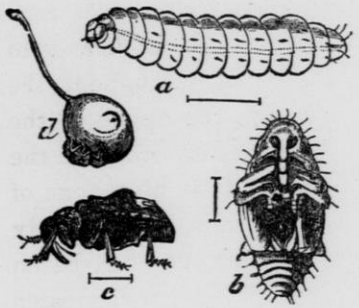

FIG. 7. PLUM CURCULIO.

The accompanying cut (Fig. 7) illustrates the Curculio in its different stages of development. The full grown grub, or maggot, is represented by *a*; *b* gives the chrysalis form; *c* the perfect beetle; *d* the young plum, showing the way the egg is deposited, with the crescent incision above it, which gives rise to the appellation of "Little Turk." The hair lines at the sides denote the natural lengths of the different forms. One of the most marked peculiarities of the form of the perfect beetle or weevil is its snout, and on account of this characteristic, it is grouped with the snout beetle family. This snout is short and thick, with elbowed antennæ at the sides. Its position resembles that of the trunk of the elephant, hanging down from the head. When the Curculio is disturbed this snout is drawn back close to the body and rests in a groove between the forelegs, as seen in *b*, the chrysalis form. The length of the beetle is about one-fifth of an inch; its color is a dark gray, with a yellowish white band across the back. There is a glossy black elevation on each of the wing covers, which gives it a hump-back form. The beetle makes its first appearance in the spring about the first of May (but is occasionally seen in April), and continues to come during the months of May and even June. It is now generally conceded that it is single brooded, and that it passes the winter only in the perfect beetle state. The fact that young beetles appear in July, August, and sometimes in September, for a long time led many to infer that there were two broods in a season, but careful observation has shown that the egg-laying season of the parent beetle extends through two months and over, and consequently the larval state is also extended, and also that the young beetles show no propensity to propagate the first season of their existence, but forage on the fruit until the advent of cold weather, when they go into quarters and abide the coming of spring, then to perpetuate their species. Both the parent beetle and their progeny feed throughout the

season, and often do much damage to the mature fruit, causing it to rot by their stings. When the fruit is gone, they will feed on leaves and tender twigs.

The female deposits her eggs one at a time, at the rate of from five to ten a day and to the number of from fifty to one hundred each. Generally but one egg is laid in a single plum or apple, but when fruit is scarce and Curculio are plenty, a number are often seen in the same fruit. In laying the egg, the female makes an incision with her jaws, enlarges and deepens it with her snout, deposits the egg at the mouth of the incision, and crowds it to the bottom of the hole with her snout, and then cuts the familiar crescent mark. The egg is oval in form, and of a pearly white color. In a few days it hatches out and eats its way into the fruit. Its growth is rapid, reaching maturity in two or three weeks. When full grown it is about half an inch in length. The grub by feeding checks the growth of the fruit and causes it to drop from the tree. Soon after the fruit falls the worm digs its way out, and burrowing in the ground, goes into the chrysalis state, where it remains for three or four weeks, when it emerges in the form of a perfect beetle.

In the selection of its winter quarters, the beetle seems to prefer the shelter of trees or timber, for they are seen in much larger, numbers in orchards standing near timber land and in the trees in the outside rows of the orchards, but they take shelter in the fences and under bark, boards, shingles or any rubbish on the surface of the ground in the open field or garden. They have been found under the rough bark on the trees, and under shingles on buildings. They are very hardy and are little affected by cold. If their place of shelter is exposed to the early warmth of spring, they make their appearance earlier in the season; in fact very many of them come out, often two or three weeks in advance of the time when the fruit sets or is large enough to be injured, and may be destroyed before they can do any harm. They are nocturnal in their habits, and, except when the female is depositing her eggs, they remain concealed during the day and feed at night. In the early part of the season, and during cool weather, they prefer shelter during the day on the ground, and may be

found at such times, in quite large numbers, concealed under boards, sticks or shingles placed on the ground under the trees for that purpose, but later in the season when the weather becomes warm they remain all day concealed on the trees. This peculiarity can be used to good advantage for their destruction in many cases, but will not enable us to exterminate them, as some claim, for large numbers of the beetles do not leave their winter quarters until the weather will permit them to remain night and day on the trees.

The extreme timidity of the beetle is another peculiarity which can be taken advantage of, in fact is used largely for its destruction. When disturbed suddenly on the trees, it has the habit of dropping to the ground and feigning death, and the plan the most used to kill them is to place sheets stretched on a frame under the trees, and then by giving the tree a sudden, sharp blow, cause them to drop on the sheets, when they are readily killed. For some time after falling they will remain perfectly quiet, hoping to escape notice. Their size, dark color and irregular form would enable them to practice this deception completely, when this habit is not known or a sharp look-out kept. Early in the morning is regarded as the best time to jar the trees by most, but some who have tried both think that toward evening is better. During the warmer part of the day they fly more readily, and are not usually found on the trees in as large numbers.

Another point favorable for attack is found in the fact that the larvæ do not leave the fruit until some little time after it drops from the tree, and if the fruit that has been stung were picked from the tree, or picked up from the ground soon after it falls, and destroyed, the race would be well nigh exterminated, so that a crop might be obtained the next and a number of following seasons. Some have advised making light floors of boards or cement under the trees, and thus prevent the worms from going into the ground, and as they cannot travel they must soon perish. Another way to accomplish the same object is to arrange a screen of cloth or boards so that when the fruit drops it will roll into a tight barrel, box or tub. Where the number of trees is small and the numbers of the Curculio has been so reduced that but a

portion of the crop is stung each year, this method might be used advantageously, but to depend on this alone will not be likely to prove very satisfactory to those who expect fruit without any care or labor.

Another means used to prevent the destruction of the fruit is by the application of poison or some offensive substance to the tree at the time the eggs are deposited. Instances have been given where the application of Paris green and arsenic has been followed by a full crop of plums. Some entomologists claim that this is not feasible, for, to have any effect, the poison must come in contact with the beetles, and very frequent application would be necessary to do any good at all; but where we have the testimony of well known and reliable fruit growers, and of such men as Prof. A. J. Cook, of Michigan, that the application of poison will prevent the depredations of the Codling moth, there is some reason to believe that it will also be beneficial in destroying the Curculio. Experiments made with quick-lime and ashes have been reported as successful. Trees to which they have been applied have borne full crops; others, where the Curculio had taken part of the crop before they were used, gave a part of a crop, while trees standing near, that were not so treated, did not bear a plum.

That there is some virtue in such applications would seem to be demonstrated by the statements made by T. S. Gold, Secretary of the Connecticut State Board of Agriculture, before the Massachusetts Board of Agriculture. In giving his experience with the Curculio, he says: "It has been said that you cannot scare away the Curculio; that you must catch him and kill him; but if I have not scared him away from my place, I have deceived him, and made him believe there was no place for him to lay his eggs in the young plums. With very little trouble, say two hours trouble a year, in caring for the trees, I have been able to obtain a full supply for my family, for the last ten or fifteen years, of some dozen varieties of plums. The secret of success is to apply to the trees, soon after the calyx falls, some mixture or substance, either liquid or in powder, that shall so affect the Curculio that he will avoid the tree. There are two that I have used successfully. One is to take the drainage of the barnyard, the liquid

manure, put a few pailfulls in an old barrel, mix in a pound of sulphur and a quart of salt; let it stand until you want to apply it. When the flower has just fallen off and the Curculio begins his work, take a few quarts of the liquid, reduce it with water to a moderate degree of strength, add to it a quantity of ashes, making it about the consistency of cream, and, with a basin or broom, drench the top of the tree. If not washed off by a shower, one application will be sufficient. If washed off, repeat the operation, two, three or four times, and your trees, that have lost every specimen of fruit before, will come to the harvest loaded with plums. The other is to mix common tar with soap, boiling it up in an old kettle, dissolve this in water and apply the liquid to the trees with a garden syringe or in other ways."

Another method by which the same object has been reported as having been attained is, by burning coal tar under the trees and covering leaves and young fruit with a coat of lamp black. In the use of these methods and application, the conditions may not be always alike favorable and consequently the results may not be equally satisfactory; but, if the remedial agent is used understandingly and thoroughly, much benefit will be obtained from any or all of them. The proper time to do the work, as well as the observance of the other conditions, and habits of the insect, must be regarded. Boards, shingles or other things placed under the trees to trap the beetles will be of little or no avail if left until settled and warm weather has come, or they are not visited in the early part of the day; the beetles will not be found there, and the experiment will be a complete failure. So with jarring, if left until much of the fruit has been stung, or it is followed up carelessly, or left until well into the forenoon, the result will not be satisfactory, and the remedy will be pronounced worthless. Also the applications, whether of lime, ashes, poisons, offensive liquids or tar smoke, if applied imperfectly or not repeated after heavy showers or rain, the anticipated benefit will not be realized, and the remedy will be regarded worthless. The failure to use the remedy at the proper time and in the right manner will doubtless account for the great diversity in result, and

the consequent conflicting opinions entertained in regard to them. Therefore we have faith to believe that any and all of them are good and may be used to great advantage, and that a little effort and labor will enable us to secure a regular and abundant supply of this native fruit.

But little aid in the work of protection or destruction can be expected from natural agencies. The beetles are tenacious of life and are little affected by climatic conditions. Their parasite enemies are few, and can do but little to diminish their numbers. Chickens and hogs, when confined under the trees, will destroy many in the larval state, and if the number of trees is small, and they are so situated as not to be continually restocked from other trees near by, and if the range is limited, and the number of chickens and pigs is large, a good crop of fruit may sometimes be obtained by their help alone, but generally, unless other means are used, enough of the beetles will escape to secure the destruction of the crop from year to year. When the bulk of the insects are destroyed by artificial means, then these animals will do most effective service as gleaners.

We have, as stated before, thus grouped together these old facts and remedies in the hope that some might be led to declare war against the "Little Turk," and by their victories encourage others to enter the contest, so that, at least, the number of the foe will be so reduced that his natural enemies can hold him in check. Much may be done by individual efforts, but the labor would be greatly lessened by concerted action. With farmers generally, the excuse given for neglecting the destruction of these insect foes is want of time, but it is better and will be cheaper to cultivate less, and by giving the necessary care, realize the best possible results from what they do. Some of these methods for the destruction of the Curculio can be intrusted to children, and if a stimulus in the way of reward were given, their interest would be aroused. Local societies or neighbors interested have offered bounties for the largest number of beetles captured, or so much per hundred, and have thus secured the destruction of a large number and saved their fruit. When the labor and expense connected with

any or all the means recommended are less than those necessary to secure a crop of anything else, and we do not make any effort, we should certainly not complain of the losses incurred.

Apple Curculio, *Anthonomus quadrigibus*, Say.— Complaints are occasionally made of the gnarly, deformed condition of apples and pears, and wonder is frequently expressed, even by old hands in fruit raising, as to what can be the cause. Little, if any of the trouble may have been noticed for some years previous, when all at once there comes a season in which the fruit is so badly injured as to greatly lessen the value of the crop. Old and well known varieties are sometimes so distorted as to be recognized with difficulty. Instead of the usual round, smooth form, they are very much dwarfed in size, irregular in shape, with ridges, humps and depressions here and there, and in each depression a small, black dot is seen, looking as though the surface of the apple had been drawn down by a thread, as in a well-stuffed cushion. Coming so suddenly, and producing so great a change and loss in the fruit, it occasions much surprise to those not acquainted with the real cause, which we fear includes the majority of our farmers and fruit raisers. If they had taken careful observation, especially of the pear and native crab and thorn apples, they would have seen more or less of this trouble every fruit season, and the sudden appearance and extent of the evil would then have been to them much less a matter of surprise.

The general belief is, that this condition is caused by the sting of some poisonous insect when the fruit is small, but what the species is, which one of the many insect enemies is the guilty cause, few are able to tell. Most of them may have heard of the apple Curculio, and have seen the work of the plum Curculio. They find that when the plum is stung, an egg is laid, which hatches, and the plum drops off, and soon rots or withers up, but on examination of the stings in the apple or pear, they find in a great majority of cases no signs of an egg or anything to denote that one had ever been deposited there. In the few instances where there are signs of a worm having been at the core, it resembles, and is often judged to be the work of the codling moth; but the apple still hangs to the tree, and continues to grow,

though slowly, through the season. Not being acquainted with the habits and manner of work of the apple Curculio, the real culprit, he escapes their notice and they give the discredit to some other enemy.

This beetle, like the plum Curculio, is a native of this country and was seen at a very early period on the Wild Crab and Thorn Apple trees. Until a comparatively recent date their depredations were mainly confined to these varieties of the apple, but they have gradually acquired a taste for better fruit and seem to be steadily increasing in numbers and destructiveness. The perfect beetle is of a dull brown color, with reddish brown and ashy gray shading on the wing covers. On these wing covers are located four humps, which are peculiar to it, and which give it a distinctive name. Like the plum Curculio, it is a snout beetle, but differs from it in the form, length and position of its snout. With the plum Curculio, it hangs down and can be folded back to the body, but cannot be extended in front; it is also short and stout; but while the apple Curculio is much smaller, its snout is much longer and more slender, in proportion to size of the insect. In the male it is about half the length of the body, but in the female it is fully as long as its whole body; in both it is curved in form and extends forward in nearly a straight line with the body and cannot be folded back.

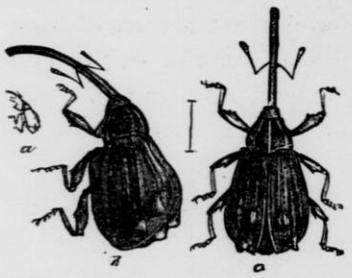

Fig. 8. Apple Curculio.

In the above cut (Fig. 8) *b* gives a side view of the full grown beetle, *c* the back view; *a* represents the natural size, and the line at the side of *c* the full length of beetle and its snout.

The apple Curculio, like the plum, is single brooded and passes the winter in the perfect beetle state. It makes its appearance in the spring, the last of May or the first of June; usually a little later than the plum Curculio. With their long, slender snouts they attack the fruit, both male and female, drilling small, round holes almost a tenth of an inch in depth, but scooped out much broader at the base. Most of these holes are made for the purpose

of getting their food, a few only for depositing their eggs. As the beetle is supposed to live for a number of months, and as far as known feeds entirely on the fruit, each one makes many incisions for this purpose, and wherever they sting the fruit, the effect is to check all growth. In the part thus stung a hard callous is formed about the hole, and by preventing any development of the fruit, gives it an irregular, distorted form.

For the depositing of her eggs the female makes these holes somewhat larger than usual. The egg is placed in the bottom of the cavity made, and soon hatches out and makes its way to the core, feeding around it. In about a month it reaches its mature larval state, when it is a soft, clumsy, humpbacked worm, full of crinkles, without feet, and, as it cannot straighten, with little power of locomotion. Thus it is shut up in the apple, and compelled to go into its chrysalis state where it hatched out and grew to maturity, as said before, the fruit still clinging to the tree. In about three weeks it transforms to the perfect beetle state and digs its way out, to live on the now mature, ripening fruit, causing it to decay by its poisonous stings. On the advent of cool weather, it seeks shelter under the leaves and rubbish on the ground, or in the fence corners and under the rough bark of the trees, to appear again in the spring and renew its destructive work.

Remedies.— The fact that they go through the chrysalis state in the fruit, while it hangs on the tree, makes it difficult to destroy them, except by gathering and destroying the stung fruit. This would be attended with much labor and care. The fact that they seem to prefer the native crab and thorn apples, and the fact that among cultured pears and apples there are some varieties to which they take a special liking might be taken advantage of, and by sacrificing the fruit on these trees the great bulk of the beetles might be destroyed with much less difficulty. The same remedies used against the plum Curculio, are said to be useful in checking this pest also, but owing to diffierences in their character and habits, the remedies cannot all be used with the same degree of success. The apple Curculio is much less inclined to drop from the tree when disturbed by sudden jars; the length of time during which it is depositing its eggs, and the length of season

required to reach maturity, would make it necessary to greatly prolong the contest to be as effectual. Covering the fruit and tree with soot from burning coal tar might make it so offensive to them, as to drive them to some other tree or orchard, but whether it would be possible to use enough, even of this disgusting stuff to drive away an insect so totally depraved in taste as to relish the wild, bitter crab apple is a question. As remarked in regard to the use of poisonous compounds to kill the plum Curculio, which is now recommended for the codling moth and has been indorsed by some of our leading fruit growers and even entomologists, there seems to be no reason to suppose that this remedy would be any less effectual with the apple Curculio than with the others mentioned. It may be possible also to furnish the beetles with inviting shelter, near at hand, for winter quarters and then to destroy home and occupant. Those afflicted with this and other pests should carefully observe their habits and try all possible, practical means to effect their destruction.

The Pea Weevil — *Bruchus pisi.* — All who are interested in gardening, or who use dry peas are more or less acquainted with "buggy peas." Their presence in the mature pea, when ground and used for cooking purposes or for planting, is regarded with anything but favor; and the sight of a few peas that have been inhabited by the bug, as it is usually called, often causes the rejection of the whole lot with disgust, but this same insect in the larva state is unconsciously eaten in large numbers by the most fastidious, and with great relish. Surely "ignorance is bliss" to the lover of "roast lamb and green peas," for did he realize what is in a great measure true of every mess of green peas grown in this state, except in the extreme northern portion, that at least one-half of them are inhabited by a worm which in time would develop into one of these bugs, it would not add greatly to the flavor of the dish. It cannot be said that their presence really detracts from the flavor or is in any way harmful to the eater, yet most epicures would prefer to take their soup clear from them. Aside from greater pleasure and confidence in the use of peas in the green state, where they are not infested by the weevil it would add much to the value of the dry, mature pea whether to

be used for seed or for food, for few care to plant infested seed, and the mature beetle is decidedly harmful in the meal or berry, where it is to be served for the table. For this reason, great care should be taken to secure seed free from the weevil, and in every possible way to exterminate the pest.

The Weevil makes its appearance the last of May or in June, according to the temperature of the season, and is ready as soon as the young peas begin to swell in the pods to provide for the continuation of the specie. The eggs are deposited on the outside of the pods and fastened there by a viscid substance which quickly hardens. These eggs can be readily seen on the pods during the month of June. They are about a thirtieth of an inch in length, long and slender in form, of a deep yellow color. Sometimes a dozen and more will be found on a single pod. The larva soon hatches out, drills through the pod and works its way into the young berry. The hole in the pod soon grows up and there is nothing to indicate the presence of the inhabitants within. The color of the young larva is a deep yellow with a shiny black head. There are often many more larvæ on the pod than there are peas within, but there is only one to a berry; the rest perish. The larva continues to feed on the albumenous part of the pea and but rarely touches the life germ, so that the vitality of the berry is not destroyed. On reaching maturity it eats a round hole to the outside of the pea, leaving only the thin hull to inclose it, and then passes into the pupa state. It usually remains in this condition until the following spring, then to become the mature Weevil. When the season has been very favorable for their early development and the hot weather continues late, the larvæ sometimes mature and transform late in the fall, but in the majority of cases they winter in the peas.

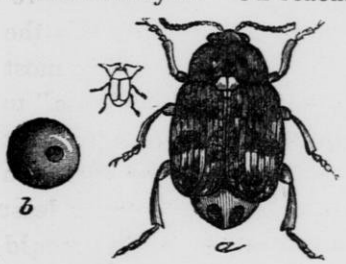

Fig. 9. Pea Weevil.

The Weevil is of a rusty black color, with several gray spots and bands on its back and wing covers. The abdomen projects beyond the wing covers and is tipped with white, inclosing two well defined black spots, oval in form, as seen in figure nine. The

small outline at the side denotes the natural size. The transformation takes place either in the ground, where the seed is planted, or in the storehouse, where the peas are kept. When the proper season comes they eat their way out through the slight shell left by the larva, and, if unrestrained, soon find the vines and stock them anew with the young larvæ.

They are much more abundant and develop with greater rapidity in a southern climate, and are seldom seen where the summers are short and the seasons cool. It is generally believed that there are localities where the climate or the character of the soil are so unfavorable for their development that they are seldom or never seen, and peas from such places are much sought for for seed. Manitowoc and the adjacent counties in this state, and also a large portion of Canada, are reported as specially favored in this respect, and peas are extensively cultivated there for eastern and other markets. But, while the natural conditions doubtless hold the Weevils in check, the exemption they enjoy is largely due to greater care in selecting seed, and in preventing the escape of the beetles that may come out from the peas while in store.

In the selection of seed for planting, care should be taken to get that which is entirely free from the Weevil. This can be done by keeping the seed until two years old. Also by putting the peas into water, when the sound ones will sink, and the wormy ones swim. The Weevils can be, for the greater part, destroyed by soaking the peas in boiling water for a few minutes, just before planting them. Also by keeping them stored in tight jars, strongly impregnated with camphor. But it seems to us that the most effectual method would be to plant, late in the season, either seed from the first crop or that which is two years old. The peas from such planting would be entirely free from "bugs," and if enough were raised to supply the neighborhood and the old crop was kept tightly sealed, so that the beetles could not escape, the first crop the next season would be entirely free from these insects.

The Clover Root Borer — *Hylesinus trifolii.* This new enemy of the clover has recently made its appearance in this country, and in some cases has done very serious damage. Prof.

Riley states that in many places in the state of New York, it has been so prevalent as to destroy the crop of clover, entirely destroying the roots, so that the plants pulled out with the greatest ease, and gathered in winrows before the mower. He further states that in searching a number of hours he failed to find a single plant that did not contain more or less of these insects, many of them in large numbers. The insect is a native of Europe, and was doubtless introduced from that country here. It has been known there for many years, and was first described by Muller who was of the opinion that its natural food plant was the clover, and as they do not apparently occasion any perceptible injury until the second year, he concluded that death of the clover at the third year was due to the injury done by these borers. Prof. Riley is also inclined to favor this opinion, from the observations he has made. This seems to be open to question, for the clover was classed among the biennials long before this insect was known either in this country or in Europe. This peculiarity or habit of the clover plant may have been induced by improper culture, or the rigors of the climate, but it has become a fixed characteristic of the *trifolium pratense*. The fact that occasionally plants are seen to live the third season does not disprove the theory, for on an examination it will usually, if not always, be found that the old root received some injury the second season, but had sufficient vitality tothrow out new roots, and thus gain another year's lease of life.

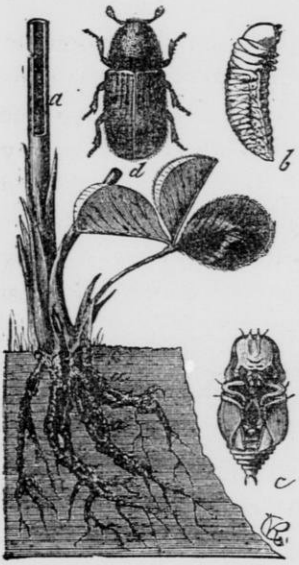

Fig. 10. Clover Root Borer.

Prof. Riley, in describing the beetle in its various stages of development, as far as it had come under his observation in this country, says: "It is undoubtedly true that this beetle flourishes most in the roots of plants that have been injured, and that have already begun to decay — bearing out in this respect the well-known habits

of other species of the family, which are known to prefer the bark of trees and the woody stems of plants that are sickly from one cause or another. I have found this insect in all three stages of larva, pupa and adult up to the time of frost (represented by *b*, *c* and *d*, in figure 10), though the perfect beetles at this season very greatly predominate. The insect hibernates in any of these stages, and continues propagating as spring opens, the beetles issuing from the ground and pairing during the early spring months. The female then instinctively bores into the crown of the root, eating a pretty large cavity, wherein she deposits from four to six, pale, whitish elliptical eggs. These hatch in about a week, and the young larvæ at first feed in the cavity made by the parent. After a fews days, however, they begin to burrow downward, extending to the different branches of the root. The galleries made in burrowing run pretty regular along the axis of the roots, as seen at *a*, *a*, *a*, in figure 10, and are filled with brown excrements. The pupa is formed in a smooth cavity, generally at the end of one of these burrows, and may be found in small numbers as early as September.

"The clover seed is usually sown in the spring, while the snow is yet on the ground or the frost disappearing. The clover is allowed to go to seed in the fall, and usually produces but little. During the second year one crop of hay and a crop of seed are obtained. It is during this second year that the injury of the Hylesinus is most observed. No experiments have yet been made with a view of preventing the injuries of this clover pest, and no other mode of prevention suggests itself to my mind than the plowing under of the clover in the spring of the second year, if the presence of the beetle is observed."

This pest will doubtless soon reach this state, if it has not done so already, and farmers should be on the lookout and turn under the field as soon as signs of its presence may be discovered; and in this way, taken while few in number, and only here and there a field infested, they may effectually hold the enemy in check.

FUNGUS IN LIVING PLANTS.

The subject of fungus growths and mildew is one of much importance, and one concerning which, much is said while but little

is really known. To throw a little light on this question, we copy a very practical address delivered by Prof. W. S. Farlow, before the Massachusetts Board of Agriculture.

What is meant by a fungus? Fungi are plants of a very low organization, which are never of a grass green color, and which are not capable of absorbing inorganic matter, and converting it into nourishment for themselves, but must take directly from other plants or animals the organic matter which has already been formed out of the inorganic materials contained in the soil or air. All plants which are capable of changing inorganic into organic material contain a quantity of green coloring matter known as chlorophyl, which is not found in fungi. Fungi are, in the strict sense, parasites, and not being able of themselves to assimilate the inorganic materials about them, must appropriate it from other plants and animals as best they can; consequently any plant which has a fungus growing upon it must not only manufacture food enough for itself out of the surrounding earth and air, but enough also to support the fungus. If enough cannot be provided for both, it is the plant which must suffer, and not the fungus, which helps itself without ceremony to any organic materials which it wants. The more the fungus grows the worse for the plant on which it is growing. Fortunately for the world the different species of fungi do not all require the same substance for their support. Some do not grow upon living animals or vegetables, but only on dead substances, and are useful, inasmuch as they hasten the decomposition of bodies which would otherwise slowly putrify. The fungi which live on dead, inert matter, are called "saprophytes," from a Greek word meaning rotten. Of course, none of the fungi of this class are the source of disease in fruit trees. Other fungi grow upon living plants and animals, and produce many serious diseases. Of the fungi which grow upon living plants, the greater part of them are limited in their range, and do not grow indifferently upon any plant, but either upon a particular species or on several species which are botanically nearly related. The reason for this selection of plants upon which to prey is probably that different chemical substances are necessary to the existence of the different species of fungi, and

consequently they can only flourish on the plants which produce these substances. This is a matter of inference rather than observation; for we do not yet know, for example, what the chemical substance is which enables the fungus known as *Sphœria morbosa* to grow on plums, and some varieties of cherries, and produce on them the excrescence known as "black knot," while it will not grow on apples or pears. The limitation of different species of fungi to a single plant, or at least to a comparatively few plants, is a great protection to the farmer; for, were this not the case, a disease once attacking a single crop would cause a general devastation.

Not only are fungi destitute of the green coloring matter found in the greater part of other plants, but their structure is much more simple than that of the ordinary plants with which you are most familiar. Instead of being composed of a more or less solid mass of cells packed together, as are the bricks in a house, for a great part of their existence fungi are composed only of delicate, colorless threads. When we say delicate, we must understand that the word refers to the general appearance of the threads and not to a lack of resisting power. If we submit the cells of the higher plants and the threads of fungi to the action of chemical reagents, as caustic potash or acids, we shall find that the threads are less quickly destroyed than the cells: consequently if we have a leaf in which a fungus is growing, we are able, on boiling it in caustic potash, to cause a separation and disintegration of the leaf-cells, while the threads of the fungus remain comparatively unaffected. The name given to the threads of the fungus taken collectively is *Mycelium;* and the separate threads are called *hyphœ*, or *flocci*. In the case of the moulds which do not grow upon living plants, the mycelium forms usually a mass looking more or less like cotton wool. In those which inhabit living plants, the threads wind about amongst the cells of the plants on which they are growing, and, when seen on the surface, appear like a fine web or frost work.

As has just been remarked, for a great part of their existence fungi consist of a mass of threads, but, under favorable circumstances, reproductive bodies known as "spores" are produced,

and in producing them, the threads undergo a variety of changes, some of which are very complicated. There are no true seeds or flowers in fungi, but in their power of germinating and reproducing the species from which they were derived, the spores of fungi correspond to the seeds of higher plants. Unfortunately for the easy understanding of the subject, the mode of production of the spores is a difficult subject to follow, and it is made more difficult by the fact that many, perhaps most, fungi produce more than one kind of spore, a state of things to which we have nothing directly corresponding in the higher plants with which we are familiar.

After this preliminary description of what is known as fungus, let us examine the disease known as the "black knot." The knots are most striking in the autumn and winter. If we make a microscopic examination of a knot gathered in mid-winter, we shall find that it is composed partly of a fungus and partly of the diseased and distorted cells of the plum-stem. The white threads of the fungus are found twisted together in bundles (Fig. 13 A), which in general are parallel to one another, and run from within outwards. They extend down into the stem for a short distance below the knot, but not more than a few inches. The threads in the knot, as they come near the surface, branch more and more and become black, and at the surface form a granular mass. The granulations can be seen with the naked eye, and when examined under the microscope each granulation is found to contain a cavity (Fig. 11), in which are a number of sacs intermixed with white threads. In the sacs are eight spores (Fig. 12), each of which consists of two parts, one being smaller than the other. The whole cavity opens outwards, and it is easy to see how the spores reach the air.

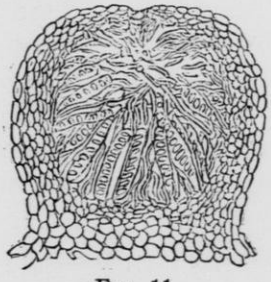

Fig. 11.

When spring comes, the threads which were concealed in the stem below the knot begin to grow again, and cause a new swelling just below the old knot. In a few weeks they will have grown to such an extent as to burst through the bark and appear

on the surface in spots which are green colored, not like the color of a leaf, however, but a very dark, deep green. A microscopic examination of the greenish knots which are found late in the

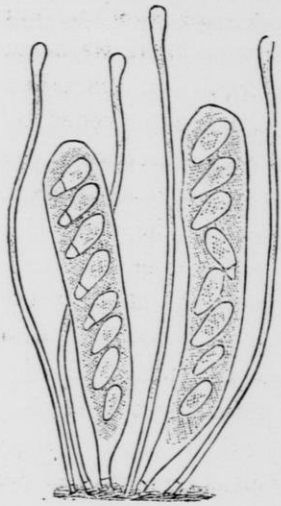

Fig. 12.

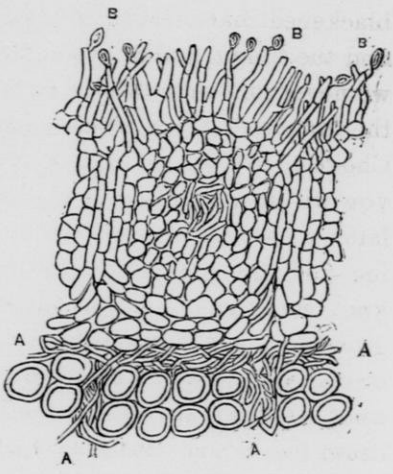

Fig. 13.

spring shows on the surface a number of threads, on which are borne small bodies which are also spores; and to distinguish them from the other spores they are called *conidial* spores (Fig. 13 B). As the conidial spores ripen and fall off, we find beneath the surface the beginnings of the cavities and the sacs which are to contain the winter spores. The knot grows rapidly blacker and rougher.

Having given as briefly as possible an account of the development of the black knot, it remains to state the conclusions which may be drawn from the knowledge obtained by means of the misroscope. In the first place, we may say that the disease is caused by a fungus. Why caused? you, perhaps, will ask. The word "cause" is not used in natural science to signify ultimate, but proximate cause. Ultimate causes are discussed in philosophy and theology, but they do not properly fall in the scope of natural science. When we say that a disease is caused by a fungus, we simply mean that the manifestation of symptoms which we collectively call the disease is invariably preceded by the presence and growth of the fungus. To illustrate: the formation of the

black knot is invariably preceded by the presence of the fungus known to botanists under the name of *Sphœria Morbosa*, and the onward growth of the mycelium of the fungus in the healthy stem of the plum is followed without fail by the swelling and blackened characteristic of the knot. On the one hand, we never find the fungus unless accompanied by the knot; on the other, we never find the knot unless accompanied and also preceded by the fungus. If you examine the slightly swollen branches of the Choke-cherry in the spring, before the bark has cracked open, you will find the threads of the fungus already in the stem, and later in the season you will certainly find the characteristic swelling and blackening. If the fungus were only found with the knot, we could not say that it was the cause of it. As the knots grow old, there is usually a number of insects and fungi found in or on them; they cannot, however, be considered the cause of the knot, as they are found in other excrescences as well. It is because the fungus consistently precedes, as well as accompanies the knot, that we are entitled to say that it is the cause of the knot.

As to the means to be taken to prevent the spread of the disease: our knowledge of the habits of the fungus throws light upon this point. First, we have seen that the threads of the fungus extend in the stem some inches beyond the knot itself, and these threads will, the next season, be followed by a new knot. Hence, in cutting away the knots, one should cut several inches — to be safe, we will say about ten inches — below the knots. The way the disease increases in a plant once attacked is by the onward growth of the mycelium. The next question is, how to prevent its spreading to other trees. The spreading is produced by the growth of the spores, one kind of which ripens in mid-winter, and another in early summer. The spores are all light, and easily blown about, and when they fall upon other trees, germinate by sending out new mycelial threads, which can enter into the stems upon which they have fallen. The object, then, should be to cut off the knots before the spores are ripe. By cutting in summer we can prevent the maturing of the winter spores; by cutting early in the spring we can prevent the ripening of the conidial spores. It is not enough, however, simply to cut off the diseased

branches. If the winter spores have begun to form, they go on, and ripen, even if the knots are cut from the trees, notwithstanding they may be exposed to a great degree of cold. Knowing this, we can infer that it will be safer to burn all knots which are removed.

The black knot is unknown in Europe, although the European cultivated plums and cherries are botanically the same as ours. How does it happen, then, that our trees have a disease unknown in Europe? The reason is, that the fungus which causes the disease is a native of America, and grows on our wild plums and cherries. * * * Being a native of America, when plums and cherries were introduced from Europe, the fungus grew upon them as well as upon our own wild species. Its injurious effects are better known on the cultivated plums and cherries, because, being cultivated for their fruit, they are more generally observed than the comparatively worthless wild species. All our wild cherries are not attacked by the fungus, as, for example, the rum cherry, *Prunus serotina*; and there are a number of cultivated varieties of cherry which are not subject to the disease. In attempting to check the disease, one should not forget to remove the knots from the wild cherries growing near orchards, as well as from the cultivated cherries.

Probably but few of the tumors on trees and shrubs can be said with certainty to be caused by fungi, yet no tumor of any size is probably free from them. The number of species of fungi is enormous, and not a small proportion inhabit dead wood and bark; and the rough surface of any old tumor forms a suitable place of growth for a great many species. They are, however, not the cause of the knots, but an aftergrowth, and are recognized as such by those who make a special study of fungi. Many tumors are known to be caused by insects, and, as a rule, the distortion produced arises not so much from the attack of the insects themselves as from the effort of the plant cells in succeeding years to perform their normal work. The injury often consists in the invasion of a leaf bud by some very small insect, and, as a result of the irritation, the leaves constituting the bud enlarge, become hardened, and often unite into a comparatively solid mass. The

next year the indurated mass itself acts as a foreign body, and there grow around it, in succeeding years, layers which are all more or less distorted, until finally we have a large knot, in which it is quite impossible to detect the original lesion.

In the beginning of the lecture, we divided diseases caused by fungi into two general classes, tumors and blights. The latter is by far the larger and more destructive, and more generally recognized as caused by fungi. Of course the consideration of blights on fruit-bearing plants should not be kept distinct from that of blights on vegetables, for in a scientific point of view they are very closely related. To describe in detail even a small portion of the blights of cultivated plants would require several lectures, and I can now call your attention only to two, which are common

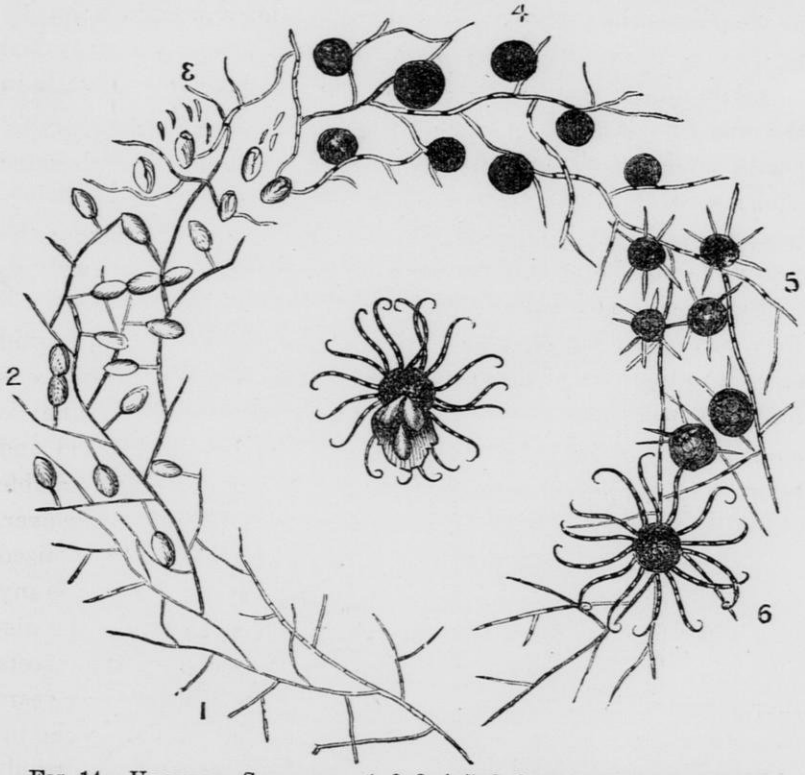

Fig. 14. Uncinula Spiralis. 1, 2, 3, 4, 5, 6 show the different stages of its development.

on grape vines, and let them serve as types, two large and very destructive orders of fungi. The fungi to which I refer are found

as well on wild grapes as on cultivated, and neither species is yet known to occur in Europe, although both are common through the Eastern United States.

You may have noticed that the leaves of many cultivated grapes are apt to look dusty after the first of August. The dustiness, if such it really were, would of course disappear after a heavy rain. But such is not the case. During the damp weather the dusty look increases, and after a while the leaf dries and shrivels. As the leaf shrivels the dustiness disappears, and in its place we see a number of very small black bodies scattered all over both surfaces of the leaves. In some cases, instead of looking dusty, the leaves seem to be covered with a tolerably thick white web, which extends to the leaf stalks, and in extreme cases to the grapes themselves. The blight is often supposed to be due to *Oidium Tuckeri*, the fungus which caused formerly a great deal of injury to the grape crop in Southern Europe, and especially in the island of Madeira. The development of that fungus is only partly known, and there is no proof that our fungus is the same. The American fungus referred to is called *Uncinula spiralis*, and belongs to a large group of leaf parasites, the *Perisporiacæ*. The dusty or webby appearance of the leaves is caused by the growth of the mycelium over the surface. The mycelial threads, although they may cover a great part of the surface of the leaves, do not enter into their interior, except that at intervals the threads are furnished with little suckers, which just penetrate into the external cells, and serve to attach the mycelium. During the summer some of these threads grow up from the surface of the leaf, and at the tip divide into a number of squarish ovoid cells (Fig. 15)

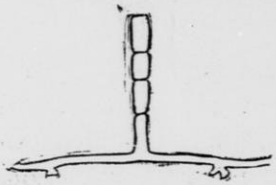

Fig. 15.

which are spores corresponding to the conidial spores of the black knot. Later in the season a number of round bodies

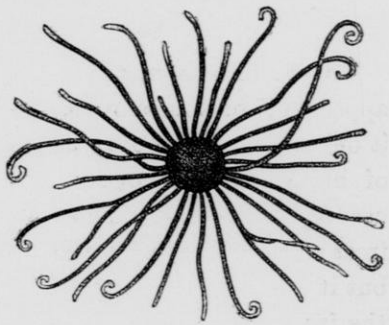

Fig. 16.

(seen in Fig. 14 at 4, 5, 6 and Fig. 16) are formed on the threads. They are at first yellowish and afterwards black. These black bodies are hollow, and contain a number of sacs (seen in the center of figure 14 and Fig. 17), in which are spores which may be said to correspond to the winter spores of the black knot. These black bodies have attached to them a number of peculiar threads or appendages, which are rolled up at the end, from which the name *Uncinula* is derived.

Fig. 17.

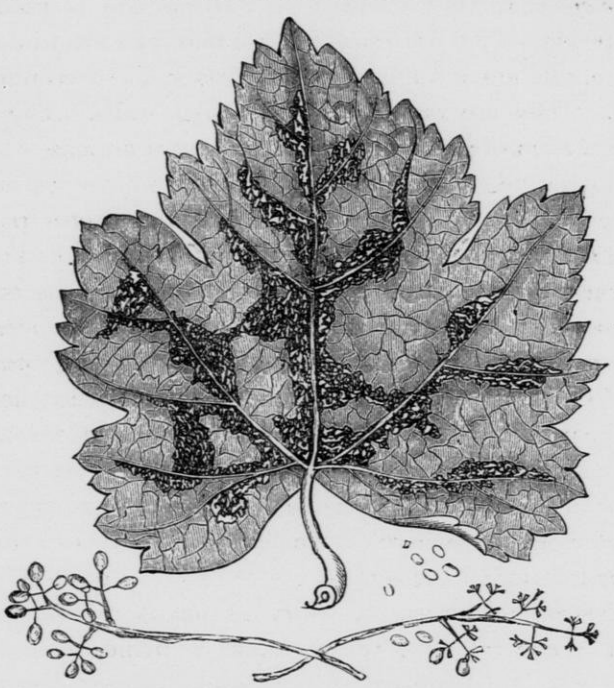

Fig. 18. Peronospora Viticola.

The second form of blight which occurs on grapes begins to appear about the same time as the first, and may be mixed with it on the leaf; or more frequently it occurs alone. The first form of blight may be found on either side of the leaf. The second occurs only on the under surface and appears when fresh like frost work. The leaf stalks are sometimes covered by the fungus, but it does not attack the grapes themselves. An examination of the frost-like spots on the under surface shows that they consist

of branching threads, on whose tops are borne oval bodies (seen in the branches in figure eighteen), which are the conidial spores. The threads do not, however, grow all over the surface of the leaf, but make their way from the interior into the air, through the holes which abound on the under surface of most leaves, and are known by the name of "breathing spores." If we follow the threads still farther, we shall find that they penetrate through all parts of the leaves and stems, making their way between the leaf cells. The threads are also furnished with small suckers, which push their way directly through the walls of the plant cells into their interior. The bodies which we may call the winter spores of this blight are not found on the surface, but are imbedded in the leaf. They are round and have thick walls. The name of the second form of grape blight is *Peronospora viticola.*

A comparative study of the two blights we have just described is instructive. They both first appear on the leaves about the first of August, and both cause them to shrivel and drop off. One sometimes attacks the grapes, while the other does not. The two blights may be distinguished with the naked eye by an ordinary observer, as one forms a sort of dusty-looking web on any part; the other, frost-like spots on the under surface of the leaves. Both have conidial spores, which grow on stalks in the air. Both have what we may for convenience call winter spores, which ripen late in the autumn. Those of the *Uncinula* are in the round black bodies on the surface of the leaf; those of the *Peronospora* are in the interior of the leaf.

A microscopic examination shows us that it is not correct to speak of grape milldew, or blight, as a distinct disease. We have just seen that there are at least two different fungi which produce a blight; and the two differ decidedly in their habits and growth, so much so, that the means taken to prevent the growth of one will not apply to the other. Let us consider this practical point more at length. We will suppose that the grape grower recognizes that his plants are attacked by the first form of blight described — *Uncinula spiralis.* As a microscopic examination shows that the fungus is on the surface, and not in the interior of the leaves, it is plain that the object should be to

check the growth of the mycelium on the leaf. The injury that the *Uncinula* does to the grape is, that it covers the leaves, which in a certain sense may be said to be the respiratory organs of a plant, so that the necessary supply of light and air is shut off. The growth of the fungus may be checked by the use of sulphur strewn over the plants. We must also consider how the disease is propagated from one plant to another. The conidial spores already described are light and easily blown from one plant to another. Wherever they fall, if the weather is only moist enough they begin to send out threads, which form the mycelium of a new *Uncinula*. The threads only grow to any length, as far as we yet know, when the spores have fallen on or near grape vines. From this we can infer that the *Uncinula* does not live entirely upon material found in the air, or accidentally on the surface of the grape leaves, but that it also requires some peculiar substance produced only by the grape plant. A great many of the species of fungi, however, which are botanically closely related to the *Uncinula*, are not limited to the plants of a single genus, but grow indifferently on plants which are not nearly related botanically.

Another question also arises. How does the fungus survive the cold of winter? The conidial spores which can spread the disease rapidly are killed by the cold. The round, black bodies which contain the winter spores are much tougher. The winter spores are not ripe till late in the autumn, and fall to the ground with the leaves on which they are growing. They remain dormant during the winter, and when spring comes, germinate and make their way into the nearest grape vines. It would not be unwise in the autumn to collect and burn all the grape leaves, that is, as far as practicable, in districts which have in the summer suffered from the *Uncinula*. In this place we should bear in mind what has been said about the black knot extending from wild species to the cultivated. This blight can extend in a similar way, as it is found on wild vines, but as far as we yet know the fungus does not grow on any wild plants except grape vines.

If we turn now to the *Peronospora*, which grows on grape vines, we see that the preventive measures, which in the case of the

Uncinula would be of advantage, would here be of little avail; because the fungus is not confined to the surface, but pervades the whole plant, and in fact does not grow through the breathing pores into the air until it has already traversed a considerable part of the interior of the leaves and stems. The first warning of the presence of the fungus, viz., the white spots on the under surface of the leaves, is not to be interpreted as showing that the disease is beginning, but that it is already far advanced. To sprinkle sulphur on the leaves is quite useless in the case of the *Peronospora*, for it will not affect the mass of the fungus which is in the interior. The only thing which will check the disease is to diminish the moisture in the air, but that, unfortunately is beyond human control. If the season happens to be dry, all very well; if very wet, then the *Peronospora*, once started, will grow in spite of everything.

The disease spreads from plant to plant durtng the summer by means of the conidial spores. They may be carried about by the wind and rain, just as the conidial spores of the *Uncinula;* but when they fall on a place sufficiently moist they germinate, but in a different way from the conidial spores of the *Uncinula.* The contents of the spores separate into a number of distinct bodies, which break through one end of the spore and escape, leaving the empty spore-wall behind. The bodies which escape, to which the name of "Zoöspores" is applied, swim about by means of two hair like threads called "cilia," which are in constant motion. Being very small, they are able to move about in the moisture which is found on the ground and on plants when it is not dry weather. They swim about for only a short time, and then the cilia drop off, and the Zoöspores come to rest. They then give off threads like the conidial spores of the *Uncinula*, and the threads penetrate into the interior of the grape plants on which they may be. Once inside, the threads constitute a mycelium, which extends through the plant at a rate corresponding with the external moisture, and finally the threads make their way through the breathing pores into the air, and produce new spores. It will be seen that the conidial spores of the *Peronospora* have an advantage over those of the *Uncinula*, because they pro luce a num-

ber of Zoöspores, generally from five to fifteen, each of which is capable, under favorable conditions of producing a new mycelium and spores. Like the corresponding bodies in *Uncinula*, the conidial spores are destroyed by cold.

The winter spores of the *Peronospora* are thick and tough, and are produced in the interior of the grape leaves by a rather complicated process, which, although interesting from a botanical point of view, need not be described here. They fall to the ground with the leaves in the autumn, and are set free by the rotting away, during the winter and spring, of the leaves in which they are contained, and as the season advances they germinate, and enter the nearest vines, but the details of the germination have not yet been made out. The remarks already made about burning the grape leaves apply also in this connection. The mycelium of the *Peronospora* in the interior of the vines affected during the summer may remain dormant during the winter, and start up again when the warm weather returns. Just how much harm the *Peronospora* does to the grape vines is not easy to decide. I have, on a previous occasion, expressed the view that it is not unlikely that the harm done has been exaggerated, because the fungus never attacks the berries, and it does not cause the leaves to shrivel and dry up until comparatively late in the summer, when, as some say, their room is better than their company, for what is especially needed is, that there shall be plenty of sunlight to ripen the grapes, which is not the case when the foliage is luxuriant, and covers up the branches. Whether the shrivelling of the leaves in the latter part of August permanently injures the vines, and injures the crop is a point to be settled, not by the botanist, but empirically by the grape grower, and as far as can be learned, on this point opinions differ.

My object in describing the two principal blights on the American grapes has been to show that an accurate and scientific knowledge of the causes of diseases in plants requires a careful microscopic study, and that such study is not without definite and practical results. The time has passed when the labors of botanists should be considered of interest only to special students of science. From them the farmer may learn certain facts of which

he cannot afford to be ignorant. The high science of one decade it must be remembered, becomes, in the course of three or four decades, the popular belief, and is then honored with the name of common sense, just as though not more than half a century previously, people had not been considered fools for believing just such things. Only within a few years have fungi been recognized as the cause of disease in plants, and there is a growing tendency to account for almost all obscure plant diseases by saying that they are caused by fungi. If a disease suddenly makes its appearance, and inquiry is made as to its cause, up jumps Dr. A., and says, "it is a fungus; I have found some mycelium." Or Prof. B. startles the community with the announcement that he has found "spores." Neither Dr. A. nor Prof. B. tell the public to what form the mycelium and spores belong; nor do they apparently know that it is almost impossible to find a leaf or stem in which, or on which, there are not some traces of mycelium or spores. The spores and mycelia of the common mould are everywhere; and if one is determined to see in fungus the cause of all diseases, he has not to look long before finding them in abundance, such as they are. It savors of quackery to make a little bit of mycelium, or a few spores of some ordinary mould, explain the appearance of wide-spread and devastating diseases.

A few years ago everything was laid to insects by the agricultural quacks; but as a knowledge of entomology spread, that became dangerous ground, and they then took up fungi, about which the public were not so well informed. Before long, it is to be hoped that there will be such a general knowledge of the habits of fungi, that the war cry, "Mycelium! Spores!" will have lost its terrors. Where then will the quacks take refuge? At the lowest limits of the vegetable kingdom; some would say below the lowest limits is a large group of very minute beings called "Bacteria." They are very small; they are found everywhere; their study taxes the *highest powers of the first scientific men.* It will be a long time before the scientific world will know much about them, and longer still before the public do. Without being a prophet it will be safe to predict that within the next ten years the agriculturist will have to listen to an immense amount of

nonsense about the harm these small bodies do, and the diseases they cause. In the meanwhile let us not underrate the harm done by fungi, while deprecating all attempts to make them responsible for every disease which may make its appearance; and here, as in other things, a little knowledge is a dangerous thing, for it is only by cautious and careful research that we reach results that are really valuable, either scientifically or for practical application.

Cut-Worms. There are various kinds of worms embraced in this general class, differing but slightly in size, form and in their habits. The appellation, "cut-worm," is given to them from the manner in which they attack the plants upon which they feed. In Europe they are called surface worms or grubs, because they are found in the destructive period of their existence near the surface of the ground. The worms, or caterpillars are stout in form, of a dusky, greasy color, varied in shadings and markings, in the different species, and also in the individuals of the same species. This variation has led to some confusion of names and classification, but instead of denoting different kinds, is usually to be attributed to the difference in kind, color or amount of food of which they have partaken, or to the different stages of growth or maturity. The first indication of their presence is usually the wilting or falling down of the plants in the field or garden. On examination the stalk will be found to have been cut off, or nearly so, at or near the surface of the ground. No worm will be in sight, but on carefully removing the loose dirt near the plants, a short, thick worm, apparently lifeless, rolled up in a circular form, will usually be found. This inactive, torpid condition, is wholly assumed on being disturbed, for in their natural movements, they are quite active and lively. There is some difference in the part of the plant which these caterpillars will attack. While some cut off the main stalk of the plant below the surface, there are others which will cut it off at the surface, or even above it. Others will climb the stalk and cut off the leaves to devour them at their leisure. Others will climb shrubs and vines, rose bushes, and even standard fruit trees, and eat out the flower and terminal buds,

and even the leaf buds. The worm has eight pair of legs; three pair near the head, which are the true legs; four under the middle part of the body called prolegs, and a pair near the posterior part called anal legs. Their sudden appearance in an almost mature state, especially where their habits are not known, often occasions much surprise, as well as their more sudden departure, after a brief but destructive career. The reason for this will be evident when their habits are considered. As remarked at the outset, the different kinds differ but slightly in the manner of their development, so that one general description will serve for all.

During the months of July, August and September, dark, sombre colored moths are frequently seen flitting about in the early evening, and often come into rooms where a light is burning, attracted by the blaze, into which they often plunge. Though nocturnal in their habits, they are sometimes seen flying about in the daytime, in dark, cloudy weather. They are also to be found behind the shutters, under boards or in other places that will afford them a dry shelter from the bright light of day. Their bodies are stocky; about an inch in length. The wings when extended are usually from one to one and a half inches in length, the fore wings being narrower, but much longer, and generally of a darker color than the hind wings. When the moths are at rest, the wings cover the back like a flat roof, the hind wings being folded under and entirely covered by the fore ones. The color of the wings varies from an ashy gray to a dark brown, often mottled or shaded with spots of lighter or darker shades. Tufts of hair are usually placed on the shoulder and on the abdomen.

After mating, the female deposits her eggs either on the plant from which they are to draw their sustenance, or near it, on some substance close to the ground. The instinct of the moth leads it thus to provide for the future wants of the young larvæ, and this will account for the fact that land where the cultivation has been clean, and there is little vegetable growth, is seldom troubled with them, and that they especially abound in grass land that has been seeded for a number of years. Prof. Riley says that the moth of the variegated cut-worm lays its eggs in clusters on

the twigs of trees, on which the young larvæ feed in the early stages of their growth, and to which it returns on reaching its maturity. These eggs soon hatch out, and the young worm works its way into the ground, feeding on the tender roots of the plants it may find there. It requires but little nourishment the first season, and as the food is abundant, but little damage is done. When cold weather approaches, the caterpillar burrows further down, curls up and passes the winter in a torpid condition. When warm weather returns, the larva starts out in search of food, and eagerly devours whatever it finds suited to its taste. It soon reaches the surface, nearly mature in size, but with an enormous appetite, and speedily lays waste all within its reach, going from plant to plant, feeding at night and lying concealed by day in the earth near at hand. It soon arrives at maturity, and disappears more suddenly than it came, burrowing into the earth for three or four inches, passes into the chrysalis state, where it remains from two to four weeks, then to appear as the parent moth.

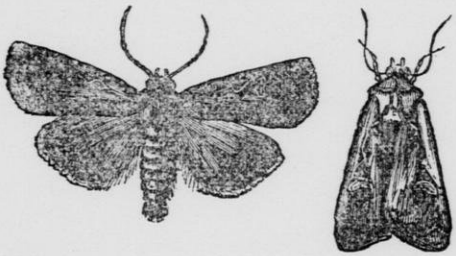

FIG. 19. WESTERN STRIPED CUT-WORM.

The Western Striped Cut-Worm, *Agrostis Subgothica*, Fig. 19, is the well known corn worm, but which by no means confines its depredations to corn alone. It is a general feeder, and will take melons, turnips, cabbage, tomatoes, young trees, tobacco, etc., with equal relish. This species has the reputation of providing for the day's food by dragging the plants cut down at night to its burrow where it lies concealed by day and eats at leisure. Prof. Riley says: "When full grown they are from one inch to one inch and a quarter in length, of a dirty white, or ashy gray color, with three broad dark lines, and two light narrow ones along the sides, and a light one, edged on each side with a dark one along the middle of the back. This species remains longer in the ground than any of the others, and the moth does not appear till August and September." The wings of the moth are peculiarly marked, the lighter portion being of an ashy gray color, and the darker parts of a deep brown.

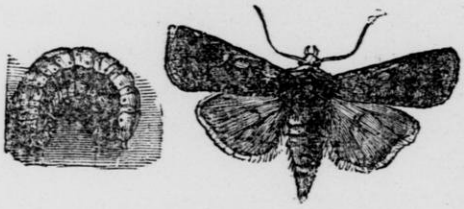

FIG. 20. THE DARK SIDED CUT-WORM.

Climbing Cut-Worms. From what is generally known of the cut-worms' habits and from their form and appearance, the common opinion is that their depredations are confined to the portions of plants that are in or near the surface of the ground, and the statement that they climb trees and destroy leaves and fruit there will hardly be believed by many. But careful observation has demonstrated that some of the species do climb rose bushes, grape vines, and others shrubbery, and even standard trees and there eat out the fruit, flower and leaf-buds, to such an extent as sometimes to destroy the plant or tree, and some entomologists are of the opinion that all of the species can and do feed in the same way when driven by scarcity of food nearer at hand. Prof. Riley in treating of this class of worms says: "Orchardists in spring frequently find the heart of their fruit-buds, on young trees especially, entirely eaten out and destroyed, and this circumstance is attributed to various causes; as birds, winged insects, beetles, slugs, or late frosts, unsuitable climate, etc. Never have cut-worms received the blame, all of which should have been ascribed to them, for the germ hold of many species on a sandy soil in early spring is the fruit tree. This is a very important fact to fruit raisers, and let those who have attempted to grow the dwarf apple and pear on a sandy soil, and who have become discouraged, as many have, from finding their trees affected in this way every year, take courage, for knowing the cause they can easily prevent it.

"These climbing cut-worms will crawl up a tree eight or ten feet high, and seem to like equally well the leaves of the pear, apple and grape. They work during the night, always descending just under the surface of the earth at early dawn, which accounts for their not having been discovered at their work of destruction in former years. They seldom descend the tree as they ascend it, by crawling, but drop from the leaf or bud on which they have been feeding; and it is quite interesting to watch one at early morn, when it has become full fed, and the tender skin

seems ready to burst from repletion, and see it prepare by a peculiar twist of the body for the fall. This fact also accounts for trees on hard, tenacious soils being comparatively exempt from them, as their instinct doubtless serves them a good turn, either in preventing them from ascending, or by leading the parent moth to deposit her eggs, by preference, on a light soil. * * * The miller prefers to lay her eggs near the hill or mound over the roots of the trees in the orchard. They have been known to deposit them in a spring dressing of ashes and lime, put on to prevent the May beetles' operations, thus giving the larvæ a fine warm bed to cover themselves up in during the day, concealed from the observations of their enemies. They will leave potatoes, peas and other green plants for the buds of the apple and pear. The long, naked young trees of the orchard are almost exempt from their voracious attacks, but I have found them about midnight, in dark, damp nights, well up in the limbs of such trees. Salt is not repulsive to them; they burrow in it as quickly and as comfortably as in ashes and lime. Tobacco, soap and other washes, do not even provoke them."

The dark sided cut-worm, given in figure 20, is one of this species, and perhaps the most common one. Prof. Riley, in his description, says: "The general color of the larva is a dingy, ashy gray, but it is characterized by its sides being darker than the rest of the body. When young, it is much darker, and the white which is below the lateral band, is then cream-colored and very distinct. There is but one brood a year. The moths appear through the months of July and August. Their color is a light, warm gray, shaded with brown and umber.

In speaking of their operations, copying from the reports made to him, he says: "In the beginning of the evening its activity is wonderful; moving along from limb to limb swiftly, and selecting at first only the blossom-buds, to one of which having fastened, it does not let go its hold until the entire bud is eaten out, and from this place, so thorough is its work, no latent or adventitious bud will ever again push. From a six year old fruit tree, I have, on a single night, taken seventy-five of these worms, and on the ensuing evening found them well nigh as plenty on the

same tree. When all the blossom-buds of a tree are taken, it attacks with equal avidity the leaf-buds. * * * * The instinct of the perfect insect, like that of all insects injurious to vegetation, leads it unerringly to deposit its eggs where they will hatch out by the warmth of the sun, and where the larvæ will be nearest the food necessary for its sustenance, and hence I have never found the eggs on clay or heavy, cold ground."

FIG. 21. WHITE BRISTLY CUT-WORM.

The Bristly White Cut-Worm is often found in the garden, where it feeds mainly on the roots of plants, and especially flowers. It is of a dirty white color, and is covered with stiff, yellow bristles. It is usually seen early in August. The caterpillar, when full grown, is about three-quarters of an inch in length. Early in August it passes into the chrysalis state, from which the perfect moth emerges in about two weeks. The moth is smaller than those of the other species. It is very prettily marked, the fore wings are of a dark gray color, shaded with brown, and variegated by three moss green patches.

There are quite a number of insects that prey upon the cut-worm in its larval state, but they are not sufficient to hold them in check, or even to make any perceptible diminution in the numbers of the foe. Among the parasites who destroy the larva by depositing their eggs in the worm, are the Ichneumon fly, and also a species of the Microgaster, bred from the worms, and described by Professors Riley and Thomas. Among the insects that devour the worms bodily are the Spined Soldier Bug and the Fiery Ground Beetle.

FIG. 22. SPINED SOLDIER BUG.

Figure 22, *b*, represents the first with one wing extended, the other folded under the wing cover; *a* is a highly magnified view of its short, stout beak, with which it impales its victims, soon pumps them dry and leaves them an empty shell. This insect, vulgarly known as the "Stink Bug," is the friend of the farmer and horticulturist, and should be protected in every way possible.

The Fiery Ground Beetle — *Calosoma calidum*, Fig. 23, is a black beetle about an inch in length, and has three rows of copper colored dots on each wing-case. In its grub or larval state it is especially beneficial in the destruction of injurious insects, and from its boldness in attack, its ferocity, has well earned the name of cut-worm lion. The larva has a flattened form, is black in color and has six legs placed near the head; from the extremity of the abdomen are two arms or projections, giving the appearance of a crescent. The jaws are stout and hook shaped. They follow the cut-worms into their hiding places, and sieze them when found, though greatly inferior in size, and will soon conquer and devour them.

FIG. 23. FIERY GROUND BEETLE.

Of artificial remedies, where the ground planted is stocked with worms, there is nothing of much avail but hunting the worms and killing them. The application of poison may destroy those that attack the plants or trees above ground, but where they cut off the roots or stalks below the surface, no application will reach them, and nothing will prevent their destructive work but a "still hunt" and a personal attack. The climbing worms may be captured by shaking them off from the trees or shrubs at night onto sheets spread beneath the trees; or they may be kept from ascending by encircling the trunk of the tree with strips of tin of some width, the lower edge being imbedded in the earth close to the stem of the tree.

Fall plowing has been found very beneficial in destroying the larvæ and many instances are given where the ground plowed in the fall has escaped the ravages of the worm, while crops on similar land near by and even in the same field, plowed in the spring, were nearly destroyed by them. The later in the season the plowing is done the better, for if the weather is still warm the larva will be able to prepare new winter quarters. Very early fall plowing may also be beneficial, when it destroys all vegetation, by checking the development of the young larva from want of food. Clean culture is also a good preventive remedy for the

same reason, or because the parent moths will shun such fields, knowing that their young progeny will not find there the necessary food. Fall plowing, however, will have but little effect on the worms in sod land, probably owing to the compactness of the sod when turned over, and it is in such land that these worms especially abound. The best way to serve such ground is to plant or seed it to crops that are least affected by the worms, or to summer fallow or plant to crops that will not mature sufficiently to be injured by them before the worms are prepared to assume their chrysalis state. Where the sod ground is covered with dry grass or other rubbish, burning it over late in the spring and then turning it under will destroy many of the worms. Some recommend in planting corn on ground stocked with worms to plant three or four more kernels than are wanted in the hill, but one worm is generally sufficient for a whole hill and often has appetite enough left for the next, and is pretty sure to find it too, unless he is discovered at his work and crushed.

The number of these and of many other of our insect enemies might be greatly reduced by the means of lights put out at night, either an open blaze or a sheltered light so placed that the insect flying against it would drop into water or some sticky fluid. This method is largely used in some portions of the country, and should be resorted to generally, if we would hold our foes in check. Nearly all, if not all of the nocturnal moths are our enemies and a great majority of our worst foes are either nocturnal or crepuscular in their habits and can easily be lured to their destruction by these decoy lights. The expense attendant upon this practice will not be great and were it considerable, would be economy, for the numbers of the destroying army will be greatly diminished by the destruction of a few parent moths.

Much might be accomplished in this direction by enlisting the interest of the children in the work. Instruction given in regard to our insect friends and foes would keep them on the watch, and a slight bounty offered for the destruction of the insects now devouring our crops would give a practical direction to their interest, so as to greatly diminish the present numbers of the foe, and would create such an interest in the subject of entomology in the coming generation, that its importance would be better realized,

and lead to general, concerted action, and to the use of more efficient means for the preservation of our crops.

Hessian Fly — *Cecidomyia Destructor.* The first serious obstacle to successful wheat culture in this state was the advent of this pest, which made its appearance in sufficient numbers to attract attention, in 1842. So rapidly did it spread that in 1846, it extended quite generally over the southern portion of the state, and in such numbers as to seriously injure the crop that year. It also made its appearance the following years, and became so destructive as to compel a general abandonment of raising winter wheat for a time. Spring wheat was then quite largely raised — in fact, almost exclusively — until the chinch bug appeared on the field. By giving up the cultivation of winter wheat, the Hessian Fly was, to all appearances, exterminated, but on the resumption of fall seeding, it soon returned in great numbers, and in occasional seasons did great damage. The loss they have caused has been very great, but their appearance cannot be regarded as an unmitigated evil, for they have driven our farmers to give up exclusive wheat culture, and resort to diversified farming, and if now we can discover when the foe will attack us, and are prepared to rout his forces, positive good will come out of the evil. Their introduction into this country, like that of the chinch bug, is charged to the mercenary allies which England employed to subdue her revolted colonies. The insect was first noticed on Long Island, in the year 1776, and was called Hessian Fly, on account of its supposed origin. Though tiny in form, and "defenseless against the least enemy, crushed by the most delicate touch," it has proved a more serious foe than the troops whose name it bears, and is estimated to yearly occasion more damage to this country than the whole cost of the Revolutionary War. A good example,

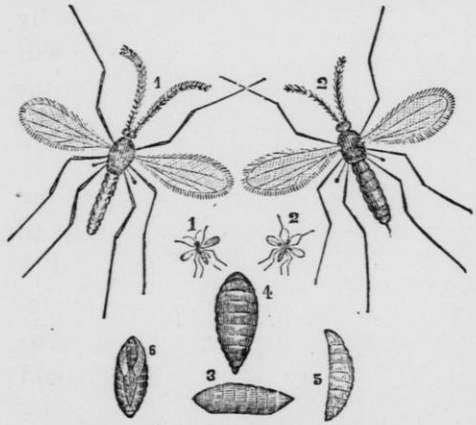

Fig. 24. The Hessian Fly.

as has been remarked, of the evil results that may flow from one bad act.

The following description is taken from Professor Packard's report, as a member of the United States Entomological Commission. "This insect belongs to the Dipteria or two-winged insects, of which the common house fly is the best known type. It belongs to the family *Cecidomyidæ*, a large group of minute flies resembling the crane flies or daddy-long-legs, but of diminutive form. They are nearly all gall-flies, the females laying their eggs by means of the soft extensible end of the body which slides back and forth like the joints of a telescope. The irritation caused by the egg results in the swelling of the stems of the plants, or the formation of tumors or galls on the leaves and buds. The Hessian Fly does not produce true galls in this way, but the presence of the insect in the flaxseed state, between the leaf and the stalk, causes the stem to swell and the leaves to wither and die. The body of the female (Fig. 24—2, 2,) is rather slender, uniformly dark brown, the head is round but somewhat flattened the eyes are black, the wings uniformly dull smoky brown, while the legs are paler brown than the rest of the upper side of the body. The body, wings and legs are provided with fine hair-like scales, those on the wings being in many cases quite broad and ribbed, somewhat like the scales on the wings of a butterfly or moth. The brown antennæ are about half as long as the body; the joints, seventeen in number, are very distinct, like a string of beads. The legs are of the same color as the under side of the body, being a little paler than the back. The abdomen is rather full, with nine well-marked rings or segments, the paler small ovipositor forming the tenth. The length of the fly is about one-tenth of one inch.

"The male (Fig. 24—1, 1) is rather smaller than the female, being distinguished by the long, slender abdomen, and the longer and more hairy antennæ, in which there are twenty joints."

The egg is of a pale red color, very minute in size, about a fifteenth of an inch in length. The eggs are usually laid on the upper side of the blade near where it joins the stalk or crown of the root. Professor A. J. Cook, of Michigan Agricultural College,

says that "the fly very rarely lays more than three eggs at one time without change of position. She more frequently lay two, and generally but one. In case she lays but one, it takes less than a quarter of a minute, and less than a half a minute to lay three, when they are all laid without a change of position on the part of the fly. After laying she seems to draw in her ovipositor, soon to extend it again, at the same time crowding into it the one, two or three eggs that are next to be laid. She then flies to another leaf, alighting usually, not always, with head towards the end of the leaf. She then appears to wipe the eggs off the jointed ovipositor. She really crowds the egg till the end touches the leaf, when by friction of the leaf and adhesion of the egg, the latter is held fast while the egg-tube is withdrawn. If the second and third are to be laid she repeats the operation, after which she retracts her ovipositor, restocks it, and in a trice is depositing the fatal germs on another leaf. I say usually on the upper surface, for occasionally eggs are laid on the stalk, and sometimes on the under side of a leaf. I have observed that the fly often makes many unsuccessful efforts to cause the egg to adhere on the outer face of the leaf before she succeeds. I have seen a fly work thus for two minutes before success crowned her efforts. The fly may thus learn by experience that it is easier to deposit on the inner or upper face of the blade, and so generally choose that surface.

"These eggs hatch in from four days to two or three weeks, according to the weather, and the larva or maggot (Fig. 24, 3, 5) makes its way down to the base of the sheath, which in the young winter wheat is at the crown of the root. Here it fastens lengthwise and head downwards to the tender stalk, and lives upon the sap. It does not gnaw the stalk, nor does it enter the central cavity thereof, but as it increases in size, it gradually becomes imbedded in the substance of it, causing it to swell and the plant to turn yellow and die. By the end of November, or from thirty to forty days after the wheat is sown, they assume the "flax-seed" (Fig. 24–4 and 6) state, and may, on removing the lower leaves, be found as little brown, oval, cylindrical, smooth bodies, a little smaller than grains of rice. They remain in the wheat until warm weather; in April the larva rapidly transforms into the

pupa within its flaxseed skin, the fly emerging from the flaxseed case about the end of April. The eggs laid by this first or spring brood of flies soon hatch; the second brood of maggots live but a few weeks, the flaxseed state is soon undergone, and the autumn or second brood of flies appears in August. In some cases there may be two autumn broods, the earliest August brood giving rise to a third set of flies in September. The first brood of flies lay their eggs on the leaves of the young wheat from early April till the end of May, the time varying with the latitude and weather; the second brood appearing during August and the early part of September, and laying about thirty eggs on the leaves of the young winter wheat. Thus our crops of winter wheat, as is stated by Dr. Fitch, are liable to two attacks of the Hessian Fly, one generation reared at its roots producing another, which occupies the lower joints of the stalks. Thus the larvæ and pupæ are present in it almost continually from the time the tender young blades appear above the ground in autumn, till the grain ripens and is harvested the next summer. Our spring wheat, on the other hand, can rear but one brood of these insects; they consequently resort to it but little, if at all. Nor can the Hessian fly sustain itself except in districts where winter wheat is cultivated in which for it to nestle during the autumn and winter."

The first evidence of their work is the change in color of the wheat, turning from a bright green to a yellow shade, and this appearance is noticed the earliest on the higher ground, where the soil is dryest and light. This has been supposed to indicate that dry weather, as with the chinch bug, is most favorable for their development, while the reverse is true. This is evident from the fact that the year preceding the years when they have been the most destructive have been noted for their excess of moisture, and that they are seen to propagate much more rapidly in a warm, and wet autumn, and even in a cool and moist season than a warm dry one. Where they have full possession of the field early in the spring and in large numbers, the damage done by them in dry seasons is more marked, for the drouth diminishes the amount of nourishment taken up by the plant, and the larva appropriates so much of what there is, as to leave little or none for the wheat, and

therefore it starves. This will also account for the seeming contradiction, that while moisture is favorable for the development of the fly, the first and seemingly the greatest damage is seen on the dryest ground. Poor soil and land suffering from drouth cannot furnishs ustenance sufficient to bear the drain made by the vampires and to mature the wheat, while good, rich soil, land that is in good tilth and has abundant moisture will furnish enough to maintain a vigorous growth, and for the blood suckers too. Where there is sufficient nourishment to maintain the vitality of the plant it will tiller out and the rank growth of the parts of the plant not infested will make a rapid growth and cover up the affected stalks so that they will not show. Those varieties of wheat that have a tendency to make a rank growth and have a hard flinty stalk are the least injured by the fly. Some think that vigorous growth throws off the fly, others that being gross feeders they furnish enough for both plant and foe. This would seem to indicate that by the selection of the proper variety, by good culture, liberal fertilizing, underdraining, etc., we may be able to raise fair crops in spite of the fly.

Another method taken to circumvent them is to sow the wheat so late in the season that it will not come up until the cool weather has destroyed the fly. The success of this will depend largely on the character of the season. If the fall be cool and dry, and the conditions yet favorable for germination of the wheat, and the following winter mild, with a good covering of snow, wheat sowed after the middle of September would probably escape injury from the fly and do well; but should the fall be late and the weather warm, even after there had been heavy frosts, flies would probably come out in sufficient force to thoroughly stock up the field, and the result would be more disas trous from the lack of vital power in the very young plants; and if there were no flies, a hard, open winter would make the destruction fully as complete. Some have been successful in sowing a narrow strip around the outside of the field quite early in the season, with a thorough preparation of the whole field; then if the fly appeared they would expend their energies on the early sown wheat, which could be turned under about the middle of

September, and the whole field be seeded under favorable conditions for a good fall growth, weather permitting. If the first brood can be planted in this way, the second brood will "come up" minus. There is one thing certain, where a field of wheat has been sown in the fall, and the flies make their appearance in such numbers as as to indicate the destruction of the crop, or so as to materially injure it, which can be easily told by the color of the wheat, or by even a cursory examination, the whole may be turned under in the fall, or early in the spring, burying the foe beyond the power of resurrection. If the wheat be early sown, the seed and labor will not be lost, for the green coat turned under will add to the value of the next crop; and the gratification of having outwitted the enemy, and having sent them to an untimely end, will lighten the labor of putting it in.

Pasturing affected wheat with sheep in early fall is said to be attended with good results; also, when ground is dry, early in the spring. Some of the eggs and larvæ may be destroyed in this way, and the tendency of close cropping is to cause the wheat to tiller, and as the remaining larvæ cannot move from their original stalk, the new shoots would strike out for themselves, and being free from the parasitic burden, would soon draw the vigor of the plant to themselves.

It is a very common practice where the fly has destroyed a crop of wheat, so that it is not worth harvesting, to set fire to the dead and crinkled straw; also, where the crop has been cut from such a field, to burn off the stubble, in hopes of thus destroying the destroyer. Those who have made this subject a study claim that this is a very questionable practice. In nearly every instance where the fly has been very destructive in a season, it is followed by one or more seasons where few, if any, are to be seen, and that it is only by degrees that much of a perceptible increase in their numbers is seen. This is largely attributed to parasitic foes. These are mainly two species of ichneumon flies, the most important of which is a four-winged chalcis fly,— *semiotellus destructor*— that lays its eggs in the "flaxseed" larva, and the *Platygaster* that devours the eggs of the Hessian Fly. Conditions favorable to the fruitfulness of the Hessian Fly are said to be far more favorable

for these foes, and that their fecundity is so great that the fly is well nigh exterminated for a season. Burning the fields destroys many of the enemy it is true, but the greater portion of them are said at this time to be carrying from one to twenty of our friends in their bodies, who will not only destroy the foe, but when fully developed will continue the good work.

Rolling of the land after the wheat is up, the application of lime, soot, salt, etc., are recommended, but the methods most effectual are late sowing, thorough culture, recuperating by close cropping and by fertilizers, and turning under and reseeding infested fields.

CULTIVATION OF FLOWERS.*

Read by Mrs. C. A. Willard, before the Brown County Horticultural Society.

The husbandman, in his labor, finds but little poetry or romance in the routine of his life; hard, practical methods are his, and the stern realities of hard manual labor, amid sunshine and rain, are to determine the result, whether it be recompense or disappointment. There is a satisfaction, if not overburdened with work or care, in having a keen relish for whatever of food, rest or recreation he may have, and a still greater satisfaction, as he toils, in knowing that of all men he is the most independent and farthest removed from the ills that so often wreck and beset men in occupations that seem much more pleasant and profitable.

But you will say, What has all this to do with flowers and their cultivation? In the words of another, we would say, "Much, every way." As they are a part of nature upon which the Creator has expended such wonders in design of structure and coloring, we can but feel that they have, as have all the lower orders of life, an important relation to man.

To the husbandman, is it not possible for flowers, in all their beauty of expression and delicacy of dress, to add something of poetry and art, to brighten and color the sombre of his daily toil?

* This paper was not received in season to be incorporated with the regular Report from the Brown County Horticultural Society, of which it form a part.

His cottage, though but one story, and however rude its structure, can be made, by a profusion of flowers, to reflect the presence of a taste and culture that wealth might envy and genius admire.

We would recommend that the farmer and his family make friends with the flowers. This friendship will prove a mutual good to yourselves; and the beautiful flowers, while it may cost labor and trouble to prepare suitable beds for these delicate beauties to display their charms, they will amply repay you in the good that they will do you in return. The effect of the presence of large numbers of bright, showy flowers around the house is certain to arrest the eye and attention of the most indifferent laborer; and when once the attention is arrested and directed upon a thing of beauty, the sensations of admiration are awakened; taste, refinement and discrimination are cultivated. The habit of observation is stimulated, and, as a result, a keener relish of the beautiful grows in the mind to enrich and profitably occupy it in its leisure hours. There is nothing that grows that appeals with the same effect for admiration as flowers, and there is not a man nor woman, however rough and coarse, that can resist their gentle, silent pleading for attention and admiration.

Herbert Spencer says that the number of things that are done by man day after day, in the routine of habits and daily toil, without thought, is perfectly astonishing; hence, any influence around the home that induces the habit of thought and observation is of the greatest practical importance.

While this view of the value of flowers may seem simple and of slight account, let us remember that there is no branch of industry where a keen, discerning observation of things in nature is of as much importance as in farming. Besides it is a known fact that some of the greatest discoveries, and most valuable contributions of knowledge to the world have been suggested by observing very simple things; for instance, Watt's observation respecting his mother's tea-kettle lid gave the world her greatest motor, steam; and the slight and simple occurrence of the falling of an apple suggested the great law of gravitation. In fact, it is the observation of these trifles that science in all her vast and useful departments, has made her most valuable and important contributions.

If not accustomed to flowers, the more delicate and tiny may not be as desirable to cultivate as some of the more showy and conspicuous. In fact, we sometimes think that we, who are accustomed to their cultivation, make a mistake in devoting ourselves to the delicate and exquisitely beautiful, and do not give attention enough to the cultivation of the coarser and larger varieties, such as would be more attractive to those not accustomed to notice and admire flowers. There are a great variety of high colored flowers, which, while not very attractive in themselves, when planted in masses, combined with other varieties and colors, produce very beautiful effects in the yard.

My preference for the location of a flower-garden would be to have it face the south or southeast, and if it is protected on the north and partially on the west, by buildings or trees, much better success may be had in the cultivation of flowers. We have such high winds, and so frequent, that it is almost absolutely necessary to have some wind break, as it is termed further west.

Judging from a paper read at the last meeting of the St. Petersburg Society of Gardening, the Japanese must be allowed to have distanced us altogether in at least one branch of education. M. Grigroneff tells us, they are all taught gardening in their schools, and all have their little plots of ground. They are instructed in practical horticulture and in the artistic arrangement of bouquets, and all classes, from the palace to the cottage, manifest a passionate love of such humanizing and healthful occupations. Nowhere in Europe, we are assured, are gardens so numerous, or the love of floriculture so extensively developed. One very curious art they seem to have brought to great perfection. Their gardens often being small, and their taste leading them to take pride in the possession of trees of the bigger species, they have gradually developed the art of dwarfing them without in any way sacrificing their general shape and proportion. Father and son and grandson will grow an oak, for instance, for fifty years or more, and will take means of preventing it ever attaining more than eighteen inches or two feet in height, though still presenting all the characteristics of the full-grown tree in trunk, branch and foliage. Among their family treasures to be handed down from one gen-

eration to another may often be found a well-arranged garden, established in some antique specimen of Japanese pottery in the shape of a capacious bowl. Within this receptacle will be walks and trees and flower beds, with a great variety of floral favorites, all dwarfed to proper proportions.

Now we will suppose that the flower beds are laid out according to your own individual taste. To commence with the earlier plants that bloom, I would have a bulb-bed, planted out, of course, in the fall, in a bed that is well drained and made rich with fertilizers, with also the addition of a little sand, as that seems to warm the soil. Then I would plant out a variety of crocus, as their beautiful blossoms peep out of the ground almost as soon as the snow is gone. Also hyacinths, narcissus, snow drops, jonquils and tulips. Right here I would say in reference to tulips, I had often been told, and perhaps, had read in the catalogues, to take up my tulips and replant every two or three years, without giving any reason why. Ten or twelve years ago I discovered (what perhaps you all know) that the new bulb is formed each year, a little below the old one, so that if the bulb is left too long without removal, it will bury itself so deep that it cannot flower. After having planted out the bulbs as the cold weather comes on, cover the bed with leaves, straw or something that will answer as protection against severe cold.

If your time is so occupied with other duties that you have but little leisure for the cultivation of your flowers, I would advise the planting out of perennials, filling in between the perennials and around the edges of the beds annuals, reserving at least three beds for special plants, verbenas, pansies and phlox, as they are much prettier by themselves. Perhaps I had better mention some of the perennials. I have derived a great deal of satisfaction in the cultivation of the perennial phlox, hybrid varieties. Also in the varieties of delphinium or larkspur, that with a little care may easily be grown six feet in height. The varieties of digitalis or fox-glove are pretty. Lychnis chalcedonica will give you a peculiar red blossom that you can scarcely find elsewhere. Lobelia cardinalis, that you can find sometimes on the river banks in this vicinity, is another beautiful scarlet flower. There

is also a blue lobelia but it is a much coarser p'ant, although the blossom has a beautiful color. There are also many varieties of aquilegies or columbines, but the prettier is the bright blue, long spurred, Rocky Mountain variety. There are many other perennials that are worthy of mention but space forbids. We must only say in reference to perennials, that they are well out of the ground and some of them budded before the season is far enough advanced to plant seeds of our annuals.

Verbenas may be raised from the seed, procuring the colors you desire in separate papers, as the mixed papers are apt to produce too many light colored flowers, with scarcely a scarlet or rich colored one among them. I have had better success with my verbena-bed when it was so placed that the sun did not reach it until about ten o'clock, leaving the dews to remain on the bed awhile in the morning. In such a situation, I have never heard of the plants being affected with the black rust, which sometimes makes so much trouble. The following spring, after you have planted your verbenas, if you do not disturb them too early, you will find hundreds of seedlings coming up that will make strong and thrifty plants for the ensuing year, but you will need to plant some of the scarlet varieties, as there is such a tendency to run to the light colors, although I have kept them bright without renewal for three years.

Pansies require a cool, moist situation, and ought, by all means, to be planted in clumps or beds, as then their rich mass of bloom, so mixed and many colored, produces the best effect. They may be raised from seed, and are best started in the house or hot bed, and then transplanted where they are to flower, placing them about five inches apart, and after having once commenced to bloom, they will continue to do so all summer, and you might almost say, all winter, as since we have been here in Wisconsin I have had a pansy bed that I covered late in the fall, and every month that winter, by raising the covering carefully, I picked beautiful pansies for bouquets. When we remember that they are natives of Siberia and Sweden, growing in great luxuriance in their pine forests, we can easily see why they require a cool situation. As the young plants produce the largest flowers, it is best

to renew the beds every two years. I think that if one has garden room sufficient, that it would be well to make one new bed each year, not destroying the old bed until the third spring.

I would like to say a word before I close in reference to foliage plants. If you have a shady nook, where you think plants will not bloom nicely, that is just the place for a bed of foliage plants (although many varieties will do equally well in the sun). They are mostly raised from cuttings, and range in color from silvery white to the deepest crimson, and a bed well grown and arranged with taste is about as showy and effective as a mass of bloom.

FRUIT STATISTICS.

Counties.	Apple Orchard.		Bushels.	Acres.	Bush'ls.	Acres.
	No. of acres.	No. of bearing trees.	Apples.	Cranberries.	Cranberries.	Growing timber.
Adams	181	6,481	1,542	547	32	41,023
Ashland		10				800,000
Barron	49	1,317	150			3 0,000
Bayfield	2	100				944,640
Brown	268	10,023	1,606	135		42,396
Buffalo	205	8,924	1,432			22,684
Burnett	8	274	46	421	759	269,415
Calumet	697	25,712	3,063			46,905
Chippewa	91	3,689	601	13		1,400,000
Clark	198	6,425	1,158			750,000
Columbia	2,067	73,022	20,919	56	16	86,223
Crawford	946	22,793	10,100			121,527
Dane	3,883	113,892	42,416			119,844
Dodge	2,987	105,436	27,295		1	45,837
Door	143	3 248	681		6	80,922
Douglas		100	5			171,650
Dunn	195	9,013	1,898			92,630
Eau Claire	252	10 689	1,448			30,196
Fond du Lac	3 246	113 921	25,447			58,672
Grant	2 432	102,504	44,108			93,555
Green	1,636	64,778	25,400			54,457
Green Lake	1,321	49,997	12,179	825	111	23,165
Iowa	1,093	42 937	25,053			63,781
Jackson	201	7,395	1,442	8,137	5,534	108,969
Jefferson	7,255	111,035	38,404	39	95	29,355
Juneau	612	18,2 4	5,392	12,769	5,875	29,151
Kenosha	1,957	62,562	25,623			16 466
Kewaunee	145	4,612	816			34.559
La Crosse	1,049	15,160	3,404	150	29	49,726
La Fayette	1,549	58,462	15,600			37,895
Lincoln	5	105	144			1,820,000
Manitowoc	1,167	24,237	1,788	1	1	109,306
Marathon	37	2,104	250			2 4,383
Marinette	35	464	82	100	100	420,000
Marquette	533	16,232	8,267	163	390	45,634
Milwaukee	1,842	63,743	25,810			15,691
Monroe	792	16,768	5,251	1,002	900	88,603
Oconto	99	2 582	827			450,000
Outagamie	1,030	26,439	5,023			112,281
Ozaukee	1,227	31,126	7,961			23 128
Pepin	91	5,021	1,672	1		10.879
Pierce	284	8,318	2,022		5	88,834
Polk	72	3,416	904	28	289	164,426
Portage	120	3,730	977	360	1,335	35.392
Price	1					664,320
Racine	2,230	66,753	26,284	1	6	16,036
Richland	914	27,701	8,041			140 093
Rock	3,628	129,764	57,383	100		53,458
St. Croix	353	9,260	2,081			83 327
Sauk	1.705	56.944	19,866	1	7	93,338
Shawano	118	3,410	537	1	68	3?4,358
Sheboygan	2,428	86,582	19,876			55,874
Taylor	7	15				618,630
Trempealeau	401	16,014	1.727		3	57,702
Vernon	1,058	34 096	9.747	5	18	119,734
Walworth	3,998	122 834	61,342	18	137	50,037
Washington	2, 29	69,582	23, 60	2	10	51,485
Waukesha	3,361	117,026	56,919	49	119	45,442
Waupaca	453	14,480	5,285	29	122	112.069
Waushara	540	24 488	5,915	909	17,739	84.516
Winnebago	1,727	98 769	11,125	85	2,258	19,324
Wood	76	2 871	893	2,491	20,740	170,000
Total	67,192	2,140,629	718,687	17,804	67,339	12,424,263

SUMMARY OF METEOROLOGICAL OBSERVATIONS TAKEN AT THE UNITED STATES SIGNAL SERVICE STATION, MADISON, WISCONSIN, FOR THE YEAR 1879.

Month.	Thermometer Exposed in Open Air.				Barometer Corrected for Elevation and Temperature.				Inches of rain and melted snow.	Miles of wind.	Percentage of saturation.	Percentage of Winds.—3 Telegraphic Observations, 6:10 A. M., 2.10 P. M., 10:10 P. M.							
	Max.	Min.	Mean	Variation	Max.	Min.	Mean.	Fluctuation				S.	SW.	W.	NW.	N.	NE.	E.	SE.
January	46	—22	19.7	68	29.345	28.568	29 035	.777	0.79	7,276	63 5	39	31	46	60	21	7	8	4
February	46	—12	22 0	58	29.469	28.592	29.042	.877	2.54	7,842	70 0	33	16	35	42	20	24	12	14
March	68	5	30 7	63	29 550	28 659	29 022	.891	1 31	8,626	66.3	37	25	45	59	12	11	5	23
April	82	12	48 2	70	29.293	28.220	28.982	1.078	3.33	7,613	59 3	40	14	9	37	32	31	14	33
May	86	35	60.7	51	29.4 2	28.537	29 0 0	.865	3.91	7,482	60.4	45	23	11	20	14	29	31	45
June	86	42	67.4	44	29. 67	28.392	28 972	.975	2.80	6,020	69.6	29	25	18	15	21	19	22	51
July	91	55	74.3	36	29.193	28.026	28.948	567	5.91	5.458	71.3	43	54	33	23	17	9	20	19
August	90	47	70.6	43	29.154	28.711	28.953	.446	0 99	6.054	66 8	48	30	21	42	18	12	15	31
September	78	37	59.0	41	29 379	28.064	29 016	.6 2	2 79	7,294	7 3	47	16	43	42	15	5	3	37
October	84	24	58.0	60	29 509	28 591	29 069	.938	2.50	7 787	67.0	70	23	22	34	10	7	15	36
November	67	11	37.0	56	29.422	28.508	28 994	.914	6.02	7.9 9	73 1	42	28	28	46	13	11	10	22
December	54	—12	21.1	66	29.375	28 369	29 005	1.006	2.31	7 873	73.9	23	21	57	19	25	25	22	25
Sums									35.2	87,214									
Means			47.9				29.010				67.0	42	25	31	37	18	16	15	28
Range	91	—22		113	29 550	24 220		1.330											

1880.

January	58	6	34 5	52	30.615	29.334	29 953	1.281	2.75	8,688	73	21	7	21	20	13	3	3	4
February	55	0	28.2	55	30 8 4	29.134	29.958	1.710	1.75	8 740	70	13	6	8	18	9	6	13	11
March	57	7	31.6	50	30 640	28.911	30.021	1.729	2.11	9,645	68	2	7	16	26	22	5	12	3
April	78	23	46.6	55	30.401	29.173	29.864	1.228	5.48	9,758	65	15	4	13	19	10	9	11	8
May	84	44	65.5	42	30.383	29 438	29 877	.945	4 45	7,344	62	21	3	6	10	3	10	30	7
June	87	50	69.6	37	30.251	28,986	29.862	1.265	9.31	6,077	71	9	11	2	16	7	7	28	10
July	93	53	71.9	40	30.190	29.698	29 916	.492	6.00	5.343	72	14	17	9	22	7	7	10	4
August	92	52	71.0	40	30.217	29 665	29 952	.552	5.90	5.691	74	13	12	11	7	13	5	24	8
September	85	40	60 6	45	30.374	29.584	29.974	.790	4.44	6 1-5	71	16	17	14	13	9	5	5	11
October	75	26	48.5	49	30.471	29 068	29 985	1.403	1.68	8,060	67	19	13	18	15	11	3	2	12
November	60	—7	26 8	67	30.741	29.264	30 123	1.477	1.68	7,915	72	20	15	25	0	5	1	5	9
December	40	—21	17.0	61	30.747	29.200	30 099	1 527	1 17	7 402	75	9	7	26	22	13	3	4	9
Sums									46.72	90,887									
Means			47.8				29 980			7,571	70	15	10	14	16	10	5	12	8
Range	93	—21		114	30.844	28.911		1.933											

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