TRANSACTIONS

OF THE

ILLINOIS STATE HORTICULTURAL SOCIETY

FOR 1875,

BEING THE PROCEEDINGS OF THE TWENTIETH ANNUAL MEETING,

HELD AT

QUINCY, DECEMBER, 14, 15 AND 16.

TOGETHER WITH THE PROCEEDINGS OF THE

Horticultural Society of Northern Illinois,

ALSO OF THE

ALTON, WARSAW, GALESBURG, JACKSONVILLE, AND OTHER LOCAL AND DISTRICT HORTICULTURAL SOCIETIES:

FOR THE YEAR 1875.

Embracing Essays and Discussions in all branches of Scientific and Practical Horticulture; Lists of Fruits, Trees and Plants adapted to each fruit district in the State. Also, descriptions, by Prof. Cyrus Thomas, State Entomologist, of Insects affecting Horticulture, with remedies for noxious species.

EDITED BY THE SECRETARY,

O. B. GALUSHA, NORMAL, ILL.

NEW SERIES—VOL. IX.

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1876.

CONTENTS.

OFFICERS FOR 1876.

PRESIDENT:

A. C. HAMMOND, Warsaw.

VICE-PRESIDENT:

J. W. ROBISON, Tremont.

SECRETARY:

O. B. GALUSHA, Normal.

TREASURER:

JONATHAN HUGGINS, Woodburn.

EXECUTIVE BOARD:

A. C. HAMMOND, Warsaw.....President, State Society.
O. B. GALUSHA, Normal.....Secretary, State Society.
L. K. SCOFIELD, Freeport.....Pres't, Hort'l Society of Northern Illinois.
J. E. STARR, Elsah.....President, Hort'l Society of Southern Illinois.
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PARKER EARLE, Cobden....Vice-Pres't, Hort'l Society of Southern Illinois.
H. C. GRAVES, Sandwich...Vice-Pres't, Hort'l Society of Northern Illinois.

COMMITTEE ON GENERAL HORTICULTURE

FOR 1876.

This committee is expected to report, each for his respective district, of the *status* of horticulture therein, modes of culture and results, the weather and its effects on the development of fruit, adaptation of different species and varieties of trees to different soils, prevalence of insects and remedies for noxious species: in short, report all *facts* which he may be able to collect which will be of benefit to fruit growers and tree planters.

(See page vii. for bounds of districts.)

1st	District.....	J. S. Rogers.....	Marengo, McHenry county.
2d	"	D. F. Kinney.....	Rock Island, Rock Island county.
3d	"	A. L. Hay.....	Jacksonville, Morgan county.
4th	"	Albert Dunlap.....	Champaign, Champaign county.
5th	"	G. L. Brunton.....	Centralia, Marion county.
6th	"	W. C. Flagg.....	Moro, Madison county.
7th	"	G. H. Baker.....	Cobden, Union county.

STANDING COMMITTEES.

Gentlemen named on these committees are requested to investigate and report independently, not only such facts as directly affect or are intimately connected with horticultural operations, but also all conditions and circumstances which are related to, have an influence upon or explain existing facts bearing upon horticulture, with a view to arrive at intelligent apprehensions of causes and effects in all departments of scientific and practical horticulture.

GEOLOGY.

T. McWhorter, Aledo; Prof. A. H. Worthen, Springfield; H. C. Freeman, Cobden.

BOTANY AND VEGETABLE PHYSIOLOGY.

Mrs. P. V. Hatheway, Damascus; Mrs. J. J. Taylor, Warsaw; Prof. T. J. Burrill, Champaign.

ENTOMOLOGY.

Prof. Cyrus Thomas, Carbondale; D. B. Wier, Lacon; Prof. C. V. Riley, St. Louis.

ORNITHOLOGY.

Prof. S. A. Forbes, Normal; C. W. Douglas, Waukegan; Prof. J. W. Velie, Chicago.

ARBORICULTURE.

Samuel Edwards, Mendota; Robert Douglas, Waukegan; Prof. J. F. Stewart, Peoria.

FLORICULTURE.

Thomas Franks, Champaign; Mrs. H. V. N. Standish, Galesburg; Tyra Montgomery, Mattoon.

VEGETABLE GARDENING.

E. C. Hatheway, Ottawa; H. K. Vickroy, Normal; Capt. E. Hollister, Alton.

ORCHARD CULTURE.

S. G. Minkler, Oswego; B. Whitaker, Warsaw; Jona. Huggins, Woodburn.

VINEYARD CULTURE.

J. E. Starr, Elsah; Robert Rankin, Payson; O. L. Barler, Upper Alton.

BERRY CULTURE.

L. Bancroft, Pontiac; Thos. H. Leslie, Ipava; Parker Earle, Cobden.

UTILIZING AND MARKETING FRUITS.

W. T. Nelson, Wilmington; Dr. B. F. Long, Alton; J. Bonham, Carbondale.

METEOROLOGY.

Prof. J. B. Turner, Jacksonville; Prof. J. H. Tice, St. Louis; Prof. Gove Wright, Rock Falls.

LANDSCAPE GARDENING.

Dr. J. M. Gregory, Champaign; Dr. A. G. Humphrey, Galesburg; Hon. J. M. Pearson, Godfrey.

FARMERS' HORTICULTURE.

This committee is created to meet an obvious want. Its object will be to demonstrate to farmers—on small as well as large farms—how they may increase the value of their farms, and promote the health and comfort of themselves and their families by cultivating orchards, gardens, ornamental trees, etc.

Jonathan Periam, Chicago; Marion Vernon, Millersburg; Hon. A. M. Brown, Villa Ridge; Burden Pullen, Centralia; L. C. Francis, Springfield.

FRUIT OR HORTICULTURAL DISTRICTS.

I. NORTHERN ILLINOIS.

1. *Fox River District*—Boone, Cook, DeKalb, DuPage, Grundy, Kane, Kankakee, Kendall, Lake, La Salle, McHenry, Will.—12.

2. *Rock River District*—Bureau, Carroll, Henry, Jo Daviess, Lee, Ogle, Putnam, Rock Island, Stephenson, Whiteside, Winnebago.—11. Total, 23.

II. CENTRAL ILLINOIS.

3. *Illinois River District*—Adams, Brown, Cass, Fulton, Hancock, Henderson, Knox, McDonough, Marshall, Mason, Mercer, Menard, Morgan, Peoria, Pike, Schuyler, Scott, Stark, Tazewell, Warren, Woodford.—21.

4 *Grand Prairie District*—Champaign, Christian, Coles, DeWitt, Douglas, Edgar, Ford, Iroquois, Livingston, Logan, McLean, Macon, Moultrie, Piatt, Sangamon, Shelby, Vermillion.—17. Total, 38.

III. SOUTHERN ILLINOIS.

5. *Centralia, or Wabash District*—Clark, Clay, Crawford, Cumberland, Edwards, Effingham, Fayette, Franklin, Hamilton, Jasper, Jefferson, Lawrence, Marion, Richland, Wabash, Wayne, White.—17.

6. *Alton, or Kaskaskia District*—Bond, Calhoun, Clinton, Greene, Jersey, Macoupin, Madison, Monroe, Montgomery, Perry, Randolph, St. Clair, Washington.—13.

7. *Grand Chain District*—Alexander, Gallatin, Hardin, Jackson, Johnson, Massac, Pope, Pulaski, Saline, Union, Williamson.—11. Total, 41. Grand Total, 102.

LIST OF MEMBERS FOR 1876.

NAME.	POST OFFICE.	COUNTY.
Ament P. W.	Fox Station	Kendall.
Averett J. W.	Macomb.	
Baldwin Elmer	Farm Ridge	La Salle.
Baldwin Isaac	Jacksonville	Morgan.
Barler O. L.	Upper Alton	Madison.
Bassett John R.	Aledo	Mercer.
Beach J. A.	Woodburn	Macoupin.
Bird Rev.	do	do.
Blanchard & Bailey	Rock Island	Rock Island.
Bourland B. L. T.	Peoria	Peoria.
Brinkman H. A.	Warsaw	Hancock.
Bryant Arthur, Sen.	Princeton	Bureau.
Burrill Prof. T. J.	Champaign	Champaign.
Burroughs E.	Bloomington	McLean.
Capps G. S.	Mt. Pulaski	Logan.
Chandler Seabury	Warsaw	Hancock.
Cochran J. W.	Blue Island	Cook.
Coe Ira,	Quincy	Adams.
Curtis A.	do.	do
Curtis B. O.	Paris	Edgar.
Daggy E.	Tuscola	Douglas.
Daniels L. E.	Center Town	Grundy
Dennis C. N.	Hamilton	Hancock.
Doan F. M.	Jacksonville	Morgan.
Edwards Samuel	Mendota	La Salle.
Egginton G. W.	La Harp	Hancock.
Eisenmayer J. C.	Clinton.	
Eisenmayer Philip	Mascoutah	St Clair.
Engleman Adolphus	do.	do.
Emery H. D.	Chicago	Cook.
Flagg W. C.	Moro	Madison.
Forbes Prof. S. A.	Normal	McLean.
Francis L. C.	Springfield	Sangamon.
Galusha O. B.	Normal	McLean.
Gaston J. R.	do.	do.
Graves B. G.	Warsaw	Hancock.
Graves H. C.	Sandwich	DeKalb.
Gutchell A.	Quincy	Adams
Hammond A. C.	Warsaw	Hancock.
Hammond Harley	do.	do.
Hargis J. H.	Quincy	Adams.
Hatheway E. C.	Ottawa	La Salle.
Hayden Fred	Alton	Madison.
Hilliard A. A.	Brighton	Macoupin.
Hollister E.	Alton	Madison.
Huggins H. J.	Woodburn	Macoupin.
Huggins J. C.	do.	do.
Huggins Jonathan	do.	do.
Huggins P. C.	Bunker Hill	do.
Humphrey A. G.	Galesburg	Knox.
Hunt R. M.	do.	do.
Johnson Jas. F.	Warsaw	Hancock.
Johnson J. S.	Elvanston	do.
Jones K. K.	Quincy	Adams.
June William	Morris	Grundy.
Kelm Conrad	Warsaw	Hancock.

NAME.	POST OFFICE.	COUNTY
Kinney D. F.	Rock Island	Rock Island.
Lee Graham	Hamlet	Mercer.
Leffingwell H. W.	St. Louis, Mo.	
Leslie Thos. H.	Ipava	Fulton.
Lewis S. D.	Payson	Adams.
Long Dr. B. F.	Alton.	Madison.
Mann W. H.	Gilman	Iroquois.
Mathews Prof. B. A.	Knoxville, Iowa.	
McCune E.	Warsaw	Hancock.
McKinstry B. N.	Grant Park	Kankakee.
McWhorter Arno	Altona	Polk.
McWhorter Tyler	Aledo	Mercer.
Milligan Prof. J. M.	Jacksonville	Morgan.
Minkler S. G.	Oswego	Kendall.
Montgomery Tyra	Mattoon	Coles.
Morris Dr. Geo.	Quincy	Adams.
Nelson W. T.	Wilmington	Will.
Pearson J. M.	Godfrey	Madison.
Pennington Dr. L. S.	Sterling	Whiteside.
Periam Jona.	Chicago	Cook.
Pettingill J. A.	Bunker Hill	Macoupin.
Phœnix F. K.	Bloomington	McLean.
Piggott J. L.	Hamilton	Hancock.
Pollock Catherine	Aledo	Mercer.
Reeder John J.	Melrose	Adams.
Robison J. W.	Tremont	Tazewell.
Sanford E.	Morris	Grundy.
Schnyler W. H.	Chicago	Cook.
Scofield L. K.	Freeport	Stephenson.
Scott D. W.	Galena	Jo Daviess.
Sherman L. C.	Quincy	Adams.
Shinn J. K.	Warsaw	Hancock.
Shinn James	Quincy	Adams.
Sinnock Thos.	do.	do.
Skinner O. C.	do	do.
Snedeker Isaac	Jerseyville	Jersey.
Spitze J. F.	Warsaw	Hancock.
Starr J. E.	Elsah	Jersey.
Stewart John	Fowler	Adams.
Taylor Dr. J. J.	Warsaw	Hancock.
Terry Jas. W.	Viola.	
Thomas Prof. Cyrus	Carbondale	Jackson.
Trabue Edwin	Woodburn	Macoupin.
Tubbs H.	Kirkwood.	Warren.
Turner Prof. J. B.	Jacksonville	Morgan.
Turner Samuel B.	Quincy	Adams.
Vernon Marion	Millersburg	Mercer.
Vickroy H. K.	Normal	McLean.
Walker Geo. P.	Warsaw	Hancock.
Weed H. M.	Peoria	Peoria.
Wier D. B.	Lacon	Marshall.
Willet R. S.	Malcom, Powiesheik co. Ia.	
Wolfe John	Liberty	Adams
Wood R. O.	Woodburn	Macoupin.
Wright E.	Normal	McLean.

HONORARY MEMBERS.

Dr. J. A. Warder, North Bend, Ohio; Prof. J. H. Tice, St. Louis; Prof. C. V. Riley, St Louis; B. A. Matthews, Knoxville, Ia.; Dr. Wm. LeBaron, Geneva, Ill.; Prof. J. B. Turner, Jacksonville, Ill.; Prof. H. H. McAfee, Ames, Iowa; J. S. Stickney, Wauwatosa, Wis.; Suel Foster, Muscatine, Iowa; Dr. Allen Furness, Danville, Ind.; O. S. Wiley, Benton Harbor, Mich.; Dr. J. M. Gregory, Champaign, Ill.; J. H. Nicholson, Bridgeport, Ind.; Prof. Cyrus Thomas, Carbondale, Ill.; J. M. Stewart, Macon, Missouri.

CONSTITUTION AND BY-LAWS

AS AMENDED AT THE ANNUAL MEETING, 1874.

CONSTITUTION.

I. This Association shall be known as the ILLINOIS STATE HORTICULTURAL SOCIETY.

II. Its object shall be the advancement of the science of Pomology and of the art of Horticulture.

III. Its members shall consist of *Annual* members, paying an annual fee of one dollar; of *Life* members, paying a fee of twenty dollars at one time; and of *Honorary* members, who shall only be persons of distinguished merit in Horticulture or kindred sciences, who may, by vote, be invited to participate in the privileges of the Society. The wives of members shall be members without fee.

IV. Its officers shall consist of a President, one Vice-President and Secretary, who shall be elected at the annual meeting, and serve until their successors are chosen: also, an Executive Board, as hereafter provided.

V. The affairs of the Society shall be managed by an Executive Board, to consist of the President and Secretary of the Society, and the President and one Vice-President from each of the three District Horticultural Societies of the State.

VI. The Society shall hold annual meetings, and publish its transactions annually, *provided*, there are sufficient funds in the treasury to defray the expenses of publication.

VII. This Constitution may be amended at any regular meeting, by a two-thirds vote of the members present.

BY-LAWS.

I. The President shall preside at all meetings of the Society; call meetings of the Executive Board, and, under its direction, have a general superintendence of the affairs of the Society, and direction of the expenditure of money; he shall deliver an annual address upon some subject connected with Horticulture, and shall appoint all special committees, unless otherwise ordered.

II. The Vice-President shall preside at the meetings in the absence of the President.

III. The Secretary shall conduct the correspondence of the Society, have charge of its papers, books and reports, and prepare its reports for publication; and shall receive, for so doing, his necessary expenses for postage, stationery, printing, expressage and office rent, and the sum of three hundred dollars per annum; he shall render an annual account in detail of such necessary expenses, which shall be referred, with the Treasurer's report, to a special auditing committee.

IV. The Treasurer shall receive and keep an accurate account of all moneys belonging to the Society, and disburse the same upon the written orders of the President, which he shall retain and file as vouchers; he shall make an annual report to the Society of the receipts and disbursements, which, with the vouchers, shall be referred to a special auditing committee appointed at the annual meeting. Before entering upon his duties, he shall give bond to the Society in the sum of five thousand dollars, for the faithful performance of his duties; such bond to be approved by the Executive Board.

V. The Executive Board shall perform all the duties required of them by section four of the "Act re-organizing the State Horticultural Society," approved March 24, 1874. They may appoint such standing and other committees as they may deem advisable.

VI. These By-Laws may be altered at any regular meeting, by a two-thirds vote of the members present.

STATE LAWS AFFECTING HORTICULTURE.

An Act to incorporate the Illinois State Horticultural Society.

Section 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly*, That Smiley Shepherd, O. B. Galusha, S. G. Minkler, W. C. Flagg, J. T. Little, W. H. Van Epps, Lewis Ellsworth, Jason C. Ayers, W. A. Pennell, J. W. Fell, W. Durley, Samuel Edwards, their associates and successors, members of the Illinois State Horticultural Society, be and are hereby declared to be a body politic and corporate, known by the name and style of "*The Illinois State Horticultural Society*."

Sec. 2. The object of the Society being to promote the science of Pomology and the art of Horticulture, they shall be allowed, for those purposes only, to take and hold real and personal estate to the amount of fifty thousand dollars.

Sec. 3. This Society shall have the right to contract and be contracted with, to sue and be sued, to plead and be impleaded, to answer and be answered unto, in all the courts of law and equity of this State, and shall further enjoy all the privileges incident to incorporations of said character, and not inconsistent with the laws of this State.

Sec. 4. It shall and may be lawful for said corporation to have and use a common seal, and the same at their pleasure to change, alter, and make anew, and in general have and exercise all such rights, privileges and immunities as by law are incident to or necessary to the Society herein constituted.

Sec. 5. The Society shall have power to alter or amend their present constitution, to make, alter or repeal such by-laws, as may be deemed necessary for carrying out the objects of the Society.

Sec. 6. This act shall be in force from and after its passage.

Approved February 16, 1865.

[Note.—The Society was *first* incorporated Feb. 11th, 1857—two months after its organization.—Ed.]

An Act to re-organize the Illinois State Horticultural Society.

Section 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly*, That the organization heretefore chartered and aided by appropriations, under the name of the Illinois State Horticultural Society, is hereby made and declared a public corporation of the State.

Sec. 2. The Illinois State Horticultural Society shall embrace, as hereinafter provided, three Horticultural Societies, to be organized in the three Horticultural Districts of the State, which shall be known as the Horticultural Society of Northern Illinois, now operating in the counties of Bureau, Boone, Cook, Carroll, DuPage, DeKalb, Henry, Grundy, Jo Daviess, Kane, Kendall, Kankakee, Lake, Lee, LaSalle, McHenry, Ogle, Putnam, Rock Island, Stephenson, Whiteside, Winnebago, and Will (23); the Horticultural Society of Central Illinois, operating in the counties of Adams, Brown, Cass, Champaign, Christian, Coles, DeWitt, Douglas, Edgar, Fulton, Ford, Iroquois, Hancock, Henderson, Knox, Logan, Livingston, McLean, McDonough, Marshall, Mason, Mercer, Menard, Morgan, Macon, Moultrie, Peoria, Pike, Piatt, Sangamon, Shelby, Schuyler, Scott, Stark, Vermillion, Tazewell, Warren, Woodford (38); and the Horticultural Society of Southern Illinois, operating in the counties of Alexander, Bond, Clark, Clay, Crawford, Calhoun, Cumberland, Clinton, Edwards, Effingham, Fayette, Franklin, Green, Gallatin, Hamilton, Hardin, Jasper, Jefferson, Jersey, Jackson, Johnson, Lawrence, Madison, Macoupin, Marion, Monroe, Montgomery, Massac, Perry, Pope, Pulaski, Richland, Randolph, St. Clair, Saline, Union, Wayne, White, Washington, Williamson and Wabash (41).

SEC. 3. The affairs of the Illinois State Horticultural Society shall be managed by an Executive Board, to consist of the President and Secretary of said Society and the President and one Vice-President from each of the three District Horticultural Societies; *provided*, that the eligible officers now elect of the Illinois State and District Horticultural Societies shall be the first members of the Executive Board created by this act, and shall hold their office until their successors are elected, as herein provided for.

SEC. 4. The Executive Board of the Illinois State Horticultural Society shall have the sole care and disposal of all funds that may be apportioned [appropriated] by the State of Illinois to sustain the Illinois State Horticultural Society, and shall expend the same in such manner as in their judgment will best promote the interests of Horticulture and Arboriculture in this State. They shall meet at Springfield, on the second Tuesday after the first Monday in January, 1875, and biennially thereafter. They shall render to the Governor of the State a detailed statement of all funds received from the State and all other sources; which statement shall, also, include all expenditures made by them, and the specific objects in detail for which said sums were expended. They shall make no appropriations without having funds in hand to meet the same, and if any debt is created, the members of the Board shall be held severally and jointly liable for the payment of the same; and in no event shall the State of Illinois be held liable or responsible for any debt, obligation or contract made by the Illinois State Horticultural Society or its Executive Board.

SEC. 5. The Illinois State and the three District Horticultural Societies shall hold annual meetings, at which their officers for the ensuing year shall be elected. Within one month after the annual meeting of the District Societies, they shall forward to the Secretary of the Executive Board a report of their transactions, including a list of officers elected at such meeting. The Executive Board shall publish, annually, at the expense of said Society, a report of its transactions and such other papers as they may deem of value to Horticulture and Arboriculture. Four members of the Executive Board shall constitute a quorum for the transaction of business.

SEC. 6. Members of the several District Societies shall be entitled to all the privileges of the members of the State Society, except that of voting for officers.

SEC. 7. By-laws and rules that do not conflict with the laws of this State may be passed and enforced by the several Societies herein mentioned.

Approved March 24, 1874.

SYNOPSIS OF OTHER STATE LAWS,

AFFECTING HORTICULTURE.

1. AN ACT approved Feb. 26, 1861, provides with fine of from ten to fifty dollars and imprisonment not exceeding twenty days for entering an enclosure and taking or destroying fruit.

2. AN ACT approved Feb. 16, 1865, is a re-enactment of the above, (No. 1).

3. AN ACT approved Feb. 16, 1865, provides that any one injuring or destroying any fruit or other trees, shrubs, etc., of another shall be fined not exceeding five hundred dollars and imprisoned not more than three months—or both.

4. AN ACT approved Feb. 24th, 1859, is as follows:

SECTION 1. That it shall not be lawful, in this State, for any person to shoot or in any other manner to kill or destroy, or to entrap, ensnare or otherwise capture any of the following description of birds, to wit: The blue bird, swallow, martin, musquito hawk, whip-poor-will, cuckoo, woodpecker, cat bird, brown thrasher, red bird, hanging bird, rice bird, sparrow, wren, humming bird, dove, goldfinch and mocking bird.

SEC. 2. Every person who willfully violates the provisions of the preceding section, or who shall willfully destroy the nest or eggs of any of the birds hereinbefore designated, shall be punished by a fine of not more than five dollars for each offense.

5 AN ACT approved March 4th, 1869, provides: That any warehouseman or commission merchant who shall embezzle or neglect to remit proceeds of sales (less regular charges or commissions) to consignors, shall be liable in double the amount; and where the amount does not exceed one hundred dollars may be fined to amount of five hundred dollars; and where the amount retained or embezzled is over one hundred dollars, he shall be liable in double amount of damages and a fine not exceeding five hundred dollars, or imprisonment not exceeding one year in county jail; or both, at the discretion of the court.

6. AN ACT approved March 25th, 1869, provides as follows: That it shall be lawful for owners or occupants of lands bordering upon any public road in this State, to plant shade and ornamental trees along and in such road, at a distance not exceeding one-tenth of the legal width of the road from its margin.

AN ACT to encourage the Planting and Growing of Timber.

(Approved February 9, 1874. In force July 1, 1874).

SECTION 1. *Be it enacted by the people of the State of Illinois represented in the General Assembly*, That it shall be lawful for the Board of Supervisors, or County Commissioners' Court, in any county in this State, to offer a bounty to any person in said county who shall hereafter plant one or more acres of land with forest trees, and properly cultivate the same for three years, any sum not to exceed $10 per annum for three years for each acre so planted and cultivated; *provided*, that trees so planted shall not be at a greater distance than ten feet apart each way.

SEC. 2. Any person claiming the bounty under this act, shall make proof before the county clerk that he has complied with section 1 of this act, and that the trees planted by him are in a healthy and growing condition.

SEC. 3. Upon proof of a compliance with this act, the county clerk shall issue his certificate to the person entitled to the same, setting forth that the provisions of this act have been complied with, and the number of acres so planted.

SEC. 4. The Board of Supervisors, or County Commissioners' Court, desiring to offer the bounty herein provided for, shall do so by resolution, to be made of record, and giving notice in some newspaper published in the county three weeks prior to the first day of April of each year; said resolution and notice to state the amount of bounty offered for each acre planted and cultivated.

AN ACT making an appropriation in aid of the Illinois State Horticultural Society.

Be it enacted by the people of the State of Illinois represented in the General Assembly, That there be appropriated for the use of the Illinois State Horticultural Society, the sum of two thousand dollars per annum, for the years 1875 and 1876, to be expended by said Society for the purposes and in the manner specified in "An Act to re-organize the Illinois State Horticultural Society," approved March 24, 1874.

REPORT TO THE GOVERNOR.

To His Excellency John L. Beveridge, Governor of Illinois:

I have the honor to present the Ninth Volume of the new series of Reports of the Illinois State Horticultural Society. It will not require a perusal of the volume to inform you that the horticulturists of the State have had much to contend against during the past few years; yet I trust that you will recognize a determination on the part of the members of this and auxiliary societies to grasp the nature of all obstacles and to put forth persistent efforts to overcome them, or achieve success in spite of them. That the investigations and labors necessary to success have been, and must continue to be, made at considerable personal sacrifice to the members of the Society is apparent.

Since the annual meeting at Quincy I have, under instructions from the Executive Board, issued circulars offering surplus copies of our Transactions to District School Libraries; and in response have received, up to the present time, applications for about three thousand volumes. It is confidently hoped that this plan, with others in contemplation, for extending the sphere of usefulness of the Society, will result in much good to the State.

Your obedient servant,

O. B. GALUSHA,

Secretary Illinois State Horticultural Society.

Normal, Ill., Feb. 25, 1876.

PROCEEDINGS

OF THE

TWENTIETH ANNUAL MEETING

HELD AT

QUINCY, DECEMBER 14, 15 AND 16, 1875.

The Illinois State Horticultural Society convened for its twentieth annual session in the city of Quincy, on Tuesday, December 14, at ten o'clock A. M.

The President of the Society, Dr. E. S. HULL, having been removed by death, the Vice-President, L. K. SCOFIELD, of Freeport, took the chair and presided over the entire session.

The meeting was opened with prayer by Rev. Mr. ANDERSON, of Quincy.

OPENING REMARKS BY THE PRESIDENT.

President SCOFIELD addressed the Society as follows:

The march of time has recorded the events of another year since last we met; a year that to many of us has been fraught with hopes and fears, sorrows and disappointments.

The circumstance which makes it my duty to preside at this meeting will not tend to the promotion of your joy and pleasure while here.

During the year our ranks have been thinned by death. Our worthy President, Dr. E. S. HULL, has been called to his reward.

One of our ex-Presidents, Hon. M. L. DUNLAP, and another valued member, who was your former Secretary, FRANK STARR, have been called to close their earthly career since our last annual gathering. We will not only miss them here, but thousands all over the land will mourn with us the loss of such men as HULL and DUNLAP, whose names have become so

well known among horticulturists. It seems appropriate that this Society take immediate action and appoint a committee to prepare suitable resolutions and testimonials of respect to the memory of our dead, to be presented at a suitable time, which I suggest be fixed at this morning's session.

And now, I trust that all our discussions may be harmonious, and that when our deliberations close we may all feel that much has been accomplished, not only for our own good, but that the cause of humanity has also been advanced, and thereby our labors rewarded.

ADDRESS OF WELCOME.

Mr. WILLIAM STEWART addressed the Society as follows:

Mr. President and Gentlemen of the Illinois State Horticultural Society:

It has been made my duty to say to you to-day, on behalf of the Adams County Horticultural Society, what every member would gladly say for himself, were it proper or necessary for us all to speak separately, that is, "We bid you a hearty welcome to our city, our society, and our hearts."

In the past many circumstances have conspired to hinder, to some extent, the forming of that familiar acquaintance which we have desired with our fellow workers in other parts of our great State. Located here upon its extreme western border, and finding our markets for the most part still farther to the west and north, we have seldom met with them excepting when, as individuals, we could occasionally make a visit to your annual gatherings, or perhaps to the State fairs; yet, during our half century of labor here, most of the time in pioneer work, we have neither been ignorant nor indifferent as to what was being done in other parts of the State. We have learned to esteem you all very highly for your works' sake; and, desiring a more intimate acquaintance, we invited you to become our guests. We are glad you have accepted our invitation, and have come.

We feel a little ashamed, it is true, on account of the many defects you can not fail to discover in our horticultural housekeeping, and we regret exceedingly that your coming finds us almost entirely without fruit, which we had hoped to have in abundance; but knowing that your charity on the one hand, and your knowledge of the exigencies of our climate on the other, will find for us more excuse than we deserve on both these points, we ask that you will accept this hall and these rooms, and use them as your own during your sessions here. We hope that you will

find them sufficiently comfortable and adapted to your purposes, and that your deliberations may contribute largely, as they undoubtedly have done in the past, to the success and development of the *first of the arts*—the *only* art man ever practiced with hands unstained by sin.

RESPONSE BY THE PRESIDENT.

THE PRESIDENT then responded to Mr. STEWART's address in the following words:

In behalf of the members of the Illinois State Horticultural Society I return to you, sir, their heartfelt thanks for the cordial reception and welcome greeting you have so generously extended to them. We thank you for the generous hospitality proffered.

The name of the Adams County Horticultural Society, which you have the honor to represent, is no stranger to us. We see all about you the rich fruits of your labors. The first of our race, no doubt, felt proud when placed in the "Garden of Eden," and no less proud may your Society feel in the possession of so goodly a heritage as you have here inherited; and may you so act therein that you may not be driven from this "Eden," so beautifully located on the banks of this noble river, that floats on its waters the commerce of one of the richest valleys of the world.

I trust that in the discussions of this body of horticulturists, assembled in your beautiful city; in the acquaintance you may form with its members; in the benefits accruing to you therefrom, you may feel, when we are gone, that your generous hospitality has not been unappreciated, or that your labor of love has not been without reward.

PROGRAMME.

THE PRESIDENT presented the following order of exercises as the one to be adopted, unless otherwise ordered by the Society:

TUESDAY FORENOON.

Action in memory of our honored dead.

TUESDAY AFTERNOON.

1. Annual address—L. K. Scofield, Vice-President, Freeport.
2. Annoucement of Special Committees.
3. Report of Secretary—O. B. Galusha, Normal.
4. Report of Treasurer—Jonathan Huggins, Woodburn.

5. Report of Committee on General Horticulture, First District—Jonathan Periam, Chicago.

6. * Discussion of subjects introduced by the report.

TUESDAY EVENING.

1. Report of Committee on Entomology—Maj. J. R. Muhlman, Woodburn, (subject, Economic Entomology and its present rank among the different branches of Natural History); E. J. Ayers, Villa Ridge; D. B. Wier, Lacon.

2. Lecture—Horticultural Entomology; its Uses and Advantages as a Special Science—Prof. Cyrus Thomas, State Entomologist, Carbondale.

WEDNESDAY FORENOON.

1. Report of Committee on General Horticulture, Second District—Arthur Bryant, Jr., Princeton; Third District—Prof. J. B. Turner, Jacksonville.

2. Report of Committee on Orchard Culture—A. C. Hammond, Warsaw; O. P. Rogers, Marengo; A. A. Hilliard, Brighton.

WEDNESDAY AFTERNOON.

1. Discussion upon Orchard Culture, concluded.

2. Report of the Committee on Arboriculture—Robert Douglas, Waukegan; Dr. M. M. Hooton, Centralia; Arthur Bryant, Sr., Princeton.

3. Report of Committee on Vineyard Culture—G. C. Eisenmayer, Mascoutah; Louis Strache, Warsaw; E. C. Hatheway, Ottawa.

WEDNESDAY EVENING.

1. Report of Committee on Botany and Vegetable Physiology—Prof. H. H. McAfee, Ames, Iowa; Mrs. Prof. J. V. N. Standish, Galesburg; Prof. T. J. Burrill, Champaign.

2. Report of Committee on Floriculture—Mrs. Oscar Taylor, Freeport; Mrs. J. M. Milligan, Jacksonville.

3. Report of Committee on Ornithology—Prof. S. A. Forbes, Normal; R. J. Douglas, Waukegan.

THURSDAY FORENOON.

1. Election of officers for 1876.

2. Selection of place for next annual meeting.

3. Report of Committee on General Horticulture, Fourth District—Albert Dunlap, Champaign; Fifth District—G. L. Brunton, Centralia.

4. Report of Committee on Vegetable Gardening—R. M. Hunt, Galesburg; O. L. Barler, Upper Alton; H. K. Vickroy, Normal.

* Each report will be followed by a discussion of its topics, unless otherwise determined by vote of the Society.

THURSDAY AFTERNOON.

1. Report of Committee on Geology—Hon. J. Shaw, Mt. Carroll; Prof. D. C. Taft, Champaign.
2. Discussions upon deferred and unfinished subjects.

THURSDAY EVENING.

1. Report of Committee on Meteorology—Prof. J. B. Turner, Jacksonville.
2. Report of Committee on Landscape Gardening—Dr. J. M. Gregory, Champaign.

FRIDAY FORENOON.

1. Report of Committee on General Horticulture, Sixth District—W. C. Flagg, Moro; Seventh District—Parker Earle, Cobden.
2. Report of Committee on Berry Culture—W. A. Nourse, Moline; H. J. Dunlap, Champaign; G. H. Baker, Cobden.

FRIDAY AFTERNOON.

1. Report of Committee on Utilizing and Marketing Fruits—D. C. Wood, Quincy; B. Pullen, Centralia; Capt. E. Hollister, Alton.
2. Unfinished business.
3. Final resolutions.

D. B. WIER moved the appointment of a committee of five to prepare and present resolutions on the deaths of Mr. HULL, Mr. DUNLAP and Mr. STARR.

The motion prevailed, and Messrs. D. B. WIER, J. E. STARR, J. PERIAM, T. MCWHORTER, and O. L. BARLER were appointed upon the committee.

On motion the Society then adjourned to half-past one o'clock P. M.

TUESDAY AFTERNOON.

The meeting was called to order by the President at half-past one o'clock.

PRESIDENT'S ANNUAL ADDRESS.

President SCOFIELD addressed the Society as follows:

When we plant trees or shrubs, we look for fruit or flowers, at least once a year. The rain, dew, air, seasons and sunlight, all aid the blossoms and the product. When the fruit is ripe there is a gathering.

So the time has again come around when we have our annual gathering; and while we do not bring here all the fruits we have gathered

from the trees we have planted, to make this a profitable time, we should bring the rich, and rare, and ripe fruit of our experience, and as freely give it as our Heavenly Father has, during the past year, given His hours, and days, and showers to benefit man.

Our first duty is to acknowledge the goodness of Him who has permitted so many of us to come together once more, to exchange views and opinions, congratulate each other on the events of another year, just closing, and prepare our plans and projects for the future.

One whom you expected to see in this place is absent. His chair is vacant, never more to be filled by him on the earth. On the 8th of November, our friend, brother, and President, Dr. E. S. Hull, of Alton, received his call from the Heavenly Father to close up his affairs on the earth.

From our acquaintance with our worthy President, I think I may say he was gathered to his reward as ripe fruit is gathered from the tree. He was ready to go and meet the messenger death, as he met the emergencies of life, with resignation, faith and hope. His memory will be cherished by every member of our Society; and suitable testimonials of respect will be presented at the proper time and spread upon the records, to be treasured up among the archives of our Society.

With him, as with our ex-President, M. L. Dunlap, who also passed away since last we met, our relations were very pleasant, and we shall miss their voices in our councils and their wisdom in our plans. May we imitate their worthy example and be ready—

> "When the summons comes to us to join
> That innumerable caravan, that moves
> To the pale realms of shade where each shall take
> His chamber in the silent halls of death * * * * *
> To go—like one who wraps the drapery of his couch
> About him, and lies down to pleasant dreams."

It may not be inappropriate for me, at this time, to refer briefly to the history of our organization and similar organizations, to the work they are doing, and show, if possible, why we should feel encouraged to make greater efforts in the future than we have done in the past. If I should repeat some things quite familiar to you, you may not be altogether displeased to learn that another has occupied his thoughts with the subject of your meditations.

The first society organized for encouraging and promoting horticulture was chartered in London, in the year 1808, and was called the London Horticultural Society. One nobleman, Sir Joseph Banks, and two private gentleman were chiefly instrumental in its organization. This society established the first experimental garden in 1817. This model garden still exists at Chiswick, having been removed to that place in 1822.

Germany quickly saw the advantages to be derived from such organizations; and they also spread rapidly throughout the whole continent of Europe; and to-day there is scarcely a town in Britain where there is not a society, duly officered, doing its good work.

Now the American Pomological Society ranks first in its influence on pomology or fruit culture. Our own Society was instituted by a few earnest men about nineteen years ago. One can not review the printed records of this Society without a feeling of thankfulness that it was created, and without admitting that it has been a powerful help in stimulating taste and knowledge in horticulture, landscape gardening, in botany, and other practical branches of successful, scientific, and practical agriculture.

The recommendations of our presiding officers, and the efforts of this Society, have resulted in the introduction of the study of botany in our schools, the establishment of agricultural colleges, the classification of subjects adapted to our wants on the prairies of Illinois, the selecting of fruits that flourish, of trees that will grow and embellish, of flowers and bulbs that are suited to the climate. Tastes that will encourage patient toil for results, skill to experiment, and a quickness to discern improved conditions, have been stimulated, and many waste and desolate places made to blossom, through the work and influence of our own and similar societies. It has been demonstrated that a little judgment in selecting, and labor in cultivating the different fruits, is all that is required to give to the humblest citizen of the State, who has a lot for a garden, or land suitable for the purpose, the several fruits in their season; so that, from sunny June to sere and yellow October, the table may be made inviting by the choicest varieties of those health-giving products—strawberries, raspberries, currants, cherries, blackberries, plums, pears, grapes, peaches, and apples, the very enumeration of the names of which makes children chuckle and dance with glee, and old folks thrill with a most comfortable feeling of satisfaction. The successful varieties have been named, and their mode of culture pointed out, at our various meetings.

I need not speak in detail of the benefits of these societies. We seldom see the bleak and unadorned cottage or farmer's house now. By the wayside everywhere the "garden smiles," and flowers in their proper season look out from their sweet depths, to gladden the eye of the traveler; and all this should encourage and stimulate us to renewed efforts in study, practice and experiment, to overcome by the aid of science the many obstacles that impede our progress, and are *too apt* to discourage the inexperienced beginner. The example of one successful nursery or fruit garden in a county or community can not be over estimated. It is the most practical way to instruct by example; and the benefits are correspondingly valuable in every respect.

The good wife knows that when her husband, who has signed the pledge yet has upon him at times the conquering appetite for his intoxicating cup, she can help him keep the pledge by presenting him the comforting cup of tea or coffee. And so our Heavenly Father knew full well that the healthful fruits in abundance would promote the happiness of man; and so, after teaching in a slow way a few men how to grow them cheaply and in abundance, He put it into their heart to establish societies, and to do such work, and encourage such discussions as to place the suitable knowledge of "how to do it" within the reach of all. Our

Society is doing a good work, and our reward is the benefits yearly conferred on man.

I would, before closing my hasty talk to you at this time, most heartily recommend:

1st. The example of an improved, luxuriant and varied fruit garden, even if it tax us late and early to plant and prune.

2d. Discussion of best methods of advancing tree planting and culture over all the beautiful and fruitful prairies of the West.

3d. The adoption, by this Society, of some measure by which its Transactions may be more generally disseminated among the agricultural classes of the State.

4th. That this Society take similar action to that recommended by the Meteorologist of the Pomological Society of Michigan, and adopted by them, in bringing before the proper authorities the importance of a more general establishment of Signal Service Stations, by which the interests of the agriculturists may be better subserved.

5th. That action be taken in reference to representation of the horticultural products of Illinois, in the great Centennial Exhibition, such as shall accord with the position she occupies in the sisterhood of States.

And now, as I am about to take my seat, there rises before me the home of the laborer that is to be—the future home of the husbandman.

The walks and walls shall be of granite; rough, that the vines may find niches and corners upon which to cling; thick, that the winter's cold shall stay out, and the summer's heat shall not produce discomfort; the rooms large, and furnished plainly but neatly; the wide hall running through from front to rear, in which the lounge shall lie, where the weary workman shall be fanned to sleep by the sweet breeze as it kisses his temples, while he slumbers after the planting, or the tilling, or the harvesting; the chambers shall be cool and clean and large; the library, or reading-room shall have tables for the books and periodicals, and writing; easy chairs, whose wide arms shall welcome the student, child or man, as he rests from his labors.

The grounds shall be laid out with taste and skill, by his own hands; the clean kept walk, winding among beds of sweet-scented flowers, and terminating in shady bowers and pleasant groves; the mill, propelled by the wind, shall raise the water to the place where it is wanted; all the common comforts shall be about the place; and all the fruits, and all varieties of shade, and all the orders of flowers shall cheer in their season; the harshest voice heard shall be God's thunders, and the only tears shall be the sweet rain upon the roof. And, if death and the white shroud shall come there, it shall be only as the *snow* upon the trees and bulbs. As "life beats in the frozen bough," so, at this home, shall the hope of eternal life be as the hope of the husbandman, that the fruits shall grow again and the flowers shall bloom again.

Fellow workers, we can all aid in making these things appear possible to the sons of toil, who, "along the cool, sequestered vale of life" keep the even tenor of their ways.

SPECIAL COMMITTEES

The following committees were announced by the President:

Auditing.—A. C. Hammond, Wm. Stewart, J. Periam.

President's Address.—Dr. B. F. Long, J. S. Johnson, A. C. Hammond.

Fruits on Exhibition.—T. McWhorter, D. B. Wier, A. A. Hilliard.

Final Resolutions.—J. W. Cochran, Robert Douglas, J. T. Johnson.

REPORT ON GENERAL HORTICULTURE—FIRST DISTRICT.

JONATHAN PERIAM, Committee on General Horticulture for the First District, presented the following report:

The last four seasons, preceding that of 1875, were those of extreme drought, with surface sufficiently frozen in winter to prevent what little rain that fell in winter and spring from penetrating the earth; consequently, the subsoil became dry to great depths.

The winter of 1874–5 was marked with exceeding low thermometer at times, but the buds of trees, having gone into winter in a thoroughly ripened state, and the soil having been somewhat moistened by the autumn rains, the destruction to buds and branches proved far less than might naturally have been expected from a superficial observation.

In my own immediate section of country, the north half of Cook county, there have, on suitable soils, been fair crops of fruits natural to the climate, with the exception of Early May or Richmond cherries. These have been a total failure—natural enough when we take into account the extraordinary and uniform crops of the two preceding years.

The crops of Morello cherries were good where planted, so far as my observation extends, probably from the fact that, the orchards being young and only just coming into bearing, they had not been weakened by serious overbearing, as had Early Richmond, the only other variety cultivated. Apples bloomed well, and when not killed by frosts at the time of blossoming, have matured good crops; excellent ones in the extreme northern portion of Cook and in Lake, which section is attracting more and more attention, as a fruit district, from year to year.

All small fruits have done well, when properly protected from the winters, strawberries especially giving a most abundant crop. Insects have not been abundant as a rule, nor particularly destructive. In some portions of the First District, west, I have heard of considerable destruction by the Canker-worm. The absence of serious depredations by insect enemies I attribute to the alternating temperature of the winter, but especially to the low summer temperature, which was about 3° below the usual average summer heat, and the abundance of rain during the spring and summer months. A marked feature of this low temperature was that it prevented the ripening of grapes. Even Delaware and Con-

cord, with me, failed to become entirely ripe, although grown on warm, sandy and thoroughly drained soil; and this has been the case generally, so far as my information extends.

The season of 1875 has been the most remarkable ever known to me in an experience in Cook county, dating back in 1838—first for its low average summer temperature; second, for abundant and timely rains. The preceding three years having been continuously dry, the organic and inorganic materials of vegetable growth have been brought up from great depths and deposited near the surface; the abundant moisture of the present season has thus made them available. The result has been an overwhelming crop of every kind not seriously affected by low temperature. This is especially noticeable in garden vegetables, which were so abundant in the Chicago market as to be constantly a drug, and often below the cost of production. Notwithstanding this, consumers have not realized the benefit therefrom they ought to have done. The selling price of dealers has not been in a corresponding ratio to the buying price.

Of my correspondence with persons in various localities in the First District—some twenty letters sent—I have received but two direct replies, although I have been promised others which may be received in time for transmission to the Secretary before the printing of our annual transactions.

Mr. EDWARD H. BEEBE, of Geneva, writes:

"The drought was excessive in the summer and autumn of 1874. This was succeeded by a cold, dry winter—the thermometer ranging from 15° to 30° below zero in January and February, 1875.

"*Apples.*—The extremes have been very injurious to the apple trees; almost all varieties having been more or less injured, and many of the old trees killed. The crop was a failure.

"*Cherries.*—Trees of Early Richmond and Leib varieties were uninjured, but the fruit buds were killed by early frosts.

"*Plums.*—Plum trees were not injured. The only varieties cultivated here are foreign ones, and the *Curculio* gathers the fruit.

"*Concord Grapes.*—The vines being annually covered over winter, received no damage from cold, and set a full crop, which, however, did not mature before frost, so that the crop was a total failure.

"*Blackberries* were a total failure—the buds of every variety, where exposed, being killed to the ground.

"*Strawberries* were also a failure; the plants were all right but did not fruit.

"*Currants* of the old varieties of Red and White Dutch bore good crops.

"*Raspberries.*—The canes of almost all varieties of *Raspberries* were injured to such an extent that they produced not more than an eighth of a crop. One variety, said to have been brought from Europe, by Wm. B. Ogden, has proved perfectly hardy here, and a prolific bearer. It is a *Red Raspberry*, too soft for shipping when fully ripe, and equal to Philadelphia in quality.

"*Vegetables* of every kind have been abundant, as the season has been very favorable to vegetable growth.

"Young trees of every description have done well, and should the coming winter not prove an excessively cold one, the damage done by the last one will in a great measure be compensated for.

"INSECTS.—The *Canker-worm* is at work in a few orchards, and will certainly destroy them, if Paris-green is not used.*

"*Codling Moth.*—The few apples which matured in this county gave evidence that it was propagating a full crop.

"*Colorado Potato Beetles* were about as plenty as for several years past, yet not so numerous as to require much extra labor to keep them under; one or two applications of Paris-green being sufficient.

"*Black Aphis.*—Early in the season this insect appeared on the cherry and plum trees, destroying the new growth, but as soon as the heavy rains set in they disappeared, having done no injury but what was repaired by after growth."

Mr. A. B. AUSTIN, of Downer's Grove, Du Page Co., writes:

"In reply to your first question, I will say that we have cultivated two varieties of ash—the white ash and green ash; the former we have discarded as of too slow growth for profit in nursery, and not satisfactory to those who want trees for street planting. The green ash grows in nursery, with good care and in ordinary seasons, (after being established) about three feet per year for two years; after that, much slower—many of our larger trees not making one foot of growth this year. The white ash grows not quite half as fast as the green ash, which holds its leaves better, and they (the leaves) burn much less during summer than those of the white ash. We find the ash a very easy tree to transplant, growing in all localities, and free from borers; but it is liable to lose all or part of its leaves every third year, from the ravages of a brown beetle (May or June bug) during the latter part of May and in June. The beetle does no injury in the nursery. In our street planting, in the fall of 1873 and spring of 1874, we lost of ash about five per cent., while of soft maples about seventy-five per cent.

"To second inquiry, we have not found the last few winters particularly injurious to trees, except to those heeled-in and those transplanted in the fall. Lost nothing in nursery, but lost heavily of fall transplanting, which was caused by the absence of moisture in the earth, the trees dying from the top down toward the roots; the roots generally were alive, but were not able to draw moisture from the dry earth to supply the sap evaporated from the trunks and branches; hence, the trees died from the extremities downwards. The great pest against which we have to contend is the borer. Every other insect sinks into insignificance in comparison, and unless a cheap and effectual remedy can be found, the setting of trees on streets will be seriously retarded. The ashes and poplars escape entirely, but the maples and elms are destroyed by thousands. Those that have a few trees can preserve them by shading with boards, or winding the trunks with some cheap material, until the tree is well established, but those that set trees in large quantities need a cheap wash that will prove effectual; our trees escaped injury this year from the borer; we used kerosene, applied with a brush, on the south and southwest side of the trees; but one application was made about the middle of June. I do not want to be understood as recommending this as a good and safe remedy, as we have used it but one year (this year), and it was a very unfavorable year for the development of borers; we shall continue to use it and note its effect.

Hon. ELMER BALDWIN, of Farm Ridge, LaSalle county, sends the following:

"I have time only to make a very brief reply to your request to furnish an item for your report.

"The peculiarities of our climate and soil will require the experience of several generations to fully comprehend and to properly adapt a system of culture to their requirements; but each year or series of years will furnish items which, in the aggregate, will, if preserved, make up the evidence necessary to approximate the desired result.

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* See vol. 5, Reports of Ill. State Horticultural Society, for full descriptions and illustrations of this insect, with remedies and plans for its extermination.—EDITOR.

"The five years, from 1870 to 1874, inclusive, have in this section been seasons of excessive drought—the drought or want of moisture increasing in intensity each succeeding year of the series; so that in 1874 garden vegetables of all kinds were almost a total failure. Small fruits, except in locations very favorable for a supply of moisture, were also a failure or very inferior in quality.

"The Apple crop was much reduced in quantity, but much more in quality. Wheat and oats, from maturing early in the season, suffered less than corn, which was less than half a crop. Potatoes were nearly a total failure.

"The season of 1875, except being rather cool, has been a very favorable one, with sufficient rain, without an excess. Had not the subsoil, which had become almost deprived of moisture for several feet in depth, rapidly absorbed the copious rains, the amount would have been excessive; but as it was, we had enough without a surfeit, and this season has been an unusually productive one—perhaps the most so of any in the experience of the oldest farmers. Even old exhausted fields, which have been cropped for forty years without manure or renovating crops, have produced about as generously as when the virgin soil was first turned. We have the heaviest crop of corn ever known.

"The fruit crop was a failure. The drought prevented the formation of fruit buds, and many fruit trees died outright for want of moisture; but those which have survived have made a healthy growth, and wear a fresh and healthful garb that is refreshing to look at. Now, why should this year be more productive than any other? My opinion is that the preceding years of drought have enriched the soil by the deposit from the atmosphere of nitre, potash, and probably other ingredients from the great and productive laboratory of nature.

"I have often remarked, during my experience of forty years in Illinois farming, that a season of drought was better than a generous coat of manure on all our cultivated land. Doubtless summer fallowing, which exposes the soil to the dry summer atmosphere, owes its success to this cause.

"This is a world of compensation. The losses of an untoward season are compensated by the yield of another, or by the permanent enrichment of the soil.

"How best to utilize such enrichment, to fix it permanently in the soil, and to keep up its productive powers to the maximum, should be the study of the intelligent farmer. We can not change the seasons, but we can learn to make the best use of that which Providence sends."

Mr. S. G. MINKLER, of Oswego, Kendall county, writes:

"The Apple crop has been light this year, though the fruit is of a most excellent quality, there being less codling-moth and scab than for several years; in fact less insects of all kinds which prey upon trees and fruits.

"There were no cherries or small fruits here, to speak of. The price of apples has been and is good, the first quality now selling at one dollar and a quarter per bushel. The prospect is good for a fruitful year in 1876.

"The injury done to orchards by the droughts and hard winters has been immense, and it is probable that they will never fully recover, though many trees are putting out healthy shoots, which will form new tops, and thus prolong their lives for many years."

In conclusion, I would suggest that a sufficient number of forms be printed, embodying the points wished, for transmission to correspondents who may be selected to observe and note the various data required. If this was generally accomplished a mass of interesting information might therefrom be collected, and from which comparisons could be drawn of exceeding benefit to the interests of horticulture.

All of which is respectfully submitted.

JONATHAN PERIAM.

DISCUSSION ON THE REPORT.

At the close of the reading of this report, Mr. PERIAM said he wished to call attention to the low ridges of black sandy soil around the head of Lake Michigan, as especially suited to the growing of grapes; and he thought that if this fact was known, these ridges would be occupied for this purpose. The soil rests upon a substratum of clay, and is safe from excessive moisture.

MR. MCWHORTER—These ridges were thrown up by the winds and waves, and formed once the old beach of the lake, which has since retired.

MR. WIER—There has been, in our neighborhood, a failure for three or four years past, in the crops of the Early Richmond cherry, while the English Morello, along side of it and on the same stock, has borne good crops; which looks as if there was some fault with that variety.

MR. MCWHORTER—I am surprised to hear this statement, for I have never known or heard of any place where the Early Richmond did not do well, and bear full crops. Last year there was little fruit, because of the damage which the trees suffered in the winter. It will take a year for the trees to recuperate.

THE PRESIDENT—Do you find any difference when grafted on different stocks?

MR. MCWHORTER—I once thought that I knew something upon this subject; but really, I do not know as much about it as I thought I did some years ago. My observation is that trees grafted on the Morello stock bear earlier than on the Mahaleb, but as they grow older I see but little difference.

THE PRESIDENT—Do you know any thing about the Mazzard stock?

MR. MCWHORTER—It is not hardy enough for our winters. It is true, if you plant the trees very deep they may survive the winters.

THE PRESIDENT—The reason I ask this question is, that a few years ago I planted trees in Freeport, grafted on the Mazzard stock, and they stood the winter as well as, or better than, trees grafted on other stocks.

MR. MCWHORTER—Are you sure that the exposure and conditions were the same with all your trees?

THE PRESIDENT—Those grafted on Mazzard were three years old; those on other stocks were five or six years old.

JONA. HUGGINS (of Macoupin county)—There is an orchard a few miles from my place, eight or nine years old, which, at the time of the

freeze three years ago, contained cherry trees on the Mazzard stock, and they were all killed by the winter, while trees on the Mahaleb stock were not killed.

MR. HAMMOND (of Hancock county)—The Early Richmond cherry bears so heavily that it is a short-lived tree. My experience is, that on its own roots it is the most healthy, and we propagate it from suckers; and our whole country has been stocked with trees thus propagated, and they give satisfaction. I see my friend G. P. Walker here, who has some experience in growing cherries, and I would be glad to hear from him.

G. P. WALKER (of Hancock county)—I did not come here to talk; but in reference to this matter, I will say I have an orchard of Early Richmond cherry trees. They are suckers that have been universally propagated in the same way throughout our part of the country. They begin to bear the third year, and this past season is the first year they have failed. I have also trees of the same variety on the Morello stock, but they are not so productive by one-half.

J. S. JOHNSON (of Hancock county)—In 1851 I bought the premises I now occupy, and upon them was an orchard of this celebrated Richmond cherry; it being, at the time, the only cherry orchard in the country. I have furnished a great many persons with suckers for planting. I furnished Mr. Walker with suckers to set his orchard. It was said that they would not produce the same cherry; but I continued to give them away, and when nursery-men discovered their value, they came for them. I sold 5,000 to one man in Iowa at one and a half cents each, and he dug them himself. It was ascertained that they were not only productive, but that they produced the same cherry. They sprout freely—too freely to suit me—and, after digging the first crop of sprouts, they were more numerous than ever. I have known orchardists to come many miles to get these sprouts. The crop of fruit failed this year with me, but my trees, planted three years ago, look healthy. The Early Richmond, in Hancock county, is in universal favor. It stands the winters even better than the Morello, and is more healthy. It is in every way fully as hardy, I think.

DR. HUMPHREY (of Knox county)—Nine years ago last spring, I bought and planted about one hundred Early Richmond trees; the third year after setting they bore a crop, and have borne every year since until last year. I am pleased with the Early Richmond on its own roots, and think this plan is the *cheapest* way to grow cherries.

THE PRESIDENT—I find on cutting into our cherry trees that the

wood from center to circumference is colored—showing the effects of cold—and that only the last year's growth is green and living. My idea is that many of our trees are dead.

MR. BURROUGHS (of McLean county)—I hope that those who have trees to sell will not send out unsound stock. It is my belief that there is not, in the northern half of Illinois, except along the bluff and at exceptional points, a sound apple tree that is more than one year old. The cold winter of 1873–4 injured all our nursery stock in Northern Illinois, and this followed by drought has virtually killed our apple trees. I have plowed up mine, because I do not think they are fit to go upon the market.

THE PRESIDENT—I wish to inquire if these cherry trees in Hancock county are the true Early Richmond cherry?

MR. JONES (of Adams county)—We regard the Early Richmond as the same as the Early Kentish. It bears the same fruit, and no one can tell the difference.

MR. MCWHORTER (of Mercer county)—We have been hearing about the Early Richmond trees "on their own roots." Now, I really want to know if this is so. *Does the Early Richmond sprout in this way?*

MR. PERIAM (of Cook county)—The Early Richmond *does sprout*, or sucker—as it is called.

MR. MCWHORTER—I think it will in a few cases, where the tree has been planted deep, and becomes self-rooted. I have had trees do this in exceptional cases. The Early Richmond and the Kentish are distinct; they are not the same cherry.

MR. WALKER (of Hancock county)—At what time does the Kentish ripen?

MR. MCWHORTER—I think that about the time the Early Richmond is gone the Kentish is ready to come in; I think there are three weeks, or at least fifteen days difference in the time of ripening.

The Early Richmond is a little more juicy than the Kentish, not as acid, is more pleasant to eat, and is a better cherry. It has a smaller stone; still they do look very much alike.

MR. WALKER—The trees on my place were brought from Nauvoo, and they ripen from the first of June to the fourth of July. I do not know of any cherry in my neighborhood that ripens earlier than this.

THE PRESIDENT—I think the Early Richmond has a little less color—not so deep a red—as the Kentish, and is about gone when the Kentish comes in.

MR. HAMMOND (of Hancock county)—I can assure you that the trees spoken of by Messrs. Walker and Johnson are the true Richmond cherry. It ripens two weeks earlier than the Kentish. I can tell you how the tree was originally put on its own roots: It was done by layering the branches of the tree for several generations of trees. I make this statement in answer to the President's question, as to whether this cherry in Hancock county is the true Richmond.

MR. WIER (of Marshall county)—There are two Kentish cherries—the Early and the Late. "Early Richmond" is only a local name for the early variety.

While I am up, I wish to take exceptions to the remarks of my friend Burroughs—that "There is not an apple tree, more than one year old, that is sound and merchantable, in the northern half of Illinois."

Winters that do not kill the peach buds, ought not certainly to utterly ruin the wood of our apple trees. True, many apple trees were more or less injured in the winter of 1873–4; but many trees in our nurseries have since overcome this injury, and are thrifty and salable to-day. I do not know what is the condition of Mr. Burroughs' trees, but I know the trees are not all dead in other nurseries. The statement of Mr. Burroughs will do injustice to our nursery-men and, if believed, will be an injury to those who ought to plant trees.

MR. BURROUGHS—Perhaps I should have excepted the Ben Davis and Duchess of Oldenburg. If it be a fact that our nursery stock is unsound, let us have the courage to say it.

THE SECRETARY (McLean county)—I can not indorse Mr. Burroughs' statement that our nursery apple trees are all unsound, and hence not fit to be put upon the market. You will not find two nurseries alike; but will find all grades of damage in the nursery. While some trees are virtually dead, other trees have received but slight injury, and are capable of bearing crops of apples for fifty years; and to say that these trees are not merchantable is saying too much. I am not speaking as a nurseryman, for I have no trees to sell. I was this summer in a nursery where I saw trees that ought not to be sold; and I said to the proprietor, "These trees should not go out; they are considerably damaged, and very many of them will fail to grow and do well; I advise you to dig them up and burn them." But in this same nursery I saw another block of trees that were in good condition to sell and bear fruit. I think the declaration is too sweeping to say there are no sound apple trees in our nurseries, and that it is calculated to deceive and do harm.

MR. MCWHORTER—When was that?

MR. GALUSHA—In July last. It is no doubt correct and right to say that a large portion of the older trees in many nurseries are damaged, and that people should be on their guard in purchasing; but to say more than this would, as Mr. Wier has said, do injustice, both to those who have trees to sell, and those who want to buy.

MR. MCWHORTER—Any tree that has made a good and vigorous growth this last summer is not seriously injured; and indeed I have not seen, for many years, better wood-growth in our orchards than has been made this last year. Trees that have been damaged in their roots do not grow, and no man can be found foolish enough to buy such trees, and no nursery-man to offer such trees for sale; it is foolish to warn the people not to buy dead trees, for they will not do it, and no nursery-man of any reputation will send out such trees.

MR. PERIAM—If any man knows that he has trees in his nursery that are unsound, he is certainly competent to come into this meeting and say so, but he should not come here and say there are no sound trees in other nurseries, with which he is not acquainted.

J. S. JOHNSON (of Hancock county)—We are well aware that there is a great deal of bad stock on hand, and I am perfectly willing to leave this matter in the hands of planters and the nursery-men. I believe our nursery-men are as honest as any other class of men: this has been my experience with them; they have never imposed upon me.

DR. HUMPHREY (of Knox county)—A tree may be all dead inside, but if it has a healthy bark and good top it will live, and bear, perhaps, many crops if left to stand.

MR. WIER—The heart wood of a tree is nothing to the life of the tree; it performs none of the vital functions of the tree; it gives strength and support, and that is all that it does do. If trees are injured in the nursery, let them stand another year and form new and healthy wood, and then they may be removed to the orchard. Oftentimes strong, healthy cions will spring up from the bottom of a damaged tree, and if the tree is young, one of these may be left to grow and form the trunk of the tree, and the damaged trunk be cut away.

DR. LONG (of Alton)—I claim to know something about orcharding, having been in the business forty-five years. I was the first, perhaps, who bought trees and set out an orchard at Alton. Now, the assertion that damage to the heart of the tree does not hurt it, is all bosh; it is not half a tree without a sound heart. If your tree is blackened and dead

inwardly, better dig it up and throw it away, and plant another that is sound—you will make by it. To say that the heart wood is non-essential is to misstate the facts. To avoid the suckering of the Morello and Early Richmond stocks spoken of, I would recommend planting seeds of Mahaleb and Morello, and budding or grafting upon the seedlings; as these are not as liable to throw up shoots as those are which are propagated from suckers.

DISCUSSION ON NEW FRUITS.

THE SECRETARY—*Mr. President:* It seems to me proper that we should discuss the subject of *New Fruits*. It is desirable that we know if there are any new fruits that are superior to those we now have. I suggest that we take up this subject of new fruits.

THE PRESIDENT announced that such would be the order, unless objected to.

MR. WIER (of Marshall county)—I have the Lady grape from Mr. Campbell, of Ohio, and I have reason to believe that it is a valuable addition to our list of grapes; it seems to have all the merits that have been claimed for it. I have had it but two seasons, and have not fruited it yet, but I saw and tasted the fruit in Chicago, and think well of it.

MR. STARR (of Alton, Jersey county)—I examined this grape in Chicago with a great deal of care and interest, and I confess I was disappointed in it, and do not think it is what Mr. Campbell claims for it; it has a foxy flavor. I think the Elvira, in the hands of Mr. Bush, of Missouri, is much superior to the Lady grape of Ohio.

DR. HUMPHREY (of Galesburg) called attention to the Siglar grape, as he had done on former occasions. He thought it a very fine grape; it had been tested for five years, was comparatively hardy, and has never failed to give good crops of the best of fruit.

MR. GALUSHA—I have eaten this grape grown in Galesburg, and to my taste it is not altogether a pleasant grape; while it is rich and sweet, it soon cloys; it is not refreshing, like many other varieties of grapes.

MR. WIER—Tastes differ very much. I know parties who will eat the Clinton and call it good, preferring it to the Concord. Others take the Concord before almost all other varieties. The Isabella is a very unpleasant grape to eat for some, but it suits my taste better than the Concord. And so there is no end to the diversity of tastes in eating grapes.

MR. HAMMOND (of Warsaw)—A few years ago we thought that we had got by the discussion of the varieties of fruits—but we now find that we need new and hardier varieties. There is an apple among us, called

the *Hythe*, that I think worth recommending; it is an apple of good quality, but has one fault—it lacks high color; being like the Rawles Janet in this respect. The size is satisfactory; the tree is hardy; "It has been more profitable than any five trees in my orchard," says the owner of the original tree. What the result of further trial may be I do not know; it is now very promising. This winter the apples have not kept quite as well as heretofore. My trees of this variety are four years old from the graft. The old original tree has been miserably pruned; a man went at it with saw and axe, and he has left his marks upon it in a manner not to his credit, or to the health and well-being of the tree. We have another variety—the Monta Bella—a beautifully-colored flesh, but is too tender for market purposes. It might be well to propagate it for amateur purposes.

MR. MCWHORTER (of Mercer county)—I thought it was nearly as good as the Northern Spy. I have fruited a great many Southern apples, but I find only two that seem worthy of cultivation—the Red Ox and the Red Warrior, with the preference, perhaps, to the Red Warrior. I can not speak of their keeping qualities. I have kept them in good condition till February, and have kept the Red Warrior till March.

THE SECRETARY—Does the Red Warrior keep better than the Red Ox?

MR. MCWHORTER—I did not say so; I do not know.

MR. WALKER (of Hancock county)—The Baldwin is a large, fine apple, the tree makes excellent growth, and for the last eight years in my orchard it has not failed to bear a partial crop, though seldom a full crop. We have kept them till January, and we like to eat them. They are disposed to rot. They are large and heavy.

THE SECRETARY—I would like to hear about the Charles Downing strawberry. I think a little information respecting this comparatively new variety will be valuable.

DR. HUMPHREY—I think Mr. Leslie, of Ipava, is a large grower of this and other varieties of strawberries, and he can tell us something about the Charles Downing.

MR. LESLIE was called for, but was not in.

MR. JONES (of Quincy), said it would not bear shipping like the Wilson. It produces well.

DR. LONG (of Alton)—I have never been able to get more than two full crops from the Wilson; it is constantly lifting itself out of the ground, and from exposure to the hot sun the roots die out, and the bed

needs to be renewed often. The fruit will not sell like the Downing. The Downing is large and productive. It is more trouble to get it to market, to be sure, but when there in good condition it will sell for more money. I understand Mr. Stewart, of Alton, to say that when his Wilsons brought him thirty-five cents, his Downings brought sixty-five.

DR. HUMPHREY—Mr. Leslie says the Downing is the best berry to can. He has put up seven thousand cans of them the past year, and he gets one or two pickings more from them than from the Wilsons. We have got to turn our attention to utilizing our fruits in this and other ways.

THE PRESIDENT—Mr. Oscar Taylor, of Freeport, has good success with the Charles Downing.

THE SECRETARY—The fruit growers of Central and Northern Illinois have long been looking for a blackberry which will stand the cold of our winters and give us crops of fruit, and have been testing different varieties; but I know of no variety which has been at all satisfactory until the Snyder was introduced. This variety has been thoroughly tested at Bloomington, and to some extent at other points, and has, I believe, been satisfactory wherever the genuine variety has been planted. I took pains to examine the plantations of Mr. Vickroy and Mr. Gaston, at Normal, (near Bloomington) this year, at different stages of growth and fruiting, and I am satisfied that this variety is an acquisition. While at this point the Kittatinny and other varieties failed, being dead to the ground, the Snyder bore a good crop, the canes nearly all having passed through the winter in good condition. I discover but one fault with the plant—it fruits uniformly too heavily. You do not get sufficient size in the last pickings. The berry is fair in quality, I can not say it is first-rate—it has no central core, and is of medium size. I have considerable hope that we have in this berry something that we can rely upon to give us fruit.

MR. STARR—Do you say it bore a crop this season?

MR. GALUSHA—Yes, a good crop.

MR. STARR—I want it then.

MR. GALUSHA—I ought perhaps to say, while on this subject, that there is danger of getting spurious plants. The plant has some peculiarities of leaf which distinguish it from other varieties. I did not refer to the plantations of our brother members, at Normal, to advertise them: for while on the one hand we should not grind our own or other people's axes here, on the other hand we should not withhold any fact which fruit

growers should know, from fear of being accused of advertising some one. We want the best and most profitable varieties of fruits, no matter who has them, or whose business we aid in securing them. There is more than one variety which goes under the name of Snyder blackberry; and perhaps the danger of procuring spurious varieties of this fruit is as great as in purchasing that other valuable new fruit—the Wild Goose plum. There are at least a half dozen varieties sold as the genuine "Wild Goose."

MR. STARR inquired if the Sops of Wine apple and William's Favorite were identical, as stated in some catalogues.

MR. MCWHORTER answered, positively, that there were *two varieties*, and not identical.

THE PRESIDENT (of Freeport)—Before we lose sight of the blackberry, I want to ask if any one can tell us any thing about the Ancient Britton. This variety has proved perfectly hardy with me, and is very productive; it has never failed till this year. They are very shy about throwing up suckers: the berries are not large, sweet, and are excellent table fruit.

MR. WIER (of Lacon)—With me the Kittatinny bore a third of a crop, while the Ancient Britton killed to the ground.

I would call the attention of this Society to the raspberry called Burn's Seedling. It is absolutely *hardy*, it stands drought, and may prove to be very valuable. It resembles Doolittle.

MR. JONES called for a statement from Mr. Dennis, of Hancock county, in reference to the "Miami."

MR. DENNIS—I sold from one-third of an acre of Miami raspberries, after supplying my family and paying for picking, sixty-five dollars' worth.

J. T. JOHNSON (of Hancock county)—I know of no fruit which yields as much net money per acre as the Miami raspberry.

THE SECRETARY—This Society voted several years since to call this variety the "McCormick." It is known also, as Miami, Large Miami, and Mammoth Cluster. We should adhere to the name *McCormick* until we decide to change it.

On motion of Mr. STARR, the hours of meeting, for the present session, were fixed at nine o'clock A. M., and at half-past one and seven o'clock P. M.

The Society then adjourned.

TUESDAY EVENING.

The Society re-assembled at seven o'clock; and the President announced, as the regular order of business, a lecture from Prof. Thomas, State Entomologist. But, as there was a less number in attendance than was expected, he suggested that a half hour might be spent in discussions.

DISCUSSION RESUMED.

THE SECRETARY—*Mr. President:* I would like to ask a few questions of Mr. Leslie in regard to the Charles Downing strawberry—as he was absent this afternoon, and is known to have grown this variety extensively. What are the peculiarities and habits of the vine? What are the market qualities and comparative profits of the fruit? What are the best methods of cultivating and marketing the strawberry?

MR. LESLIE—I have tested some sixty varieties, and my opinion is that the Charles Downing is the best berry, either for canning purposes or for market. The Wilson is a good berry, but the Downing is better, and brings a better price in the market. The objections to the Wilson are: the berries lay too near the crown of the plant; the fruit stems do not stand up like the Charles Downing, and the plant is more difficult to mulch; and it does not stand the hot sun like the Downing. I think well of the Col. Cheney; also, of the Downer's Prolific and the Kentucky. I cultivate in rows, three and a half feet apart, setting the plants one foot apart in the row; let them root over the ground for twelve to fifteen inches in width; plants outside of this strip I treat as so many weeds; in the early winter, after freezing up, I cover with straw, four inches thick, evenly distributed and shaken up loosely; in the spring I rake the straw between the rows, and leave it until after fruiting. The Charles Downing needs renewing once in two or three years, which I do upon the same ground, by plowing up the old plants with a wheel coulter on my plow, first on the one side, or half, and then the next year on the other side, turning the furrows away from the rows; I sprinkle manure in this furrow before leveling the ground.

Voice—What is your soil?

MR. LESLIE—My soil is clay—the "hazel barrens" of Fulton county.

Voice—Do you say you put on the mulch four inches thick?

MR. LESLIE—Yes, four inches when spread on at first. My object in putting on so much mulch is to keep the weeds down between the rows, and to retain the moisture. I prefer straw to any other covering; prairie grass is good; leaves not so good, and saw-dust worst of all.

MR. JONES—What is the shape of the berry of the Downing?

MR. LESLIE—It is conical.

Voice—How long have you been in the business.

MR. LESLIE—Eight years.

MR. STARR (of Jersey county)—The Downing is the best berry for Alton, and takes the lead there: it excels in quantity and quality of fruit, and sells for more money than the Wilson.

MR. WIER—I have the Kentucky and the Charles Downing, but the one I have as the "Downing" is not so productive with me, and it does not answer the description given by Mr. Leslie; the berry is a large, angular berry; while the Kentucky is more uniform, and the better of the two. Perhaps the names are changed.

LECTURE ON ENTOMOLOGY.

BY PROFESSOR THOMAS.

The time allotted to discussion having expired, the President introduced Professor CYRUS THOMAS, State Entomologist, who delivered the following lecture:

Having but recently entered upon the duties of my office, and having for several years previous thereto devoted my attention almost exclusively to a single order of insects, I come before you ill prepared to present you with any thing fresh and new from my present field of labor.

I shall, therefore, talk this evening about those old enemies with which you are all familiar, and with which you have long battled. But do not imagine I have any startling discovery to announce, or any wonderful specific to propose, for if such should be your expectation you will certainly be disappointed. On the other hand, for me to suppose that stringing together a few general statements in regard to insects will meet your expectations on this occasion, would be doing injustice to your intelligence and general knowledge of the subject.

While I shall not attempt to give you any new facts in regard to these old enemies, I will try and present you with a plan for utilizing those already known.

Is it true, that notwithstanding the rapid strides in Entomology, the great advance in vegetable physiology, agricultural chemistry and all that relates to agricultural operations and laws, injurious insects appear to be little more under control, practically, now than formerly? I fear our answer must be, yes. But why is this so? Why is it that while the

discoveries and advance in the knowledge of the laws of heat, galvanism, and electricity are working out such important practical results, the discoveries and advance in Entomology, so far as it relates to agriculture, has failed to produce in full the results anticipated?

Entomologists have certainly carefully described the injurious species, thus making them known, and marking them as culprits; they have also given fully and elaborately their history and habits, thus marking their various hiding places and uncovering their retreats; and basing theories on this knowledge, they have, in many instances, suggested practical remedies. Farmers and horticulturists have frequently tried these proposed remedies, and others of their own invention, sometimes, it is true, without success, yet often with favorable results.

Let us examine this matter a little, and see if we can ascertain the reason why this is so; and next, whether a practical plan can be proposed to remedy it.

In the first place, I must assert my faith in the final triumph of science; but science does not propose to work miracles, although the results of her operations sometimes appear miraculous; she does not propose by a species of magic to annihilate the myriads of Chinch-bugs, which have invaded the farmers' fields, or to stay the onward march of the Locust army. She can only work in accordance with the laws and appliances which Nature has placed in her hands, and so far as insects are concerned, it is the province of the entomologist to study out and explain these. Too much, in this respect, has been expected, and there has been too much waiting and hoping for a grand *coup de grace*, and too little disposition to put into operation those gradual means which require steady perseverance.

Mr. Hammond, President of the Warsaw Horticultural Society, in an address, delivered before that Society last year, struck the key-note of the difficulty when he said, "There is no other known way of combating our insect enemies only by concerted action—*systematized co-operation.*" That is the word—*systematized co-operation*—that is what is needed to accomplish this great work, and, until it is obtained, the present method of guerrilla warfare will go on, as it has in the past, with similar results.

Entomology, as a science, has been placed on a systematic basis, and in this respect there can be no cause for complaint against it; but there is work to be done in this respect in Economic or Applied Entomology. But it is in regard chiefly to operations that system is needed, and here the entomologist is powerless when left to himself. Entomology and agriculture must work together in generalizing and systematizing the means of operating against these diminutive foes, before the advantages of scientific knowledge and investigations can be realized.

I shall, therefore, call your attention at this time to a plan for doing this, in a measure at least, so far as horticulture is concerned. And, as the first step, I suggest the division of Economic, or Practical, Entomology into at least three distinct sections, as—"Horticultural Entomology," "Farm Entomology," and "Domestic Entomology;" and that each be considered as a special science.

But what advantage are we to gain by this division into distinct branches or sciences? Each particular species must be fought in a particular way, depending upon its peculiar habits and habitats. Let us examine this point for a moment, and see how far this idea of isolated and specific battles in the war with insect foes is correct. So long as we sit down content with this conculsion, just so long is it in vain to talk about systematizing operations and generalizing remedial agencies. No progress will be made, no advanced step taken, until we admit that possibly this question has two sides to it.

Leaving the other divisions, let us confine ourselves at this time to the consideration of the "uses and advantages of Horticultural Entomology as a special science," and see whether it is possible to generalize the remedial agencies thereby suggested, and to devise a plan for systematizing operations.

What then are the advantages of this division into sections? What advantage are we to derive by considering Horticultural Entomology as a special science?

There is a growing tendency in the present age to produce specialists, one-idea men; and it is most undoubtedly a favorable one, so far as the advance in knowledge is concerned. The rapid advance now being made in the Natural Sciences, is owing chiefly to the work of specialists; and what is true in this respect in regard to the Natural Sciences, is also true in Agriculture.

Horticulture is a science, depending in great part upon natural laws, and the skillful operations of these to produce given results. It therefore can reach its proper standard only through the labors of those who make it a specialty, and even then the field is so broad that it may well be divided into separate branches, as the orchard, the nursery, and the garden; either of which affords a field sufficiently wide for special work. The specialist wants all that relates to his particular branch separated from that which has no reference to it, and brought into as concise and compact a form as possible. Here, then, we see the first advantage to be derived from the division proposed, and considering Horticultural Entomology as a separate science: The horticulturist who desires to know what has been ascertained in reference to his insect foes, can learn this much sooner if the division suggested were made, and the list belonging to his department clearly and distinctly made out.

As a second advantage to be derived from this division, I suggest that the method of culture in one department is so widely different from that in the other, that preventive or remedial measures which in any way depend upon the method of cultivation must necessarily differ in the two, and hence are better understood when considered separately.

There are a number of other reasons for this separation, but the principal advantage to be gained by considering Horticultural Entomology as a special science is that a more complete and exact generalization of the habits of insects which affect horticultural interests can be made; the general remedies applicable can be more easily ascertained, and operations more readily systematized. The more limited the number of

insect enemies and the smaller the number of substances operated upon, the more exact becomes the generalization and the greater the number of characters which are common, and as a natural consequence, the greater becomes the probability of a feasible point of attack.

Let me illustrate this point in order that it may be clearly understood, for it really forms the basis of what I have to say at this time.

If we attempt to give a definition which will include all animals and exclude every thing else, we shall find it exceedingly difficult to fix upon any character which is universally permanent in this kingdom, and found nowhere else, no matter how broad we make our definition. If we limit ourselves to the articulates, we find the task much easier, and more than one character which we can seize upon. If we take the Insect Class only, we find the number of common characters considerably increased; and so on as we descend to the order, family, etc.

Now let us make a more direct application of this idea to the subject before us. Thorough, clean culture is properly considered an important agency in preventing and counteracting the attacks of injurious insects; that is to say, other things being equal, as a rule, less injury by insects will accrue under this method of culture, than under a careless, slovenly system.

It is true that this is a broad generalization, yet it constitutes the very first step in systematizing operations against our insect foes. If you undertake to define, in strict and concise terms, what clean and thorough culture is, you will find that in order to make it applicable to the farm, the garden, orchard and nursery, your definition will have to be much broader and far more general than it would be if limited to horticulture alone; and if confined to the nursery, flower garden or peach orchard, it becomes still more exact and definite. As a natural consequence, the more characters there are in common, the more points of general defense are presented.

As stated in reference to the attempt to define an animal, I am doubtful whether a simple, concise definition of clean and thorough culture, as applicable to all agricultural operations, can be framed; and even if limited to that embraced under the term Horticulture, it is still doubtful, as few, if any characters, are common to all its operations. But when we descend to the subdivision of the latter as the orchard, nursery, etc., we find the task much easier, as characters, common to the various operations under these separate heads, are greatly increased.

This will suffice to illustrate the idea I am trying to present, and will also furnish a reason for the division proposed.

Now, it is evident to any one at all acquainted with the subject, that in attempting to systematize horticultural operations, so far as they relate to the war with injurious insects, we must select either the habits and characters of insects, or horticultural operations, as our basis, and carry out the plan in accordance therewith. In other words, it must be based upon insect characters, or upon methods of culture.

Certain well-known facts, in reference to insect life and habits, afford excellent characters for a systematic arrangement; as for example, that

the vegetable eaters do most of their feeding, and hence their injuries, while in the larva state; that the habits of the species of a group are usually more or less similar; that those which feed upon leaves seldom attack the fruit, or bore into the stem, etc. But, unfortunately, these do not afford us any means of generalizing practical remedies.

For instance, the fact that the attacks of insects upon vegetation are chiefly made in the larva state, although warning us that we must make war upon them while at work, or seek them elsewhere in other states, does not suggest any general method of counteracting them; that is to say, a remedy which reaches the leaf-eaters or leaf-crumplers, can have no possible reference to the borers, etc. It is true that a remedy applicable to one borer is usually more or less applicable to another; but when we come to apply this to the fruit and leaf destroyers, we find the principle will not hold good. It is evident, therefore, that if any thing is to be accomplished in the way of systematizing, *horticultural operations* must be taken as the basis. Another reason why this is best is, that labor may be simplified and time economized.

Take up our very best works, essays, reports, etc., relating to injurious insects, and run over the list of remedies, and you will find work enough to occupy your entire time, and applications and remedies sufficient to destroy the stoutest tree, if the whole series should become necessary in one season.

For this species, infested leaves must be plucked and destroyed; for that, injured fruit must be plucked and destroyed; for another, a webby branch must be clipped; for a fourth, a punctured twig must be removed; for a fifth, an egg-encircled branchlet must be severed and consigned to the flames; then lime must be sprinkled over it; then the syringe must flood it with soap-suds, quassia water, whale oil mixture, carbolic soap-suds, etc., etc.; then the long-handled brush must sweep the boughs and foliage for webs and their spinners; the swab must be used upon the limbs, and the fire-brand among the congregated larvæ; the roots must be laid bare and scraped and rubbed, and bathed in hot water or saturated with soap-suds, brine or some other offensive mixture, or gouged and punctured for the borer; the trunk must be scraped, and rubbed, and curried; next soaped, greased, white-washed or painted; then tarred, bandaged with paper, straw, rags or tin; here one gouged for a borer, plugged with camphor or perforated with a wire; thumped for curculios, hammered for the caterpillars, and finally, the weary orchardist must gather injured fruit with one hand and pick caterpillars with the other. If he should unfortunately be a farmer also, then this will only constitute his extra work.

It is true this picture is drawn in somewhat high colors, and can not be applicable to any one orchard in a single season; nor would I imply that each or any of these remedies are not appropriate or useful at certain times; yet this list does show the effect of considering remedies separately, no matter how efficient each may be with reference to the particular species it is intended to counteract.

It also indicates, in a clear and distinct manner, the necessity of

systematizing operations, so that modes of culture may as far as possible be made remedial agencies, and that general remedies so far as it can be done be substituted for the special ones.

At particular times and under certain circumstances, these special remedies become the only hope of the horticulturist; but if certain methods of culture can be adopted which will form general remedial or counteracting agencies, then the war against them goes on unceasingly; and special assaults will be less often needed.

I shall therefore take it for granted that any practical plan of systematizing remedies—(and it is a *practical* one, if any, that you desire)—must be based on horticultural operations, and that methods of culture may be used as a means of defense against injurious insects; that they constitute what may be properly termed *general remedies;* and commencing with the most comprehensive headings will proceed to unfold the plan as I descend to the smaller subdivisions.

Of course, as I am not a professional horticulturist, I may make assumptions in reference to horticultural facts and operations which will be erroneous; nevertheless, as I am only presenting the outline of a plan, they will suffice to illustrate the ideas I am advancing, and will therefore answer my present purpose.

Taking it for granted that no general definition of clean and thorough culture, applicable to all horticultural operations, can be framed which will be of any practical utility, we must necessarily, as our next step, subdivide the operations of this department. And this, fortunately, we are able to do by sufficiently distinct and well-known characters; thus:

HORTICULTURE.

1. Culture of the Nursery.
2. Culture of the Orchard.
3. Culture of the Vineyard.
4. Culture of the Garden.

In a strictly technical arrangement the first three might perhaps be included in one group; at least the vineyard might be placed with the orchard, but the operations in the two being so different, and the latter (vineyard), in reference to insects, requiring separate and special notice, this division, which in fact is only used for illustration, is considered the best practically. Ornamental and forest-tree culture will perhaps require a fifth subdivision.

Properly the nursery should be considered before the orchard in a complete systematic arrangement; but a single subdivision will answer our present purpose, therefore we will confine ourselves to the orchard.

I must now take it for granted that you can give a general but concise definition of what constitutes clean and thorough, or proper orchard culture. And as you may inquire how this is to be made practically useful, and what bearing it is to have on the insect question, I will explain.

If your definition is a good one, it must be susceptible of being put into practice; and if properly practiced must, as a rule, result more favorably than any other general method. For example: if you should say, "Keep the trees and ground clean and cultivate the soil," then, as a rule, this, when practiced, should result more favorably than leaving the soil uncultivated, the surface covered with rubbish and the trees uncleaned. Consequently, if an orchardist can be persuaded to go with you no farther to put into practice, in the broadest sense, the requirements of your general definition of this primary head, he is profited thereby, and all the surrounding orchards are benefited; and thus far, at least, co-operation is obtained. As to the entomological bearing, no general definition will be perfect unless it includes expressly, or by implication, the insect element.

Assuming then that your definition has been given, we will now take our next step. As our general heads under orchard culture we have: I. Clean, thorough culture; II. Careless, slovenly culture—representing two opposing grand divisions. The first, as we have agreed, results more favorably in respect to insect injuries than the second, and therefore constitutes our general heading in the systematic arrangement for fighting our insect foes. But orchard culture has several divisions, into each of which this principle of clean, thorough culture should be carried. Let us make this division:

CULTURE OF THE ORCHARD.

I. Clean, thorough culture.
   1. In planting.
   2. In cultivating the soil (including all that relates to mulching, manuring, etc.)
   3. In pruning (including all that relates to keeping the trees clean and in good order).
   4. In harvesting the fruit (including all that relates to the care and manipulation of the fruit—good and bad).

Taking these in the order they stand, let us see how far each may be used as a means of preventing insect injuries, or counteracting these foes; and, in doing this, it will be impossible at present to do more than give a general outline; particulars will have to be omitted. And I state here, that much, which I will mention, you have long been familiar with; but you will please remember I am simply endeavoring to give the indications from the insect side, and where these agree with the plant side, so much the better, and besides, I am giving chiefly the fundamental principles.

Location undoubtedly has some bearing upon the insect question; but from the slight examination I have given this point, I am rather inclined to believe the indications from the two sides clash here, that is to say, the location best adapted to plant growth and fruit development is most likely to be infested by injurious insects. But, be this as it may, the orchardist, as a general rule, must plant in the soil he possesses, therefore we may dismiss this point without further consideration.

In the first place then, as a rule, which admits of no exceptions, the trees selected for planting should be sound and healthy, and entirely free from insects or insect injuries.

I am fully aware that this is a very commonplace remark, which has been repeated a thousand times, yet it is here the orchardist must begin the campaign against his insect foes. If this is neglected, as has been too often the case in Illinois, the enemy may obtain a permanent foothold on his premises before he is aware of the danger with which he is threatened.

You as a Society, and I as your Entomologist, have a work to do here, for it is our duty to keep this constantly before the people, in order that no new recruit, entering the horticultural army, may begin his work unwarned of the dangers which line his pathway. Here is one of the enemies' strongholds, and hence we should make the first onset with ungloved hands. What advantage to you is it for me to trace out the genealogy and scientific name of some solitary guerrilla, found nibbling at an apple, or sucking at a leaf, when the hosts of your inveterate foes are pressing hard upon you? What do you care for the solitary wanderer who happens to destroy an apple, or clip a leaf, when the curculios, canker-worms and codling-moths are sweeping away the fruits of your labor? It may interest your curiosity to know its name and history, and it affords satisfaction to the entomologist, who is able to announce the discovery of a new enemy; but this is poor recompense for your heavy loss. How much better would horticultural operations in Illinois be to-day, had this precaution been rigidly heeded from the beginning? How much less numerous would fruit and tree-injuring insects have been here to-day, if only healthy trees from our young, untainted nurseries had been used after they went into operation? Doubtless these insects would finally have found their way hither; while others, it is true, are native species, but the evil day would have been greatly postponed.

Although it does not require a knowledge of the Baconian philosophy, or even the rudiments of Entomology to know this, but simply the exercise of a little common sense and the eyes, yet there are many persons who can not be convinced that the young and thrifty trees grown in our home nurseries, which are comparatively new, are more adapted to our soil and climate than those of the older eastern nurseries.

Once, and once only I received some fruit trees through a tree peddler from an eastern nursery, and these I found when planting were infested. I then resolved I would purchase no more trees of peddlers for nurseries outside of our own State, and I have faithfully kept that resolution for about sixteen years, having always sent to the nearest nursery for any thing I wanted in that line, and as far as possible persuaded others to do likewise. The result has been that I always obtained better trees, never infested by insects, always what they purported to be, and at much lower rates.

Dr. Fitch, in one of his reports, states that a young friend of his, ignorant of the injury he was doing, sold and delivered, in Virginia, several thousand trees, which were generally affected with the apple-root

plant-louse (*Eriosoma Pemphiguspyri*, Fitch). Dr. Kennicott once (U. S. Fair, 1859) remarked that his trees were but little affected with bark-lice prior to the receipt of a lot of apple seedlings from Buffalo

As a second precaution in planting, in order to avoid the attacks of insects as much as possible, I would suggest that as a matter of course the ground selected should be clean and clear of rubbish, logs, stumps, etc., and should be thoroughly cultivated at least one year previous to planting, in some crop requiring frequent stirrings of the soil. If this has not and can not be done, it ought to be plowed and exposed to the frosts the winter previous, especially if it has been in sod or grass; and, as Mr. Overman suggested in an essay on orchard culture some years ago, this should be deep.

Trees should never be planted in the sod or grass, or in uncultivated soil; and here the insect side of course agrees with the plant side.

I think it would be well to dip the roots of the trees in soap-suds before setting them, as it would have a tendency to destroy any root-lice which might be upon them.

Although the subject has not, so far as I am aware, been tested sufficiently, experimentally, yet there are some good reasons for believing that, as a rule, insects will be less injurious in an orchard planted with alternating rows of fruit trees of different kinds. But as the peach decays much sooner than the apple, it is doubtful whether these should be mixed. Other items in reference to planting might be mentioned, but these constitute the chief general remedies or rather preventives under this subdivision of orchard culture.

Now, let us begin our synopsis or tabular statement—for if we can not tabulate we can not systematize—and see how it would stand so far as we have proceeded:

CULTURE OF THE ORCHARD.

I. Clean and thorough culture.
- 1*a*. In planting.
- 1*b*. Select sound and healthy trees, that are entirely free from insects or indications of them, and from home nurseries.
- 2*b*. Cultivate the ground a year or so previous to planting in some crop requiring plowing; or plow and expose the soil to the previous winter.
- 3*b*. Never plant in the sod, meadow or grass; and in the timbered section carefully clean out the logs and stumps before planting.
- 4*b*. Dip the roots of the trees in soap-suds just before setting.

So far then as planting is concerned, it appears that it can only be used as a preventive measure, but in this way it can be made very beneficial. I am not certain but it would be well for our Legislature to impose a penalty on any one setting a tree from another State which is affected with insects or injurious fungus growths.

Cultivation of the soil.—This is our second division of Orchard Culture. Let us see what general preventive or remedial measures, if any, it

affords. And, first, I may state that cultivation of the soil is beneficial as a means of keeping down injurious insects; that is, as a general rule, the result is more favorable in this respect under cultivation, than where the soil is left wholly uncultivated; and I believe this accords with the conclusion drawn from experience on the plant side of the question. The next point, and one of some importance is, should a crop of any kind be raised, and if so, what should be its character? Looking at the subject from an entomological standpoint only, I am rather inclined to think that, as a general rule, the answer would be that it would be best without any, especially after the trees come into bearing. But looking at the matter from the side of economy, I suppose it will have to be conceded that while the orchard is young the value of the crops will exceed the difference between the results of the two methods, and hence it is best to have something in cultivation.

But grass should never be grown, as it affords food not only for larvæ, which may injure the young and tender roots of the trees, as the wire-worms (*elaterida*) and grubs, etc., but also for those which may come forth in the perfect state, as the various May-beetles, to destroy the foliage; it also affords shelter and a hiding place for many others more or less injurious to the trees and fruits, especially those which appear early in the spring, or remain late in the fall after the leaves have fallen. I am inclined to believe, though I have not investigated this point carefully, that the predaceous ground-beetles, which are such excellent auxiliaries in this warfare, are less apt to accumulate where grass is growing than where it is not. I might also add that the Tettigonians, or leaf-hoppers, are more abundant where grass is than where it is not, and although the species generally confine their attacks to a particular group or even species of plants, yet in dry seasons their operations, in a limited degree, may be transferred to the leaves of the trees, which are ill able to bear it at such times. The grass, if heavy, is likely to draw nourishment from the soil to the detriment of the trees, thus weakening them, and rendering them more liable to the attacks of the flat-headed borers, or Buprestians, which, as a rule, attack in preference those trees which are injured, sickly, or in some way weakened in their growth; and nature has given them such a delicate instinct that they can often ascertain this before the orchardist has perceived it.

For similar reasons, though not applicable to the same degree, I think wheat, oat and barley crops should be avoided, at least winter wheat. I will mention here one case bearing upon this point, which was recently brought to my notice:

About a month ago I received from Effingham county some caterpillars, which were doing considerable damage to wheat at one point. They were evidently the larvæ of an *acronyctian*, either very closely allied to, or identical with *A. oblinita* of Smith & Abbott, a moth which Prof. Riley, or some one else, has named the Smeared Dagger. The larva of this species is a very general feeder, attacking not only the *Polygonum* or knot-weed, which it appears to prefer, but also wheat and the leaves of fruit trees, and according to Prof. Riley, especially the peach.

It is two-brooded, and the young wheat in this case is evidently furnishing it the means of completing its larval state, thus carrying it over the winter; whereas, without this aid, it would probably have perished.

Corn is certainly much less objectionable, and has the advantage of requiring frequent stirrings of the soil. Looking at the matter from my standpoint, I can not but think that root crops would perhaps be least objectionable, but there may be, and probably are, counterbalancing reasons against this on the plant side. It is more than probable that there is a difference in regard to the applicability of the crop according to the nature of the orchard; that is to say, it does not necessarily follow that a crop which is least objectionable in an apple orchard, is also least objectionable in a peach or pear orchard. But this is a point which needs further investigation.

Late fall plowing has often been discussed in this connection, and has its advocates, as well as those who think it useless; but I must say I am decidedly of the opinion that, as a general rule, it is beneficial not only in the orchard, but also on the farm and in the garden; and I believe this is the verdict rendered by experience. Leaving you to weigh the evidence derived from experience, I give my reasons for my faith in this remedial agency, which are drawn chiefly from the entomological side. All such insects as pass the winter in the pupa state, but a few inches below the surface of the ground, are certainly largely destroyed by bringing them to the surface and exposing them to the frost; and there are a number of such species, among which we may mention as one of the most prominent, the Canker-worm; there are also some of the cut-worms, etc. If the plowing is deep it may also reach many of the grubs or their pupæ, as these usually retire to a greater depth than the other species mentioned. But it is the pupæ that are chiefly affected by this operation, as they are unable to work their way back into the ground after being once exposed to the cold; and, as has been well stated by Prof. Riley, plowing at this time breaks up the fragile cocoons of such insects as the Canker-worm.

I know not how much digging about the roots the trees will bear in the fall, but if it can be done without injury to them, I think it would be well to practice it occasionally. I see it was recommended several years ago as a means of destroying the Rose-bug, and has since been suggested in reference to other species which attack orchard trees.

I am not prepared at this time to give full lists of species under these different heads which I think would be affected by the measures proposed, as I have not had time to go over them and classify them since I concluded to present this subject to you in this form; my object now being, as before stated, simply to present to you a plan for systematizing operations against your insect enemies. But if you should deem it worthy of action, I propose, after thorough consultation with a committee you may appoint for that purpose, to prepare a paper in accordance with the plan agreed upon, in which the species will be named under the different heads, with more particular specifications than can be given at this time.

Mulching, which we have included under this subdivision of orchard culture, appears to be considered by horticulturists as an important item in this branch of operations. I confess I am at a loss in attempting to give a general statement in regard to its uses in reference to insects, as it sometimes forms a harbor for your insect enemies, thus enabling them to continue their labors, whereas without it they may not be able to do so; while on the other hand it often affords a retreat for your little friends, and thus proves advantageous.

It is, in fact, one of those orchard operations which depends to a great degree, so far as insects are concerned, upon circumstances, and the method adopted, in order to be the best, must be determined by an examination of the surroundings of the base of the trees late in the fall. And in order to do this properly, the orchardist must be able to distinguish his insect enemies from his little friends. If the latter are more abundant than the former, this will indicate that he should leave them undisturbed, and add such protection as may be needed; if his enemies predominate, he must take steps to destroy them at once, remove the substance around his trees, and put other mulching there, or add lime or ashes, or some other substance which is likely to be obnoxious to them.

If injurious insects which pass the winter in the perfect state have been abundant, then mulching should be delayed until as late a period as possible, and should have some obnoxious substance mixed with it.

It is therefore scarcely possible to give any general plan, but I will suggest a plan which I am inclined to think would be generally beneficial where the examination above suggested—which is always best—can not be made; but I wish you to understand it is only given as an opinion, and may prove ineffectual or incompatible with the healthy growth of the trees.

In the fall, after the fruit has been gathered, let every thing be carefully cleared away from beneath the tree, and the soil to the extent of its branches stirred to the depth of a few inches and exposed to a few frosts, one or two at least, then let it be smoothed with the harrow or by drawing something over it. Immediately around the base of the tree apply a mulch containing more or less leached ashes or slaked lime. This will have a tendency to destroy the root plant-lice around the base of the trunk, and will render it less apt to be used as a harbor. If any covering is applied outside of this, leaves should be used wherever they can conveniently be obtained, but as a general rule it is best not to use the leaves from the orchard. If a few boards are laid upon the ground under the trees, they will form a good harbor for the predaceous ground-beetles which are fond of such situations; these could also be examined by those who know how to distinguish friends from foes, and the injurious species found under them destroyed; in fact, it is advantageous to have boards thus placed through the year, if care is taken to examine them occasionally and destroy the noxious species.

I see that Mr. Muhlman, in an address to the Alton Horticultural Society, states that he has made this use of boards in his orchard, by

means of which he has been able to destroy many foes, as Chinch-bugs, Curculios and Canker-worm moths, and protect many friends. The plan, I think, is certainly a good one, and deserves more attention than it receives.

It will be seen from what I have said that I think, so far as insects are concerned, only such crops should be grown as require cultivation, and as are planted and harvested the same season; and here I may add that, beyond all doubt it is well to rotate, and this rotation should not consist simply of a change from one cereal to another, but from one character of plants to another.

Pruning.—The third division of Orchard Culture, as we have arranged it, applies to pruning, including under that head all that relates to keeping the trees clean. Here the horticulturist comes in direct contact with his insect enemies; here he meets them face to face. Here he meets the Canker-worm and Leaf-rollers, destroying the foliage of his trees; the Tent-caterpillars, covering the branches with unsightly webs; the Bark-lice, spotting their twigs and stems with minute scales, sucking the life therefrom; the Flat-head borers and larvæ of the *Saperdae*, perforating their trunks; the *Aegeria*, channeling their roots, and the Apple-root blight, knotting and distorting these vital organs.

The long-range gun and far-reaching cannon are of no value here, the bayonet must be set and the sword unsheathed, for here the battle becomes hand-to-hand.

One of the first means of contending with these myrmidons, which suggests itself under this head, is so far as possible to *dislodge* and destroy them. This means work, but I have no remedy to propose that does not mean work in some form, except one, which I will hereafter mention. If this could always be thoroughly and completely done, it would, as a matter of course, be a specific, but unfortunately this is seldom the case, and even where it is possible the cost usually exceeds the profit, which is a matter always to be considered in proposing remedies. Still much, and I might say very much, can be done in this way to decrease the number and lessen the injury; in fact, under this head we find some of the most efficient special remedies which have so far been discovered.

Large numbers of various species, as you are well aware, may be dislodged and brought down by *jarring* the trees. This, I believe, is still considered the chief remedy against the little Turk, and also one of the most effectual against certain caterpillars. A number of ingenious devices, with which you are all acquainted, have been adopted to aid in this operation. But without going farther into particulars—which is not our intention at present, except so far as necessary to illustrate—we may include all relating to this point under the heading—

Dislodging by Jarring.—Another method of *dislodging* is by *gathering*. This forms one of our most important practical remedies, and should be rigorously resorted to so far as practicable, and if a little ingenuity is displayed this is oftener the case than many conceive it to be. Under another head I will mention another agency which can aid in this operation.

The Tent-caterpillars, Fall Web-worms, and others which form webs, are gregarious to a certain extent, at least during a portion of this their larval state, and may, if attacked in time, to a great extent be removed by hand; others may be reached by means of brushes, sweeps, etc., fastened to rods, and their numbers at least greatly diminished by this means.

Thorough knowledge of the habits of the species, and practice will greatly aid in this work.

Under this head, also, belongs the gathering of the cocoons and chrysalids, which remain on the trees during winter in various forms and conditions; also, the gathering of the cases of the Basket-worms, etc. This important subdivision of Clean Orchard Culture, in a thorough exposition of horticultural entomology, on the plan proposed, would require a number of specifications.

Under the general head *Dislodging*, we may place another important remedial agency, which consists in destroying the eggs. During the winter, while bare of leaves, the trees should be carefully examined, and the twigs and small limbs, on which the eggs are found, should be cut off and burned.

Some years ago (1862) Dr. Warder, in an address to your Society on the subject of Orchard Culture, stated that "All trimmings of the trees, as well as the leaves that are annually cast off from them, should be allowed to remain upon the surface, even at the expense of being considered slovenly, because these constitute the very best mulching material, and also manure the orchard."

I am aware the Doctor is one of our best authorities on this subject, yet I am constrained to believe, if insects had been prominent in his mind at the time, instead of mulching, he would have recommended burning both leaves and trimmings—perhaps neither extreme is correct.

In order to know when and where to look for eggs, it is necessary to know something of the history and habits of the species which are injurious to your trees. This, it is the duty of the entomologist to furnish you, but in order to make this available, you should study thoroughly the characteristics thus given. Especially would I urge this upon our young horticulturists. As you are just entering upon this work, make it a profession, make it a specialty, and thoroughly acquaint yourselves with what has been done and what is known, and then press onward at least one step farther towards perfection. The young orchardist, who learns to distinguish the larvæ of the Lady-bird from those of his enemies; or to know at sight, and when and where to look for the eggs of the Tent-caterpillar, has learned that which is of more advantage to him than a knowledge of the metaphysics of Kant, the *pros* and *cons* of Darwinianism, or the wordy battles of the politicians. Each apple saved, each additional peach produced, or pear placed in market, is so much absolute addition to our material wealth as a nation; and he who learns how to do and does this, does more to directly benefit mankind than did the logic of a Mill or the stories of a Dickens.

But we must return to our subject. As an additional means of destroying eggs, or preventing their deposition, the trunks of the trees

should be washed or coated, at the proper season, with some substance that is offensive to the female insects, and which will have a tendency to keep them from depositing their eggs. This remedy, which is directed chiefly against the borers, requires some caution, as improper substances may injure the trees: or, if applied at an improper time, no benefit will accrue. Hence, under this head, specifications will be necessary.

Scraping and rubbing with a very stiff, harsh brush, made of somewhat rigid material, will often do much good in the way of removing eggs from the bark, or destroying them.

Here also belongs most of those specific remedies, as bandaging the trees with paper, straw, rags, etc., to be used as traps, and with tar, tin, etc., to prevent the ascent of the wingless females of the Canker-worm.

But I can not stop now to enumerate all the methods belonging to this division of our subject, which may be adopted to rid the trees of insects and their eggs. I therefore sum up the whole matter under this general statement: *Remove and destroy them in every possible way.* Here the entomologist can materially aid you by giving the history, habits and descriptions of the various species in their different stages.

Gathering, or Harvesting the Fruit.—This last division of Orchard Culture affords one or two important means of diminishing our insect enemies, which are very simple, and therefore the more valuable. As a rule, injured fruit falls first, and in a majority of cases, before the insect contained has completed its transformations. By gathering and destroying it, you destroy the insects contained in it. Such fruit is not necessarily lost, as it can be fed to hogs or other stock that will eat it, or where it is not convenient to do this, hogs or sheep can be turned into the orchard in sufficient numbers to keep that which falls eaten, so that it may not remain on the ground long enough to allow the perfect insects to escape.

After the fruit is garnered, care should be taken to destroy the perfect insects, which come out and seek hiding places in the chinks and crevices of the boxes, barrels or walls of the bins, or cellars in which it is placed.

These remedies, so far as apples are concerned, apply chiefly to the destruction of the Codling-moth.

Having now briefly alluded to the various methods of destroying or counteracting injurious insects, which a proper mode of culture affords, I will allude to one or two other general remedial agencies which do not properly come under any of the heads mentioned.

The first, and one of the most important of these, is to be found in the protection and multiplication of insect eating birds, and is the exception alluded to which does not require work, as these faithful allies do this part of the work for us. I am aware there is some doubt in regard to their utility even in the minds of some horticulturists, but why, I am unable to say, unless it be that some species have occasionally injured some fruit for them. But the simple fact that the Author of Nature has given to them this [illegible] eating habit, is evidence sufficient of itself to

show us that He who possesses infinite wisdom designed them as one of the chief agencies for keeping in check the myrmidon hosts of plant destroyers. The introduction of a civilized population with its uncivilized weapons of destruction, which are turned against the forest songsters and feathered tribes, has broken the balances and counter-checks which Nature arranged; and in proportion, as our allies are destroyed, our enemies increase. Let us have laws, then, which will preserve these faithful aids; not laws which stand as dead letters on the statute book, but laws which provide adequate means for their enforcement. If but one-fourth of what would be gained thereby were properly expended, it would pay commissioners to see the laws enforced, and ere long fill your groves with feathered songsters, which would act as insect scavengers for you.

I am not so thoroughly carried away with this idea as to suppose that birds will sweep from our midst the whole insect fauna, or that no more Curculios, Army-worms, or Chinch-bugs, will be seen, or even that no more orchards or fields will be severely injured by them. But I do believe that a sensible diminution of the injuries caused by insects will be the result.

I do not know that the English sparrow could be domesticated and multiplied on our prairies; in fact I have some strong doubts on this point; but other equally valuable species might be—at least our native species can be protected and multiplied.

Another general means of diminishing injurious species might be obtained through our common schools. If our children, while young, were taught to distinguish the leading species, and to know when, where and how to find them, millions might be gathered and destroyed each year by giving little rewards. Many poor houseless wanderers and ragged orphans, or those made worse than orphans by worthless parents, might not only thus be made useful instead of beggars, gain a living instead of starving, but also learn habits of industry and be made useful members of society. If this was required of all our teachers, it would require but little time in the school; a little book of a few pages, and proper illustrations, would be sufficient to give all that is necessary for this purpose. I find from experience that the little fellows take hold of the subject readily and learn it rapidly; and so far I have preferred using no book but that which nature affords, and, where they can be obtained, specimens instead of figures—except my own rough drawings on the blackboard.

And lastly, it is scarcely going too far to hope the day will come when the favorite idea of the lamented Walsh will be realized in the rearing and transportation of parasitic insects as a regular business.

Besides these general remedies which apply chiefly to the orchard only—and the list is still incomplete—there are special remedies which are applicable only to particular species, and which are important. But I have from the very nature of the subject discussed, confined my remarks to the former, in order to illustrate a plan of systematizing operations, and to induce your society, if possible, to take the initiatory step toward bringing about concerted action in this warfare.

As will be seen from what I have said, I have no idea of conquering the enemy in a single battle, but rely upon using every means in our power to destroy them, striking down some here and others there, thus by steady, continuous strokes diminishing their numbers, and thus finally bringing them under control. By this method, and this only, can the great work be accomplished.

Before closing I will present you with a synopsis or tabulated arrangement of the various divisions and sub-divisions mentioned, and the remedies under each, in order to illustrate the plan of a paper which I suggest be prepared under the supervision of your Society and placed before the horticulturists and others of our State interested in these operations. Of course it is far from complete, but will serve to illustrate the plan suggested, which is all intended at presented.

HORTICULTURE.

1. Culture of the Nursery.
2. Culture of the Orchard.
3. Culture of the Vineyard.
4. Culture of the Garden.

We will take, for purposes of illustration, the

CULTURE OF THE ORCHARD.

1. *Clean and thorough culture.*

1A. *In Planting.*

1*b*. Select sound, healthy trees, free from insects or indication of them, and from home nurseries.

2*b*. Cultivate the ground at least one year previous to planting in some crop requiring plowing; or plow and expose to the winter previous.

3*b*. Do not plant in sod or grass; and in the timbered sections first clear out the stumps and logs, and clean generally.

4*b*. Dip the roots in soap-suds before setting.

2A. *In cultivating the soil* (*including mulching, etc.*)

1*c*. Cultivate the soil in some crop that requires repeated plowings, and that is harvested annually. Not in grass or winter wheat. Rotate.

2*c*. Late fall plowing should occasionally be practiced, especially if the Canker-worm or other insect which winters in the ground has been abundant.

3*c*. Dig about the roots in the fall, after having cleared the surface under the trees of rubbish.

4*c*. Mix leached ashes or slaked lime with the mulch to be applied immediately around the trunk; lay a few boards on the ground, etc.

3A. *Pruning and cleaning.*

1*d*. Cut off the small branches and twigs affected, or having eggs on them, and burn them; also burn other trimmings.

2*d*. Dislodge and destroy.

1*a*. By jarring.

2*a*. By gathering.

3*d*. Pick off and destroy, especially during the winter, cocoons, pupæ, etc.

4*d*. Rub the trunks and larger branches occasionally with soap or other substance obnoxious to the borers, etc.

5*d*. Scrape the bark and rub with a rough brush.

4A. *Gathering and preserving the fruit.*

1*e*. Gather and destroy or feed to stock all the fruit that drops to the ground before maturity; or that will fall before ripe with moderate jarring.

2*e*. Where this can not be done, turn hogs or sheep into the orchard, and allow them to eat the fallen fruit.

3*e*. Watch for and destroy the perfect insects which escape after the fruit is housed, especially the Codling-moths.

II. OTHER GENERAL REMEDIES.

1. Protect and multiply insect-eating birds.
2. Encourage the raising of domestic fowls.
3. Teach children to distinguish the injurious species, and employ them in gathering them and trapping them.
4. Encourage the rearing and transportation of parasitic species.

III. SPECIAL REMEDIES.

Conclusion.—I presume some one is saying, this is all very good so far as it goes, but you have failed to tell us the most essential part of it: How to put it into practice? This, I am aware, is the most troublesome factor you have to contend with in working out the great problem of horticultural perfection; and I confess I do not feel so sanguine in regard to it, as I do in reference to the theoretical or talking part of the work. Yet, I think it is possible to do something in this direction; and moreover, it is certain there can be no co-operation until a plan is proposed by some such body as your Society. Will you agree that your Society has existed for nineteen years, without bringing your science or art, whichever you may call it, nearer to perfection in Illinois, than it was when you first organized? Surely not. Otherwise, your time and means spent in connection therewith has been thrown away. Why, then, despair of doing any thing in this direction? Although there is much yet to be ascertained in reference to our most common injurious species, yet enough is already known to afford sufficient data to, at least, begin this generalization, if it will ever be possible. What then, can you, as a Society, do in this direction?

You can take hold of the subject, and perfect a plan of operations somewhat similar to that proposed, varied and changed to adopt it to what you, by experience, know to be true in reference to horticultural operations. All may not agree as to any one point, but the opinion of the majority can be ascertained, and this is not apt to be far wrong. If you can not agree among yourselves, then, as a matter of course, there is but little hope of obtaining general co-operation.

In order to be more specific and directly practical, I suggest that you appoint a committee, of at least three of your members, to take this matter into consideration. As the entomological side should also be represented, I propose, if agreeable to you, to meet with that committee, at such time and place as may be agreed upon, in order to discuss and arrange the plan, item by item, in a concise and systematic form, thus bringing in the entomological and horticultural elements. Finally, I would also suggest that Professor Burrill be requested to act with us in reference to injurious fungus-growths, and Professor Forbes on ornithology.

To do this work properly, would require a sitting or sittings of some length, but the importance of the subject demands it.

After completing our labors, your committee can report the result to you at your next meeting, for your adoption or rejection; or you may authorize your Executive Board to receive it and act upon it. But, be this as it may, after the plan is agreed upon, and put in as condensed a form as possible consistent with utility, it should then be published in a cheap form for distribution. Perhaps it would be well to ask the Legislature to publish it, and with it a report which I will prepare to accompany it, on such insects as affect horticultural operations, the plan of which I will submit to you or to the committee.

After it is published, its distribution should be through your officers, and it ought, if possible, be placed in the hands of every man in Illinois, who has an orchard, nursery, or vineyard; and its adoption, in practice, urged upon them. The various horticultural societies in the State, the granges, clubs, etc., should, as far as possible, be enlisted and urged to press it upon their members.

There never has been a time in the history of American agriculture, when such a movement as this could be put on foot with as great a prospect of success as now. It is, therefore, wise to seize upon the opportune moment, and utilize the influences which you can control, and lift not only your branch, but agriculture as a whole, a step higher toward perfection. There are other important questions staring you in the face, but this is the most pressing now, and calls for action first.

As a matter of course, there will be numerous extraordinary cases which the plan submitted will fail to meet; but if I have succeeded in making myself understood, you will perceive my present object has been to call attention to general preventive and remedial measures, especially those appertaining to the method of culture; and, if I have said any thing to interest you, and which may prove of any value to you, I am amply repaid.

DISCUSSION ON THE ADDRESS.

THE PRESIDENT announced that remarks upon any topic of the address were in order; whereupon

MR. PERIAM (of Chicago) said: I must say, Mr. President, I have never listened to an address upon this subject that seems to come so near to the point as this. To use a significant expression, Professor Thomas "has struck oil," and this looks like coming to something practical and available; and if we can but half carry out the plan proposed, incalculable benefits will result. I move you, sir, that we appoint a committee, as Prof. Thomas has suggested, and that we co-operate with him in this good work.

MR. STARR—I have attended the meetings of this Society for many years; I have listened to horticultural addresses and entomological discussions, but I have never listened, with more satisfaction, than I have to-night. We have never before seemed to touch the core of the subject. This blow has hit the nail on the head. I congratulate the gentleman upon his address, and I like its recommendations.

MR. GALUSHA—I agree with the gentlemen who have spoken. You remember that, when Dr. Hull was with us, he used to say, with reference to the Curculio: "Gentlemen, unless we can have concerted action and systematic co-operation, it is up-hill business to combat this insect." We have never before had a plan put before us by which we could act together and helpfully. I fully accord with this plan, exactly as proposed by Prof. Thomas: we can not do better than to act upon it. The thing is here clearly stated, and the work to be done is definite; and if by this means we can bring about co-operative action, it will, in so far, be a grand thing, and for which the country will bless us; and our Legislature, seeing the good work we have in hand, will not withhold the needed appropriations to our Society to carry it forward. It seems to me that the appointment of such a committee as is proposed, who will carry out the recommendations, is the best thing we can do. I hope this Society will give the subject, now and hereafter, the attention it demands.

DR. LONG (of Alton)—This is the plan urged forward by Dr. Hull to rid our orchards of the Curculio, and it is the method I advise to free the apple orchards of the Canker-worm—*co-operation*; that is the thing! It will bring success, if any thing will; and I believe it might be made successful, so that when we take up an apple or peach, we would not find a worm in it.

The motion of Mr. Periam prevailed without a dissenting vote.

A discussion ensued upon the manner of selecting this committee. Motions were made for the President to appoint, which he declined doing; and for a nominating committee to present names, which was lost. A motion to refer the appointment to the Executive Board *prevailed*, and the Society then adjourned.

WEDNESDAY MORNING.

PRESIDENT SCOFIELD called the meeting to order at the regular hour; and Professor J. B. TURNER led in prayer at the opening exercise.

REPORT ON GENERAL HORTICULTURE—THIRD DISTRICT.

THE PRESIDENT called for the report of Prof. TURNER, of committee for Third District, who reported the following:

The Committee on General Hoticulture is expected to report on the *Status*, Modes of Culture, and Results of Horticulture in their several districts; the weather, species, varieties, soils, adaptations, insects, remedies, etc. So far forth as the Third District is concerned, I can speak positively only of my own near vicinity; and thereabouts I can assure you that the general "*Status* of Horticulture" is very *stationary*, indeed. During the past year we have made no great improvements in horticulture, outside of the introduction of one very remarkable, and entirely successful, great labor-saving machine; it was universally adopted, without advertisement, hand-bills, or wood cuts; though there was some little puffing and blowing done, by its most intimate friends, at various times during its incipient inauguration and trial. At first, last fall, all our people called it, not exactly a humbug, but they regarded it as a very dry and useless concern. Along in winter they began to look at it more coolly; toward spring, somewhat more cheerfully and hopefully; but in May they gave it the cold shoulder again, decidedly; while in June and July, when they come to see it fully and fairly at work, and clearly showing what it could do, when it half tried, they could not look at it without tears in their eyes; tears in their faces; tears on their heads, hats, bonnets and cloaks; tears on all the trees, and fences, and grasses; and great and perpetual thunder showers of tears, falling thick and fast all around. Of course this wonderful labor-saving machine was the weather; it, in fact, saved us, so far as fruit is concerned, almost our whole season's work; it thinned, and cultivated, and picked, and barreled, and housed, and peeled, and dried, and cored, and stoned, and stewed, and baked, and canned, and ate, and digested, almost our entire fruit crop for us; and if any of you know of a machine that can do more things than that, I would like to see it. And then it works so easy; we did not even have to grease it all the summer long. I don't know who has these machines

for sale; whether Father Tice, or old "Probabilities;" however, you need not send for one yet, as they will be around again before you will want to use one of them.

We have also in our town another thing, new to us, which I think a good thing, or soon will be, to pack fruit in, as it has already proved first-rate for packing lime, flour, etc., etc. It is an air-tight and water-tight paper barrel, manufactured by M. P. Ayres & Co. So, you see, we raise wheat on straw stalks, and stack it in straw stacks, pack it in straw barrels, and, I fear, sometimes feed to straw men, down our way. It would save a vast deal of bruising, rotting and loss if we could handle our fruit in the same way.

I have also heard of one or two apple-gatherers from Adams county, said to be good things, but I have not tried them.

Grapes.—Mr. Craven, of our city, meets with remarkable success, both as to yield and quality, in training his *Concord grapes* fan-shaped, on a trellis very close to the ground, and very closely cut back. Professor Standish, of Galesburg, is equally successful, by close and careful pruning; though I think, by the upright system, in part at least, a few vines in a garden, with a little skill and care, will bear an enormous quantity of grapes on any dry, suitable soil; and generally the dryer the better; but they will pay far more than their cost, to any family, if left to run wholly at random. It may not pay to market them, but I have always made an enormous percentage of clear profit in eating them.

Pears—As to pears, the trees still blight: our soil and climate is not favorable to them. I have myself cured the pear-blight more times than I have the Asiatic and the hog cholera, both put together. I have cured several trees—as the Irishman cured the widow's husband, "until he died;" but I still eat pears, out of pure spite.

Peaches in the Third District generally grow well and do well when not taken by the frost; but that happens so often that there is little profit in attempting to raise them for the markets abroad. One-half the time we do not get enough for our local markets.*

Small fruits that are perfectly hardy do reasonably well.

Plums are good for nothing, except to breed Curculios, to bite, and injure, and destroy all other fruits; that is, as they are almost universally managed.

The *hardy Cherries* do reasonably well; and the birds do still better, about the time they are ripening. For several years they took all the fruit, of all sorts, I had on my place, and paid me in songs, until I began to hand them back the change in shot; since then they have not bought so freely. I have discovered that they are great inflationists, as well as great singers; they decidedly prefer paper to a metallic currency. Our great standard fruit, *apples*, they do not ordinarily molest, and beyond all doubt are a very great advantage to the orchard. When plenty they

* One single seedling peach tree on my grounds has borne fruit each year of our past cold winters, in one of which the thermometer in town, for about one hour before daylight, was reported at forty degrees below zero.

save me all trouble about wine-presses for the vineyard, as well as about ladders for the cherries and baskets for the strawberries, raspberries and green peas; and I can always see where the best pear hangs in the tree-top by merely noticing that they have picked into one side of it; or, if extra good, into several sides.

Apples, hereabouts, have come to be terribly infested by the Codling moth, in all fruit-yards near the towns; but in isolated orchards in the country, where hogs, sheep and stock can be freely turned in to gather the fallen fruit, the trouble is far less. Cleaning, soaping, hooping, shingling, ragging, clouting, and bagging the trees, will do little good if you are where the insects can fly in upon you on all sides from your neighbors' neglected premises. In such conditions the only sure remedy is to take the orchard into the house and carry it down cellar; or, perhaps, to get up in the morning and sprinkle lime on the fruit itself, every time the dew falls, while the pests are on the wing.

But the poor insects have had a hard time of it the past season. That great labor-saving machine did up the job for them more effectually than it did for us.

On the whole, Central Illinois is not favorable to fruit raising as a business, except in quite favored locations. Our farmers can generally get a comfortable supply of fruits for themselves and families with very little trouble, and have a little now and then for sale; but their great staple business is now, and always must be, stock and grain raising; and in that line they are wholly unsurpassed. Along the rivers and among the hills and barren lands, quite off from our richest grain and grass lands, which will be found our best lands for fruit; and such locations can be found, abundantly sufficient to supply the country with fruit, ever ready for those who have a taste for its culture. We have reason to hope, I think, that the extreme vicissitude of the past season, its fitful colds and heats, its excessive rains, together with its almost utter destruction of the fruit crop, will tend greatly to relieve us of our insect enemies, of all sorts, and put us in the way of soon again having a fine crop of fruit.

After the reading of the report, the President announced that the next thing in order on the regular programme was a report of the Committee on Orchard Culture, and suggested that this report be heard before discussion upon Professor TURNER'S report should be held, as the same subjects, to some extent, would probably be treated in both papers. No one objecting, the President called for a report from A. C. HAMMOND of Warsaw, who presented it, as follows:

REPORT OF COMMITTEE ON ORCHARD CULTURE.

The long-to-be-remembered winter of 1855–56 was the first that had occurred, since the fruit interest had been of any magnitude, of sufficient severity to seriously injure our orchards. That winter swept most of our tender trees out of existence, and injured many more that lingered between life and death for years, but finally broke down or died.

The winter of 1872–73, following a season of extreme drought, was more disastrous to our orchards, than that of 1855–56. A large per cent. of our orchard trees were killed outright, and all so badly injured that they were incapable of producing fruit the next season. The summer of 1874 was again very dry, succeeded by a winter equaling, and in some localities exceeding those above mentioned. The result may be imagined; the vitality of trees having been weakened by the cold of 1872–73, and the drought of 1874, were in the worst possible condition to withstand the terrible cold of the succeeding winter.

Probably, about ten per cent. of our apple and pear trees, twenty-five of cherry trees, and fifty of peach and plum trees, were killed; and the remaining apple and pear trees at least so badly injured that they can never fully recover. And I make the assertion without fear of successful contradiction, that Central Illinois will never have any sound, healthy orchards, until they are grown from trees planted in the nursery since the winter of 1872–73.

Very few, besides the observing horticulturists, are aware of the real condition of our orchards; but a careful examination will, in nearly every case, show that the heart of the tree is in a black, and decaying condition; and in many instances, the trunks are split from the forks to the ground. These cracks will, during the summer, appear to heal up, but the frosts and winds of the next winter will open them wider than before. This process will go on for a year or two, the water, meanwhile, getting in and rotting the tree; when a heavy crop of fruit or a high wind will break it down.

Those trees that are discolored will fare but little better. In a year or two the branches will begin to die, when they must be taken off, which will form a passage for the water to the heart of the tree, which will, in a few years, be found to be completely decayed; and the tree will, of course, go down before the storm.

But, asks the faint-hearted orchardist, in view of the disasters of the past few years, and the present condition of our orchards, and the probability that these arctic winters will soon be repeated, "What encouragement have we to continue to plant?" We have, it is true, no fixed data from which to calculate the recurrence of these disastrous winters, but the probabilities are, that they will not again trouble us for fifteen or twenty years; and in that length of time we can grow, and reap a fair profit from an orchard.

But there are some valuable lessons that may be learned from the disasters of the past. Perhaps the most important one is to plant none but well-tested, hardy varieties. The most fruitful cause of failure has been the great number of unsuitable varieties with which our orchards have been crowded; but the future planter for commercial purposes will avoid this mistake, and plant only those few kinds that have safely passed through the recent terrible winters.

It is now generally conceded by Central Illinois orchardists, that the profitable life of our orchards will not often exceed twenty-five or thirty years. Taking this in connection with another well-understood fact, that

the orchards that are closely planted, headed low, and pruned but little, have best withstood both drought and cold, are we not admonished to dismiss the idea of our orchards lasting seventy-five or a hundred years; and plant more closely, and prune less; expecting to secure the principal profit during the second decade of its existence.

In the whole range of horticultural questions, there is perhaps no one upon which there is such a diversity of opinion as the cultivation, pruning and general management of the orchard. One man favors constant cultivation of the soil; another says keep the orchard in grass; and both can instance cases where their theory has proved to be correct. One orchardist recommends constant and severe pruning; another says, keep off the "vandal knife." One man surrounds his orchard with a dense growth of evergreens and deciduous trees; another plants in the most exposed situation.

The safe plan is to avoid both extremes; to cultivate eight or ten years, and then sow to grass, and mow and leave the grass on the ground as a mulch. During the early life of an orchard it may be expedient to take off the first crop of grass, but the second should neither be mown or fed off under any circumstances, as it is imperatively needed to protect the roots of the trees from the fervid rays of the August sun, as well as the frosts of winter.

Our forest and wild fruit trees are mulched with leaves and grass, which prevents deep freezing, the undue heating of the earth about the roots, and the evaporation of moisture in dry seasons; and the nearer we can approach to nature's plan, in this particular, the better we shall succeed.

To properly prune an orchard, considerable skill and practical knowledge is required; and the man who does not possess both had better keep his pruning tools out of the orchard. It is often necessary to prune out the inside of the tree to such an extent that a man can get into it to gather the fruit, remove branches that interfere with one another, and cut back the lower branches that may be in the way. After this, the less pruning that is done, the better.

My own observation teaches me, that a wind-break on the north and west is very desirable; even an Osage orange hedge, if permitted to grow to the height of twenty-five or thirty feet, will be found to serve as a protection against the high winds, that so often bring down our apples by hundreds of bushels. A wind break, or even an untrimmed hedge, on the south and east may be considered a decided disadvantage, as the heavy foliage prevents a free circulation of air just when it is needed, and thus encourages scab, mildew, and insect depredations.

The experience of the past few years has demonstrated that no fruit but the apple can be successfully grown, in commercial quantities, in Central Illinois. Plums, even the iron-clads and curculio-proof varieties, have "been weighed in the balance, and found wanting." The finer varieties of cherries, can not endure our cold winters, and the more hardy ones sell so low in the market that there is no margin left for profit.

Last winter hopelessly crippled nearly all of our peach orchards, and it will, probably, be many years before this interest will recover from the

blow it has received; but it is believed that, in the hands of careful cultivators, and by planting largely of our hardy, approved seedlings—and we have a number that are not excelled by any of the named varieties—partial success may be secured.

Pear orchards have suffered by the winters above referred to, but more seriously by blight; and, as we look upon the dead and blackened trees that disfigure our orchards, we are compelled to acknowledge that pear growing has more drawbacks than incentives, and that we can offer no inducements to any one to engage in it. The only pear orchard of which I have any knowledge, that has entirely escaped the blight, is one that I have referred to on a former occasion, and belongs to Mr. Ex McCune, of Hancock county. It is about thirty years of age; has been in blue-grass sod about twenty-five years, and, during most of that time, has been entirely neglected; and the suckers and water-sprouts permitted to grow up from the roots, and also about the trunks of the trees. It is now suffering from old age, and the effect of the three cold winters through which it has just passed, but is entirely free from blight.

Mr. E. DAGGY, of Tuscola, communicates the following facts in regard to the condition of orchards in his section:

"Our orchards have proved almost a total failure; they have been on the decline since the October freeze of 1869. The cherry trees are all gone, and the pear trees nearly so. There is, really, but one pear tree of which I have any knowledge, that is sound and healthy, and has borne a fair crop this season. It is a Flemish Beauty, grafted on a seedling, about two feet from the ground, some fourteen or fifteen year ago. Whether others would have done as well, if of this make up, I know not.

"We also, have a few trees left on the lawn, in sod, among the evergreens, but they have not given satisfactory results, either in fruit, or growth of tree. Out of about one hundred and fifty trees, planted on this lawn twelve years ago, there are now less than twenty sickly trees left. They have been declining for five years.

"Now I come to the apple orchard. Of the six hundred trees, of many sorts, planted twelve years ago, among nursery stock, less than two hundred are now sound. As the trees grew, (thirty feet apart), the nursery stock was reduced to the centre, with the intention of clearing it all out, at about ten or twelve years, but the result has been that nearly half of the apple trees have been taken out already, and many more are on the sick list.

"The trouble with the apple trees also began about six years ago, and a succession of dry summers, with quite a good supply of severe winters, has kept up the tendency to decline. Many of them are dead, on the southwest, while the northeast half, in many cases, is sound, and bears a fair crop of fruit.

"Trees are generally in better condition on clay, than on prairie loam."

L. C. FRANCIS, of Springfield, says:

"As to the failure of the fruit crop, I suppose it was caused by the injury the trees received that excessive cold winter. The trees that suffered least were most fruitful this season. The Rawle's Janet, though generally badly injured, in extreme cold winters, scarcely showed any damage by the last cold winter, and generally bore well with us. The Northern Spy, on timber land, also bore well. The greater proportion of the apple and other fruit trees were badly injured by the winter three years ago, and many are too feeble to mature fruit under any but favorable circumstances.

"Plum trees that survived the winter bore well, but, with the exception of the Wild Goose, rotted badly on the tree."

D. B. Wier, of Marshall county, says:

"Our Apple crop was the nearest a complete failure we have ever had, except the season of 1856; on upland prairie the failure was almost complete, many large orchards not giving fruit enough to supply a family. On the bluffs and light soils, along the Illinois river and large streams, there was about one-third of a crop of apples. The higher and more abrupt the land, the greater was the crop of fruit, thereby showing conclusively that 'frost drainage,' or the fact of the trees being above the frost line, had much to do with their fruiting; and also that late spring frosts were the most potent cause of the failure of those not so situated. Again, trees on the east bluff, with a free northwestern exposure, produced much better than those on equally good elevation and soil on the west bluff of the river, with an eastern exposure. Fruit trees and trees of all kinds were greatly damaged in their roots by the extreme drought of the past winter; many large, bearing trees were killed outright, and many had the vitality of their roots greatly weakened. This was particularly the case on very sandy, and also on very rich soil.

"The drought of the summer and winter of 1874 was especially trying to vegetable life, and the varieties of fruit that withstood this ordeal and gave fair crops the past season, have a peculiar value, and a list of them would have especial value for future reference. I will give the varieties that have done this, naming those that gave the best crops first, in each class:

Summer.—Duchess of Oldenburg, Early Pennock, Early Pound Royal, Red June, Red Astrachan and Summer Rose. The two first bore more or less everywhere.

Autumn.—Maiden's Blush, Fulton, Rambo, Late Strawberry, Fameuse and Ramsdell's Sweet. Maiden's Blush everywhere surpassed all.

Winter.—Ben Davis, Willow Twig, Smith's Cider, Stark, Jonathan, Domine, Roman Stem, Rawle's Janet, White Bellflower, English Golden Russet, Romanite, and many others, bore a partial crop in the best locations. The three first named gave more or less fruit everywhere. I am still of the opinion that the Roman Stem is the best mid-winter apple for the farm, it being the only apple I know of in the West that is nearly perfect in fruit and hardiness of tree, but is of little value for market except when well known.

"Year after year, I become more thoroughly convinced that apple trees with *very low heads*, and with no pruning whatever—or at least none of the kind usually practiced by orchardists—is best for the West. I have hundreds of trees, now fifteen years planted in orchard, that are perfect specimens of health and *productiveness*, which have never had a twig cut from them. Their last crop of fruit was as large, fine and high-colored as their first. They have neither blight nor sun-scald.

"Of other fruits, a few words will suffice. *Pears* were an entire failure in our whole region, except the Burkit, which gave about its usual crop of fair fruit.

"*Peaches.*—For the first time we found the roots of our peach trees dead last spring; but this happened only on very sandy, high, dry soil. I have peach trees on my place forty-three years old, thus showing that the roots of the peach are very hardy. On our highest, driest, sandy soil, we had considerable bloom, enough to have given a fair crop of fruit, thus showing that the blossom buds of some varieties will survive even when the mercury sinks to twenty degrees below zero.

"*Plums.*—Every root of the European plum, on my place, was killed—not a sprout left. The Miner gave no fruit with me this year, while the Wild Goose gave almost a full crop of its beautiful, early fruit, ripening this year July 18th, and were al the plums I saw or heard of in this county.

"*Cherries.*—The common Morello and Early Richmond gave a light crop of fruit in the best locations, while the English Morello gave a full crop everywhere. Its crops on my place have been five times as great as those of the Early Richmond, on the same soil and stock, for the past five years.

"I am happy to report that some of the finest of my seedling cherries gave full crops the past season."

DISCUSSION ON THE REPORTS.

DR. HUMPHREY—I wish to inquire if this paper barrel spoken of is so manufactured that it can be headed up and unheaded at will?

PROF. TURNER—It is. The head is in one single piece.

MR. GALUSHA—In confirmation of the remarks in Mr. Hammond's report, in regard to pruning and heading trees, I have this to say: Training trees low has been my theory for many years. I was, during the past autumn, traveling in a buggy through several of the central counties of the State, and took occasion to notice the condition of the orchards on the road, and how they were affected by the different methods of treatment in pruning.

My observations confirm the teaching of the essay. I stopped over one night with a well-to-do farmer, who dealt largely in swine and steers, and cared little and knew less about horticulture; and in course of the evening I inquired as to the extent of his fruit-growing on his large farm. He replied that "he planted over a hundred trees eight or ten years ago, but didn't get apples enough for his own use; his trees were sickly, and the insects at work at them and his fruit too, so he had but very little fruit fit to use. He had seeded down his orchard years ago, and it was going to ruin fast; it was no use to try to grow fruit here; he could buy it cheaper than raise it, it was no fruit country; and he was out of all manner of patience with men who were selling fruit trees and cheating people into the belief that they would do well here. He bought his fruit from Michigan, where fruit would grow."

I did not converse farther with him, knowing he was not the kind of a man to be convinced of his error; but the next morning took a survey of his orchard. It was, as I expected to find it, composed of tall-bodied trees, nearly all leaning to the northwest, some entirely dead, and many of them nearly ruined by the borers, which had attacked them, and by the winter "sun-scalds" on the southwest sides of the trunks. They looked as though they had been attacked also by that worse than insect foe—the itinerant *professional orchard pruner*, who, having learned his trade (?) in the East, has come West to make money by destroying the orchards of those who neither read the papers nor keep their horticultural eyes open; for the trees had been robbed of a large part of their branches, and, as the proprietor said, were in a feeble, dying condition, having made very little growth the past season. I had not driven a mile from this orchard before my attention was arrested by another orchard upon

similar soil and exposure, which was rolling prairie land, but of an entirely different appearance. The trees in this orchard had been trained low, having their lower branches within from two to three feet from the ground, generally, with little pruning in the orchard, and were robust, thrifty trees, which had made a fine growth last season. I do not mention this for any other reason than to impress the truth so often reiterated in this Society, that, other things being equal, trees trained low, so that their trunks are shaded by their branches when young, are usually better both in health and productiveness than those trained with trunks five or six feet to the lower limbs; and that severe pruning tends to make diseased trees.

DR. LONG (of Alton)—I was much interested in the essay. My labors in the orchard commenced many years ago. There was a time when I produced more fruit than all the rest of the State of Illinois. My orchard now has become very old, many trees have become unprofitable, and I am cutting many of them away. The Gilpin is a long-lived tree, and has produced me some very profitable crops. The Prior's Red is a long-lived tree. There is one thing to be observed: if you raise a great amount of wood you can't have fruit; check the wood growth and you get fruit. You can do this in many ways. Bore holes in the tree, if no other way; but better sow to grass, and check growth in this way.* But I never allow my trees to remain in grass more than six or seven years at one time. My grounds are always clean. Apples are now selling in the neighborhood for two dollars and fifty cents per barrel. I have sold Gilpins, in the spring, for seven and eight dollars per barrel. I advise every farmer, who has ground that he can call his own, to set out an apple orchard; it will make food for himself and family, and nothing is more conducive to good health than good ripe fruit. About this giving up the raising of pears: I have not given it up; I had seventy varieties at one time. They have now died out and dwindled to six or seven varieties; some of these trees are now twenty-four to twenty-five years old, and bear well. These are not in cultivated ground; those in highly cultivated ground seem to suffer worst. The cultivation of pears on the bluffs of the Mississippi is a success. The soil is of a nature to suit them.

The Doctor did not consider root-pruning of any advantage.

MR. HAMMOND—I would be glad to have Mr. McCune tell us something out the pear orchard of which I spoke. I do not think there has

* Dr. Long's soil is the rich, loess soil of the Mississippi river bluffs, which, at his place, is many feet deep.—SECRETARY.

been any blight in this orchard for many years: there are some conditions in the orchard that have prevented blight, as it is the only pear orchard I know of that has not blighted.

MR. MCCUNE (of Hancock county)—I came into possession of this orchard some ten years ago, and it is now about thirty years old. The man first owning it said, when the trees were young, he commenced to prune the orchard, and care for it, and it began to blight; but he stopped caring for the orchard, and said it might go to the dogs for all he cared, and he did nothing for the trees afterward; but the blight ceased, and there has been nothing of it since. There are about fifty trees, and among them about fifteen or twenty varieties. It is prairie soil, moderately rich: I do not think there is any hard-pan underneath, although in wet seasons water stands in the dead-furrows between the rows.

These trees are protected by an orchard on the north side: they stand in grass not rank in growth.

Voice—Where is this?

MR. MCCUNE—This is in Hancock county, about four miles southeast of Warsaw. The fruit is not large, and only fair in quality. The trees, many of them, have come up from water-sprouts, or shoots about the base of the dead and blighted trunks. Across the road from this orchard was an orchard of one hundred dwarf pear trees, which have all blighted and died.

DR. HUMPHREY (of Galesburg)—I think a growth of corn planted in the orchard is of great service in preventing injury, as it breaks the sun's rays, which are apt to damage trees.

ARTHUR BRYANT (of Princeton)—If my experience is worth any thing, a man can not be sure of freedom from blight by growing trees in grass. I have tried the grass remedy, and failed; there seems to be no rule established exempting any pear orchard from blight.

MR. MCWHORTER—Have you noticed that where manure is used most freely blight is worse? Is that your experience?

MR. BRYANT—I have never used stable manure on pear trees.

MR. MCWHORTER—I have noticed this in several cases—not that I would state that this is the occasion of the blight, but I have frequently noticed that pear trees blight in such situations.

MR. BRYANT—Blight, in fact, is a subject that I don't want to talk about at all.

THE PRESIDENT—Discussion on this subject has never given us much light.

DR. WARDER (of Ohio) reminded the Society that, at their meeting at Bunker Hill, some years ago, some one proposed to cure the pear blight with a *spoke shave*. He said: We laughed at the idea then, but I am not sure if the old man, who proposed this remedy, was not right; I think I have stayed the ravages of blight upon my own trees by cutting out the black patches as they appeared here and there upon them.

PROF. TURNER (of Jacksonville)—More than twenty years ago I practiced on my pear trees with a jack-knife, and thought for a while that I was succeeding. But the trees got into such a chronic habit of being doctored and patched, that they seemed to look for it; but these same trees, from which I had taken out every speck of the dead patch, so carefully, went down like a person with the consumption; at last I got sick of the jack-knife practice, and quit it, and for ten years I have neither practiced, or spoken of this thing in public, advising it.

MR. STARR (of Jersey county)—I want to say to the gentlemen from Warsaw, who say they can not grow the finer variety of cherries, and hence they grow the Early Richmond, that they can grow them. It is said the cold winters there are unfavorable. How much colder is it in Warsaw than in New York, and some other localities where the sweet cherries are grown? It is not the inclement winter that kills the tree, but the heat of summer; and if you will plant your trees on the northeast side of a building, you will get fruit; or, if you will only protect the trees on the southwest side with boards, it will be of great service. There is little trouble in growing sweet cherries when you know how.

MR. JONES—Suppose you plant on the north side of a hill?

MR. STARR—That would be a favorable location.

DR. LONG—Friend Starr is a favored man; his location is a peculiar one, and the soil is peculiar, especially adapted to the cherry, and he can hardly help having fruit. The effect of the Mississippi river, on the west side of his place, is by no means a small item. Dr. Hull, on similar soil and location, would have cherries and peaches, when I would have none, being differently located.

MR. STARR—I will say this further, that wherever you can grow the chestnut you can grow sweet cherries; it is not the cold that kills the cherries, it is the heat. You are depriving yourselves of one of the best of fruits, while you say "it is no use, we can not grow cherries." It is not the location altogether that gives me my crops. The cherry tree is one of the first trees to ripen its wood. You know this; it enters the

winter in good condition, and comes through the winter sound. If I can grow cherries, you can grow them; you have the same soil at Warsaw that we have.*

J. S. JOHNSON (of Hancock county)—It has been noticed in the case of pear trees, which die in the top, that the roots, on examination, are found to be dead, and some have come to the conclusion that the roots die first. Now, I want to ask the question: What causes the roots to die?

MR. STARR—Let us drop this subject of pear blight and pear growing, if you please, Mr. President. If any man here has a pear tree, let him hold on to it, but don't buy another one, to set out, to disappoint you. We can not grow pears in this country and make any money out of them.

MR. PHOENIX (of Bloomington)—Is there a man here who has succeeded in growing pears? If so, I hope to hear from him. I want to protest against Mr. Starr's declamation against the pear, and *cracking* up cherries instead! It is awful! I don't like to hear that. Pears are and can be grown successfully in Illinois. If a tree dies, set another, but don't let us give up the pear.

MR. STARR—I still will maintain my ground. I set out one thousand pear trees, and have some pears from them every year, but nothing in comparison with the expense; and they are going—dying—and soon they will all be gone. Because there is an isolated one who succeeds, is no reason why you and I should plant pears, and hope to reap reward. I know pear trees fifty years old, but what are the pears worth when you get them? Such trees have nothing else to do but put on life and live through the centuries; but the trees we set do not live; they die, and die early, and we are desolate.

MR. BRYANT (of Princeton)—I, too, must take issue with Mr. Starr, on the assertion that, "wherever the chestnut will thrive, sweet cherries may be grown." I have grown the chestnut, and can grow it, but I can not grow the sweet cherries. Another thing—I think the cold does kill the cherry trees. In the winter of 1855–56, I had cherry trees killed by the cold, and also more than seventy bearing apple trees killed from the same cause, and it was nothing but the cold that killed them. I think a great deal is due to the soil. Our soil is too rich for sweet cherries. I

* A deep, *loess* soil.—SECRETARY.

have seen them grow in New England, where it is colder than here; but I have never succeeded here, nor have I made ten per cent. on the cost of their cultivation.

THE PRESIDENT—The sweet cherry crop in New England has been a failure.

MR. WIER (of Lacon)—I must agree with Mr. Starr that the sun on our clear days in winter has a terrible and disastrous effect on many kinds of vegetation; my sweet cherries, in the winter of 1872–73, withstood 28° to 32° below zero, and were but very little injured, and many of them bore fruit the summer of 1873, and still gave fruit again in 1875, after 26° below zero, and none of my trees were killed either winter. But they all had their *trunks sheltered from the sun* on the south and west sides, and I have never known a tree of this class that did not have its trunk so sheltered to remain sound any length of time. I shelter the trunks of mine by training them so as to have branches from the ground up, cutting them back when young so as to have them very bushy near the ground. If we can get the sweet cherry into the form which the Scotch pine takes when growing naturally, and on dry soil, we need not fear its winter-killing. I am also well convinced that a bright winter's sun, such as we nearly always have during our coldest weather, produces effects that we have little dreamed of. On my rather closely planted lawn there were about thirty dwarf pear trees, which were planted promiscuously amongst other trees — deciduous and evergreen — and last spring the roots of every one of these trees were found to be entirely dead, except a few that were on the northeast side of other trees that shaded them and the ground occupied by their roots from twelve to three o'clock in the afternoon. All the trees that had even a very slight shade at this time of day made a vigorous growth the past summer. It is a fact well-known to all observing persons that so-called tender plants will survive a very low temperature in certain situations; and, when these situations are studied, the reason, as a rule, is found to be protection from the sun's rays in winter. How many more species of plants we find flourishing on the north side of a hedge or fence than on the south!—on the steep north hill-side than the south! How the sun kills in winter is not entirely settled in my mind; but I think mostly in two ways: firstly, by suddenly and repeatedly thawing out of the frozen tissues; and, secondly, by a specific action of light, without reference to heat, on dormant cellular organisms, especially in a dry state; as it is a well-known fact that our indigenous hardy plants are not injured by cold—no

odds how intense—if they are in contact with complete moisture, even what is termed dry snow affording an almost complete protection.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The Committee on President's Address reported, through Mr. JOHNSON, as follows:

Your committee would recommend:

1. The adoption of the suggestion of our President, in reference to the cultivation of orchards and fruit gardens.

2. The publishing of a larger number of copies of the Transactions of this Society: and that measures be adopted by the executive board, or at this meeting, for their more general distribution among the fruit growers of the State.

3. We would also highly recommend the adoption of some plan to carry into effect the suggestions of the President, relating to an increase of the number of signal stations in the agricultural districts, by which the agriculturists, and horticulturists may be more generally benefited by the meteorological observations of the Signal Service Bureau. We think the Government can not go backward, but must go forward in this matter, until even the sparsely settled portions of our land are offered the benefits of the enterprise.

4. We also recommend, that a committee of seven be appointed, to make a collection of fruits for exhibition at the Centennial celebration at Philadelphia.

All of which is respectfully submitted.

B. F. LONG,
J. S. JOHNSON,
A. C. HAMMOND. } *Committee.*

PROF. TUNER (of Jacksonville) protested against the too common fault of broad generalizing in making up our reports. He said: Because oaks and elms will do well in Morgan county is no reason why they will succeed as well in Missouri. We look abroad over these wide prairies, they look very much alike, and yet there is not a single mile square of soil that does not vary more or less. We do not sufficiently realize the great difference there is in the soils of this western country, and the effect of soil upon the life of different varieties of trees and plants.

I notice in our reports, recommendations of certain sorts of fruit for Central Illinois. Now, I doubt whether we are competent to recommend fruits suited even to Morgan county; what is suited to one section, or to one farm may not be suited to another. I think in making up our reports we should guard against too broad generalization. If we would guard this point our reports would be more accurate and valuable.

THE APRIL STORM IN SOUTHERN ILLINOIS.

The Secretary read the following interesting letter from ex-President Brown:

VILLA RIDGE, Pulaski Co., Ill., Dec. 13, 1875.

O. B. GALUSHA, Sec. Ill. State Hort. Society:

My Dear Sir: Your favor of the 8th inst. is received. I regret that I can not be with you at Quincy this week, but hope that the attendance at the meeting may be so large that my absence may not be noticed.

You ask me to send you "something in reference to the fruit crop, or some special fruits, of this vicinity." I can think of nothing that would be of interest to the Society, unless it might be a brief account of the remarkable storm that visited this region about the middle of April.

For several days prior to the 17th, the weather had been cool for the season and dry. On the morning of the 16th, the mercury had fallen to 34°, and a steady north wind continued blowing all day. At nine o'clock P. M. the mercury stood at 34°, the wind still blowing. On the morning of the 17th my thermometer indicated 25°, one of my neighbors reported 23°, another 24°, and another 20°. Ice was formed half an inch thick, and every thing green was frozen stiff. At this time peaches and plums were just going out of bloom; pears and most varieties of apples were in full bloom, though of the latter there was a considerable number of blossoms not quite fully expanded. Of course I supposed every thing was dead beyond redemption; but in this I was mistaken, for upon examining the buds in the afternoon, after the sun had thawed them out, I found that not more than one-third of the peaches were killed, and a much larger proportion of the pears and apples had survived. The next night was calm and the temperature very much moderated, but on the morning of the 18th there was a sharp frost, with the mercury at 29°, and strange to say there was more damage done than by the freeze of the night before; but the buds were not all killed, and the result was that we had an average crop of apples and a partial crop of pears and peaches, some varieties being full enough, and others yielding more or less, down to nothing at all.

In this connection an account of an experiment made by my neighbor, Mr. E. J. Ayers, will be interesting. His peach orchard consists of about five hundred trees, planted sixteen feet apart. Into this he hauled cord-wood, depositing a small pile in every other row each way; and with a handful of kindling wood for every pile, and a few gallons of coal oil to make the fires burn readily, he awaited the cold snap that he knew might come. On the night of the 17th he started a few fires, but soon saw that it would be useless on account of the high wind which blew the heat, first one way and then another, in such a way that the buds on the trees near enough would be alternately freezing and thawing. He gave it up for that night, but the next night, it being calm, he fired all the heaps, and the result was entirely satisfactory; the smoke next morning

hung over the orchard like a cloud, and there was no frost to be seen upon the ground under it. I think there were no buds killed in his orchard that night, and he had almost a full crop of fruit.

No doubt the fact that all our fruit was not destroyed by the extreme cold of the night of the 16th, was due to the dryness of the atmosphere; perhaps, also, the cool weather that had prevailed for several days had a tendency to harden the germs and enable them to resist a greater degree of cold than they would otherwise have done.

I desire to mingle my sympathies with those of the Society on occasion of the death of Starr and Dunlap, and especially of our distinguished President, Dr. Hull. The loss to the horticulturists of Illinois, in the death of Dr. Hull, seems almost irreparable. I hope that he may have left, in a permanent form, the results of his long experience and intelligent observation. He told me, several years ago, that he intended to write and publish a book on practical horticulture, but I am not informed as to whether he had ever carried out his design in whole or in part.

Truly your friend, A. M. BROWN.

Letters of invitation were read from G. B. BRACKETT, President of Iowa State Horticultural Society; F. W. CASE, Secretary of the Wisconsin State Society; and W. H. RAGAN, Secretary of the Indiana State Society.

DISCUSSION ON PRUNING.

J. S. JOHNSON (of Hancock county)—If not too late I want to say, in regard to orchard pruning, that we have several amateur orchardists in our vicinity (Warsaw) having an experience of ten years only, and who are still learning. They are looking to us for light and instruction. I have one in mind, who has alternately practiced with high and low heads, as the balance of testimony seemed to favor, and who is yet in doubt. My own opinion is, that we usually prune entirely too much; perhaps I am not competent to give instruction in this matter, but this is the view I take of it: We do not want trees to fork, we want upright stems, with heads of medium height—say four feet from the ground. I think we cut too much, gentlemen; I have seen orchards ruined by being cut too much.

MR. WIER (of Marshall county)—I do not care to say much upon this subject, having said all I want to say on former occasions. I invite gentlemen to come and see my orchard.* We are told to cut out the inside of the tree. There, gentlemen, is your first mistake; there is no

* Mr. Wier's apple orchards, at Lacon, are among the most extensive in the State. —EDITOR.

use in cutting away the inside of your tree. Cut not at all; the more you cut the more damage you are doing the tree, as every amputation gives occasion for scald, which poisons the tree.

MR. JOHNSON—If you do not trim at all, how do you cultivate?

MR. WIER—It does no good to plow under the tree. Besides, you can get just as close to low-headed trees as to high-headed ones after these have been bearing a few years; for those branching low tend to extend their branches upward, while those throwing out their lowest limbs five or six feet from the ground, tend to droop so that the ends nearly or quite touch the ground. I repeat, that you injure a tree when you cut it; you can not cut even for purposes of grafting without some damage, for you make a wound that will forever tell against you.

DR. HUMPHREY (of Galesburg)—There are exceptions to what friend Wier says. I have trees top-grafted with Ben Davis, and you can not tell where the one sort begins and the other ends—so perfect is the healing of the wound. But in many cases the injury is apparent.

MR. WIER—I do not mean to say that top-grafting apple trees may not be successful.

The Society then adjourned.

WEDNESDAY AFTERNOON.

The President called the meeting to order at one o'clock and forty-five minutes, and announced as the special order the reports of Secretary and Treasurer.

The Secretary, O. B. GALUSHA, presented the following report:

SECRETARY'S REPORT

FOR THE FISCAL YEAR COMMENCING THE SECOND TUESDAY OF DECEMBER, 1874, AND CLOSING THE SECOND MONDAY OF DECEMBER, 1875.

To the Officers and Members of the Illinois State Horticultural Society.

GENTLEMEN: The year just closed has been one which never will be forgotten by any of us; so many, to us, remarkable events have been crowded into it.

Soon after the close of our last meeting the sad news came to us of the death of one of our oldest, most useful and respected members—ex-President M. L. DUNLAP, of Champaign. Next followed, in March,

the decease of one who, though not so widely known, was most highly esteemed and beloved by those who knew him best—a member of one of our standing committees, an earnest worker in the horticultural ranks—Frank Starr, of Alton. Lastly, and so recently that our bereavement is still fresh in all our hearts, casting a shade of sadness over all our acts, came the ruthless destroyer and took away our head, our guide—him whom we had so recently, and for the second time, honored with the highest place in our gift.

It is allotted to others to speak of all these, our honored dead, putting into language the thoughts of all our minds and the deep feelings of all our hearts; therefore I will refrain.

All these afflictions came upon us in a season when we were depressed by disappointment in our early hopes for fruit—a year unprecedented in the history of this Society in the failure of orchard fruits. Yet we have, perhaps, great reason for gratitude to the All Father for causing the blossoms to fall, or blasting the fruit when small and before it had drawn exhausting draughts upon the trees; for so enfeebled had our orchards become, by excessive droughts and fruitage, that a repetition of these conditions this year would, doubtless, have proved fatal to a large portion of them.

The excessive rains of the past season have replenished the thirsty soils and subsoils of our orchards with water, causing the trees to recuperate to a degree we had not even hoped for, and have cheered us with the hope and prospect of a fruitful year in 1876.

Another event which makes the year 1875 a memorable one in the history of this Society is the

MEETING OF THE AMERICAN POMOLOGICAL SOCIETY, AND EXHIBITION OF AMERICAN FRUITS.

By invitation of the this Society, the fifteenth biennial meeting of the American Pomological Society was held in Chicago, September 8, 9 and 10, 1875. The committee appointed to secure a suitable hall or halls for the meetings, and for the exhibition of American fruits, after several meetings in which the whole subject was thoroughly canvassed, and after considerable deliberation, decided to accept a proposition from John B. Drake, of the Grand Pacific Hotel, in which he offered the use of a most elegant hall in that building, to be seated to accommodate five hundred people, *free;* the consideration being that the officers of the Society should make this hotel their head-quarters during the meeting; a reduction of fifty cents per day from regular rates of fare was also pledged.

This arrangement, as I have been assured by the officers of that Society, was highly satisfactory and gratifying to them. The meeting was a large one, and, although deprived entirely by my duties in the Exposition Building from being present, I can only report, that the general sentiment of those in attendance was that it did not fall behind its predecessors in interest and profit.

This meeting closed with a banquet at the Grand Pacific Hotel, given to the officers and members of the American Pomological Society by the officers and members of the Illinois State Horticultural Society. The funds to defray the expenses of this banquet were raised by subscriptions, contributions and sales of tickets by and among the members and friends of this Society, or at least a sum equal to these expenses was so raised, as will be seen by the financial portion of this report; so that none of the funds appropriated to this Society, by the State of Illinois, was expended for this purpose.

An arrangement was made by the Executive Board with the Board of Directors of the Inter-State Exposition, through which the National Exhibition of Fruits was made in the Exposition Building, opening September 8, and closing October 9. By this arrangement that Board of Directors allotted seven thousand (7,000) square feet of space in the south end of this building, and fitted it up with suitable tables and shelving without expense to this Society, and also presented free tickets of admission to all exhibitors of fruits, and to all members of the American Pomological Society. This arrangement, though in some respects objectionable, seemed on the whole, and no doubt proved to be, the best for all concerned that could have been made.

No one public hall in the city was large enough to contain sufficient tables for the fruits, and to have divided the exhibition into different parts of the city would have very much detracted from its value, and the interest it would secure from members of the societies and visitors. The expenses attending this exhibition were considerably greater than was anticipated, owing to the immense quantities of fruits which flowed in from all quarters of the Union and from the British Provinces; yet it is highly gratifying to know that the amount of our funds expended was several hundreds of dollars less than was appropriated by the General Assembly of the State of Michigan, and expended by its committee in collecting and exhibiting the fruits of that State alone.

Allow me here to suggest that, inasmuch as the sum annually appropriated by the General Assembly of Illinois, to this Society, for the advancement of horticulture, is barely sufficient to cover the necessary expenses of meetings of the Executive Board, the publication of one thousand copies annually of its reports, pay its Secretary his moderate salary, and defray the necessary contingent expenses, it seems appropriate, if not incumbent upon us, to ask an extra appropriation sufficient to cover the expenses incurred in this exhibition.

That portion of the building occupied with fruits was tastefully decorated with evergreen festoons and wall ornaments, which, with the fruits, rendered it beautiful and attractive.

All the tables originally provided were speedily filled, other and temporary ones were constructed, until all available space was occupied, and still tons of the most choice specimen fruits could not be displayed for want of space.

It is worthy of note that, notwithstanding the disappointment which many must have felt in being thus deprived from exhibiting their fruits,

there was an almost unanimous disposition to make concessions to others, and to acquiesce in the inevitable consequences of the in-pouring of such unlooked-for masses of fruits. Especially was this the case with the contributors from our own State. Illinois has, no doubt, been more barren of orchard fruits, in proportion to the number of trees, this year than in any previous year. Yet so many and so fine collections were made and presented at this grand exhibition, that not only the visitors, but the exhibitors themselves were astonished and delighted at their extent and value.

It would be diffiult to enumerate and comment upon these collections, without omitting some and failing to give to others the place which their comparative merits would entitle them.

Some of these Illinois collections, such as those of W. C. Flagg, D. B. Wier, N. Overman, J. E. Starr, and perhaps others, which were *not displayed at all for want of space*, were among the most extensive and valuable contributions of apples sent from any State.

On the whole, our State has reason to be proud of her part in this exhibition.

The magnitude of this exhibition may be approximately estimated, by those who were not so fortunate as to see and examine it, by the following list of States and Provinces, contributing collections, viz: Maine, Massachusetts, New York, New Jersey, Delaware, Ohio, Pennsylvania, District of Columbia, Maryland, Virginia, North Carolina, Florida, Louisiana, Mississippi, Tennessee, Kentucky, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Nebraska, California, Quebec and Nova Scotia.

Michigan made much the largest exhibition, owing to the facts that the crop of fruits was better in that State this year than in other Western States, and that the General Assembly appropriated the sum of one thousand dollars, to defray the expenses of collecting and exhibiting.

As a whole, the display was magnificent, far surpassing the hopes of the most sanguine. Several of the leading officers of the American Pomological Society remarked in substance that, "It was unquestionably the largest display of fruits ever made on the American Continent.

Mr. Daniel Worthington was employed by the executive board to take charge of the fruits, after the adjournment of the Pomological Society, and during the exposition, which was done to the satisfaction of our executive board and the board of directors of the exhibition.

In the following statement of receipts and expenditures by me, during the year, the amount of each is, of course, increased by the extra expenses incurred, and the collections made to defray these expenses, attending the preparations for and the conduction of the meeting of the American Pomological Society, and the national exhibition of fruits in Chicago:

EXPENDITURES FOR THE YEAR COMMENCING DECEMBER 14, 1874, AND ENDING DECEMBER 11, 1875.

I have expended the following sums, as per list of items herewith presented:

Postage on letters and circulars		$ 29 01
Postage on books (not to members)		24 45
Expressage and freights		38 20
Stationery		9 65
Traveling expenses, to board meetings, and when publishing		54 93
Telegrams		2 30
Paid expenses of exhibition in Chicago (as per list of items herewith) as follows:		
Help	$ 75 50	
Expressage, freights, and material	49 13	
		124 63
Paid J. B. Drake, on account, from collections		100 00
Returned to Treasurer, J. Huggins		69 00
		$ 452 17
Salary		300 00
Office rent, fuel, and lights		30 00
Total		$ 782 17

RECEIPTS.

I have received during the year, as per list of items herewith furnished, as follows:

	For books sold	$12.00
April 14.	Warrant No. 59 (on Treasurer) on expense account	50.00
Aug. 28.	Warrant No. 63 (on Treasurer), half salary	150.00
Sept. 11.	From E. S. Hull, in Chicago, for expenses	50.00
	On subscriptions and contributions	221.00
	Expressage refunded	8.00
	Total receipts	$491.00

RECAPITULATION.

Expenses and salary	$782.17	
Total receipts	491.00	
Balance due on all accounts		$291.17

LIST OF WARRANTS DRAWN ON TREASURER.

The following checks have been drawn on the Treasurer during the last fiscal year:

DATE.	No. of Warrant.	TO WHOM PAYABLE.	ON WHAT ACCOUNT.	Amount.
Dec. 9, 1874	47	C. E. Southard.....	Printing certificates (for railroads).....	$7 50
" 9, "	48	Tyler McWhorter	Telegraphing Societies of Ohio and Indiana.....	5.03
" 9, "	49	O. B. Galusha.....	Balance due	68.66
" 11, "	50	J. H. Tice.....	Expenses as lecturer.....	13.85
" 11, "	51	C. V. Riley.....	Expenses as lecturer.....	12.60
Jan. 2, 1875	52	O. L. Barler.....	Reporting—short hand.....	67.00
" 13, "	53	H. C. Graves.....	Expenses at Board meeting.....	16.20
" 13, "	54	A. G. Humphrey..	Expenses at Board meeting.....	13.70
" 13, "	55	E. S. Hull	Expenses at two Board meetings.....	34.46
" 13, "	56	J. E. Starr.....	Expenses at two Board meetings.....	31.89
" 13, "	57	O. B. Galusha.....	Expenses at two Board meetings.....	20.75
Mar. 24, "	58	C. E. Southard.....	Publishing Vol. 8, Trans. and Jobs.....	1,101.90
Apr. 14, "	59	O. B. Galusha.....	On expense account.....	50.00
" 15, "	60	E. S. Hull.....	Expenses traveling.....	30.62
May 8, "	61	C. E Southard.....	Printing circulars, envelopes and cards	36.50
June 21, "	62	C. E. Southard.....	1,000 circulars for Chicago Exhibition	7.50
July 28, "	63	O. B. Galusha.....	Half salary	150.00
Sept. 9, "	64	W. C. Flagg	Treas. *pro tem.*, expenses Chicago Exhibition	500.00
" 10, "	65	C. E. Southard.....	Printing bills and cards.....	29.00
" 11, "	66	J. B. Drake.....	Hotel bill for Board, and cash advan'd	168.50
Oct. 21, "	67	G. H. Baker.....	Expenses collecting and exhibiting Union Co. fruit.....	23.50
Nov. 22, "	68	T. Butterworth....	Expenses at Board meetings.....	24.00

All of which is respectfully submitted,

O. B. GALUSHA,
Secretary Ill. State Horticultural Society.

NORMAL, Ill., Dec. 11, 1875.

TREASURER'S REPORT.

JONATHAN HUGGINS, Treasurer of the Society, read his report, as follows:

STATEMENT OF THE TREASURER OF THE ILLINOIS STATE HORTICULTURAL SOCIETY, FOR THE YEAR COMMENCING DECEMBER 7, 1874, AND ENDING DECEMBER 14, 1875.

RECEIPTS.

Balance in hand, as per statement, December 7, 1874		$1,427 71
Membership fees		86 00
Apportionment from the State for 1875		2,000 00
Sept. 22, 1875, From	O. B. Galusha, cash	34 00
" 28, " "	O. B. Galusha, "	35 00
" 28, " "	J. Huggins, donation	10 00
" 28, " "	T. Butterworth, donation	24 00
		$3,616 71

EXPENDITURES.

I have paid warrants on the Treasurer as follows:

DATE.	NO. OF WARRANT.	TO WHOM PAID.	AMOUNT.
Dec. 9, 1874	47	C. E. Southard	$7 50
" 9, "	48	T. McWhorter	5 03
" 9, "	49	O. B. Galusha	68 66
" 11, "	50	J. H. Tice	13 85
" 11, "	51	C. V. Riley	12 60
Jan. 2, 1875	52	O. L. Barler	67 00
" 13, "	53	H. C. Graves	16 20
" 13, "	54	A. G. Humphrey	13 70
" 13, "	55	E. S. Hull	54 46
" 13, "	56	J. E. Starr	31 89
" 13, "	57	O. B. Galusha	20 75
Mar. 24, "	58	C. E. Southard	1,101 90
Apr. 14, "	59	O. B. Galusha	50 00
" 15, "	60	E. S. Hull	30 62
May 8, "	61	C. E. Southard	36 50
June 21, "	62	C. E. Southard	7 50
		Carried forward	$1,538 16

Date	No. of Warrant.	To Whom Paid.	Amount.
		Brought forward.....	$1,538 16
July 28, 1875	63	O. B. Galusha.....	150 00
Sept. 9, "	64	W. C. Flagg (Treas. *pro tem.*).....	500 00
" 10, "	65	C. E. Southard	29 00
" 11, "	66	J. B. Drake.....	168 50
Oct. 21, "	67	G. H. Baker.....	23 50
Nov. 22, "	68	T. Butterworth.....	24 00
		Total amount paid on warrants.....	$2,413 16
		Leaving in the treasury the sum of.....	$1,203 55

Respectfully submitted,

JONA. HUGGINS,

Treasurer Ill. State Horticultural Society.

Woodburn, Ill., Dec. 14, 1875.

The President—These reports, under the rules of the Society, will go into the hands of the Auditing Committee.

IN MEMORIAM.

The Committee appointed to present resolutions relating to deceased members reported, through Mr. Wier, as follows:

Mr. President, and Fellow Members of the Illinois State Horticultural Society:

Your Committee on Resolutions relating to our honored dead will report in brief, in view of the fact that your sentiments will be presented more at length by others who are to immediately follow us:

Whereas, Since our last meeting, our brethren and co-laborers in horticulture—Hon. Matthias L. Dunlap, one of the ex-Presidents of this Society; Frank Starr, Secretary of the Society in its earlier years; and Dr. E. S. Hull, the first President of this organization as a State Society, and our President for 1875—have been removed by death; and

Whereas, Deeply mourning, as we do, their death, and feeling the irreparable loss to this Society, to horticulture, and to the community at large, be it

Resolved, That the sincere sympathy of the members of the Illinois State Horticultural Society is hereby tendered to the families and friends of our deceased brothers; and that copies of this preamble and resolution be transmitted to them by our Secretary.

Signed by the Committee.

The report was unanimously adopted, by a rising vote.

DR. JOHN A. WARDER (of Ohio)—Mr. President, I would like to say one word: One object in coming here was, that I might have an opportunity to unite with you in paying respect to the honored dead. I am particularly pleased with the expressions of high regard, which I hear, in which these men were held, and whom I knew to respect and love. The resolutions offered do not contain a word too much.

IN MEMORY OF M. L. DUNLAP.

JONATHAN PERIAM read the following eulogy on the life and services of Hon. M. L. DUNLAP, of Champaign:

Mr. President, Ladies and Gentlemen:

It is with a feeling of profound sorrow that I address you upon this subject—one upon which you all deeply feel—the death of our friend and laborer, the Hon. and late M. L. Dunlap, an ex-President of this Society. It opens anew the sorrow we all feel, and causes troubled tears to spring afresh for one who has passed away from among us since our last annual meeting; but, tempering the profound sorrow for the loss of our friend and brother, we have the sweet recollection, the bright memory of the good he accomplished while living.

I experience also some diffidence in approaching a subject that I feel might have been left to some more able eulogist, who could have more perfectly portrayed the merits of one who, while giving a life labor to literature as connected with horticulture, yet as earnestly labored in the field, garden, orchard and vineyard; thus practically showing, by the work of his hands, his love of

> "An art which does mend nature—change it rather,
> The art itself being nature."

But notwithstanding the diffidence I feel—feeling my inability to do the full justice which his memory demands—I nevertheless experience great satisfaction, melancholy though it may be, in approaching this task. I, as boy and man, have known Mr. Dunlap for over thirty years, and intimately for the last twenty-five years. In all this time I have never known him fail a friend in the hour of need, shirk responsibility, however onerous, or refuse to lend a helping hand to the really needy.

> "The groves were God's first temples."

and here before man learned

> "To hew the shaft and lay the architrave;
> Amid the cool and silence he knelt down
> And offered to the Mightiest solemn thanks."

One of the best of the life-works of Mr. Dunlap, was the grouping into groves and shelter-belts trees, of varieties, perhaps, whose intense shade have sometimes formed the worshiping place of man. Not only

did he himself plant, but by his precept and example he fostered forest planting by others. So, at his home, he made extensive plantings, with a view to demonstrate that within the shelter of tree-belts orchards would bow their branches under the weight of full average, annual fruitage, and that fruits became kindly, and flowers blossomed, that without their influence would be exotic; that when trees

"Wave their giant arms athwart the sky,"

then,

"All meek things,
All that need home and covert, love, soft shade,
Birds of shy song, and low-voiced, quiet springs,
And nun-like violets, by the mind betrayed,"

might nestle, live, bloom in beauty, or in fragrance, there.

Mr. Dunlap was a self-made man, and hence the vein of plain practicality that incited all his actions, and accompanied him always. Hence his writings, like his works, though often polished, were always pointed and always practical.

Matthias L. Dunlap was born in Cherry Valley, New York, September 14, 1814, and consequently at the time of his death was sixty years and five months of age. The farm on which he was born was owned by his father and his grandfather before him, who settled upon it under a Crown grant, and while yet that whole country was a wilderness. He came to Illinois in 1836, and for a time taught school in LaSalle county. After that he was employed in Chicago as a dry goods clerk, and later was with Hugenin & Brown, a firm connected in the construction of the Illinois and Michigan canal. In 1838 he purchased a farm at Leyden, in Cook county, then known as Dunlap's Prairie, and followed the business both of farming and surveying. In 1846 he started a nursery, but the railroads built about that time did not afford him an accessible depot or desirable transportation. He therefore purchased a farm near Champaign, in 1855, before the Illinois Central was completed. In 1857 Mr. Dunlap and his family removed there and settled upon the spot chosen, where he resided until the day of his death.

While in Cook county he was a member of its first and several subsequent boards of supervisors. He was also elected to the State Legislature from that county in 1855, when it had but four members. His devotion to agriculture and horticulture is well known. He aided greatly in securing the location of the Industrial University at Urbana, and was one of that institution's first board of trustees; and no man has done more than he in moulding that institution to the true status which it is now occupying.

Mr. Dunlap was a contributor to many agricultural and horticultural periodicals, East and West, and for six years edited the *Illinois Farmer*, published at Springfield. No one man has probably done more in the West to advance the cause of his chosen profession than Mr. Dunlap. We might look far to find one more simple and hearty in his manner, earnest and assiduous in his labors upon the farm, prolific and practical

in his literary work, honest and courteous in his dealings with men, or of more sterling moral worth. His busy pen has forever been laid aside: but his green memory will last in the hearts of all who knew him.

Now, that he is gone, what shall we say? I can not say it better than in the words of a journal whose editor knew him well: "How faint must seem the praise that our poor words can utter. For nearly a score of years we have known him personally—known him as a friend—admired his enterprise and energy, which seemed to halt at no undertaking, however difficult—admired the ability and zeal with which he labored with his pen—admired the devotion and patience with which he sought to instruct his less informed brethren in the noble pursuit of agriculture—admired the enthusiasm and pride with which he followed the business of farming—admired his integrity as a man, his enterprise and example as a citizen, and the pride which he had a right to feel in gifted daughters and a large family of sons, nearly every one of whom is well settled in life, and an industrious, worthy, honorable citizen. The full and proper eulogy of this good man can not be pronounced now. It will be sounded in time to come, when his memory will be handed down as one of the foremost workers among the few who devoted their lives to ennobling the art of agriculture."

Thus, Mr. President, have I briefly sketched something of the life and services of our lamented co-laborer; one who was ever earnest in fostering industrial pursuits, and as earnest in his efforts to induce education to the industries; acting always in antagonism to evils; asserting always the honorable dignity of honest labor; laboring always himself with pen and plow; striking strong and stringently against horticultural heresies; striving always in the strict line of what he deemed his duty; an honest man, fearing none, yet loving and upholding all who strove for the right. He was firm as a friend; genial in his nature; hospitable at home and abroad; and with a hand never closed to the wants of the worthy poor.

Warriors and statesmen have marble monuments reared to perpetuate their names, and the memory of their deeds; but marbles and sculptures crumble, are broken, fall, and, lying in the dust, the warrior and statesman are alike forgotten. Our friend has left a more enduring record—one which will stand when models of the sculptor's art alone remain to be admired of men who have failed to keep the memory of those for whom they were reared. His memory will be kept green in the daily record of his pen, during a long and active life, in which he labored for the advancement of his chosen profession—Horticulture. Monuments to his memory and glory are as numerous and various as the green trees he has planted.

When sculptured obelisks shall have crumbled and fallen to the earth; when they shall no longer give record of those for whom they were reared: these trees, growing as time grows, and waxing strong, will become landmarks on the prairie; in their green tops the birds of heaven will build their nests and brood their callow young; the summer breeze playing among their leaves will rustle them into soft murmurs of praise;

gorgeous in their autumn beauty, the sweeping winds will raise the strain into a stronger symphony; and, defying the blasts of winter, each noble stem shall remain as an enduring monument of the planter, while the leafless branches, and their neighbors, the evergreens, will whisper in a language that man and beast alike understand: come and seek the shelter given through the bounty of the planter. So birds will gather from year to year, and from generation to generation, within their leafy coverts, and trill their songs to the ALL GIVER.

When generations shall have come and gone; when the family name of the planter shall, perhaps, in the course of generations, have become extinct; still these trees may wax in strength, and grow into great landmarks, strong and mighty, rejoicing in their wealth of timber.

Even the giant oak of the forest, which waves its leaves in the air for five hundred years or more, must succumb at last to time, and another five hundred years in the natural process of decay may see it turned again into dust. So he whom we mourn, having lived his allotted time, has yielded up his body to the earth, from whence it came. The birds of the air, the beasts of the field, and the trees of the forest perish. Not so the spirit of man. The warrior smites thousands on the field of battle that he may be glorified among men; the statesman rules the councils of a nation that his name may be great before the people; the potentate conquors an empire for his own aggrandizement. If the grand deeds done in the body are remembered in heaven, which should the rising generation rather emulate, one of these or our honored dead? who, while humbly and cheerfully working on his farm, or in his garden and orchard, as earnestly and cheerfully labored for his friends and brethren, and who, at the same time, reared so enduring a record to his honor and glory. Let us hope the orchards and forest trees he has planted, or those which may be produced from them, may stand as long, and endure to the memory of the planter, as have the mammoth *conifera* of California, so grandly described by our horticultural poet Hempstead, who says:

"They were green when in the rushes lay and moaned the Hebrew child;
They were growing when the granite of the Pyramids was piled.
Green when Punic hosts, at Cannæ, bound the victor's gory sheaves,
And the grim and mangled Romans lay around like autumn leaves;
From their tops the crows were calling when the streets of Rome were grass,
And the brave Three Hundred with their bodies blocked the rocky pass;
In their boughs the owl was hooting when upon the Hill of Mars
Paul rung out the coming judgment, pointing upward to the stars;
Here, with loving hand transplanted, in the noonday breeze they wave,
And by night in silent seas of silver-arrowed moonbeams lave."

IN MEMORY OF DR. E. S. HULL.

Mr. JAMES E. STARR read the following eulogy on the life and services of Dr. E. S. HULL:

"Death! great proprietor of all! 'tis thine
To tread out empires, and to quench the stars;
The Sun himself by thy permission shines;
And one day thou shalt pluck him from his sphere.
* * * * * * *
Insatiate Archer! could not one suffice?
Thy shaft flew *thrice*; and *thrice* my peace was slain."

DR. EDWIN S. HULL,
BORN IN CONNECTICUT, MAY, 1816;
DIED AT HIS RESIDENCE NEAR ALTON, NOV. 8, 1875.

Having, while a youth, attained the education afforded by the schools of New England at that time, he was apprenticed to the watch-making business, pursuing only the more intricate and delicate branches of that art. After arriving at his majority, feeling no desire to continue in that trade, his aptness with tools led him to study dentistry with his father, who was at that time practicing at Lowell, Mass. A few years of close application made him a proficient, and upon his father's retiring from business the son continued its practice. In consequence of feeble health, he was compelled to relinquish his business in Lowell, and seek a more genial clime. He therefore removed to Charleston, S. C.: when in the full tide of success, his all was destroyed by the great fire, and he then returned to Lowell, and resumed the practice of his profession there. Admonished by failing health after a few years, his tastes and inclinations led him to the pursuit of horticulture. His first step in that direction was the purchase of a small place near Woonsacket, Rhode Island, in 1841. Here, and in this pursuit, he found congenial employment; but the climate, soil, and general character of the country hampered him; he longed for a wider field, and in 1844 he came West, seeking for a new home, a land of greater fertility, of wider resources, better adapted to carry out what was to be his life's work; and found it at the place which afterward became famous as the Hull Farm, near Alton, Illinois.

Let it be remembered that he was embarking in what, at that time, was comparatively a new enterprise, without experience here, and with but a brief experience East; with no one to whom he could go for counsel, with no horticultural society from which to gather ripened experience.

As a consequence, large orchards were at once planted, embracing many varieties of fruits at that time almost unknown in the West. Apples, pears, plums, cherries and peaches, all were started in the full hope of success. Fortunate for the future of horticulture was this.

The years rolled on: the fruits so hopefully planted, so carefully watched and tended, came one by one into bearing; but, alas, the end was not yet; hopes were blighted and the promised harvest was not. Insects preyed upon his fruits, and diseases destroyed or threatened the life of his trees. Dr. Hull was not cast down nor discouraged: every new enemy that appeared, every misfortune that beset him, called for new means of destruction and developed his untiring energy in efforts to subdue them. He resolved to succeed, and through this resolve he obtained that thorough, practical knowledge of tree, plant and vegetable diseases, and habits of insect life, which in later years made him an authority on such subjects.

In the pursuit and destruction of insects, the Curculio in particular, he was eminently successful. His attention was early called to the use of the sheet for the purpose of catching this insect, but the slow process of carrying and spreading from tree to tree he found to be impracticable when applied to large numbers of trees, and his ingenuity (with which he was largely endowed) brought out the "wheelbarrow inverted umbrella," which for years was in his hands a most efficient instrument.

This was a step in the right direction, but it had serious objections; it was too cumbersome and unwieldy, and its use was found to injure the trees. He therefore, ever seeking to lesson labor and make more efficient the means by which to reach insect enemies, constructed and was persuaded to patent a "curculio catcher," a light and efficient apparatus, which was a complete success.

In his efforts to discover the cause of *pear blight*, he was convinced by deep study of the subject, and for reasons which he has made familiar to you all, to try *root-pruning*. Here he found the remedy, and from noticing the effect of such practice upon the pear, he was induced to extend his operations until he came to believe that in a judicious use of the system of *root-pruning* of fruit trees lay one of the great secrets of success. He believed that the time would come when it would be found an important aid and not to be set aside.

In every thing pertaining to fruit culture he was an eager, earnest student, and practically tested all schemes which gave promise of improvement.

From having felt, in his early trials and experience, the want of counsel, he became the warm advocate and efficient promoter of horticultural societies. To him more than any other belongs the honor of organizing the Alton Horticultural Society. He was also one of the few earnest workers that met at Decatur and founded this Society, of whose interests he was ever watchful and of its influence ever proud.

His ripened experience, and intimate knowledge of insect life; of tree, plant, and vegetable growth; his zeal and energy in the promotion of horticultural knowledge, led this Society to select him for the important position of State Horticulturist. In this capacity he visited and lectured throughout the State: boldly attacking false theories and practices, advocating and promoting the true.

His contributions to horticultural literature were varied, and have appeared in many of the leading horticultural journals in the East, and he

was for several years the horticultural editor of the *Prairie Farmer*, during which time he aided greatly in the advancement of horticultural art and horticultural science.

The ability he displayed in the performance of these duties, extended his reputation and made it national. You who have so often listened to the words of experience that fell from his lips, enforced by the earnest conviction and sincerity of manner of the speaker, will deeply feel his loss; to the cause of horticulture, in its broadest sense, it is a national misfortune. He was an ardent lover and student in horticultural pursuits, and always strove to excel. No misfortunes dampened his ardor, no disappointments checked his progress; but he was ever hopeful, ever full of faith, cheerfully looking forward to better results.

If insects brought desolation to his crops, he studied their habits and sought their destruction; if diseases attacked his trees, he studied the laws of vegetable growth, and sought and found a remedy. No discouragement dismayed or overcame him, but, always true to the cause he believed in and warmly espoused, his course was ever onward.

He has gone: the ripened experience of years, the hard-earned knowledge gathered by practical research is to us no longer available; the example set by his warm, earnest nature, in the practice and advocacy of horticultural knowledge, remains.

You, who, from year to year, have exchanged glad tidings with him, who have looked to him as an authority whose teachings and counsels were to be heeded, will remember him as associated with much that was pleasant, and regret his loss as a personal misfortune.

The societies with which he was associated have lost an active coworker, experimental horticulture its deepest student, and practical horticultural science its most thorough and able teacher and advocate.

You, his co-laborers, are yet spared to carry on the work so near to his heart. His place among us is vacant; his voice no longer heard; his presence will no more be seen; his work is done.

"Oh! thus whate'er our path of life,
Through sunshine or through gloom,
Through scenes of quiet or of strife,
Its end is still the tomb.

The chief, whose mighty deeds we hail,
The monarch throned so high,
The peasant in his native vale,
All journey on—to die!"

IN MEMORY OF FRANK STARR.

SECRETARY GALUSHA read a letter from Hon. J. M. PEARSON, stating that he had intended to attend the meeting, and comply with the request of the President in preparing a paper upon the life and character of FRANK STARR, deceased; but was called away upon official business. He inclosed the following:

FRANK STARR DIED MARCH 12, 1875, AGED 49 YEARS.

He had been actively engaged in horticultural pursuits for more than twenty years; serving the State Horticultural Society, as Secretary, one year; and was an active member of the Alton Horticultural Society for twelve years. He was modest and retiring, yet enthusiastic in all the departments of horticulture, especially in the culture of flowers. We have lost another friend, another of our working men.

Dr. HUMPHREY offered the following, moving its adoption:

Resolved, That the thanks of this Society be returned to Mr. J. E. Starr, for his just and able eulogy upon the life of Dr. Hull.

The resolution was adopted.

ARBORICULTURE.

ARTHUR BRYANT, Senr., of Princeton, from the Committee on Arboriculture reported:

In reporting upon arboriculture for the present occasion, the writer regrets that he has not observed an increasing interest in the subject, or any considerable progress in tree planting. How is it that the discussion of this subject in our horticultural societies, for so many years, produces so little effect? Do we not overrate our influence? The annual list of members of our State Horticultural Society rarely exceeds one hundred—an almost ridiculously small number, it would seem, in so great and populous a State as Illinois; our few local societies are still smaller; our farmers are engaged in the production of corn, pork and beef, and pay little regard to any thing else. Probably not one in fifty ever reads our essays upon forest planting, or is even aware that the subject is discussed. It is a mortifying fact that one man, endowed with a good degree of shrewdness, impudence and falsehood, can, in one year, awaken a more general interest in some humbug, than all our Illinois societies have hitherto been able to do in favor of arboriculture. In proof of this assertion it is only necessary to instance White Willow Pike. Attempts to obtain legislative action have availed little. In this State, the boards of supervisors are permitted to offer bounties for planting timber trees; and until the attention of the people is more generally attracted to the subject, this is all that probably need be expected. The act of Congress for the encouragement of forestry, as is commonly the case when men undertake to legislate upon matters of which they know nothing, amounts to a mere nullity.

There are no new inducements to be held forth, or new arguments to be advanced, in favor of forest planting; and, to one who has occasion to write or speak frequently upon the subject, the reiteration of the old story becomes hackneyed and wearisome. Especially is this the case when, as at present, it seems most probable that the discussion will come to the knowledge of very few, if any, of those whom it is most desirable to

interest in the matter. What more, then, can be done? Clearly but one thing: ourselves to put our principles in practice. The force of example is far greater than that of precept. It is true that some who have spoken and written upon this subject are not in a situation which enables them to put their ideas in operation. Yet there are others owning lands on the prairies, where the advantages of planting groves and screens may be best demonstrated, who might plant a few acres. Seeing is believing: men who have never read — perhaps never even thought upon the matter, and whom no amount of preaching would move, when they perceive the facility with which groves of timber may be raised, and their manifold advantages in shelter and utility, will go and do likewise. Progress in this way will indeed be slow; but with this we must probably content ourselves until the attention of land owners shall be compelled by necessity. Mere talk avails little; what is needed is action.

DISCUSSION ON THE REPORT.

DR. WARDER—I must say I feel somewhat disappointed with my venerable friend's style of presenting this matter of tree planting on the prairies; he has so little to tell us in the way of encouragenent; and yet I know what he says is true. The hindrances and discouragements are many, and it will perhaps be many years before the Forestry Association can make any great impression upon the country and influence the farmers of these prairies to plant timber instead of corn; in fact, we are, as it strikes the farmer of these prairies, asking too much of them, and this is the reason we have not been more successful. Our farmers are, most of them, in moderate circumstances, and we can not persuade them to take land that will produce fifty or sixty bushels of corn to the acre and plant it to timber, and wait thirty or more years for a return. They can not afford to do it.

But they can do this: they can appropriate to this purpose land that is not fitted to corn growing. There is scarcely a farm of a hundred acres that has not upon it patches that are not fitted to grow grain, and that are adapted to timber growing. We advise the appropriation of such land to this purpose, and there would be profit in it aside from the mere value of the timber.

The Forestry Association, which I have the honor to represent, propose to investigate the following points, and to obtain information upon them:

1. Estimates of the area of forests in square miles of acres, and the age of trees.

2. Estimates of their productiveness per acre in cubic feet of lumber and cords of fuel.

3. Lists of native trees, and woody plants, with local and botanic names, and their special value in the arts—whether for civil or naval architecture, engineering, cabinet ware, agricultural implements, wagon making, or mill-wright work, etc.

4. Location of species relative to elevation, soil, etc.

5. Natural grouping and consociation of species, etc.

6. Numbers, kinds, and acres of artificial forests planted, and acres protected, in order to encourage natural reproduction; also the kinds planted.

DR. HUMPHREY—I had hoped that I should be able to make something of a report with regard to timber-growing in the West. There is a great need of forest-tree planting, and many of our Eastern States are beginning to plant trees. In returning from Chicago last fall, I made the statement that I believed the time would come when the people of this State would ask and receive $100,000 from the Legislature for this purpose. People laughed at me. I may not live to see it, but my son, now seven years old, may live to see it. If this is not attended to we shall be in want some day. Attention to this matter now will add wealth to the nation and soften the rigors of the climate. There must be an end to the destruction of timber in our country, and a beginning to plant and rear timber, and *that beginning must be in this Society*.

MR. PERIAM—It is said that the notion advanced that forests affect the rain-fall is all a *humbug;* and we see statements in the papers occasionally that the annual rain-fall is identical—forest or no forest.

Another statement is made, viz.: that there are to-day more trees in Illinois than there were twenty years ago. I will grant that the statements may be true, but it is the distribution of the rain-fall that is effected by forests; the rain-fall is more uniform in a timbered country, and hence more effective for the purposes of vegetable growth and health, and convenience every way.

In regard to there being more timber in Illinois, that may be. There may be more timber in Nebraska and in Kansas, but taking the country over there is *vastly less timber* than twenty years ago, and we are running short. I am glad the Forestry Association has been organized and has taken this subject into consideration.

PROF. THOMAS—What did I understand was your opinion in regard to the effect of forests on the rain-fall?

MR. PERIAM—My opinion is that the amount of annual rain-fall is not affected by forests, but that the country where there is growth of timber will have continuous, or more frequent rains, and will not suffer with drought or floods as much as prairie country does.

PROF. THOMAS—I think that opinion is, in the main, correct, and that there is a better distributing of the rain-fall in wooded countries. I am decidedly of the opinion that forests have influence in this matter of rain-fall and evaporation.

MR. PERIAM inquired as to the effect of forest-tree planting in Europe, where a great deal of attention was paid to this subject.

DR. WARDER referred him to Brewer's publication of Walker's Census, which gives a great many interesting statistics in regard to these matters. He further stated that in this country two merchantable walnut trees, for example, per acre was about the extent of the crop, while in Europe the trees stood much thicker, and much more profit per acre was realized.

PROF. THOMAS—The amount of hard-wood timber in the North-western States, and the Territory of Dakota, is much less than is generally supposed. I know of but one important area, which is the Oak Woods, in Minnesota. I was told by the workmen upon the bridge across the Mississippi river, at Dunleith, that the piling which they were using came from Southern Illinois, because no suitable timber could be found in that region. There is no hard-wood timber west of the one hundredth meridian which is fit for use, and west of this line you could not find timber to make a wagon, or even an ax handle. When in San Francisco I went into the wagon shops, and pointing to one after another of the pieces of hard-wood timber, asked where it was obtained, and was informed that it all came from the States; that the oak and ash of the Pacific Coast was unfit for use on account of brashness. While excellent timber for building purposes and furniture can be found, no good hard-wood timber grows there.

MR. BRYANT—In Bureau county the timber has been cut off—say two-thirds of it—for railroad purposes. This was mostly hard wood, such as hickory, walnut, elm, and oak. The trees that are left are small, and but little of it is soft wood.

DR. WARDER—The railroads are very destructive on young timber. I saw, as I came to this place, great piles of ties of young timber. It must strike any one who observes at all as very destructive.

PROF. TURNER—I wish to suggest what is the stumbling-block in the way, in this whole business. You may think strange of it when I tell you what is the trouble. It is *ten per cent. interest.* Now, it is impossible to figure out ten per cent. on investments in tree planting, and you can't make our hard-working farmer, who works for pay, see any money in this business. Those who plant trees must be those who, like you and

me, plant from instinct, or from some other reason than the pecuniary reward. We ask more than land owners are willing to give. I am not complaining of this, I am only stating the fact, and this fact can not be got out of the way. Men are slow to invest money at three per cent. when they can get ten per cent.!

DR. WARDER—Where can you find a farm of one hundred and sixty acres that has not land on it that will not produce ten per cent., and that might not be planted to timber, and bring satisfactory returns?

MR. WIER—I think this subject one of the most impracticable and unprofitable subjects that you can bring before this Society; for the reason that men are not going to grow timber for making money. This is the business of the Government. I would go in for the Government owning a great part of the land—for the purpose of timber growing; we can not and will not grow it. Farmers are all the while cutting down timber, "so the grass can grow, and they can make money." Timber is worthless to them. I would encourage timber growing, but not as a profitable industry.

MR. MCWHORTER—I can sanction the remarks of my friend Wier, for I know that in Mercer county groves of timber are given away to have it taken off. To the farmer, the land is more valuable without than with the timber. Still, I would encourage the planting of timber, but not on tillable lands as a pecuniary investment to the farmer.

MR. ROBISON (of Tazewell county)—We want some kind of a provision to encourage the planting of timber. The land covered with trees should be exempt from taxation, or some consideration allowed to enable land owners to enter into this industry. Gentlemen say we have more trees than we had twenty-five years ago; we may have more trees, but we have less timber. We have not the large trees, and most of the timber land is pastured, which keeps down the undergrowth, so that when the present crop is taken off that will be the last of it. The timber growth is also inferior now to what it was twenty-five years ago; where white oaks are cut off, red and yellow oaks take their places. Railroad ties are now being cut from young timber, and at a great waste, as young trees are cut which make but a single tie to the cut, and sold for twenty-five cents if black oak, or fifty cents if white oak. Some inducement should be offered to save the young timber; for if we can induce men to save their young timber, perhaps we can afterward induce them to set out trees.

This discussion was terminated here by a call from the President for a report from the committee on

GRAPE CULTURE.

GEO. C. EISENMAYER presented the following report:

The culture of the grape is a department of industry which has been engaged in from the earliest times. In the period of the Pentateuch mention is made of cultivating grapes, and we find much valuable information on the same subject in profane history. In fact, grape culture, for the manufacture of wine from the fruits' rich and valuable juice, extends back through all ages and to the remotest ends of antiquity. I may take it upon myself, too, to advance the statement that we shall find it still continued through the most distant centuries of the great and illimitable future. So long as there is a remnant of æsthetic material still left to make up the taste and character of the great human family, we shall find this pursuit in existence.

Grapes are of thousands of different varieties, and each species differs in some degree from all the others. There is some distinguishing quality or characteristic peculiar to each kind and variety of this noble fruit; each sort possesses certain peculiar and particular advantages, and must be cultivated, treated, and turned into the common product, wine, after a certain method. One common plan and climate will not answer for all of the many species of grapes, but for each distinct kind we require a separate manner of procedure, and, as diversified and numerous as are the varieties of the grape, so diversified and numerous are the systems of cultivation and manufacture. When we consider, therefore, the enormity of the ground that would be covered in a full and complete treatise on the subject of grape culture, we must become astonished with the amount of knowledge that one should possess in order to be thoroughly and completely informed upon all its particulars.

We sometimes view grapes and wine as an article of luxury and as something that might be dispensed with; yet, when we reflect upon the fact that we are supplied with so many varieties of this fruit, each designed for its own special climate, and each possessing its own special qualities, do we not recognize it as an article of such necessity that the wisdom of the great Creator has deemed it necessary to distribute it in such a way as to furnish the greater inhabitable portion of the earth's surface with it? The wisdom of the great Designer has made it adaptable to a wide range of climates, so that mankind may be everywhere made capable of obtaining it. Our attention, as fruit-men, should be given in a greater degree than it has been given to the culture and development of the grape.

To illustrate something which will show the varieties and the influence of climate and soil, let us turn to the celebrated country of the Rhine, the Moselle, and other like famous wine-raising regions. There you will find the grapes of all grapes the best and finest. This is owing to the excellent, healthy and balmy atmosphere, and in a great degree to the nature of the soil of those districts.

But, by far, that which makes these grapes superior to those of any other land is the scientific and careful attention that is paid to their cultivation.

The climate there is mild and temperate, and therefore nature has not covered the berry with a heavy coat, but has encased it in a wrapping of a fine and silken skin. The flavor of the grape is rich, aromatic and delicious, and, if I may be allowed to make use of the expression, would almost tempt the gods to partake of it! Our own country, under the influence of a severer climate, produces a coarser variety. We find the berries surrounded by a thick, heavy skin, containing a less vinous but more fleshy pulp, having large seeds, and furnished with a more vulgar flavor. Probably, if our varieties of grapes were better, the corn-juice-imbibing class would prefer wine. Still, in this rough and rugged climate, grapes are grapes and a delicious fruit. Who does not appreciate eating a bunch of fine black Concords? Ah! I fancy I hold some now; how ripe they are, and how my mouth waters in vain with eager expectation to taste them! We could go on with other districts, carefully observing the differences of soil and climate, and we would notice each variety of grape in exact conformity with the circumstances which surround it in the location of its growth. Wherever we go, we shall still find it the best, the noblest and the most delicious fruit, and, I may say, the most easily obtainable.

The great value of the grape lies in the liquid which we press from it, and which is endeared to us universally by its property of keeping for years—nay, for centuries. For my own part, I must confess that I like grape juice that keeps well; the older it is, the more I value and esteem it, and the better it becomes. But I will refrain from dwelling any longer on the wine, because I am aware that some of my friends present are of an opposite turn of mind. Yet, why should we look down unapprovingly on it? Mankind has drunk wine from the earliest period of barbarism to the most exalted condition of modern civilization. So much, then, for a description of grapes. Now, let me take up another branch of the subject.

If you, Mr. President, were desirous of being informed by me whether grape culture in this country were profitable or not, I would reply both negatively and affirmatively.

First. It is certainly more profitable for you to raise grapes than it is to go to Bascom's cross-roads, and discuss the topic of shinplaster currency; it is better for you to raise grapes, to supply the kitchen wants, than to have to buy them from your neighbor, or than to hear your children accused of hooking them from another's vineyard.

For ornamental purposes simply, it is certainly prettier to have grapes growing around your premises and climbing the sides of your dwelling, than to raise the deadly night-shade, or than to allow your door-yard to be monopolized by the rank growth of strammonium or dog fennel. It is as profitable for beginners to raise grapes as to raise apples; from the time of planting, a ton of grapes may be more quickly and cheaply raised than a barrel of apples; yet, do not permit the raising of one first to interfere with or set aside the raising of the other.

Second. I do not consider grape cultivation a profitable pursuit in our latitude. We can not make the business pay largely enough to derive a sufficient income upon which to alone subsist. We can not raise the finer varieties of grapes in this climate. The common species are so plentifully raised that the markets soon become clogged with the supply. Concord, Ives, Clinton, etc., all ripen at about the same time, and are heaped upon the market together, so that the price becomes small, and will hardly pay for the transportation expenses.

The main products in this valley of the Mississippi must still continue to be wheat, corn, hay, etc. The cultivation of grapes, figs, oranges, pine apples, lemons, etc., must be left to the more temperate regions.

We have experimented greatly with costly hybrids, but we have not made any advance, and I do not quite know what varieties might be recommended for our section of the country. Every man must make his own experiments and must choose those kinds with which he is best pleased. I have tried a number of different kinds, and can give you the opinions from my experience.

I think that I may safely say that the Martha is much superior to the Concord; Miner's Seedling, sometimes called Perkins, is also a very excellent variety; Taylor's Bullet, if you happen to get the bearing sort, may also be placed among the first on the list; Iona, Catawba and Delaware are three varieties which I would recommend that every vineyard should contain. It may be the case that they will only bear once in three or four years, but when they do bear the value of the yield is worth more than three or four regular annual crops obtained from some other varieties. The only Herbemont vine that ever bore a crop in St. Clair county entirely failed last season. This variety is only fitted for southern climates.

I would say, plant Concord, Martha, Taylor's Bullet, Miner's Seedling, and for the sake of experiment, as many of the finer varieties as you have spare time for. As to the mode of planting, the distances you place your vines apart, the method of preparing and attending to the ground, you are at liberty to determine for yourself. Pruning the vines is an important part of the business, and should be carefully attended to. It requires experience to become a good hand at the business, but any one may learn to do the work if he only possesses the proper will.

To conclude; as a matter of duty, ornament and pride, and notwithstanding all the drawbacks to grape culture, I would urge upon every one the raising of grapes. I find my neighbors are all at the work, and I long to see every little homestead supplied with a pretty grapery. Yes, I am in favor of seeing every door-yard in this country testifying to the fact that God has given us many beautiful things in this world, that we might make use of them and that they might soften and cultivate our own hearts and minds.

Let every man's little door-yard be an index to his state of refinement, and let us see every farm and little homestead supplied with its orchard, its vineyard, its pine trees, fir trees, its odoriferous flowers, crimson roses, and all the beauties that the earth abounds in. Let us see every orchard protected on the north and west by a good and beautiful

fence made of cedar trees. To the adage of the great and illustrious philosopher who said, "Young man, go West," I would add, "Plant grapes and trees."

DISCUSSION—PRUNING GRAPE-VINES.

DR. HUMPHREY—I would like to state a fact in reference to pruning: We speak in our instructions of leaving an arm here and an arm there, cutting this and leaving that, and so on; now all this is unmeaning to the inexperienced vineyardist; he does not know what you are talking about. The thing to do is to take the man into the vineyard and show him how the work is done. I recollect once taking a man into the vineyard and telling him to cut off this cane, to leave so many branches, and as I talked I proceeded to cut and trim after the approved style. The man said he saw how it was; he had learned more in five minutes than in all the hours he had spent in reading books and listening to discussions on the subject.

Voice—How about summer pruning?

MR. MCWHORTER—My practice is, after the vine has got to growing vigorously, and the growth begins to get in the way of cultivation, to arm one or more boys with a light, slim corn-knife, or keen butcher's knife, and send them between the rows to clip the tips of the vines, so as to check the longitudinal growth. This operation may be performed three times during the summer, the object being to cause earlier ripening of the fruit and of the wood. I think the vines stand the weather better for this clipping, and consequent early ripening of the wood.

Your Stenographer (Mr. Barler), while this little speech was being said, kept up a terrible thinking: he would not allow boys with butcher-knives in his vineyard. No, no! If summer pruning must be done, let it be done *early* in the season, when tender shoots are about three or four inches long, and as soon as two bunches of grapes appear. This will probably give a more compact bunch of grapes, but at the expense of the health of the vine; he does not do even this. No summer pruning is done in his vineyard; he plants wide enough apart so that cultivation is not hindered, and trains on a two-wire trellis every time. But this might as well have been unsaid. It is heretical doctrine and the orthodox will not accept it.

DR. WARDER (to Mr. McWhorter)—Where do you cut the heads off, above or below the ears? [Laughter.] I would like to know what he cuts them off at all for. Don't you do it. The summer pruning is done before summer comes. My time for doing this work is just as the vines begin to show fruit in the spring. You want no knife in this operation,

the thumb and finger are all that is needed; this slaughtering of the vine in the summer will induce disease and death to come into your vineyard.

MR. JOHNSON—How about the success of grape growing around Cincinnati?

DR. WARDER—We do not grow grapes any more on the banks of the Ohio; we can't do it.

MR. STARR—I have fifty acres of grapes on my place, and have some experience in this business. The canes that are to produce fruit next year should be let alone; the fruit-bearing cane should be pinched in when the vine shows the second bunch of grapes. This is done early; no summer pruning other than this is needed.

MR. MCWHORTER—I think I must have been misunderstood. My practice is not to "cut and slash," but to take off the tips of the growing canes. I do not advise indiscriminate slaughter in the vineyard. I think my practice enables the vines to ripen their wood early, and they stand the winter better for this, besides it hastens the ripening of the fruit.

MR. STARR—I am very sorry to hear that our Cincinnati friends have given up growing grapes. Our friend Riley, of Missouri, has discovered the cause of failure in grape-growing, and I am sorry that he is not here to tell us more about it. I think the time will come when our Ohio friends will renew their efforts in the grape business, and will be successful. I hear that the grape insect has reached California, and that whole vineyards are destroyed. Prof. Riley says sandy land is the most favorable, for the reason that the Phylloxera can not work to advantage in sand; and also there are certain varieties that are seldom attacked by the insect.

DR. WARDER—Millions of cuttings are in demand in France, of these hardy varieties that are not affected by the insect. One man told me that he had received an order for the cuttings of all his Clintons, but he would not send them for the reason that they were badly affected by the grape insect. We know that the leaves of the Clinton are worst affected of all, and I would be afraid of this variety. It does not promise exemption from this disease.

PROF. THOMAS—There are some points in regard to which I am in doubt. I have not had the opportunity to study up this insect as Prof. Riley has, yet I am inclined to believe that they are not as injurious on sandy soils as on clay, and that they are less injurious in California, and in Utah; but I am in doubt as to there being some varieties which this Phylloxera will not attack. We shall know more about this by and by.

REPORT ON GRAPE CULTURE—(CONTINUED.)

MR. E. C. HATHEWAY, of Ottawa, from the Committee on Grape Culture, not being present had sent in the following paper, which was read by the Secretary:

So far as this district is concerned, in general the past season has been one comparatively poor, and to a great extent profitless, in the matter of *grape growing*, the cause of which being the poor condition of the vines consequent upon debility, arising from excessive drought in summer of 1874, and the extreme cold of the following winter.

To these facts we can now add also the indisputable one of the presence of the *root-louse* or *Phylloxera*, the work of which can be clearly traced in most localities, even on some of our most hardy vines. The Concord, for instance, which has been considered quite proof against its attacks, the past season has in many instances shown itself to be badly affected; but this is probably due in a measure to the debilitated condition of the vines, for reasons before mentioned.

I have in many places in this district dug up the roots of many varieties, and but very few of them seem to be quite free from the partly dead and knotty condition, resulting from the work of the root-louse. I may mention the fact that the vines least affected, so far as I examined, were the Perkins and Concord, while the worst were Delaware and Clinton. Of course, with a few good seasons, these vines that show any reasonable amount of vitality may recuperate, but wherever the present year's growth has not been at least three feet I have recommended, and have also followed the same course myself, of digging up entirely those infected vines, and resetting with good, strong two-year olds, from the nursery. In which case I throw the earth out sufficient to make a large hole, which is then filled with good, fresh soil taken from other localities than the vineyard, in which the young vine is placed and the hole is filled.

I think this plan of resetting in case of injury to vines from almost any cause the better course to pursue, as a vigorous two-year old will generally be in a condition to bear fruit as soon, or sooner than an old one left to recuperate, no matter how good the treatment, with the advantage also of having a younger and absolutely perfect and healthy stock for a base.

As a general rule the grape crops in this district have been much below the average in quantity as well as quality, in consequence of which the price for good fruit has been higher than for many years. But little wine being made, so far as my knowledge extends, will leave a better chance for a realization of higher prices for wines held from the vintages of previous years.

The low price of grapes for several seasons past, as well also the wine product therefrom, has led a very large percentage of our grape growers to abandon the cultivation of their vineyards. The consequence has

been that through neglect many vineyards have become wholly ruined, the result of which will be undoubtedly better prices in the future for vine products, for a time at least.

So far as my experience goes, I am satisfied with the results to me of grape growing, and shall, instead of abandoning it, plant more, and *take care of them too.*

As to writing up an article on vineyards or vineyard culture, it to me seems quite superfluous after perusing the many articles so often found in our horticultural and other papers.

But a short time ago I came into the possession of a "Manual of Grape Culture," published by Bush, Son & Meissner, of Missouri, which seems to cover the ground so perfectly in almost every instance, so far as my experience goes, that I certainly feel that to attempt to record any particular part of my own experience would be to reiterate much that is there elaborately written out, that I feel justified in advising beginners to obtain and carefully peruse it; and I doubt not it would be of much value, also, to many that have made the culture of the grape a life-long study.

DISCUSSION ON GRAPES—(CONTINUED).

DR. HUMPHREY—I have a neighbor who has a vineyard on high, dry soil, and his crop was a failure. My vineyard is on low ground, and I had a full crop. I account for it in this way, that it was the dry freezing that did the damage. Dry freezing will kill almost any thing, even Morello cherries. I think this accounts for the injury in high vineyards.

MR. MCWHORTER—My vineyard is on a dry, rolling ridge, and the vines that have suffered most have been those on gravelly ground. My manner of training is to tie to stakes.

MR. J. T. JOHNSON—The vineyards near Warsaw are planted seven feet by ten feet. Posts are set with two vines between the posts, and a trellis is made by stretching upon the posts two wires. I am not a practical grape culturist, but I thought I would mention this mode. The Concord is the most successfully cultivated grape. Excessive culture and cuting and caring for the vine does not seem always to produce the best results. I have seen neglected vineyards produce larger and better crops than the carefully tended and petted ones; which shows that we may kill by kindness.

THE SECRETARY—I want to call attention of gentlemen to the fact, that the full history of this grape Phylloxera, as given by Prof. Riley, is contained in the volumes of our Reports: volume seven contains its history and habits, by Prof. Riley, with illustrations of infested leaves and roots; also of the insects and their work in every form, so that any one

can there readily learn to detect this enemy; also in volume eight several pages are devoted to it, where is given a list of varieties of grapes exempt from its attacks.

MR. WHITAKER (of Warsaw)—We have never experienced such a root-killing as in the killing of the wheat last winter. The tops looked well enough, but the roots were dead; the same root-killing was extended also to our nurseries. I want to ask this question, What was the cause of this root-killing? We have experienced colder weather than last winter, but never have we experienced such a loss of the wheat crop. What was the cause of this root-killing? for the wheat was killed in the root, while the top looked well. Tell us the cause.

DR. WARDER—It is an old saying, "If the sun rises in the East, you must look to the East for light." If the wheat of Illinois was killed in the root, as we are told it was, we must go to the roots to look for the cause; and Mr. Whitaker is, perhaps, best able to answer this question.

MR. WHITAKER—The explanation we give is this: The ground, being very dry, absorbed the moisture from the roots of the wheat plant and the young fruit trees spoken of, and the drought continuing, the roots died. This is the only explanation we have of the matter.

MR. MCWHORTER—The explanation, I think, is the right one.

MR. IRA COE (of Quincy), invited the members of the Society to call at a neighboring store and examine his *fruit gatherer*.

MR. STARR—I will say that I have practically tested this fruit gatherer, and I would not be without it. You can gather four times as much fruit with it as you could in the old way of hand-picking; it is practical and worthy of your attention.

On motion the Society then adjourned.

WEDNESDAY EVENING.

The convention opened at the usual hour, and the regular order of business was resumed.

Prof. BURRILL, of the Committee on Botany and Vegetable Physiology, had telegraphed that he had missed connections of trains and could not arrive this evening.

REPORT ON FLORICULTURE.

Mrs. JOSEPHINE M. MILLIGAN, of Jacksonville, from Committee on Floriculture, presented the following report, which was read by the Secretary, entitled

FLORICULTURE FOR THE HOME:

So much has been written on the subject of floriculture, during the past ten years, that it has become like an old field whose surface-soil is exhausted; it needs the subsoil plow.

The nature and requirements of plants need to be more thoroughly studied. Many experiments are made, but their results are not as carefully watched, compared and recorded as they should be.

Plants are treated too much as if they possessed a human organization. Man has a power of adaptation to any climate and to various foods, but the structure of plants makes it impossible for them to adapt themselves to all physical conditions. The old saw, "What is sauce for the goose is sauce for the gander," may do for geese, or for people, but not for plants.

Landscape gardening deservedly stands classed as one of the six fine arts. Door-yard gardening, and window gardening, however humble the scale, are departments of this fine art. The artistic effect of the rows or patches of sunflowers, hollyhocks or marigolds, seen in many rural yards may not be visible to all eyes, yet who can doubt that even these have their beneficial influence, and that their presence denotes a degree of culture not found in homes where chicken and pig wallows adorn the yards. The little ones who play under the sunflowers and hollyhocks will want pansy and verbena beds when they have homes of their own. Things of beauty appeal to and develop the intellect. Therefore we can not doubt why God has made the flowers so beautiful and so free to all. But a long preface, like a long grace, is not to be endured before a good meal, much less before a poor one.

Flower culture by amateurs may be divided into three departments, viz: Door-yard gardening, pot-plants for summer, and pot-plants for winter.

In out-door gardening one of the first points for consideration is the laying out of the beds. In grounds of ordinary size, it is now generally conceded that beds dotted around singly in the grass have a more pleasing effect than when grouped into one garden-plat. Most plants flourish best in beds made level with the surrounding surface; if the beds are elevated it should be but slightly, and they should be sloped from the center to the margin. Beds should never be so large that all parts of them can not be conveniently reached for the purpose of weeding and pruning. The outlines of beds are more easily preserved if formed of curves or obtuse angles—elaborate patterns do not pay for the trouble of making and keeping them in order. A circular, or oval bed, when filled with flowers, looks quite as attractive as a star-shaped one, have it never so many fine points. We are apt to forget, in our zeal for beautiful beds, that designs that can be taken in at a glance on paper, with all their details, can only be seen by sections in real flower beds. Stars are very beautiful in the firmament, but they poorly adorn the earth unless we can take a birds-eye view of them from above.

There is one form of flower bed with which some localities are sadly afflicted: I allude to those long, narrow strips of earth, two or three

feet wide and from twelve to twenty feet long, without a single curve to redeem their entire ugliness. These beds usually contain every sort and condition of plant, from straggling rose bushes to low-growing annuals. When such beds are made to border straight brick walks, they become still more unsightly. One can imagine that a gracefully curved walk, with well-kept, narrow borders of verbenas, pansies, or portulaccas might be endured; but straight walks should never have their ugliness made more conspicuous by flowery borders. It is doubtful if even curved walks are improved by being thus bordered. Such flower beds, however, have these advantages, that they can be enjoyed at any hour without damp feet, and that visitors can be welcomed with bright bloom and sweet odors. Even a Heraclitus would forget his tears while inhaling the balmy breath of mignonette and sweet alyssum, and would imbibe with their fragrance more cheerful views of life. Walk borders should measure less than half the width of the walk; for instance, if the walk is five feet wide, the border should not measure more than two feet in width. Wide borders give a clumsy appearance to the whole. It should be borne in mind that only the lowest-growing, perpetual-blooming plants should be placed in these borders.

In selecting and setting out bedding plants, their habits of growth, their color, and their blooming qualities should be considered. A bed planted with flowers of different heights, promiscuously intermingled, will have a ragged appearance. In a bed of scarlet geraniums, plant the tallest-growing varieties in the centre, graduating their heights to the margin of the bed; and so with all other plants of different habits of growth, when planted together. A bed of scarlet fish geraniums, properly arranged, has a very fine effect; but if red foliage plants are placed in the same bed, much of the effect is spoiled, the two reds acting unfavorably on each other. If balm geraniums are planted with the scarlet, they likewise spoil the effect, giving too much foliage for the amount of bloom.

It is much the fashion at present to mass flowers. When this system is followed, care should be taken to preserve the individuality of the flowers as much as possible. A glare or patch of color is better suited to public grounds, where it may be viewed from a distance, than for a home garden. In the case of scarlet geraniums, they can be massed with impunity, as nature has furnished each cluster of flowers with such a rich setting of leaves that it remains a geranium and not so many inches of color. In the pansy, drummond phlox, and portulacca, the foliage is not so marked a feature; hence their individuality is lost when massed in a single shade. It is truly a pathetic sight to see a bed of the folksy little pansy all of one tint. It makes one think of a whole asylum full of orphans in uniform. I once saw such a bed; it was the variety called "King of the blacks." Poor little kings! I hope never to see such a monotonous expression on flowers again; they looked dreadfully tired of each other; there was not enough variety among them to make life spicy. A more pleasing effect is obtained by mixing the colors and shades of a certain kind of plant, either with or without regularity, than if it is attempted to secure a single shade in a bed.

Those who can not conveniently have flowers in their yards in summer, may derive much enjoyment from a stand of pot plants. It is much the best plan to have the pots set in boxes of sand, the sand to be kept slightly damp, thus preserving a more even moisture. The plants should be shaded from the sun a portion of the day. Few pot plants can endure the full force of the sun between the hours of 10 A. M. and 3 P. M.; being limited in soil they must be limited in heat. Plants grown for summer blooming require more pot room than those grown in the house, out-door culture giving them greater vigor.

Formerly it was quite common at some parts of the South, in rural homes, to see boxes filled with soil fastened to the outside of the houses, directly under the windows, having a variety of plants growing in them and vines trailing over their edges. Such box gardens are pretty from within and without the dwelling, and would afford a delightful recreation to those who from any cause are confined to the house. Of course, where outside shutters are used, these gardens are inadmissible, and to have them flourish luxuriantly, the proper conditions of sun and light must be secured.

Thirty years ago window gardening was not so extensively followed as at present. Those who were successful in this art were supposed to possess some peculiar knack or charm for making plants grow not attainable by all. This idea is not quite dead yet. We forget that floriculturists, unlike poets, are made as well as born. Any one can grow plants successfully who will give sufficient attention to their habits.

The preparations for pot plants for winter should be commenced in mid-summer.

For soil the old formula is perhaps as good as any, viz.: equal parts of rotted manure, leaf mold, garden soil and sand. These should be heaped together and worked over every two or three weeks, till the whole becomes thoroughly mixed, fine and mellow. Before using this prepared soil, it should be dampened slightly and baked in an oven, till sufficiently heated to destroy animal life, thus avoiding much trouble from the various plant pests. The baking is not a difficult process. Take an old pan or box, fill with the soil, place in the cook stove oven when other baking is not in process; have the oven hot enough to brown flour, then from thirty to sixty minutes—according to the amount of soil—will be sufficient to cremate the most incorrigible insects and their germs.

A delightful part of the work is the raising of plants from cuttings. There is a pleasant sense of complete ownership and knowledge of pedigree attached to the plants developed by one's self. It is doubtful if there is any thing that will take one back more completely to childhood days than the care of a box of cuttings. There is the same temptation to pull up the slips too see if the callous has begun to form, that there was to pull up the peas and beans in that little corner patch to see if they were growing. This practice is not of any particular benefit to the growth of the plant, but there is a great deal of satisfaction in it.

The process of raising cuttings is simple, and, if done in August, expeditious. Take a box about six inches in depth, fill one-third with

mellow soil, the remainder with common sand. The object of soil in the bottom of the box is to furnish the plantlets with food as soon as they are ready for it, as it is not always convenient to pot the cuttings as soon as rooted. Set the box on blocks that will raise it three or four feet from the ground; this will allow the warm air to circulate around it. All the light possible should be given to the cuttings, without allowing the direct rays of the sun to touch them. A tree or grape trellis forms a suitable shelter. The best time to take off cuttings is in the evening, when plants are partially at rest. Short cuttings, as a rule, do better than long ones, and they should be taken off smoothly with a sharp knife, as when slips are broken or cut with a dull knife the delicate tissues are ragged and torn, thus the chances for a healthy new growth taking place are lessened. When the new plantlets are sufficiently rooted to pot, they will send out new leaves.

The most easily managed and the most economical pots for plants are those of common unglazed earthen. In choosing select those that are almost as large at the base as at the top. Those that taper downward look more graceful perhaps, but they hold least earth just where most is needed. The form of the pot will not be noticed if the plant is admirable. Always adapt the size of the pot to the plant it is to receive, allowing at least an inch of soil between the roots and sides, and two or three inches between the roots and bottom. If the pots have been used previously it is well to scrub them inside and out with hot soap suds, to destroy any insects or their eggs that may be harbored on them. Whether the pots are new or old, soak them for ten or fifteen minutes in water before using. These pots are very porous, and will draw the moisture from the soil placed in them, if not previously soaked. Put enough bits of broken earthenware and charcoal in each pot to cover the bottom of it, being careful to place one piece directly over the opening in the bottom. This will prevent the soil from washing out, and will not prevent a surplus of water from draining off. Plants that have been in pots all summer, and are desired for winter blooming, should be treated as follows: Withhold water from them for as long a time as may be done without causing them to wilt. Loosen the ball of earth from the sides of the pot with a thin knife, invert the pot, then by gently knocking on the bottom, the plant and soil will slip out entire. Hold the ball of earth in your clasped hands and shake carefully, allowing as much of the soil to sift through your fingers as will do so without breaking the small roots. If the old soil does not all, or nearly all, fall from the roots, keep the plant in the same position, and move it gently back and forth in a tub of water till the roots are free from dirt; re-pot immediately in fresh soil, water, and keep in the shade for a few days. This method of re-potting must be followed only when bloom is not desired for six or eight weeks. When a plant has been kept in the same soil for a number of months, it will give satisfaction for a much longer time if potted according to the above directions, than if the ball of earth containing the roots is removed to a larger pot with a necessarily small amount of fresh soil around it. It is too much the fashion to wait till time for frost before preparing plants for

the house. They should be potted, or re-potted, as the case may be, at least six weeks before their removal to the window. This gives them time to recover and start into growth, and secures a beautiful window from the first, instead of the usual array of too visible pottery filled with forlorn, blossomless specimens. An important point is, that sudden changes are injurious to plants; hence they should be gradually accustomed to less sunshine and light by placing them on the shady side of the house, and afterwards in a shady porch. Large plants potted from the open border do not often prove satisfactory; plants started from cuttings made during the summer are best. Small plants may be successfully potted from the flower bed, if the soil in which the roots are imbedded is removed with them. When the soil is allowed to fall from the roots, the tender extremities of the roots which feed the plant are more or less injured.

The list of plants suitable for window gardening is large, and has been printed so often that it need not be repeated here. I will, however, give a list of those that grew and bloomed last winter in the loveliest winter garden I ever saw: There was the salvia splendens, dwarf variety; hyacinths; begonias, scarlet, pink and white; Chinese primroses, pink and white; Egyptian callas; Cyclamen persicum; two wonderfully healthy and motherly-looking geraniums of the rose and balm varieties; these well deserve mention, for they furnished background for many a dainty blossom that was sent forth to cheer those sick in mind or body; three or four red foliage plants; a pot of mignonette, and another of sweet alyssum; last but not the least charming were luxuriant vines woven back and forth across the upper half of the window, and hung in tropical festoons from the cornice of the bay window, not fearing to climb the solemn looking book-cases standing near, and making beautiful their dark mouldings with tender green. These vines were the common German and English ivies, a sweet potato and a wax plant. The sweet potato is really a very desirable vine for the house. It is a rapid grower, and is much more delicate under house culture than when growing out of doors. If a vine of this kind is desired, select—the earlier the better—a well ripened tuber of the Red Nansemond variety, as this kind is said to be the most vigorous grower. If the potato is eight or ten inches long and three or four inches in diameter, it will be about the right size. A hyacinth glass is a pretty and suitable holder, but a common glass fruit-can, or small earthen jar will do. Fill the vessel with rain water, and stand the potato in the mouth of it, allowing about one-third of the potato to go into the water; set in a warm place to sprout, and fill the holder with water as fast as it evaporates. Probably a great many sprouts will start. Break off all but three or four of the strongest of these, as this will make the remaining vines grow longer and be more luxuriant.

Pot plants are benefited by the application of liquid manures. Ammonia, sparingly administered, agrees with all plants; procure at a drug store a quarter of a pound of the salts of ammonia, break it into small bits, put into a quart bottle, fill with warm rain water, and shake thoroughly. Of this liquid, use one tea-spoonful to a quart of water, and water the plants with it once in two weeks. A tea made from decayed

wood is excellent for plants: get well pulverized wood mold from an old log or stump, pour boiling water on it; when of the right temperature, stir, and pour grounds and all over the soil in the pots. Fuchsias, primroses, the English ivy, and the oxalis do particularly well with this food.

Before closing, allow me to add a few words on the importance of flowers in the home. "The garden is a spiritual breathing place." In cultivating flowers we cultivate a taste for sweet odors, lovely tints, and graceful forms. The boy who has been trained to appreciate flowers, will not be easily charmed with the fumes of whisky and tobacco. The husband who comes at evening from his daily labors, weary, perhaps discouraged, will be cheered and refreshed by "these smiles of God" in his home. The mother, with her never ending tasks, finds sweet companionship and sympathy in the cheerful, patient little workers, whose mission is peace and good will to all. Then cherish the flowers; they are God's free gift to every one of us.

REPORTS ON VEGETABLE GARDENING.

Mr. R. M. HUNT, of Galesburg, presented his report, which was, at his request, read by Dr. HUMPHREY:

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

Having, at the suggestion of my friend Dr. Humphrey, been booked for a paper on Vegetable Gardening, I acknowledged the *corn* to your Secretary, and promised him one based upon my own experience of fifteen years in Market Gardening, at Galesburg. In doing this, I have turned my back upon all that is poetical, and ignored all fine-spun theories.

Vegetable Gardening, among the masses would appear to be one of the lost arts. I venture the assertion that, among the farming communities of the Northwest, there are not two in ten heads of families who have, or ever had, a good vegetable garden; nor could they tell asparagus from vegetable oysters, cauliflower from an overgrown mushroom, or know that there are any other cabbages than Early York and Drumhead. Should you ask one of them why he does not give more attention to the garden, the answer probably would be: No time to attend to such small things. In fact, the old story of hog and hominy. Should you describe to him the good qualities of some of the latest introductions, he would probably ask you if it would make pork as fast and cheap as corn? It is really a deplorable fact, that the health-giving products of the vegetable garden are enjoyed by so small a proportion of those who till the soil. The question comes home: How can this be changed? What inducements should be held out, to stimulate the farmer to pay greater attention to his garden? I have hoped this would be brought about by the influence of horticultural and agricultural societies; but progress seems to be slow. It seems the proper key-note has not yet been struck. Perhaps a system of special premiums of large sums of money, given to *farmers especially*, for enumerated articles of garden production, might stimulate to their

growth; for the pocket is a very sensitive part of humanity. I believe also, that in your annual deliberations, while correcting your fruit-lists, you should give a full proportion of time to making a vegetable list. Assuming as above, that the pocket is the mainspring of action, let us take this as our starting point, and talk of "Gardening for Profit." As my experience has all been as a market gardener, I should treat the subject from that standpoint. And let me remark, that what I have to say will apply to home gardening, with the exception of extensive hot-beds for starting plants, for which small boxes kept near the fire while germinating the seeds, and near the window for the growth of the plants until time to plant them out, may be substituted.

What are the requisites to success? First of all, good seeds. By this I mean fresh, well-matured, well-kept, and of the choicest varieties, both old and new; for there are many old varieties that are as good and even better than many late introductions, yet there is a vast improvement upon the older kinds generally. In vegetable gardening Paul's advice, "Prove all things, hold fast that which is good," is as applicable here as when spoken it was to matters of religion.

I always endeavor to keep up with the times, and make it a rule neither to condemn or permanently hold fast to any thing new, short of a three years' trial; and when once rejected, though the whole world should sound in praises, I am content to let it alone. You may ask, how are we to know when we get good seeds without testing them? This I admit is a difficult matter for beginners. Ascertain who are the most reliable dealers, try them, and if their seeds prove all right try them again, and continue to buy of them so long as their seeds prove good. The venders of garden seeds will no doubt have their full share of sins to answer for, but I have charity enough for them to believe that many of their accusers will become weak-kneed in the day when it shall be known they have charged so many sins to the seedsmen which they themselves committed; for many thousands of dollars' worth of seeds have failed to grow in consequence of the ignorance and carelessness of those who planted them.

After getting the right varieties we should grow our own seeds as far as possible. After having procured our own seeds, the next thing is to get them to grow. For this the market gardener requires a hot-bed.

Many have an erroneous idea of a hot-bed. They seem to think that bottom heat is necessary to the germination of seeds, which is a mistake, as demonstrated every spring. When the spring sun warms the surface of the ground, many of the hardy seeds will grow, although not far below there may be two feet of frozen ground; and I have read in descriptions of Alaska that seeds germinate and vegetation grows in a few inches of soil with forty feet of solid ice beneath.

We must remember, however, that only the seeds of the hardiest kinds of vegetables grow thus early. Nature has so wisely arranged this matter that the seeds of tender varieties will not germinate at so low a temperature, but will, if sown or planted, either perish or lie dormant until the ground is quite warm, which will generally insure their safety from biting frosts and cold, blighting winds. Knowing these facts, and

being disposed to take advantage of the knowledge, we make use of the hot-bed, that we may, by artificial means in advance of the season, create the requisite warmth of soil to germinate the seeds and, at the same time, maintain for a long while the proper temperature to hasten the growth of plants, and protect them from the freezing blasts without. In making hot-beds I long since discarded the old stereotyped method of the books, making them entirely upon the surface of the ground; as, when digging into the ground, I often lost my heat by water filling below the surface. I now set strong stakes into the ground and make a tight board frame, one foot and a half high on the front side and two feet high behind, to give sufficient slope to the sash to let the rains pass off; across these I place my rafters and fit my sash. After having filled the frame with good hot manure by sections, packing it well with a fork to within two inches of the top of the front side, upon this I place six inches of good, rich, mellow dirt, which will settle as thrown on till about even with the top of the front. ' I sow my seeds immediately, and, by the time the plants are up, the excessive heat will have passed off. This amount of heat will be right for tomatoes, peppers and egg plants. For cabbage, cauliflower, lettuce and celery, half this amount of heat will suffice. The former should be transplanted into beds of lighter heat, and gradually hardened to fit them for the open ground, while the latter should be transplanted into a cold frame for the same purpose. The next thing to be considered is the soil. All vegetables for the table like loose, light soil; the amount of manure required depends upon the character of the soil, sandy soils requiring much more than our rich prairie soil. We must also remember that some varieties of vegetables require richer soil than others. These I must designate as I come to them. Let me here remark, very much of success in getting a good growth depends upon early and frequent stirring of the surface while the plants are young.

I now come to open ground planting. In treating of this I shall include what, when, and how to plant and cultivate, taking them alphabetically, beginning with

Asparagus.—Up to within a few years, no one thought of making an asparagus bed without first trenching the ground four or five feet deep, and filling in great quantities of bones, dead animals and manure, replacing the dirt, and setting the plants with stereotyped exactness. In setting my asparagus beds I back-furrowed the ground to a good depth with the plow, leaving it highest in the centre, with deep dead-furrows at each side to insure a rapid passage of surface water from the beds, planted in rows three feet apart, setting the plants one foot apart in the rows, with their crowns about three inches below the surface—depending upon top dressing for fertilizing. I believe most of the planting is now done in that way. Until the appearance of Connover's Colossal, a few years since, it was generally believed there was but one variety of asparagus. Although we sometimes heard of White-top, and Purple-top, the difference was attributed to difference in soils. My observations lead me to the conclusion that the temperature makes the difference in color—that growing early, when the ground and atmosphere are cold being purple;

and changing to light green, as the season advances. It was quite amusing to notice some of our leading seedsmen declaring but one variety, and fighting the first introduction of Connover's Colossal, and then suddenly changing front and having great quantities of the seeds of the "*Great* Connover's Colossal" for sale. Having tried both Connover's and Van Sicklen's in close proximity to the old variety, I have come to the conclusion that any of them planted three or four feet apart both ways, as they recommend for the Connover's, and manured heavily, will grow mammoth stalks—one kind as large as the other—and either of them grown carelessly will produce small stalks; and I still doubt there being any difference, except in cultivation. Asparagus may be planted either in spring or fall. It should not be cut until the second year, and then lightly. Salt sprinkled thickly along the rows keeps down the weeds, and improves the yield. I prefer putting in manure as a mulch, at the close of the cutting season; it keeps down the weeds, and is washed down by the rains of summer. My objection to fall or winter manuring is that it retains the frost in spring, making it late starting. In cutting asparagus, cut it entirely above the surface, unless you want such stuff as we often see on the market—white, hard, tough, and tasteless. Why any one, who knows enough to grow asparagus, should cut it below the surface I never could divine. Next comes

Beets.—These being among the most hardy, can be planted as soon as the frost is out and ground in good condition. Plant in drills, fifteen to eighteen inches apart; sow thicker than you want them to grow, and thin out to four inches when large enough to use for greens.

Until the introduction of the Egyptian, the Early Bassano was the best early; but the Egyptian is so much earlier, so very dark in color, and smooth of surface, with such a small tap root, that it is the *sine-qua-non* of early beets, but it is fit for nothing else; therefore we can not abandon the Early Bassano. As a succession after the Early Bassano, I find "Bastian's New Blood Turnip" unsurpassed—so smooth, so round, so large and good; and this, with "Bastian's Half Long" for winter, completes the list. This brings us to

Beans.—Of bush or snap beans, the Early Fejee is probably the hardiest we have; Early Mohawk is good; Black Wax is better, but German White Wax the best. Although very poor land will grow beans, rich, mellow ground will grow them much quicker and better. Pole beans actually require rich, light, warm soil. Having tried many kinds, I have discarded all but large and small white and spotted Lima. With a crowbar to make holes eighteen inches deep, set your poles in rows five feet apart, the poles three feet apart in the row; plant upon the surface at each pole, three beans, covering one inch and a half deep; hoe often and cultivate thoroughly.

Cabbage.—For the last six years I have not grown the Early York. The Jersey Wakefield superseded it; and for three years I have grown the Early Wyman in preference to either for earliest; Early Winningstadt for next, and "Fotler's Improved Drumhead" for further suc-

cession. The Wyman is fully as early as the Wakefield, twice as large, and equally as good; Winningstadt is so sure to head, so solid that it may lie around for a week and still be good, and in flavor and tenderness is second to none. The Fotler grows very large, and when first cut is very firm, but in a few hours begins to wilt and gets quite soft. Sow the seeds of these three varieties at the same time, and you will have a succession. The Wyman and Winningstadt may be planted out two and one-half feet by one and a half. The Fotler will require two and a half by three feet; they can be planted in the open ground at Galesburg from April 25th to May 10th. For winter cabbage I prefer Flat Dutch to all others. It is sure to head, large enough, and as good as any. American Drumhead is good, but not so sure to head; Savoy is good, but not sure. Marblehead Mammoth is too far from home to be profitable. Contrary to James J. H. Gregory's recommendations, I find Stone Mason very unreliable; out of several hundred plants grown this season, treated in every respect like the others, I think I did not get a single head, and a neighboring market gardener had the same result. I would advise the change of name from "Stone Mason" to "Free Mason," and probably *Blanchard* would "*put a head on it.*" Do not forget that cabbage requires your richest ground.

Carrots.—For table use I grow only the Early Short-horn. Seed can be sown from first to tenth of May. Give them rich, light soil.

Cauliflower.—For early, Dwarf Erfurt; for late, Lenormand's Short Stem; plant and cultivate as cabbage.

Celery.—Away from the lake region I consider the growing of celery very unprofitable, so much so that I place it among the luxuries that cost as dearly when grown as when bought. Our long droughts, with a hot sun, burn the plants so that growth is out of the question till late in the season. On this account I have about concluded we must discard the dwarfs, growing only the large varieties, in order to get any size after the season of drought. The past season was unusually favorable to the growth of celery. The Boston Market is the best dwarf, Giant White Solid as good as any of the large kinds. Probably no seeds in the vegetable catalogue so often bring disappointments as celery seed; to insure germination it must be kept moist constantly. Except for early use, July 20th to August 15th is early enough to set in trenches. The plants should be transplanted from the seed-bed, giving them three inches of space each way, as soon as they have three or four leaves, and carefully removed from this to the trenches, if possible in damp or cloudy weather; if hot and dry, should be shaded a few days, removing the covering at night; water often at evening until well established. It will not be necessary to earth-up until the plants are a foot high, except enough to keep the stalks in an upright position. A few days before earthing-up the first time, water each plant with a weak brine—say a single handful of salt to a bucket of water, which will protect it from worms. In earthing great care should be taken to keep the stalks and leaves closely together, while the dirt is carefully pressed up to them. This should be repeated at each succeeding six inches of growth. At the approach of the first hard freeze

in November, snug the dirt closely to the tops and cover with litter, increasing with the cold, and use from the trench in preference to digging and packing in cellar.

Cucumbers.—Growing cucumbers under glass will not pay unless accessible to a large city; but plants may be started under glass either in pots or inverted sods. White Spine, Early Russian and Early Cluster are most reliable and best for table use, and Long Green for pickles. When planted in the open ground look out for striped bugs. "Eternal vigilance is then the price of"—cucumbers. I find nothing better than air-slaked lime to keep them off; cover the plants thickly, and renew the application as often as the wind blows it off, or rains wash it off, until the plants get large enough to defy them.

Corn.—I believe there is nothing grown in the garden more palatable than sweet corn when nicely boiled, and he who neglects to grow it robs himself and family of one of the choicest and cheapest of luxuries. Having tried nearly every thing introduced within the last fifteen years, I prefer for earliest a variety I obtained some years since as the Early Darling; the ears medium size, eight-rowed, quite sweet, and the earliest sweet corn I ever found. I plant this from the 10th to 15th of April, and make another planting of this variety about ten days later, when I also plant Crosby's Early. Ten days from this I plant Crosby's again, and also Stowell's Evergreen. Then I continue to plant Stowell's every ten or twelve days till July 10th, which method gives me a regular succession, seldom missing a day until frost puts a stop to the corn business. I obtained from the Agricultural Department last year Bate's Early, which comes in with Crosby's. I believe this is the sweetest corn I ever grew, and should it continue so another year it will be likely to supplant the much esteemed Crosby's in my estimation. I use great care in saving my seed corn, taking the earliest and best ears. The Early Darling can be planted in hills, one and a half by three feet, the others two and a half by three and a half.

Egg Plant must be started in hot-bed with tomatoes, transplanted in lighter heat, thence to the open ground. New York Improved I consider the best.

Lettuce, for early, should be started in hot-bed, and transplanted into a very rich bed three by six inches, and when beginning to crowd pull every second one, leaving them six inches each way. Having tried many varieties, I have now settled upon the Hanson and True Boston Curled, both very fine, the Hanson making the more solid heads.

Melons.—Of musk-melons, perhaps, in the presence of the Alton delegation, it would not be wise to place any thing in advance of the Alton Nutmeg, and I am perfectly willing to cater this much to their local pride. Of water-melons, I think the Mountain Sprout, Mountain Sweet, Black Spanish and Sculptured Seeded are the best for market; for home use the Orange. This is too small for market, but excelled by none in flavor; the rind peels off like the skin of an orange; it is very sweet and delicious. Plant in open ground May 1st, and remember *not* in mercy the striped bugs.

Onions.—The profit of an onion crop depends much upon locality. Galesburg, being within forty-five miles of Davenport, Iowa, (the "Wethersfield" of the West,) is not a profitable place to grow onions from the seed, as they often sell at Davenport for twenty-five cents per bushel, and this has a tendency to make low prices at Galesburg. I find the only profit is growing from sets, and bunching early in the season. For this, the top or button sets are principally used: but bottom sets, grown from Yellow Danvers seed—sown thickly for the purpose—make the earliest and best onions: but these sets are difficult to keep through the winter. In growing from seed, the best varieties I consider to be Early Yellow Danvers, Yellow Strassburg, Early Globe, Early Yellow Cracker, and Large Red Wethersfield. Onion seed should be sown as early as possible: they require very rich soil, frequent hoeing and weeding, and seem to do best when grown upon the same ground, year after year.

Parsnips.—They require rich soil, but it should have been manured the previous year: if not, the tendency will be to throw out many side roots. The beauty of parsnips consists in being smooth. The Hollow Crown I consider the best for general crop, with a few Early Short Round, for early fall use, as they grow thick and short. Parsnip seed should be sown as early as the ground can be gotten in good condition: sow in drills, eighteen or twenty inches apart; sow thick, as it is better to have them too thick than too thin, as they can easily be thinned to four inches. Remember, you can not depend upon parsnip seed more than one year old: hence the great necessity of growing your own seed. Parsnip seed being very slow to germinate, I generally scatter radish seed very thinly in the row, which comes up much sooner than the parsnips, and enables me to follow the rows, if necessary, to weed them before the parsnips appear. I thus get a crop of radishes without cost. I dig my parsnips early in November, sort them, pile the marketable ones in long piles about three feet wide at the base, and the same in height, bringing them to a sharp top or ridge; this I cover lightly with straw, and four inches of dirt, and as winter comes on I increase the dirt, covering to eight inches. I can then begin at one end of the pile to take out, stopping the opening thus made with litter, and if they freeze, it does no harm, but rather improves them. If frozen too hard to handle, put them in the cellar to thaw gradually.

Peppers.—Of these I plant Sweet Mountain and Long Cayenne—the former for stuffing. Pepper seeds should be started in hot-beds with tomatoes, and treated the same until planted in the open ground.

Potatoes.—Who of us can carry his thoughts back to the days of Pink Eyes and Neshannocks in their glory, without wishing he could exchange the whole catalogue of to-day (excepting, perhaps, the Early Rose), with the rot and Colorado beetle thrown in, for those old favorites? But, alas! they are of the past, and we must content ourselves with what we have until we get some thing better. We have, indeed, made progress in point of season; in those days it was a great achievement to get new potatoes and green peas by the Fourth of July, and often there was a strong resemblance in point of size. The Early Rose has a wide reputa-

tion as an early potato, being both early and good, succeeding well on any soil adapted to potato growing; and if I am never compelled to have a poorer one for winter and spring use I shall not complain. The Early Vermont is smoother than the Early Rose, no better, but nearly ten minutes earlier. The Peachblow is fast failing, and we must soon find something to take its place. I plant White Peachblow, Peerless, N. Y. Late Rose, Campbell's Late Rose, Brownell's Beauty, and Compton's Surprise. The White Peachblow is better than the old Peachblow: N. Y. Late Rose very productive and good: Peerless is also very productive, but of second quality: Brownell's Beauty is a heavy cropper, all large, handsome and good: Compton's Surprise is quite productive and of first quality.

I plant my late potatoes when planting my early ones, cut them into small pieces, plant in drills—one piece in about every foot,—plant near the surface, cultivate level until in blossom, then throw the dirt to them.

Peas.—For early I find nothing as good as Carter's First Crop, being as early as any and more prolific, while for quality it is not excelled in its season; for second early, McLean's Little Gem is not surpassed by any thing that I have tried. Blue Peter with many is a great favorite; with me it "petered out" so soon after getting one picking that I could not get my seed again: so Peter and I parted. Tom Thumb, as a pot plant or for a hanging basket, might do very well, but beyond that it is useless. My method is to plant Carter's First Crop as soon as the ground can be prepared, and, when they begin to come up, plant the balance of my Carter's, also McLean's Little Gem, Laxten's Prolific Long Pod, Excelsior Marrow, Dwarf Marrow, and Champion of England or Yorkshire Hero. This gives me a continual picking through the pea season. I aim to plant six inches deep, in order to withstand drought, and I finish culture by throwing the dirt up with a large single-shovel plow. I do not brush my peas; it would not pay. The profts of a pea crop with me are small, as in our market we have to begin just before Quincy peas go out of the market, so that the price of their last run is our starting price. I grow them only for variety's sake, and follow them with sweet corn in drills for fodder at a better profit than the peas themselves.

Radishes.—Short Top Scarlet and Red and White Turnip I find most profitable; the former gets pithy very soon, therefore they should be sown in succession at intervals of a few days. I grow most of my radishes in my parsnip rows. Those growing them in beds should select very mellow, rich soil—if quite sandy, so much the better.

Spinach pays as well for the amount of labor bestowed and ground occupied as any thing in the garden. I grow the round-leaved variety, sowing it as early in spring as the ground can be prepared; sow in drills fifteen inches apart, covering one inch. One weeding and two hoeings generally make the crop. It must have very rich soil.

Squash requires good, rich ground. For early there is nothing better than White Bush and Yellow Crookneck. Plant in hills, four by four feet, the first of May, and, as soon as you suspect them of being up,

visit them with a bucket of air-slaked lime, as a *peace-offering* to the striped bugs. I plant fall and winter squash six by eight feet apart, the first of May. I prefer for fall Boston Marrow, which keep till January in a dry, cool cellar: for winter I prefer the Valparaiso to the Hubbard. It produces twice as many pounds to the acre; the squashes keep about as well, are better in quality, and do not require an axe or beetle and wedges to open them. I am not yet prepared to speak for or against the Marblehead and Butman, having not yet fully tested them. I would advise every farmer who has cows to grow the Valparaiso squash in preference to any thing else for milk production; for, having tested it with carrots, parsnips, and sugar beets, I know whereof I speak. This brings us to

Tomatoes.—Having tried almost every new introduction for the last ten years, I prefer the Canada Victor for early, and Trophy for late, to any thing now in the market. Neither of these are up to my standard of perfection in flavor, and I hope ere long to produce something superior to either in this respect. In order to get tomatoes as early as possible, I start a few hundred plants in a box from the first to the middle of January: these are ready to prick into my first hot-bed, say February 15th. I thus gain from two to three weeks in ripening, which is quite an item. In the latitude of Galesburg it is not safe to put tomato plants into the open ground before the 18th of May, as we often get a frost hard enough to kill or injure the plants on the 17th. Tomato plants should be set three feet apart in the rows, and make the rows five feet apart, hoe twice, and cultivate as long as you can get a horse between the rows. This closes the list, and a few suggestions will end the chapter.

Let us remember that gardening, like any other business, will be a failure unless we have a taste for it and a determination to overcome all difficulties, a fortitude to meet cheerfully all disappointments, a perseverence that knows no give up, a cheerful spirit that can laugh at mistakes ever so disastrous, and a disposition to make the most of a success, and remember the lessons taught by failures.

We should study the requirements of our market and aim to meet them, endeavor to grow only the best varieties, and grow them *well*; but above all deal honorably, give full weights and measures, be *honest*, and an honor to the profession.

O. L. Barler, of Upper Alton, read the following report:

The Vegetable Garden is a very old institution. Did not our first parents tend a garden on "the hill-tops of Eden?" And has not the human race continued the *business* for nearly sixty centuries, down to the present day? And are not the essays and teachings put forth upon this subject like "the fish of the sea" for multitude? and yet we are not fully instructed: every year we need to inquire how to grow a cabbage—how to make the most out of the vegetable garden. And no wonder! There is here no fixed science.

The experiences of last year are not the experiences of this year: seeds and soils that once brought forth bountifully have failed us in the

last decade; the manipulations that served us once serve us no longer; we need to search for newer varieties and newer methods continually. If we do well this year, we have encouragement that we can do better another year: great secrets are being continually unearthed in the garden, yielding to us and rewarding us for all our study and labor.

The subject, then, though old, is ever *new* and *fresh* to the operatives. But, it is astounding to the natives how these "old war-horses" of the farm and the garden can meet year after year, and times without number, and find any thing to talk about and publish in a book. But there is not a man among us to-day, no matter how elderly and venerated, who has not learned something in this year of our Lord 1875, and who is not wiser in these things *now* than he was a twelve-month since. The veteran Dr. Warder can tell us more about forestry and evergreens than ever before in his long and useful life.

The experiences of the past have taught him things he knew not before, and he is able—thank God!—to come here and tell it to us, and we, all eager listeners, stand with ears, if not with mouths, wide open to catch all he says.

Yes: and there is our friend D. B. Wier, a ready speaker, and communicative. He can tell us at this meeting more about the Wild Goose plum than even himself expected to know!

My neighbor—there he sits—Jona. Huggins, is wiser on the apple orchard, and "its profits," than ere his years were so many, and yet he will listen to others, and expects still to learn!

And so I might go on through the list: our experiences in these matters are alike: our testimony is one.

To grow vegetables *means work*, it can be made to mean *slavish work*. At Alton, it is not any more particularly remunerative as a business, for the reason, Chicago being our market, we have to compete with the rich gardens of sunnier climes, and of earlier springs. By economy and hardest work, a man may live thereby—if he does not die! Understand, I am not in this boat: I have a garden, but my fortune is not buried in it.

The business may not always rest under present clouds: the world must have its soups and its salads, and somebody must grow them, and some pay will come out of it. My advice is, if you have nothing better stick to *this*. If better things offer, why, then pitch in! only keep clear of "the whisky rings" and *sich*.'

You ask me for my experience in growing vegetables. I will commence with letter "A" in the catalogue:

"A stands by"—as a little white-headed urchin I used to know would say when looking at the zebras, and other pictures in his primer—"A stands by ass." Very well, A stands for

Asparagus.—I propose, then, first to tell you how I grow asparagus. The story is short and simple: I take strong one-year old plants, set them in rows from three to four feet apart each way, and cover about as deeply as I would potatoes, and give clean cultivation for the first year. In the

fall I put upon it all the stable manure I have and all I can buy for money. You may salt and pepper your beds with guano, bone dust, and superphosphate, to your heart's content, and then put on a *little more*—it will do no harm, and will do much good. You can now go to bed and sleep soundly, for you have done what you could.

If at the harvest, after repeating the above for two years and reaching the third season, your sales are not sufficient to cover the cost, why, you are just so much out of pocket; that's all. But persevere—peradventure another year will repair misfortune and give a profit. But I would have you know that it is the *man* and the *management* that makes the profit, and not so much the sort of a crop grown.

We cut our asparagus green, not white, *i. e.*, at the top of the ground and not below it. It is more tender, and we think far better; we tie in bunches two and one-fourth inches in diameter, and eight inches long, and pack in one-third bushel boxes, eighteen bunches to a box, and send to northern markets by express. It requires a quick transit, or it will heat and spoil in the box. Early in the season the price is satisfactory, but soon the market fills up, and you are fortunate if you are paid for your labor. I would be glad to learn if there is any difficulty or any profit in canning asparagus; and also if the quality of the asparagus is well preserved in the process of canning?

Cabbage.—Early cabbage should be started in hot-beds in February in the latitude of Alton, transplanted to a cold frame in March, and set in open ground by the first of April. Early cabbage require, on most soils, seventy-five two-horse wagon loads of stable manure per acre to do well. This will push them up firm and large, while to save the manure will be to lose the cabbage. Late cabbage will do on strong soils without the manure.

The varieties most in favor with us now are, Wakefield, Winningstadt, Fotler's, and Flat Dutch. These are named in their order of maturity. Plant the early kinds two and one-half feet apart each way, and the later varieties from three to four feet apart each way; give clean culture in all cases.

Cauliflower and Celery can be grown with us, but not without special attention, that involves a great deal of labor, unless the summer happens, as the last, to be cold and wet. Usually, our seasons are too hot and dry for these vegetables to do well, and we cheerfully turn these over to our northern growers, who can grow these vegetables in perfection. We think it better to attempt to grow only those kinds that are suited to our latitude and climate.

The Hubbard Squash is another vegetable that it is almost useless for us to attempt to grow. You in the North may have it.

Lettuce—For early lettuce, it is best to start the plants in the fall, in cold frames, and winter over. Every body can grow lettuce, and the markets are so glutted with this salad, that there is not much money in it for us who live three hundred miles from market. The same may be said of radishes—easily grown and not much profit in it.

The Tomato, when brought forward early, is perhaps one of our best vegetables, and deserves as much attention as any other. The seeds should be sown in hot-bed by the second week in February; transplanted in hot-bed once, from thence transplanted in cold frame, eight inches apart, and about the 10th of May, at Alton, they are ready to set in the open ground; the plants by this time will have formed young tomatoes. There is still another method than the double transplanting method of which I have just spoken. It is, to transplant the first time in square boxes made of weather boarding, and sawed so as to make the boxes six inches square at the top, and five inches square at the bottom, leaving the boxes without bottoms. When you are ready to fill them, set the boxes firmly upon a board, put in two inches of dirt and pack it down firmly—this will serve as a bottom to the box—now fill up with good soil and set your plants deep in the dirt, and put under the glass in the hot-bed; the roots will strike down below the box as well as fill the box, and will not be cramped for room; and when, in May, you come to set them in the field, it is done without the knowledge of the plant. At any rate, they will grow right along as if nothing had happened, when, behold, an earthquake was at their feet!

I am at last converted to the plan of staking tomatoes. It is better to set half the plants, and stake them, as the half staked is greater than the whole not staked, in profits. The per cent. of rotten tomatoes, when the vines are upon the ground, is great—greater than you may suppose; and the extra labor in gathering what is good is almost enough to pay the expense of labor in tying up. There is nothing better than the inner coatings of the bark of the bass or linn wood for tying. Tie first in a hard knot around the stake, and then tie loosely around the plant; tie once, and then again at the top of the stake, which is three feet above the ground when set; prune the plant six or eight inches above the top of the stake. Do this and you will have tomatoes to eat and to spare, in abundance.

The Nutmeg Melon has for years been with us a favorite and profitable crop—nothing more so. We grow the old Alton Nutmeg exclusively; we know nothing better for a market melon; it is large, round, bears shipping well, and is good to eat *when ripe*. Half the melons that go to the Chicago market are not ripe, and are not good to eat. We start a few hills on sod in the hot-bed—sod three inches square, and one seed on a sod. This planting may be made about the first of April, or a few days before. To get ahead of the mice—always troublesome—I mean to try, this year, a tight box, with lock and key, if necessary, and see if I can *bar out* this "ridiculous muss." If there is a better way, I want to hear about it. Perhaps a cat in the "meal tub" would be the best thing. We ship in crates, with twelve by twelve inch heads, and slats two feet long, holding a dozen melons of average size. These crates cost from ten to twelve cents each.

These are the crops with which I have had most to do. The record given is simply my way of doing things. There may be a "more excellent way." Show the road, and we will walk in it.

H. K. VICKROY, from the committee, presented the following, which was read by the Secretary:

Mr. President and Gentlemen of the State Horticultural Society:

Another season has passed, with its many changes, and left its lessons to be considered. One thing is certain, market gardeners have not realized a fortune; vegetables have been very plentiful and prices *very* low nearly all over the country. Never have I known prices to be so low. I have noticed when vegetables are cheap they sell very slowly. When cabbage will bring seventy-five cents to one dollar per dozen, and other vegetables at corresponding prices, they sell rapidly; when they get much below that price, the wealthy people who buy most consider them poor food.

The outlook for the commercial gardener at present is not very encouraging, especially at the West. Eastern gardeners have more to encourage them, particularly next season, on account of the Centennial.

I think the greatest lesson gardeners have learned this year is to grow less and have it of a better quality. No man can expect to succeed in growing vegetables unless he has a love for the business and a love for hard work, rain or shine, low prices or high, good crops or poor. I say "stick to your bush," and you can at least make a living at it. Last year we prayed for rain, this year for dry weather.

Every gardener should put his ground into such a condition that he can grow a good crop, wet or dry. I believe I prefer the dry. In a wet season, I think underdraining is a great advantage, but in a dry season I am not prepared to say it is of any advantage—I rather think a detriment on our soil, at least. In a dry season the ground should be thoroughly pulverized, kept as fine as dust—the finer the better, and kept stirred every few days: and especially after every rain, never allowing the soil to form a crust. In a dry season, I think mulching with rotten straw or manure would be good; at least I am going to give it a fair trial the first dry season. Earliness is the great *desideratum;* the early bird in this case gets the worm, sure. No sluggards here, if you want to get the needful. The teachings of our lamented President, how to accomplish this end, are too fresh in our minds to need repetition. Read the back volumes of our Society's Transactions.

The Colorado potato beetle has been very voracious in this vicinity the past season. When they finished the potatoes they "went for" the tomatoes, eating the vines and fruit. Egg plants seem to be their chosen food; but Paris green will lay them low if properly applied, and the best way I have tried is putting a table-spoonful* into about ten or twelve quarts of water, in a garden watering pot having a small nose the size of the end of the spout with very fine holes. This is the only insect that has given us much trouble the past season. Of the large green caterpillars that

* A tea-spoonful, well heaped, is plenty for twelve quarts of water.—EDITOR.

troubled our tomatoes so much last year, I don't think I saw over half a dozen this season. The following list of vegetables is very good, either for the market or kitchen garden:

Radishes—French Breakfast, Scarlet and White Turnip, and Long Scarlet.

Lettuce—Early Curled Simpson and Hanson. The latter is very fine.

Beets—Early Egyptian.

Cabbage—Jersey Wakefield, Early Wyman and Winningstadt, and Flat Dutch for late.

Corn.—Early Minnesota, Burr's Improved. The last is the best evergreen corn I have seen; it is large and fine.

Cucumbers.—Early White Spine and Long Green.

Potatoes.—Early Rose and Early Vermont. The Vermont, I think, is a *little* earlier than the Rose, and a little better potato. I have not seen any thing that will excel the Peachblow for late, if well grown; the great trouble with most of the Peachblows seems to be that they are not planted early enough: people think, because they want them for late potatoes, they need not plant them early, so that nearly or quite one-half of them are injured by the frost before they have matured. They need a long season.

Beans—Black Wax and Lima are best.

Peas.—Tom Thumb, Dan. O'Rourke, and White Marrowfat.

Egg Plant.—New York Improved. Look out for the potato beetle if you want any eggs.

Melon.—Alton Nutmeg.

Parsnip.—Long Smooth.

Squash.—Hubbard and Marblehead.

Tomato.—Canada Victor and Trophy.

Turnip.—Purple-top Strap-leaf.

Sweet Potatoes.—Yellow Nansemond and Southern Queen. The Southern Queen is very prolific and a good keeper; quality not first-rate. I have seen nothing better than the Nansemond when well grown and matured.

Celery.—Incomparable Dwarf White and Large White Solid. If you are growing for market, there is a class of customers that want it five or six feet tall and five or six inches in diameter; no difference about the quality; they would rather pay *three or four cents a dozen* for that kind. I prefer the dwarf kinds. I think this is one of the most relishable vegetables grown, though very difficult to grow in our climate, unless the ground is well prepared beforehand and you have plenty of water. It loves shade also.

Every thing should be ready in the autumn except manure for hot-beds, which should be got ready in winter for starting the plants early in the spring, so we can "take Time by the forelock."

DISCUSSION ON THE REPORTS.

MR. BARLER.—My method of making hot-beds differs a little from that described in Mr. Hunt's essay. Instead of making a box two feet high and filling with manure, we make the bed of manure eight feet wide,

eighteen feet long, and one and a-half feet deep, evenly spread and pressed down by laying a board across it and walking upon it. Our box is then made, sixteen feet long, six feet wide and fifteen inches deep on the upper side, and eight inches on the lower side. This is set upon the manure and filled half full or more with rich soil prepared the fall before. But usually several beds are made at once, in which case the area of manure may be sixteen feet by thirty-four feet. When the boxes are set on, manure is packed in between them, or banked up to the top of the box, to retain the heat.

The Hanson and Boston Curled lettuce, especially the former, we do not like; it is more green and less tough than leather. We do not eat it, because we can get better. We can buy nothing in the seed stores that gives us as much satisfaction as a variety that has been in the hands of Alton gardeners for more than a dozen years past. I suppose it started with what was the Early Curled Silesia, but it is improved till it is far ahead of that now. It is light-colored, curled and crisp, makes only a moderately compact head, and, when well grown, is good enough to set before a king.

We grow the Trophy tomato, but do not like it because of its hard core and imperfect ripening. Hathaway's Superior and Cook's Favorite will be tried by us another season, as I am inclined to think they will suit better.

DR. LONG—I want to call attention to the garden as indispensable to every man who owns ground enough to make a garden. Garden vegetables are necessary for the body, giving vigor and life and health. It is a pleasant recreation to be up in the morning and out in the garden at work before breakfast.

In regard to time of preparation, *now* is the time to prepare your ground; plow deep, manure heavily, and ridge up the land, so as to get the benefit of the frosts. As to kinds and varieties, the radish, I think, a bad thing. It is not fit to eat; but the Bassano beet is a good thing, and there is, perhaps, no beet earlier or better. Other kinds are good, but this is good enough. Then come peas and early corn. The Golden Sweet corn is the best and earliest. I have never eaten any thing nicer than this. I have sweet corn for the table from about the 25th of June till the first of September, or later, by planting every two weeks until the 5th of July, which will carry me till frost. Early Rose is my potato, both for early and late use. I plant and cover two inches with dirt, and then cover with straw, and I have good crops. For late use I plant late, my last planting being about the 10th of July. They are superior to the

White Peachblow. Clean cultivation and frequent hoeing is the price of success in the garden; this working of the garden at the right time is of more importance than you may suppose; get at it as early as you can see in the morning and *hoe the dew in.* You will reap a richer harvest for your early industry.

DR. LONG, in answer to a question, said: I cover my potatoes four or five inches deep with straw. I took, this year, twenty-three bushels of potatoes from a piece of ground four by eight rods. I plant in rows three feet apart and one foot in the row; and I can succeed with planting small potatoes as well as with large ones. Work every thing while the dew is on, except beans. I am well satisfied with my experience. My tools are not left out to rot and rust, as many are. I expect my men to do a good day's work, and for this I give them good tools.

MR. ROBISON—Is it good doctrine to teach, this getting out early in the morning?

DR. LONG—Yes; I advise every man to get up in the morning early—but do not stay out late at night.

MR. JONES moved that the election of officers, which will be the regular order of business for nine o'clock to-morrow morning, be made the special order for eleven o'clock, urging, as a reason, that many of the members could not attend at the opening of the meeting.

The motion prevailed, and the Society then adjourned.

THURSDAY MORNING.

The meeting was opened with prayer by Rev. H. O. HOFFMAN, of Quincy.

THE PRESIDENT stated that inasmuch as the election of officers, which was the regular order for the morning, had been made the special order for eleven o'clock, the next business would be reports from the Committee on General Horticulture, and called for a

REPORT FROM THE FIFTH HORTICULTURAL DISTRICT.

MR. G. L. BRUNTON, from the Standing Committee on General Horticulture, reports as follows for Centralia and vicinity:

The Fifth District embraces seventeen counties, from most of which I have no information relative to the status of horticulture therein. I shall therefore report only for the region around Centralia.

The past season has had its extremes of heat and cold, wet and drought, and has been very unsatisfactory to the horticulturist. I will mention, before beginning my report proper, a most remarkable phenomenon, which occurred at Centralia, at ten o'clock A. M. of June 16th. The weather upon that morning was cool and wet, but at ten o'clock a wave of scorching hot wind, lasting but five or six minutes, swept over an area of a few miles in and around Centralia. So sudden and hot was the wind that it caused men to drop their tools, or their boxes of fruit, where packing strawberries, and run from the field. Some of the inmates of houses were sure they were on fire, and, in alarm, hurried about to find the location of the fire. Who can account for this sudden and stifling heat, upon such a cool day?

A general apathy, and distrust of success in horticulture, seems to prevail here. Theory after theory about tree blight, insect life and insect remedies, is promulgated, only to be exploded, and we find ourselves, if not as ignorant, yet nearly as helpless as ever in contending with the many obstacles to horticultural success.

All varieties of fruit trees were full of buds this year.

Peaches and *Cherries* were mostly killed by the cold in January.

Apples and *Pears* blossomed full.

April 16th, ice formed ½ inch thick—thermometer at 6 A. M., 26°;
" 17th, " 1½ " " " " " 24°;
May 2d, " ½ " " " " " 30°;
" 17th and 18th, frost killed tender plants and blooms, but did not damage the apples and peaches which had escaped the previous freezes. Pears were killed; blackberries badly damaged.

The Curculio prevented from maturing the few peaches which the frost left.

The *Apple* trees, having borne too heavily last year, were glad to shed most of their fruit early in the season, and the Codling-moths (in great abundance, owing to our large crop of cheap apples last season,) were quite ready to despoil us of the balance.

The result is a very light crop of very faulty fruit, though trees which bore few or none last year gave a fair crop this year. Would not judicious thinning insure nearly annual crops? Those who have apples this year get good prices for them.

Grape vines were heavily loaded, but the fruit nearly all rotted.

Strawberries yielded well, and prices were satisfactory.

Blackberries were a very light crop.

Raspberries were a medium crop of very choice fruit—only Black Caps being cultivated here.

Currants and *Gooseberries* were plenty.

Of orcharding in this locality, the apple interest is advancing; the cherry orchards claim some attention; but the interest in peach, pear and plum culture is nearly extinct.

Grapes are only raised for wine and home use. Of strawberries the acreage is largely increased, and the plants promise well, though culture has cost double the usual amount.

Blackberry and raspberry plantations are receiving some attention, several small plats having been planted with the Turner last spring.

I have found, in cultivating blackberries, or in digging the plants, that wherever I have disturbed the roots there the orange rust has appeared, and in no other place. Is not the plan of planting upon good land, and giving no culture after the first year, the best one to adopt?

From June 10th to August 5th it rained almost incessantly, and every thing planted upon flat land suffered in consequence; but from August to November no rain fell to lay the dust. Thus have extremes followed each other. Respectfully submitted,

G. L. BRUNTON.

Following this, the SECRETARY read a report from Hon. W. C. FLAGG, Committee in the Sixth Horticultural District, as follows:

REPORT FROM THE SIXTH HORTICULTURAL DISTRICT.

MORO, MADISON COUNTY, ILL., December 1, 1875.

O. B. GALUSHA, Secretary, etc.,

Dear Sir: As I shall not be at Quincy, owing to other engagements, I forward to you a brief report concerning our district for the year 1875, prefaced by a few statistics that may be of interest, at least to those immediately concerned.

The year was remarkable for its wetness during the growing season. There have been no such rains for some six years. The low and flat lands were rendered unsuitable for crops or trees, while the high and dry lands came out with extraordinary crops of corn and a strong growth of fruit trees. The latter part of the season was dry, even to excess, in the southern parts of the district, and the ripening of late fruits was affected thereby.

The evil influences of the dry, hot and cold seasons from 1870 to 1874 still show themselves in the decrepitude of old and even of some young orchards, and, I am inclined to think, to some extent in the short crop of fruit this year. Inquiries I have made of persons from different parts of the State lead me to believe that the damage to orchards in the northern, central, and, to some extent, in the southern part of the State, is so great that the safest plan is to plant young orchards of healthy trees, and not trust to the possibility that the old will revive.

The Sixth Horticultural District comprises the following counties, whose area and acres in orchard are given from the assessment of 1874:

	Square Miles.	Orchard Acres.	Acres Orchard to Sq. Mile.
Bond	378	1,938	5.1
Calhoun	255	2,368	9.3
Clinton	489	3,432	7.0
Greene	546	not given.	
Jersey	365	1,926	5.2
Macoupin	864	5,984	6.9
Madison	748	10,900	14.4
Monroe	381	2,007	5.1
Montgomery	702	3,928	5.5
Perry	444	not given.	
Randolph	577	2,647	4.5
St. Clair	665	6,879	10.3
Washington	556	4,666	8.5

I subjoin reports that I have received from seven of these counties:

CLINTON COUNTY.

Dr. M. M. Hooton, near Centralia, reports as follows:

"Trees have not grown as well as might have been expected; but appear to be in good condition for the coming winter. The extremely wet weather through June, July, and August, rather retarded growth than otherwise. The change from wet to dry weather was very sudden, and extreme; yet, notwithstanding these unfavorable conditions of weather, the prospect for fruit another year is better than it was last autumn.

"Small fruits are in average condition. Insects are more scarce than for many years. The apple and peach crops were light this year, especially the latter, which was quite a failure."

JERSEY COUNTY.

Mr. James E. Starr, of Elsa, Jersey county, writes:

"There are but few commercial orchards in Jersey county; among them, however, are some remarkable for the number of trees cultivated, and others for their specialties.

"The apple orchard of A. Swan, near Elsa, contains five thousand bearing apple trees.

"The cherry orchard of S. S. Ellis, near the same place, and that of E. A. Riehl, on the Mississippi bluff, are both examples of success in the culture of the finer varieties of cherries. The success, if measured by the amount of money made, will, I think, compare favorably with that of any agricultural product. The past four years have not been favorable: scab, late frosts, etc., have cut off or greatly injured the crops.

"*Peaches*, along the bluffs, are as successful as in the immediate vicinity of Alton.

"*Grapes* were extensively planted some four years since, and for a time the prospect of good results was very flattering, but the low price of both wine and grapes has checked and almost destroyed this branch of horticulture.

"*Small Fruits* are not much grown. The farming community evince much interest in the culture of all varieties of fruits, and as they find themselves growing into the possession of means, they surround themselves with the beautiful and useful in horticulture. Little Jersey is particularly adapted to fruit culture; thousands of acres invite the intelligent pomologist to test them in this line. Our County A. & M. Society, by offering liberal premiums for fruits, flowers, etc., has done a good work in awakening the public to their importance."

MADISON COUNTY.

Capt. E. HOLLISTER, of Alton, writes as follows:

"The depressing influence of short crops generally, and total failure of some in particular, has been the rule the past season; yet I learn of the planting of some orchards of Apple trees, and plantations of small fruits, and a more hopeful feeling for the future. There have been as many as usual, and perhaps more, Strawberries, Raspberries, and Blackberries, planted, but I do not learn of any Peach trees having been set, or to be set in the spring. Apple trees will be planted quite largely next spring. The hot-bed gardeners will do about the usual amount, and all seem determined to push along notwithstanding the hard times."

J. BAUSIGER, of Highland, Madison county, sends the following report:

"You might have found, easily, a reporter more able to inform you about the condition of horticulture in this county, and particularly in that part of it in which I live. Though taking a very great interest in this particular branch of agriculture, but not often leaving my home, I have seldom an opportunity to see what is done in this respect in places outside of my immediate neighborhood. But as you have honored me with your request, I shall try and give you the wished-for information as well as I am able to do it.

"It seems to me that it can not be doubted that horticulture has progressed considerably for some years in our county. When one sees the thousands and thousands of young fruit and ornamental trees, and other plants, distributed by nursery-men and their agents every fall and spring in all our towns, and perhaps as many more sold at the nurseries themselves; when one sees on nearly every farm a fine and thrifty orchard growing, some fine shade trees planted, and a garden with beautiful flowers, shrubs and vegetables; when one sees such gardens and trees even on nearly every town lot, where they are even better tended than in the country, one must be convinced that our population has a growing taste for horticulture. Times and circumstances have changed in this respect. Some twenty-five or more years ago there were more farms without than with orchards and gardens to be seen; even in our towns large patches of hazels and briars were about the only ornamental shrubs, and wild prairie flowers (though by no means devoid of beauty, and many of them well worthy to be set by the side of cultivated ones,) about the only floral adornment to be found.

"People who could afford it went to Bond county, where old and extensive orchards even then existed, to buy their provisions of fruit. Then the hard-working farmer and mechanic of the town had more pressing wants; he had to till his fields and work in his shop from early dawn till night to provide for the most pressing necessities for himself and his family; they could not afford to buy trees or fence up a garden. The immigrant from Europe was familiar enough with horticultural objects, and few of them were devoid of taste in this respect, but they had to wait for better times and easier circumstances ere they could afford to satisfy it.

"Now times have changed. Now nearly every farm, with the exception of a few recently established ones, has its orchard, producing apples, peaches, and even some pears; it has its garden, with flowers and vegetables, and many of them even a larger or smaller vineyard. As I have already mentioned, every fall and spring a large number of new trees and vines are planted, and instead of having to go abroad for a supply of fruit, the farmer raises it himself, and provides the inhabitants of the town with it. Only in years of failure, as the present one, there may be a scarcity of it in some respects. As far as I had occasion to see, apple orchards that bore a full crop this year were a rarity; peaches could be found only on a few seedling trees; the Concord grape, and a few others, rotted very badly; pear trees bore, with a few exceptions at most, only half a crop; cherries were very scarce. This nearly general and so exceptional failure in the

fruit crop must be attributed, first, to the last winter's cold (though it was not so bad as two years before), to late frosts in the spring, and frequent heavy rains during the blossoming time, and afterwards.

"I shall now report upon the different kinds and varieties of fruit-bearing trees and shrubs, and other plants, which we cultivate, and which I have had an opportunity to observe, mentioning particularly those which I have found to be valuable.

"*Apples.*—Summer: Red Astrachan, Yellow Harvest, Red June, White June, Summer Bellflower, Maiden's Blush. A Summer Rose, brought here from Switzerland, bears, with me, enormous crops every alternate year, is ripe about the first of August, is of medium size, fine (red striped) color, good quality, though rather tart; sells well; tree well formed and a strong grower.

"Fall and Early Winter: Rambo, Pennsylvania Redstreak, Yellow Bellflower, Golden Russet, Pennock (Big Romanite)—this is not of first quality.

"Winter and Spring: Rawle's Janet, Small Romanite (Gilpin), Ben Davis, Esopus Spitzenburgh, White Winter Pearmain (is often scabby, but of good quality—not fine enough for a good market fruit), Pryor's Red, Winesap, Limber Twig, Milam, Priestley (is not of first quality, but a good keeper, sells well, owing to its fine size, a regular but not abundant bearer). The Green Pippin does not do very well here; it is injured by bitter (black) rot on the tree. The Yellow Newtown Pippin is a better and more profitable fruit.

"Of the *Siberian Crabs*, I have tried Transcendent, Cherry and Hislop—all good bearers, fine for preserves, jellies, and such like. Also different *Cider Crabs*, particularly one which is called here Pennsylvania Crab (is it Hewes' Virginia Crab?); superior to all others for cider, a small, oblate, flattened, pale green apple, with light red stripes, thin and long stem; acerb taste.

"I have many other varieties of apples under trial, and among them several seedlings of my own, but am not yet prepared to give an opinion about them.

"*Pears.*—Of this fruit I have no great experience, as it is not many years since I have cultivated a considerable number of varieties, and they are, mostly, not yet in bearing. Generally, pears are not largely planted here, owing to the blight, which destroys so many trees when they are beginning to bear fruit. I have found the Bartlett to be one of the most reliable; Seckel was killed by the blight, with me, and also various other varieties. Flemish Beauty, grafted on the limbs of a large tree which bore fruit of no value, is doing well enough, though not quite free from blight; it is bearing every year. Louise Bonne de Jersey, Vicar of Winkfield, and Easter Beurre, planted in my garden, died with blight when they commenced bearing fruit. Since then I planted all my pear trees, mostly standards, in the sod, where they grow slowly, but are nearly always free from blight.

"*Peaches.*—Most peach trees here were killed by the cold winter three years ago, or, at least, greatly injured, and for this reason bore very little since then. I have set out many new varieties, but they have not showed any fruit yet. Among the old ones I could recommend: Troth's Early, Early York, Indian Cling, Mixon Cling and Freestone, Stump the World, Crawford's Late, and Heath Cling.

"*Cherries.*—The Bigarreau varieties are nearly all tender here, except in a few particularly favorable situations, which are the highest that can be found. There, some of them have withstood even the most severe winters. These are, I believe, Governor Wood and Black Tartarian. The Dukes are hardier, but even May Duke was killed on my farm by the winter of 1872-3. The Early Richmond is the only one that has proved perfectly hardy with me, for even the common Morello has suffered from the most severe winter's cold. I am trying some new varieties, reputed to be hardy, but as yet have had no experience with them.

"*Plums.*—I have found none yet which withstand the attacks of the Curculio except the Chickasaw; am trying the Wild Goose, which is a Chickasaw, too.

"*Quinces.*—Of these, the common apple, or Orange quince, is doing well here, when well tended; it is hardy, as well as the Angers quince, whose fruit I have never seen. The Portugal has proved rather tender with me.

"*Raspberries.*—Among the black-caps, I could recommend the Doolittle and McCormick, or Mammoth Cluster; and the Kirtland and Philadelphia, among the red ones; the Clarke is very tender; I have planted the Turner, which I found very hardy, and a good grower; it is only beginning to bear, wherefore I am unable to say whether it is a good bearer or not, but its fruit is fine and rich.

"*Blackberries.*—I have tried the Lawton and Kittatinny, and found the former too tender, but the latter perfect in every respect, except for its awful spines.

"*Strawberries.*—Wilson's Albany is still the most generally cultivated; but I had to give it up because it did not stand our hot and dry summers well enough. I replaced it by Green Prolific and Downer's Prolific, which proved hardier and more enduring. The latter is an early and the former a late variety; both are very good bearers, of fine size and good quality. I have others on trial.

"I do not know whether you want me to say any thing about

"*Ornamental and Shade Trees.*—Concerning these my experience is very limited. As far as I know, the best of evergreens are the pines—Austrian, Scotch, and White pines—they are the hardiest, fastest and healthiest growers; cedars, spruces, and firs do not quite as well generally, and are of a slower growth. Of deciduous trees, the White maple, Sugar maple, Box elder, American linden, and elm, (particularly the White) and the Silver poplar grow well, and are quite hardy and fine. Oaks and nut-bearing trees are rather difficult to transplant successfully. The ashes are fine shade trees, and good growers, but the foliage is too much exposed to attacks from insects. One of the fastest growers is the Golden willow.

"*Grapes.*—By far the most generally planted variety here is the Concord, which is not without reason called "the grape for (or rather of) the million." But this last season it has disappointed not a few of those who cultivate it, by rotting very badly (at the rate of fifty per cent.) during and after the rainy season. I have observed that on young vines, bearing their first or second crop, the fruit remained healthy, or rotted but little, and the rot was worst on older vines. Of other varieties, the Telegraph, Rogers' No. 2, and Maxatawney suffered about as much from this disease as the Concord. Of Alvey, Iona, Martha, Hartford, Herbemont, and Taylor, about one-fourth rotted. Others have not suffered from rot, but greatly from mildew, such as Delaware, and Wilder, whose fruit did not ripen at all; or Goethe, only a part of it got ripe. The following have proved quite healthy: Cynthiana, Norton's Virginia, Cottage, Northern Muscadine, Perkins (which bore an immense crop of rather foxy fruit, making a good Muscat wine), Ives Seedling and Rulander (this is not a great bearer, and very tender). I could recommend, according to the experience of the vine growers in this neighborhood, and my own, as tolerably hardy, healthy, and good bearers: Ives, Northern Muscadine, Martha, Mary Ann (only for a very early table grape); Hartford, Concord. The Rogers' Hybrids are much better table grapes than these, but too tender and too much subject to mildew, though they do well enough in favorable seasons. For wine especially, though not bearing so large crops as the above named varieties: Alvey (not quite hardy), Cynthiana, and Norton's Virginia: Herbemont and Cunningham, excellent wine grapes too, are too tender, and our soil here is too rich for them; they do not well ripen their wood, and do not bear well.

"Concerning my Seedlings, I can say: The first ones I raised were from Concord seed. Among these were several bearing white fruit; from these, I selected as the best, 14 and 32, both quite hardy, good growers and bearers (not inferior in this respect to Martha); bunches and berries medium size; 14 somewhat foxy, although not as much so as Martha, not entirely free from rot in bad seasons like the last one, of fine yellowish green color, ripe with Concord, but hanging late on the vine. 32 is of better quality, has never rotted yet, berries about the size of those of Martha, of a fine golden yellow color, with few seeds, very sweet and not foxy. It is an early grape, ripe about the same time or directly after the Hartford, but hanging, with me, in good condition till late in October, and growing sweeter from day to day. The must of both varieties mixed together, showed on Oechsle's scale, 84° in 1874 (last fall I did not make wine of them.) I have obtained two black Concord seedlings (1 and 2,) whose fruit is of

much larger size in bunch and berry than their mother's, of very fine appearance, though hardly better in quality than Concord; both ripening late, about the last of September. I got, also, a white Seedling of Norton's Virginia, which is very late too. It did not ripen this fall, ere the first heavy frost came on; but last year it was very fine and sweet. Its bunch is rather small, the berry same size and form as Norton's; the vine very hardy and healthy, and about as good a bearer as its mother. It may prove valuable for the South, as a good wine grape."

Prof. B. G. ROOTS furnishes the following concerning

PERRY COUNTY.

"I had no fruit of value, and knew of none. Upon diligent inquiry through the county, I believe *Peaches* to have been one-twentieth of usual crop; *Apples* one-fifth; while other fruits were too scarce to estimate. More trees have died than have been planted within three years past. The cultivation of vegetables (*Tomatoes* mainly) for export, has increased a very little.

"PINCKNEYVILLE, Dec. 6, 1875."

ISAAC SNEDEKER, of Jerseyville, writes as follows of horticulture in

JERSEY COUNTY:

"We think that horticulture is steadily progressing, but not very actively. There are but few persons in our county who make fruit growing their principal business. The fruits and vegetables grown in the county are mostly consumed here, though there are annually sent abroad a few thousand barrels of apples, a few hundred barrels of cider, and a few hundred barrels of wine. All that is done in Pear culture is to keep the number of trees good which are killed by blight. The Apple crop this year was about half an average crop; though a neighbor, David Ross, made about a thousand barrels of cider.

"Nearly every farm in the county now has its apple orchard, with cherry and peach trees and a full list of fruits; but in small numbers, or about sufficient for home consumption. I think there are about fifteen commercial orchards and vineyards, but mainly connected with some other business.

"Insect depredations are the great drawback to successful fruit-growing here.

"The following is fair statement of the comparative fruit crops for 1875:

"*Apples*, half a crop; *Peaches*, none or nearly none; *Cherries*, a fifth of a crop; *Grapes*, a fair crop; *Pears*, a fair crop; *Berries* of different kinds, about one-fourth a crop; *Quinces*, about one-fourth crop; *Vegetables*, a good crop, although there was some loss on wet ground.

"You, no doubt, regret as deeply as I do the death of our friend and co-laborer, Dr. E. S. Hull. He has gone to his reward, but his usefulness has not ended here; his work was for the good of the country at large."

Mr. E. GASKINS, of Mulberry Grove, writes thus from

BOND COUNTY:

"In answer to your questions, I will say that the past season has been one of short crops in this county. There were *no Peaches*, and but a limited crop of *Berries* and *Grapes;* the *Apple* crop was also short—perhaps not over one-fourth of the usual crop. Orchards generally are much neglected—indeed, usually left to take care of themselves—perhaps from the fact that there is no money in apples when we have them. I know of no person in this county that makes a special business of growing fruit, and I believe it is generally conceded by all those that grow fruit that it does not pay. Very many farms in this county have orchards of a limited number of trees, but, as a general thing, the owners attach but little importance to them; consequently, give to the trees but

little care or attention. Our farmers, however, still buy trees from the tree peddler, and, if one in ten of such trees reach the bearing age, we shall still have fruit to sell, though no one may wish to buy. I suppose that the prospect for the coming year is good, as the trees seem to be healthy."

E. AUG. BOEHTEL communicates the following from Staunton,

MACOUPIN COUNTY:

"The interest in planting fruit trees has not materially increased this last year in this district, though the interest in planting ornamental trees (mainly evergreens) is awakening considerably, as the people learn to plant them and to take care of them; also, the raising of flowers and shrubs is increasing, especially among the female portion of the population. The season has been very wet, and, on dry land, trees, shrubs and all vegetables made a wonderful growth; but, on low, flat ground, fruit trees got injured in many instances.

"The *Apple* crop in this county and parts of the adjoining counties has been nearly a failure; fall apples were more plenty than winter varieties; the Rambo seemed to bear full in every orchard; the Ben Davis, Rawle's Janet, and Winesap seem to be the most reliable bearers we have; the Janet is, of late, very liable to rot. Winter apples sold from sixty to eighty cents.

"*Pears* were more plenty this season, although the blight was very bad on the trees. In this part of the State the Duchess of Augouleme seems to be the most reliable pear in every respect; the Howell is a very good bearer, but is subject to blight; the Winter Nelis seems to be a healthy tree and a good bearer too, but the fruit is knotty.

"*Peaches* were an entire failure in this county, on account of the fruit buds being winter-killed.

"*Cherries* were also very poor, as the Curculios were very numerous.

"Miner and Chickasaw *Plums* were very abundant, although the Curculio worked on them considerably.

"*Grapes* bore plenty in young, thrifty vineyards; on old vines the rot was very bad, mainly with the Concord. Iona, Delaware, Roger's Hybrids and other tender varieties mildewed badly. The healthiest of all the vines seemed to be the Ives, and next to it the Norton's Virginia and Martha. The interest for small fruit seems to be decreasing; *Strawberries*, on that account, were scarce, while the crop was good and of fine quality wherever found.

"*Currants* and *Raspberries* produced well.

"*Blackberries* did not do so well. The Kittatinny and Snyder seem to do best.

JONATHAN HUGGINS, of Woodburn, Macoupin county, reports as follows:

"I am hardly in a mood to write on the growth of horticulture in our county. The horticultural road, for several years, has been a hard road to travel. It has been too cold or too hot, too dry or too wet; insects have swarmed by the millions in our orchards; they have worked on the foliage of our trees, on the limbs, the bodies, the roots; they commenced on the tender buds of early spring, and worked faithfully throughout the frosts of spring, the heat of summer, the rains of autumn, and were not idle during each warm spell of winter. Our pear trees blighted, our peach fruit buds were killed by untimely frosts, our apple blossoms blasted, and our fruit trees generally refused to give us fair paying crops. But nevertheless we to-day report those among us who are full of hope, believing that the unfruitful seasons are past, and that those who have in the past properly cared for their orchards may in the near future look for the reward, bound, sooner or later, to follow the efforts of the intelligent labors of the fruit grower. We find those orchards in our county, notwithstanding the many drawbacks, which have been cultivated, properly pruned, etc., are in good condition for a crop the

coming year. Those orchards that have been cultivated, and those that have been pastured by hogs, have shown the best results—more apples and less imperfect fruit. The time of the blooming of the apple was cold and rainy, and the fruit failed to set largely. Of the kinds that succeeded here we mention the Rambo, Janet, Ben Davis, Red Canada, Baldwin, Hubbardson's Nonesuch, and the Wagner. All other varieties produced lightly.

"The weather has been very wet the past season, and, we hope, damaging to the insect tribe.

"Our trees generally are in good condition now for a bountiful crop next year."

A. A. HILLIARD, of Brighton, in the same county, writes briefly as follows:

"I will say, so far as I am posted, the fruit crop in this county has been nearly a failure for several years. Apple trees have blossomed very full, and bid fair for a good crop, but the late frosts and the cold nights no doubt affected them, so that a large part of the bloom dropped off. As the result we have had a limited crop. Pears and quinces failed about the same. Small fruits—strawberries, blackberries and raspberries—bore well where the plants were not injured by previous drought."

JOHN E. DETRICK, of Sparta, sends the following report of

RANDOLPH COUNTY.

"In this section there was an excellent prospect for all kinds of fruit until the sixteenth, seventeenth and eighteenth of April last, during which time there was a continual cold north wind blowing, and ice formed during each night. The thermometer ranged from six to twelve degrees below freezing. The morning of the seventeenth was the coldest, and the ground was frozen to the depth of fully one inch. Peach trees, and early varieties of pears, had commenced blooming, and apple trees were budding. Gooseberries and currants had pretty large leaves, and were full of fruit. All unprotected vegetation was frozen, and, according to the natural order of things, it was reasonable to suppose that all the fruit was killed, but it was not. Grapes were also budding and showing leaves, and were frozen, if such a degree of cold as the thermometer indicated can freeze them. Notwithstanding the freezing, however, there was more or less fruit. Some pears adhered to their stems and matured fully, but I noticed a tendency of the flesh to soften round the core while appearing perfect outside; while some had no blemish whatever, and were entirely perfect and well flavored.

"Peach trees of the hardy varieties made considerable show of fruit after the freeze, but the fruit dropped from the trees at various stages of growth, and only a few, one here and another there, adhered and ripened. The crop was a failure in this county.

"Of apples there was not an average yield, but the fruit was better than that of the previous season. Some favorably situated orchards, in the hilly and timbered portions of the county, produced fair crops, while in orchards not so favorably situated the crop was a failure.

"Cherries may be said to have been an entire failure. On some trees a few blossoms opened, more on the Morello than any other variety, but very few adhered and ripened. Previous to the April freeze the buds indicated a good crop.

"There were some currants, but rather a small yield. The same may be said of strawberries, raspberries, and blackberries, none of which, however, are cultivated very much in this county. The much abused gooseberry, which fills a place among the early small fruits, had a hard time of it during the freezing weather, but was quite abundant and acceptable under the circumstances.

"Of grapes, the Concord and Clinton did best in this section, but the yield was rather small. In some places the leaves of the Delaware, and in part the Clinton, neither of which, however, are very much cultivated, became diseased with a warty excrescence on the under side, and when the grapes commenced changing color most

of the leaves dropped, and the grapes did not mature on such vines. On the contrary, they commenced wilting after attaining about the usual size, but kept on coloring, and when fully colored were quite sour, and seemed entirely destitute of grape sugar. I noticed no diseased leaves on the Concord, which, with the Clintons that escaped the disease, ripened about as usual, and so also did a few Catawbas that I noticed.

"The wonder is that there was any fruit after the severe freezing weather in April. The blossom stems of the pears had attained their full length, and some of them were particularly noticed, especially such as showed fruit. On the morning of the 17th of April they were frozen too hard to bend the stem. On the 19th I examined some on the trees with a good glass, after the sun had shown out warm for several hours, and they appeared to be perfectly sound and healthy. The freezing was during the light of the moon; and having heard some German farmers say that fruit was not killed by frost during the light of the moon, I determined to notice the result, as it was more than a mere frost, and I thought would test the theory so severely that if the fruit was not all killed there might be something in it. The result was as stated in this section of the county."

Mr. G. WILGUS, of Richview, sends the following respecting

WASHINGTON COUNTY:

"In regard to the condition and progress of horticulture in Washington county, for 1875, I have to remark that the season has been an exceptional one in many particulars. The severe cold of the past winter and early spring was followed at mid-summer by heavy, long-continued and damaging rains. These in turn were succeeded during the autumn months by a protracted drought. Against such a combination of untoward conditions the horticulturist has been able to make but little progress. Our early fruits and vegetables were more or less 'behind time;' our mid-summer culture was frequently interrupted and sometimes indefinitely postponed, while late maturing products were greviously cut short by the protracted droughts. On the whole the season has not been a prosperous or satisfactory one. Fruits and vegetables have been produced only in limited quantities, and of a quality in general rather inferior as compared with former years. On the other hand, the ravages of insect enemies seem to have been somewhat less than usual. Whether this is owning to the heavy rain-fall preventing their hatching, as in dryer or warmer seasons, to a less inviting 'bill of fare' because of meagre crops, or some other reason to your correspondent unknown, the 'bug crop' has been relatively a light one. Nevertheless there are plenty of them left, and the horticulturist who neglects to search at the proper season for the peach and apple borers, for caterpillars, moths, etc., will find he has neglected an important part of his duty."

The KNODLE BROTHERS, of Irving, send the following notes of horticulture in

MONTGOMERY COUNTY:

"The prospects of horticulture in our section are flattering, notwithstanding the difficulties of adverse seasons.

"The *Apple* crop this year is barely one-fourth of a full one. Rawle's Janet, Maiden's Blush, Green Pippin, and Ben Davis, bore some—say fairly well; Winesap was a failure. Trees have not suffered much from the effects of the last winter.

"*Peaches.*—There were a few, and the trees are in good condition.

"*Cherries.*—There was a good crop of common Black Morellos. Other kinds were scarce. Trees were badly killed out by the wet summer, and the buds killed during the winter.

"*Plums.*—Wild Goose bore well. Curculio destoyed two-thirds of the fruit which set, but enough was left for a fair crop.

"*Pears.*—Not many are planted yet. Our young Bartletts, four years old, commenced bearing, and are in a thrifty condition. All pear trees do not appear to have suffered by the winter.

"*Grapes* of most kinds set well, but the fruit rotted badly, Concord not excepted.

"Small fruits of all kinds were a slim crop; wet weather destroyed the vitality of the bloom.

"*Evergreens.*—Pines and spruces are all right. Golden Arbor Vitæ slightly injured by frost. We had it heavily mulched or it would likely have been killed outright. It has made a fine growth this summer, and is now very beautiful. Boxwood stood the winter well on the north side of a fence. The warm spell of weather the last part of March and first of April started it to growing, when the cold snap, from the sixteenth to the tweentieth of April, brought the temperature down to twenty-five degrees, and killed three-fourths of it. Chinese Arbor Vitæ, where not mulched, was nearly killed outright. Mahonia, standing in thick clusters and mulched, was but slightly injured, the outside leaves browned, but it was badly killed out by the wet summer. Yucca Fillamentosa and Flaccida stand the winter bravely.

Mr. J. M. NISLER, of Irving, Montgomery county, also reports a gradual progress in horticulture in the county, although there has not been as much planting done in 1875 as in some former years. The peach crop was almost a total failure, and other fruits generally produced only about half a crop. The condition of orchards is pretty good, with an enormous growth upon young orchard trees where cultivated.

All the above respectfully submitted,

W. C. FLAGG,
Committee for Sixth District.

REPORT FROM THE SEVENTH HORTICULTURAL DISTRICT.

PARKER EARLE, of Cobden, Union county, reported as follows:

The year 1875 has been one of disastrous failure with most of our fruits, in the largest portion of the hill country of Egypt. The winter of 1874–5 should be chronicled as the coldest and most protracted the present generation has experienced. We suffered greater cold on two previous occasions, the mercury having reached 18° below in 1864, and 14° below in 1873, while it reached but 12° below in 1875; but this last winter began earlier and lasted longer, and the persistent cold had little intermission. The peach buds were very generally killed on the ninth of January, yet a sufficient number escaped on vigorous trees to have made a fair crop but for the terrible freeze of April 17. At this time all of our hills were white and rosy with promise. A sufficient number of peaches have escaped to give us a prospect of a lively but profitable fight with the Curculio; while the Pear, Cherry and Plum orchards were as white as snow-banks, and the Apples and Strawberries were coming out rapidly, when one night, with ten degrees of frost, changed all this bright picture into a blackened waste. Nearly every opened blossom (I know no exception but the Buffam pear), of whatever kind, was killed, with a large portion of the advanced buds. The young leaves of the finest trees were killed, and the hope in our hearts of ever making fruit growing pay the most skillful and industrious a decent living was nearly killed also. It

was only a little matter of ten degrees of frost; it only lasted a very few hours, but it was sufficient to rob the fruit growers of Egypt of a million or two of dollars. And such accidents are liable to happen any year!

Need this report be prolonged? The history of a year's struggle to repair the damages, and make the year's accounts balance, scarcely need be written. Any Mark Tapley who has a genius for meeting disaster, and who fails to find sufficient difficulties to keep him jolly, should hasten to engage in fruit growing in Egypt.

REQUEST BY STATE ENTOMOLOGIST.

PROF. THOMAS—*Mr. President:* I shall be obliged to leave the hall soon, and before I go I wish to say, I shall be glad to have the co-operation of the members of this Society, and to receive from them any specimens of insects that they are pleased to send me. My address is at Carbondale, Illinois. If you feel it is necessary to place any work upon me, I am at your service. I will be glad to serve the horticulturists of Illinois in any way I am able. If you command, I will obey, for I am your servant.

J. S. JOHNSON—I wish, as a member of the Warsaw Horticultural Society, to extend to Mr. Thomas an invitation to attend our meeting, some time during the summer.

PROF. THOMAS—I will be glad to accept the invitation, and I will say this also: that in the summer, I travel at my own expense; but in the winter, if my services are needed, it is essential to provide for the necessary traveling expenses.

WANTED—A NEW APPLE.

J. S. JOHNSON—I wish to offer a resolution, with reference to the coming apple—an apple that we can call *our* apple—an apple that will be to us what the Baldwin is to the East.

I submit the following for adoption by this meeting:

WHEREAS, We have no apple in this State which meets all our requirements, in tree and fruit, of a first-class winter apple, and believing that we may in time produce an apple which will compete in all our markets with the Baldwin or Northern Spy; therefore,

Resolved, That a committee be appointed at this time to report to this meeting a plan whereby we may produce and perfect an apple which will meet our requirements.

The resolution was adopted, and the following gentlemen appointed upon the committee: Dr. J. A. Warder, D. B. Wier, J. W. Cochran, Jonathan Huggins, and J. S. Johnson.

REPORT OF COMMITTEE ON BERRY CULTURE.

H. J. DUNLAP, of Champaign, member of the Committee on Berry Culture, was not present, but had forwarded the following, which was read by the Secretary:

I am unable to present any thing new upon the subject of Berry Culture. The past season has been very poor for that, as well as all other classes of fruits, which have been almost a total failure in this county. The Wilson's Albany still heads the list of strawberries here; the Chas. Downing, which is a favorite with some, is not yet in bearing in this locality, but, judging from the fruit of that variety sent to this city for sale the past season, it will be no great acquisition.

As usual, my Doolittle raspberries came through the winter safely, and yielded a very fair crop, while the Turner and Miami, or Mammoth Custer, as some prefer to call it,* growing upon the same soil, and immediately adjacent to the Doolittles, were badly winter-killed, and bore but few berries, and those of poor quality. I will say for the Turner, however, that it has not had a fair chance, all the sprouts having been allowed to grow, which no doubt detracted from the main plants. My neighbor's Miamis suffered equally with mine.

The Blackberry crop was an entire failure, both Lawton and Kittatinny being frozen to the ground. A variety sent out from Waukegan, and called the Western Triumph, bore very well, but the fruit is small, and was all eaten by the birds.

I am in hope that our "bad luck" with the fruit crop is over for a time, and that we may have a succession of good crops and good prices.

WM. A. NOURSE, of Moline, reported the following, which was read by the Secretary:

Strawberries.—The varieties cultivated here are mostly Wilson's Albany and Green Prolific, and those who were so fortunate as to have any living plants had a good yield of fruit. The season in fruiting time was favorable, but most of the plants had been killed, by grubs in some cases, and others by drought, followed by the severe winter of 1874–5. The planting this season has been quite successful.

Raspberries produced about one-half crop on Black Caps, and very much less on the Antwerps, many of the latter having been killed to the ground by the cold winter and drought previous.

Currants gave a fair yield where the plants had a fair chance. The currant borer attacks the pith of the plant, and makes it necessary to prune vigorously: and by keeping a good supply of young, vigorous canes, we get fruit.

Gooseberries gave a good crop—mostly American, and Houghton's Seedling.

*This Society has voted to call this variety the *McCormick*.—EDITOR.

Blackberries were an entire failure, so far as I can learn. I had some Missouri Mammoth, and some wild ones, that were alive to the tip ends and bloomed beautifully, but the fruit was not picked, except by the birds, and they earned all they got of them. Kittatinny and Wilson were all killed to the ground at Davenport, four miles from me. We don't get rich on blackberry culture here.

Grapes were a light crop, yet enough to keep prices low; mostly Concords.

Cherry trees had so overborne the previous year that recuperation or death was the motto, and no fruit was to be had except a few black Morellos.

Thorough culture or mulching seems to be the necessity in growing all small fruits, and a copious supply of moisture in ripening time is very graciously accepted. We had a good supply of rain this season, but a little too late for the benefit of our small fruit crop. The prospects are now very fair for the coming season, and we hope to tell a more encouraging story then.

DELEGATES TO STATE SOCIETIES.

DR. HUMPHREY moved the appointment of delegates to the meetings of the State Horticultural Societies of Iowa, Indiana, and Wisconsin; and to the meeting of the Horticultural Society of Northern Illinois.

MR. STARR moved an amendment, making each member of this Society being present at the meeting of either of these bodies, our delegate to the same.

The amendment was accepted, and the motion prevailed.

THE CANKER-WORM.

MR. ROBISON (of Tazwell county) called attention to the extensive ravages of the canker-worm, in his county, and along the branches of the Illinois river, and about Jacksonville. His own orchard was badly damaged by them, the worms having entirely stripped a portion of the trees of their foliage. A neighbor of his—Mr. Shaw, of Tremont—had an orchard of four thousand trees entirely stripped of fruit and leaves early in the season. The worms were so abundant that you could not walk through the orchard without being molested by them. He would like to know what was the best thing to do to rid the orchard of these pests.

THE SECRETARY—The fruit growers of Illinois should carefully examine the volumes of the reports of this Society, for information upon all matters connected with their occupation. In volume five may be found eighteen pages devoted to the canker-worm, in which Dr. LeBaron, our late State Entomologist, gave a history of this insect, with full

descriptions and illustrations, and various methods of circumventing and destroying them; one of which, at least, is cheap and efficient. So that there seems to be no good reason why orchardists should have their trees damaged by this enemy.

MR. ROBISON—I have understood that some of Dr. LeBaron's reports are difficult to get.

THE SECRETARY—They may be in separate form, but I have quite a good supply of copies of the Reports of this Society which contains them.

DR. LONG—I am well acquainted with this canker-worm, and have no trouble in keeping it out of my orchard. Late fall or winter plowing is the remedy; no matter how badly your trees are affected, two seasons' "fighting it out on this line" will give you the victory. What you can not turn with the plow, turn with the hoe or spading fork, and the cold will kill them. I know what I am talking about; you need not fear the canker-worm, if you will attend to this matter of late plowing.

MR. WIER—I was about to suggest, that as Dr. LeBaron's reports are out of print, it might be well to have a new edition published with the forthcoming volume.*

* Acting upon this hint, I present the following quotation from Dr. LeBaron's second annual report, taken from the fifth volume of Reports of Transactions of Illinois State Horticultural Society, giving one of the preventive measures referred to for the canker-worm:

"Take a piece of inch rope—old worn out rope is as good as new—tack one end to the trunk, two feet or less from the ground, with a shingle nail, driven in so that the head shall not project beyond the level of the rope; bring the rope around the tree and let it lap by the beginning an inch or two; cut it off and fasten it in the same manner. Get the tin-man to cut up some sheets of tin into strips four inches wide, and fasten them together endwise, so that they shall be long enough to go around the trees over the rope. Put one of these strips around the tree outside the rope, so that the rope shall be in the middle of it; let the ends lap a little, punch a hole through them and fasten them with a nail driven through them and the rope into the tree. * * * * * *

"This obstruction prevents the females, which are destitute of wings, from ascending the tree to deposit their eggs under the bark of the trunk and larger limbs, and they will deposit them *below the obstruction*, and generally within a few inches of it."

These bands should be put on as early as March first, in the latitude of Chicago, and proportionately earlier or later to the south or north. As the eggs hatch before the red currant blossoms, the bands should be taken off before this time, or before April twenty-fifth, in latitude of Chicago, and dipped in scalding water, and the trunks of the trees below the bands to the ground should be well treated to kerosene oil, applied with a brush; then replace the bands. One application of kerosene is sufficient, and will not hurt the trees.

Other methods of destruction, both before and after hatching, are given in the volume referred to.—EDITOR.

This canker-worm has taken up, first and last, a great deal of our time in these meetings. I think there are two species of canker-worm: one that lays its eggs early in the spring, and one that lays its eggs in the fall. Late fall plowing will destroy the one, but not the other. The spring canker-worm is the more troublesome in our orchards, for it feeds upon the apple only; the other feeds upon the elm and other trees, preferring them to the apple.

THE PRESIDENT—Our reports discuss these matters fully, and, for this reason, I recommend that some means be adopted to give them a wider distribution. I do not know what course to pursue in this matter, but certainly, if they are sufficiently important to be furnished by the State, they are of sufficient importance to have wide distribution.

DR. LONG—The plowing remedy is sure. I promulgated it years ago, my attention having been drawn to it when I was a boy. My father's orchard was destroyed by the canker-worm, and, in despair, he turned in his hogs, and they plowed up the ground. The result was the destruction of the worm. I took the hint from this, and have since that time practiced a more systematic plowing, and, I know, with good results.

MR. HUGGINS (of Macoupin county)—I will say, my neighbor across the road from me had his orchard defoliated by this worm, and his remedy was plowing in the fall and hogs in the spring; the worms disappeared. They have never troubled me, and, I may say, I do not fear them, as my practice is to plow—not all the orchard at once, but a part of it each year. I understand that English sparrows destroy this insect, and I want to ask Dr. Warder if these birds, if introduced, would not be a help, or will they be the greater evil by driving away other birds?

MR. HUGGINS also expressed a doubt that there were two kinds of canker-worms.

DR. WARDER—This question has two sides, and the answer to be given is not satisfactory. Mr. Riley has recently published a paper in which he declares that there are two species of canker-worms—the spring and the fall species; they are even two genera, they are so different.

DR. LONG—Mine is the spring canker-worm.

DR. WARDER—In regard to the sparrows and canker-worms, I may say that where the sparrows abound the canker-worms do not.

MR. ROBISON—I doubt the efficiency of the plowing remedy, for I find the pupæ in the ground eight inches deep, where plowing will not

affect them; and as for hogs, I have had from three hundred to four hundred hogs running in my orchard, and not a spear of grass to be seen, and yet the foliage is all taken by the canker-worm.

MR. BRYANT—Those who live outside of towns and villages need not expect any aid from the sparrows, for they do not live in the country; they are city "born and bred," and will live only in populous districts.

DR. WARDER—This is not so now in New York. They live there in the country, and the old mother bird makes haste to push the young ones out of the nest, and bids them roam for themselves, saying, "Go West, young man." [Laughter.]

ELECTION OF OFFICERS.

THE PRESIDENT announced that the hour agreed upon for the election of officers had arrived.

MR. STARR nominated Mr. A. C. HAMMOND, of Warsaw, Hancock county, for President; and, there being no other person put in nomination, on motion of Mr. MCWHORTER, the Secretary was instructed, by unanimous vote, to cast one ballot for A. C. HAMMOND, for President.

MR. JONES, of Quincy, nominated Mr. J. W. ROBISON, of Tremont, Tazewell county, for Vice-President; and, there being no other nomination, the same action was taken, and J. W. ROBISON was unanimously elected Vice-President.

D. B. WEIR nominated the present Secretary, O. B. GALUSHA, of Normal, McLean county, for Secretary; and, as no other nomination was made, on motion of Mr. STARR, D. B. WIER was ordered to cast one ballot for O. B. GALUSHA, for Secretary.

MR. WHITAKER, of Warsaw, nominated JONATHAN HUGGINS, of Woodburn, Macoupin county—the present incumbent—for Treasurer; and no other person being nominated to this office, the Secretary was, by unanimous vote, directed to cast one ballot for JONATHAN HUGGINS, for Treasurer.

The officers elect, for 1876, are therefore as follows:

President—A. C. HAMMOND, Warsaw.
Vice-President—J. W. ROBISON, Tremont.
Secretary—O. B. GALUSHA, Normal.
Treasurer—JONATHAN HUGGINS, Woodburn.

COMMITTEE ON HORTICULTURAL ENTOMOLOGY.

THE PRESIDENT—We will now hear the report of the Executive Board, with reference to the appointment of a committee to co-operate with our Entomologist, and Prof. Burrill, in devising some plan to carry out the recommendations contained in the address of our Entomologist.

THE PRESIDENT of the Executive Board announced the following names of persons to constitute that committee: O. B. Galusha, Normal; James E. Starr, Alton; Samuel Edwards, Mendota; Prof. S. A. Forbes, Normal; Prof. Cyrus Thomas, Carbondale; and Prof. T. J. Burrill, Champaign.

LOCATION OF ANNUAL MEETING FOR 1876.

DR. HUMPHREY invited the Society to Galesburg;
MR. LESLIE " " Ipava;
MR. WALKER " " Warsaw; and
PRESIDENT SCOFIELD " " Freeport.

Each one inviting the Society urged the advantages of his location; and after a few minutes spent in discussing the matter a vote was taken, resulting as follows: For Galesburg, 14 votes; for Ipava, 19 votes; for Warsaw, 18 votes; and for Freeport, 2 votes.

THE PRESIDENT stated that there had been no selection of a place, and allowed, by common consent, a short time for further discussion, which was held in quite an animated though friendly manner.

Upon the vote being taken the second time, Galesburg received 38 votes; Ipava, 11; Warsaw, 3; and Freeport, 1.

After the announcement of the result of the vote, the Society adjourned.

THURSDAY AFTERNOON.

The Society assembled at the usual hour, President SCOFIELD in the chair.

REPORT OF AUDITING COMMITTEE.

The Auditing Committee reported as follows:

Your Committee, to whom was entrusted the reports and papers of the Secretary and Treasurer, report that we have examined the same, with the vouchers, and find them correct.

[Signed by the Committee.]

REPORT UPON UTILIZING AND MARKETING FRUITS.

W. H. SCHUYLER, of Chicago, presented and read the following essay:

The fruit grower, probably, experiences greater loss in money value through negligent, ignorant and fraudulent maketing of fruit, than through want of knowledge of the laws that govern its culture. This fact has been forcibly impressed upon me for the last two or three years by daily personal observation of the Chicago markets. Even in this last year of universal fruit scarcity, South Water and Jackson streets have been glutted with poor, unripe fruits, which, in their green state, should never have been marketed at all. These unsatisfactory products have materially depreciated the price of good fruit without realizing any profit, or scarcely any, to the shipper. To-day the apple market in Chicago is slow and dull, not because there is so large a supply on hand, but because in the early part or the season the market was stocked with poor, inferior qualities, which lowered the price of good fruits this year beyond recovery. Generally, too much green fruit is marketed; too little pains taken to insure what is marketed to be sent packed in an attractive, conscientious, honest manner. We soundly abuse the commission men for alleged want of honesty and care in the sale of fruits consigned them, and in too large a number of cases these complaints are just; yet there *are* faithful, trustworthy, competent commission men, who are no less anxious than the growers themselves that the fruits consigned shall be advantageously sold, and who return promptly and honestly all moneys received for their sales, save their commission. The unvarnished fact is, that while fruit growers, as a class, are heaping wholesale condemnation upon faulty commission men, they are themselves, by their methods of packing fruit, setting a fatal example either of dishonesty, or scarcely less criminal, carelessness. It has become a rare circumstance to find a basket or barrel packed all the way through with an even quality of fruit—with the middle and bottom layers just as good as the tempting top round. Perhaps I ought not to say that such a consignment is *rare*, for, as there are honest commission men, so I know there are many conscientious fruit growers who would scorn to stoop to fraud in the sale of their fruits, but I must candidly say that a large portion of the fruit received in our Chicago markets is *not* honestly packed, much to the disgust of the consumers.

The indignation and disappointment consequent upon the delivery of such fraudulent packages have lessened, in no inconsiderable degree, the quantity of fruit bought and consumed by the general public; and the burden of loss comes back with double force upon the original fruit shippers. Fruit of all kinds should be strictly graded in packing, and if inferior fruit be sold in the green state at all, it should be sold on its merits solely, as second or third grade fruit. Usually, the inferior grades can be much more profitably utilized by drying, or preserving. In the long run, it would be better for the fruit grower to let his *poor* fruit rot in his orchard, than to depreciate his good by sending the whole

together to the same market. But of course no such alternative is necessary, as it is not difficult to make both remunerative. As a financial measure, careful fruit growers would frequently be justified in purchasing their neighbor's poor fruit to keep it out of market, although it is true that the Chicago fruit-men are exercising, from year to year, a greater discrimination in the quality of fruits they buy, and therefore providing a less tempting market for inferior grades. In a large number of cases, not only is deception used in regard to the *quality*, but also in the *quantity*, of fruit actually delivered. For instance, what uncertain quantities prevail in berry boxes and peach baskets! I bought, for a special purpose, a crate (sixteen boxes) of strawberries, and upon emptying them out found I had only a nicely rounded and full peck measure of berries. Upon examination I concluded, in a number of instances, the berries had been packed in the wrong end of the box. Peaches were first brought to our market, as far back as I can remember, in half-bushel packages. These were gradually reduced in size till no effort of imagination could stretch them to half-bushel dimensions, when they were represented as thirds of bushels. When the process of systematic contraction had been continued a time longer, effrontery itself could only call the diminished basket *a peck*, and so they are still confidingly named, but I found last summer, upon actual trial, that it took *six* of these pecks to make a bushel! I will propound to mathematicians the interesting problem I have not been quite able to solve: at the present rate of reduction, how much less than nothing will peach-baskets hold at the close of the next decade? A barrel of apples contains the same uncertain quantity. The Michigan barrel is now, by statute, a flour-barrel in size, and is so made, except at St. Jo. and in the peach belt, where the continually shrinking peach basket seems to have demoralized the faculty of measurement and quantity. Buyers of apples in Chicago are beginning to appreciate the difference in size of apple barrels, and they ask for the big three-bushel Michigan barrel. These command from twenty-five cents to fifty cents more than the smaller. Fruits of all kinds should be sold here, as they are in California and Oregon, entirely by weight. This would solve the vexed problem of the rightful size of packages; but, till that intelligent era shall arrive, it behooves every reputable fruit grower to make his packages hold the actual quantity specified, and to see to it that the average quality of the fruit be as nearly as possible the same. Then he should brand on the consignment, "quantity and quality guaranteed," superscribing his own name. I have been a shipper of green apples from Michigan, for the past three years, and have shipped only select apples (drying the others in our Alden factory), branding the barrels with our name and guaranty. Now, there are grocers, dealers and consumers, who call regularly for our brand, paying fifty cents to one dollar more per barrel for our shipments, than for those of the regular packers, because, as they tell our commission men, our apples pan out alike all the way through the barrel, and do not grow poorer as they go down. If all fruits were faithfully marketed in this way, and only the select fruit shipped green, while the second grades were utilized and sold in a preserved form, the fruit growers' interests

would be advanced in many ways. In seasons of plenty, there would be no longer complaint that the markets are glutted, and the prices ruined by the immense pressure of quantities of green fruit. In seasons of scarcity the choice selections of the orchard would command prices to compensate for the diminished harvest. It is not the amount of fruit that determines the farmers' income, so much as the quality, and the manner in which it is marketed. I know many fruit farmers who raise and ship less than their neighbors, yet who always realize a larger aggregate money value on their crops.

The principle involved is true in all varieties of farming and in every department of human activity. Take the various States in the Union as illustrations. You will find each State prosperous not in proportion to the actual amount of its resources, but just in the measure in which its resources have been carefully developed. Success in life is nowhere achieved by the sole possession of resources, however large, but rather by the wise husbandry and development of the means at our command.

Now, permit a few statements in relation to facts of experience in utilizing fruit. For five years I have personally and practically superintended, each season, an Alden factory for evaporating fruits, and have produced from twenty-five thousand to seventy-five thousand pounds Alden product each year. When our own factory was started, the Alden fruit, which is now known and quoted by its distinctive name in all the leading markets, was yet new and untried, and I was laughed at by wholesale grocers in Chicago for asking them to buy Alden apples at twenty cents (ten per cent. off). Dried apples, they assured me, could never be sold at any such prices; yet one house in Chicago which, five years ago, derided the possibility of any sale at such figures, last year bought and used, in their own trade, sixty thousand pounds Alden apples. This year, although the legitimate season for dried fruit has not yet even begun, this same firm has already disposed of over twenty thousand pounds, at twenty cents (ten per cent. off). The United States Government uses hundreds of thousands of pounds now yearly, and, during the past year, several cargoes, larger or smaller, have been shipped to Europe and Australia. The increasing demand for Alden fruit affords the solution to the problem: What disposition shall we make of our surplus and second-grade fruits. The reduction in the expense of evaporators for conversion in the cost of preparing fruit, and the simplification of all the details of the operation of an Alden evaporator, have been such that the Alden process is now within the reach of the majority of fruit growers. After five years' actual manufactory experience in developing and perfecting methods of operation by the hundreds who are now using Alden evaporators, there can no longer remain any uncertainty of their success. They are no longer an experiment. The recognition of a name and establishment of a market for Alden fruit has been the work of time and great expense, yet it has been triumphantly achieved.

Last year the canned and dried fruit markets, especially the former, were completely demoralized, yet Alden apples and peaches not only

maintained their regular prices, but Alden apples advanced in June to twenty cents net at the factories, and Alden raspberries sold during the season at from forty-five to fifty cents, and Alden peaches at sixteen cents for unpeeled, and from forty to forty-five cents for peeled. Canned corn, pumpkin and squash, which you could buy at your own price in any quantities, demoralized the market for Alden products of those kinds; yet still the sale of even these Alden goods, of good quality, was remunerative. The cost of evaporation of Alden fruits now is merely a question of fuel, of expense of preparation. The quality and market are established. After five years of experimenting and improving, the machine for the preparation of apples (pared, cored and sliced) has been rendered nearly perfect, and this year, for the first time, its working has been entirely satisfactory. Fuel at the various Alden factories cost this year from one-fourth to seven-tenths of a cent per pound. But now for some statistical facts:

I have taken some pains to obtain for presentation some condensed, dried facts, from which all the water has been thoroughly evaporated. In evaporating or drying fruit, as well as in growing fruit, varied success is attained according to the business intelligence, economy, and care of operations, though nearly every Alden factory this year, that has been operated, has been successful, financially and otherwise.

I estimate the Alden products for 1875 at 1,500,000 pounds, about a quarter less than last year, owing to the scarcity of fruit in many sections where Alden evaporators are located. Quite a number of factories were operated only a few days, and a few were not opened at all this year, owing to a failure of apples and leading fruits in their vicinity. The demoralized state of the market in canned vegetables, and the poor condition in which some Alden vegetables were placed upon the market, affected the price and sale of Alden vegetables last year, and as a consequence less were evaporated this year, though all good Alden vegetables are meeting now a good market for this time of year. The decrease in the amount of Alden vegetables helps to lessen the amount of Alden product this year. Thirty-one new Alden evaporators were erected in the United States this year, the larger portion being on the Pacific slope—only two being erected in Michigan and four in Ohio. The fruit crop of Oregon was large this year, and they are quite extensively utilizing it by the Alden process.

I have solicited statements from all the Alden factories in the Mississippi Valley as to their business in the year 1875, and have received a large number, of which I will present a few, received within the last few days. The Alden Fruit Preserving Company of Chicago has no interest, directly or indirectly, in any of these factories or evaporators, of which I will present statements. Some of these are owned by individuals, and some by associations or companies.

Two Alden evaporators at Parma, Mich., consumed and produced as follows:

Bushels apples evaporated, 4,940; cost of apples, $1,730.56; cost of labor, $930.64 (this includes cost of packing and of preparation of corn

and tomatoes, as given in products below, etc.); cost of fuel, $186.97; total cost, $2,848.17.

Alden Products.—Evaporated apples, 24,725 pounds; evaporated corn, 1,000 pounds; evaporated tomatoes, 200 pounds; cost of Alden apples per pound, packed, 10 54–100 cts.; cost fuel per pound, 69–100 cts.; cost labor per pound, 3 4–10 cts. (including packing, etc.); number pounds evaporated apples from a bushel green, 5; number days in operation (of 20 hours each), 37.

The proprietor has sold 17,725 pounds Alden apples to date (December 10) for, net cash, $2,836.00. The remaining Alden apples at same price will net $1,120.00, and the corn and tomatoes will bring at least $200, making the net receipts for the Alden products, $4,156.00.

Two Alden evaporators at Fairfield, Mich., have given the following results:

Bushels green apples, 6,342. Cost of apples, $2,246.10; labor, $1,372.49; fuel, $110.38; cost of barrels for vinegar, of packages, sacks, etc., for dried fruit, improvements, repairs, etc., $423.32; incidentals, $200, giving a total outlay of $4,352.29.

Alden Products.—Alden evaporated apples, 35,430 pounds; vinegar, 130 barrels; cost of apples, packed, per pound, including vinegar in barrels, 12 3-10 cts.; cost of fuel per pound, 31-100 cts.; cost of labor, including packing, cost of vinegar, etc., 3 87-100 cts.; number pounds from bushel green apples, 5 6-10; number days in operation (20 hours), 49. Estimating Alden apples at 17 cts. (basis on which we have sold this season), the product would bring, net, $5,683 10; vinegar, at only $2.50 per barrel, $325; total net proceeds, $6,008.10; net balance, $1,655.81.

At Carbondale, Ill., three evaporators were operated as follows:

Bushels green apples evaporated, 5,247; corn, 62,015 ears. Cost of apples, $1,925.80; corn, $217.50; labor, $1,159.50; fuel, $200; cost of barrels and packages, $242.80; incidentals, $67.20, making the total expenditure, $3,812.80.

Alden Products.—Alden apples, 25,050 pounds; corn, 4,770 pounds. Cost of product per pound, packed, including vinegar, etc., 11 95-100 cts.; cost of fuel per pound, 67-100 cts.; labor per pound, 3 88-100 cts.; number pounds Alden apples from a bushel, 5, scarcely; number days in operation (20 hours only), 18½. Product nearly all sold, and estimating only on a little balance, the net proceeds are, for apples, $4,020.65; corn, $760.84; cider sold, $30; vinegar, $160, making the total net proceeds, $4,971.49, showing a net balance (305 bushels per day on only 18½ days) of $1,158.69.

At Cobden, Ill., three evaporators were run, doing work as follows:

Bushels apples evaporated, 2,475; total cost of labor fuel, apples, incidentals, etc., $1,510.88.

Alden Products.—Alden apples, 14,937 pounds; cost per pound, 10⅔ cts.; cost of fuel per pound, 35-100 cts.; number pounds Alden to bushel, six and a fraction. This total cost includes cost of all new machines—peelers, corers, slicers, etc.—and we quit with them in better condition than last season.

Mr. SCHUYLER gave also the results of two other manufactories, one at Benton Harbor, Mich., running two evaporators, and one in Palmyra, Mich., with four evaporators, which gave results about the same as those above given.

DISCUSSION UPON UTILIZING FRUITS.

THE SECRETARY.—This subject of utilizing our fruits is one of great importance to us, perhaps the most important one next to that of circumventing our insect enemies, that can come before us. We remember how it was two years ago; the fruit crop was abundant—so abundant that much went to waste, rotting upon the ground, because the owners knew no way to make money out of it except making cider, which many would not do. The rush into the market of fruit, in one form, caused a glut, and it did not pay to ship green fruits. We are compelled to look up other ways of utilizing the fruit crops. Now, the paper just read tells us some ways in which we may utilize our fruits, and I think the advice about assorting it and shipping only good fruit, honestly packed, is sound. It is evident that all the poor fruit should be kept at home, since it costs as much to ship poor fruit as good fruit, and we know that if mixed the price is sadly depreciated, so that often no profit is realized. The question is, how to utilize the second and third qualities of fruit to profit. The practice of drying fruit by artificial heat is coming more into use, and we get no better product from any process than by that known as the Alden process. There may be other methods less expensive, but we must adopt some method.

DR. LONG described a home-made device for drying fruit, that he thought might work well, and was not expensive. It consisted in a furnace, over which was a large inverted iron kettle set in an arch; above the kettle was a large tin cylinder, eight feet high, set perpendicular, in which the fruit was arranged on proper shelves. He thought the Alden process was too expensive; the Hawley process did not seem to answer the purpose; and that we must look for something less expensive.

MR. GROVER (of Warsaw)—I wish it understood that I am a modest man, but I note this fact: We are in the habit of overstating facts, and our teachings so far are unreliable.

One man says prune thoroughly; another says never put a knife in the tree. These opinions are extremes. One man says seedling peach trees are good for nothing—cast them out; others would plant them. I know seedling peach trees that bear fine fruit. I think we should avoid these extremes and try to be more observing, and we would come nearer the truth in our statements.

I have not had the experience of some others in horticulture. Last year I marketed two thousand five hundred bushels of apples, or rather they were sold in the orchard, at forty cents per bushel. The refused apples were made into cider and vinegar, and sold at twelve and one-half cents per gallon, barrels furnished.

MR. WIER—This matter of utilizing fruits is an important one. I would be glad to hear from Mr. Hilliard, who, I am told, sells his cider at fifteen dollars per barrel. Now, if I could get ten dollars per barrel I would be satisfied. I think the conversion of apples into cider is one of the most profitable ways of utilizing them; but I have not a great deal of faith in the drying of fruits, though perhaps by some of these cheaper appliances it can be done with profit. The indications are now that we shall have some fruit next year, and we want to know what to do with it. I advise all who can, to attend the meeting of the Northern Horticultural Society at Crystal Lake, in January. You will there see one of the largest canning establishments in the country; they have also a drying establishment connected with the business. These are some of the ways of utilizing fruit that we want to investigate.

DR. LONG—I would like to hear from Mr. Hilliard.

MR. HILLIARD (of Macoupin county)—I have on former occasions brought before this Society all the facts I have in reference to my cider making. The main thing is to have good sound winter apples to make good cider that will keep well. Any apples that will keep through the winter will make cider that will keep. We usually sell out before the first of June, and have no trouble in keeping it good till that time, though it is no stronger than ginger pop. We have no difficulty in selling out three hundred barrels at good prices. We never can keep it beyond June, because of the demand upon us for it. We have a process of refining it, by the use of a preparation of fish glue—the same substance out of which isinglass is made. We have kept our cider for eight years by bottling it. There is no mystery or secret about the thing. The chief thing is to have *sound late-keeping apples*.

DR. LONG—Where is your market?

MR. HILLIARD—Chicago, St. Louis and towns along the railroads.

MR. HUGGINS—I have given some attention, for the past few years, to this subject of utilizing fruits. The fact is, however, we have not had much fruit to utilize for some years; so this matter has not given us much trouble. My feeling is to-day that, if the good Lord will give us a good crop of fruit, I shall make the money. I have an orchard of sixty-five acres, and all I ask is the crop and health to manipulate it. I

can utilize it; I will do it, first, by turning in the hogs to eat the wormy, fallen fruit; I will do it, secondly, by marketing the best fruit when prices are satisfactory; I will do it, thirdly, by drying. I have arrangements for this purpose. I will do it, fourthly, by making cider and vinegar. The way to me seems perfectly clear to make money by utilizing all the fruit in these ways; what I want is the crop of fruit. In my packing for market I endeavor to have an honest package of fruit put up. If my apples do not show through all the barrel alike, I do not know it; in fact, my commission men give me the credit of putting up good packages. My vinegar stands in large tanks or tubs, under shelter, all winter. It freezes, but this does not hurt it. I keep a hole cut in the ice, so as not to burst the tubs.

Voice—What price can you get your vinegar?

MR. HUGGINS—From twenty to twenty-five cents.

DR. LONG—I can't sell any considerable quantity at that price.

MR. HUGGINS—In regard to the drying, I have the Hawley process, but must improve upon it; I want something better than I have got. I think I shall, perhaps, select the Alden as best suited to my purpose. I have this fall put seventy barrels of cider in my cellar, which I can sell at ten to twelve dollars per barrel, and I believe I could sell five hundred barrels. I have no fears but that I can *utilize* all the apples that I can grow, in one way or in another.

MR. SCHUYLER—I make from fifty to one hundred and fifty barrels of cider vinegar every year, and sell it in Chicago for thirteen to fifteen cents per gallon. You can hardly make the Chicago people believe that you have genuine cider vinegar; but, when they come to know this to be a fact, they will buy. I have less difficulty in selling now that at first.

MR. SANBORN, (of Warsaw), I can't make vinegar in one year. I would like to know how to do it.

MR. HUGGINS—Put it in sour tubs that have held strong vinegar before, or put good sour vinegar into the tubs and this will hasten matters.

DR. LONG—I think I have as good a knowledge of making cider and vinegar as any body, and I have been as long at the business. I have now in my cellar sixty or seventy barrels of as good an article as any man can show, and I can not sell any considerable quantity of either cider or vinegar for more than eight dollars or eight dollars and fifty cents per barrel. I have vinegar in my cellar ten, eleven and twelve years old. I sold the "Vinegar King," Mr. Nicholson, of St. Louis, some time ago, twenty barrels for twenty cents per gallon, and *I found the barrels.* This

year he came for more, and I sold him twenty barrels at the same price, and *he paid for the barrels.* But the people won't believe you have got cider vinegar; I want to be honest, and sell a good article, but I can't sell any great amount of either cider or vinegar at the high prices named. You can't make money very fast selling cider; you had better feed your poor apples to your old horses. It will make them feel young.

MR. STARR—Had you not better sell the old horses?

DR. LONG—No, sir! I say, keep the old horses for the good they have done you.

In the matter of drying fruit, I never succeeded very well, but I have succeeded best, when I have given the apples to the neighboring families and let them dry them in the sun, and return me half the product. I have made more money that way than in any other method of drying apples.

MR. STARR—I think the free discussion allowed on cider this year, will justify me in bringing a bottle of wine to Galesburg next year. (Laughter.) Cider kept good till spring could be readily sold for ten dollars per barrel.

MR. LESLIE offered a resolution encouraging the formation of co-operative associations for the purpose of utilizing fruits, which was withdrawn after a very brief discussion.

MR. WIER—Mr. Dunlap, of Champaign, had a method of heating his cider to keep it sweet—by heating it to the boiling point and skimming it; but his method destroys, in a measure, the flavor of the cider.

MR. ROBISON—I think Mr. Wier has misunderstood Mr. Dunlap. He does not, he told me, boil his cider, but raises it to a certain heat, but of the precise degree of heat to which it should be raised he had not determined; if it became too hot it affected the taste, and was not so good. Mr. Robison recommended the bushel box used by Mr. Dunlap, in the orchard, in harvesting the apple crop.

MR. WIER—The barrel is the best package in which to send apples to the market. My plan is to pick apples in bags thrown over the shoulder, and pour them upon the ground in the shade of the trees, where they are left until ready to ship, when they are put in barrels. I have tried a good many plans, and I like this best; the only objection is, that if there comes a rain the apples on the outside of the pile get dirty. There is no such thing as apples sweating in the pile or barrel; the sweating is condensation of moisture in the air.

DR. LONG—I prefer to handle apples in bushel baskets with a yoke; one man will carry two baskets, and with less damage to the apples. I send a boy and a man together; the boy gets up in the tree and the man

picks around the tree. If for sale, the apples are barreled at once; if put put away for winter, they go into the cellar. I have my most careful man in the cellar, usually myself, where I pour the apples in bins of different depths, according to the variety of the apples, from fifteen to thirty-four inches. The Pryor's Red will bear fifteen inches; the Pippins thirty-four inches.

THE SECRETARY—I want to hear from Mr. Bryant, who has had large experience in keeping apples for marketing in early spring.

MR. BRYANT—I have handled some apples. If I understand the Secretary, he wants to know how we prepare apples for market in the spring. My practice has been this: Have them picked carefully from the tree in small baskets, and carried to a place where I have a platform of boards. Here the apples are assorted; the good, salable apples are put into barrels and headed up—I do not press them at this time—and when it is convenient I take them to the cellar, and they are never disturbed till they are wanted to go to market. They are then assorted and re-barreled; the first layer is put in by hand stem down, the barrel full is shaken down and pressed, and sent to market. I keep my cellar as cool as possible and not freeze much.

REPORT UPON THE FUTURE APPLE.

DR. WARDER, from the Committee on the Future Apple for Illinois, presented the following:

Your committee, after consultation upon the matter of producing a valuable orchard fruit that shall be supremely excellent, and shall be known as the *apple* of Illinois and the West, have reached the following conclusions:

That, to accomplish so great an achievement, and one of so great importance to the people, will require long, continued efforts, and the diligent application of scientific principles in fertilizing the germs of flowers with pollen from other varieties, so as to unite the best and most desirable qualities.

That few men can afford to bestow this labor and patience with the uncertainty of success, and therefore we recommend offering a very liberal premium for the production of such a winter apple as shall meet this great want.

We further advise that when candidates for this premium shall be offered in competition, the decision shall be referred to a select committee of this Society.

JNO. A. WARDER,
J. S. JOHNSON,
JONA. HUGGINS,
D. B. WIER,
} *Committee.*

A long and somewhat excited discussion was had on this report, as to what the premium or reward should be to the man who should bring out the new apple: some said fifty dollars, some said five hundred dollars, and some said—and their voice prevailed—that no fixed sum should be named; only let it be a liberal premium, the precise amount of which to be decided in future. The report was so amended and adopted, by vote of the Society.

REPORT OF COMMITTEE ON FRUITS ON EXHIBITION.

The following was then received:

Your committee, appointed to examine fruits on exhibition, would respectfully report:

That the Warsaw Horticultural Society have about twenty varieties of apples on exhibition, including several of the newer sorts, among which are the Wythe, which was noticed in the Transactions of last year. The appearance of this apple, and its seeming keeping quality, confirms the opinion then expressed. We consider it worthy of further trial.

The Adams County Horticultural Society also exhibited a collection of apples, of about fifteen varieties—very fair specimens, of good size, and in a good state of preservation.

Ladd and Stewart, of Quincy, exhibited a small collection of good-keeping varieties.

Dr. Long, of Alton, presented some remarkably fair specimens of the Tewksbury Blush.

Mr. J. W. Averitt, of Macomb, Illinois, exhibited a jar of Concord grapes, in a pretty good state of preservation. The plan on which these grapes were kept is clogged with a patent.

TYLER McWHORTER,
D. B. WIER,
A. A. HILLIARD,
Committee.

HONORARY MEMBERS.

On motion of Mr. HUGGINS, Prof. CYRUS THOMAS, State Entomologist, was made an honorary member of this Society.

On motion of Mr. JONES, Dr. J. A. WARDER, of Ohio, was made an honorary member for life.

On motion of Mr. STARR, Prof. J. B. TURNER was also made an honorary life-member.

J. M. STEWART, of Macon, Missouri, was also, by vote, constituted an honorary member.

TIME OF FINAL ADJOURNMENT FIXED.

THE SECRETARY—It seems to me, Mr. President, very desirable that we decide, as soon as may be, upon the hour of final adjournment, as many are already talking of leaving during to-night or to-morrow morning. I do not advocate an early adjournment, yet it is better to adjourn while there is a goodly number in attendance; therefore, to test the sentiment of members upon this matter, I move that this Society adjourn at or before eleven o'clock this evening.

After a little discussion, the motion was put to vote and prevailed, by a large majority.

DISCUSSION UPON PRESIDENT'S ADDRESS.

On motion of J. S. JOHNSON, it was voted to take up for consideration, *seriatim*, the report of Committee on President's Address.

DR. WARDER called out Mr. Phenix upon the

First Topic—Ornamental planting.

MR. PHENIX—We want ornamental planting, of course we do; we want it not only for the purpose of beautifying our homes, but for comfort and health, and for its educational powers. I have been pleased, as I have strayed over this magnificent town of Quincy, to see so much ornamental planting, and to see in the bay-windows and everywhere so much attention to the flowers and plants that bless our homes and gardens. These things effect human life, and I am glad that this Society, in their resolutions, recognize these things. I am not used to public speaking, but I can not do less than express my approbation of any measures encouraging ornamental planting. Our people are not educated to these matters as they ought to be, and any action that you may take to bring these matters before the public, will tend to the desired end.

Second Topic—A wider circulation of our Reports.

On motion, this matter was referred to the Executive Board.

Third Topic—Extension of Signal Service.

MR. GALUSHA—I move that Dr. Warder and Prof. Turner be a committee to present resolutions to the meeting this evening, relative to the extension of the Signal Service for the benefit of agriculture and horticulture.

The motion carried unanimously.

Fourth Topic—Exhibition of Fruits at the Centennial Celebration.

THE SECRETARY—*Mr. President:* As it seems doubtful whether any funds can be made available for the expenses of exhibiting Illinois fruits at Philadelphia, next year, I move that this matter be referred to the Executive Board, with instructions to act conjointly with the State Board of Agriculture, or otherwise, as may be deemed best.

The motion prevailed.

DELEGATES APPOINTED.

Dr. HUMPHREY moved that three delegates be chosen to represent this Society at the meeting of the American Forestry Association, in Philadelphia, next year.

The motioned prevailed, and Messrs. L. K. Scofield, Arthur Bryant, Sr., and J. W. Cochran were severally nominated and elected as members of that committee.

Mr. GALUSHA moved that these gentlemen be authorized to appoint substitutes, in case either of them are unable to attend; which was agreed to.

Another motion was made and carried, constituting every member of this Society, who may be in attendance at that meeting, a delegate from this Society.

RESOLUTION ON POSTAGE.

Mr. PHENIX offered the following resolution, moving its adoption:

Resolved, That this Society earnestly ask a return, by the United States Postal Department, to the rates of postage on all third (3d) class mail matter, which obtained before the amendment passed at the last session of Congress; and that our Secretary be instructed to forward a copy of this resolution to each member of Congress from this State.

The resolution was adopted by an unanimous and full-voiced "AYE."

The Society then adjourned to seven o'clock.

THURSDAY EVENING.

The President called the meeting to order at seven o'clock, and announced as the first exercise of the evening an essay from Prof. BURRILL, from the Committee on Botany and Vegetable Physiology, who read as follows:

LETTUCE MOULD AND LEAF BLIGHTS.

The past summer, though not generally regarded as a fruitful one, was abundantly so when the fungus hunter's objects are considered. The wet weather, so long continued, brought out myriads of lowly-organized creatures to prey upon those of more exalted station. The air towards autumn became filled with spores, so that it was hardly possible to make an observation through the microscope without catching a glimpse of one or more kinds of the stragglers. The small grains, the corn, the leaves of fruit trees and of garden plants were attacked in a wholesale manner, seldom equalled in our country. The larger fungi grew abundantly in the woods and pastures, and some lovers of good things to eat had a chance to gratify their appetites, as rarely enjoyed with us, upon the esculent mushrooms. Some kinds were even offered for sale in the markets, a thing never seen before in Illinois by the writer. But the day is surely coming when more attention will be paid to these depised things as an article of food. The grasshopper may be good eating, but the prejudice of the people will banish it from the table long after it shall have become common for epicures to eagerly seek for the dainty fungus, and the laboring man to enjoy his mushroom beef-steak. These large fungi are not, however, leaf blights. Some of them are exceedingly destructive to wood, and others quickly rob the soil of its richness; yet, in amount of injury done, they are innocent and inactive compared with the minute things visible only through the magnifier. The effects, alas! are easy enough to discern, but the agents themselves are much below the scrutiny of ordinary observation. Sometimes their numbers become so great as to be visible objects, but even then the uninitiated are apt to take them for distortions of the plant itself, corroding sap, or bespattered dirt. Leaves curl and swell, or become a sickly yellow and waste away, sometimes falling as in autumn, sometimes becoming black and withering upon the branches. Whoever has witnessed the destruction of a crop of wheat by rust in, seemingly, a few hours' time, can appreciate the virulence of these minute parasites, for nothing can be more certain than that the fungus known as *Puccinia graminis* causes this trouble. At the last meeting of this Society, at Peoria, the apple scab came under discussion, and I determined then to make this malady the subject of investigation and the title of the present report, but the scab this year gave little chance for

examination, mainly because less apples existed for its accommodation. Some observations have been made, but not enough to spoil by being kept over. At some future time a paper will be devoted to the subject, if the Fates permit.

Lettuce Mould.—Last winter Mr. Samuel Avery, of Champaign, Ill., undertook to grow lettuce for the Chicago and home markets in an ordinary propagating house, heated by a common brick flue, with wood fire. His plants did nicely until about half grown, when they began to decay, the leaves becoming discolored, moist and rotten. He supposed the gas escaped from the flue and caused the trouble, and took great pains to make the brick-work tight, but the difficulty continued: a hundred dollars, worth had been destroyed, and more was on the same road. Without stopping to name the other guesses and attempted remedies, I may state the work was the result of a parasite belonging to the class of moulds and known in the books as *Peronospora gangliformis*, Berk., closely allied to the one causing potato-rot. In the case of the lettuce, the tips of the tender leaves were first attacked, and the disease followed down the stem, spreading and involving other leaves as fast as reached, until, finally, the whole plant became a slushy, putrescent mass; from one to two days completed the destruction. The whole history of the germination of the spore was not, perhaps, made out; neither do I find it apparently full in any works to which access is had. From its near relatives, we may, however, conclude that under some circumstances the spore (*acrospore, or conipium,*) gives origin to from six to fifteen actively moving bodies, known as *zoospores*, and these latter, after a play-time of from a quarter to half an hour, cease moving, and germinate by emitting a slender tube from their globular body. When in contact with a leaf these tubes penetrate the epidermis, and speedily spread themselves throughout the tissues of the plant. At any rate this is sometimes the behavior of the spore itself, a thing quite common among these plants of having more than one way of accomplishing their purpose. Within forty-eight hours after the germination of the spore, little white, tree-like, branching threads start in tufts from the stomata of the leaves, and bear a second crop of spores, to begin work again upon other plants, having been disseminated by the air currents. Later, inside the decaying tissues of the plant, another form of spore (oospore) is produced. This originates from a kind of sexual union of two portions of the vegetative threads (mycelium) of the fungus. On one thread a globular vessel (oogonium) is formed, holding a rounded protoplasmic mass. On another thread a smaller swelling appears, and its contents become separated by a partition from that of the rest of the thread; the latter protuberance (antheridium) is applied to the former, and soon emits a tube, which perforates the wall and reaches the globular mass inside. This latter now becomes the *oospore*, and is much more capable of withstanding the vicissitudes of prolonged existence than other spores. Ordinarily this *oospore* bridges the winter and starts growth again in the spring, all other parts of the plant perishing. But, as if not to be beaten under any circumstances, still another method of preservation is sometimes resorted to. Having a diseased leaf under a bell-glass in a

warm room for a week, I was surprised to find many hard, dark-colored kernels (*sclerotia*) as large as good-sized grains of wheat. These are analagous to tubers and bulbs of flowering plants, not properly fruit, but capable of reproducing the plant after long rest. They are filled with nutriment and have a kind of nutty crispness and flavor. Their size, compared with the spores of any kind, is immense, is latter being invisible to the unaided eye. These kernels are still preserved, but have not been further experimented with. The accompanying rough sketch may make the text clearer: Fig. 1. B shows a spore germinating, sending its filament through the cell-walls of the plant. A, a fruit stalk springing from a stomate of the leaf, whose cells are indicated by the irregular lines. After branching considerably, the ends of the limbs produce two to six spicules, upon each of which a single oval spore is borne. D shows the supposed production of zoospores from a spore, and C, the union of the two organs in the production of an oospore. All these things were made out during the investigations, but none of them are new to science, except, perhaps, the formation of the hard kernel-like bodies (sclerotia) in this particular class of plants. The mouldy appearance of the diseased leaves is evident enough to the eye.

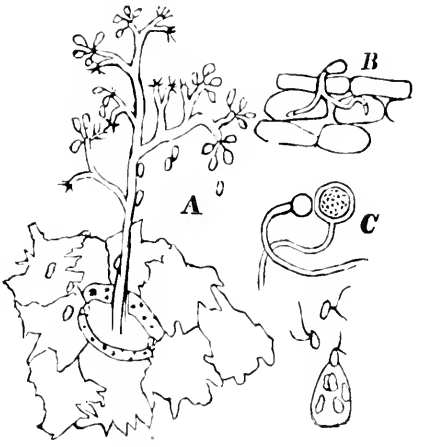

Fig. 1. Lettuce Mould.

Remedy.—Sulphur and carbolic acid, being the common antidotes, were proposed, but were not practical in this case, since they would render the plants unfit for use. The fumes of the former were tried, by burning a quantity in the house, taking care not to destroy the lettuce, but without apparent effect. It is indeed probable that such remedies, applied externally, so effective in many cases, are worthless in these, since the parasite occupies the internal parts of the leaves and stems, and is thus out of reach. On the contrary, the grape mildew, so prevalent upon Clinton vines the past season, lives entirely upon the surface, and is readily destroyed by dusting with sulphur. Hand-picking every diseased leaf as soon as attacked, admitting plenty of light and air when possible, and keeping the temperature as low as practicable, stayed the progress of the disease, and proved more efficient than other means used. Emphasis is specially given to destroying the diseased plants as early as possible, and providing plenty of light. The former reduces the fungus; the latter better fits the plant to resist its attack.

In the same house the too common "cutting-bench fungus" caused many plants to "damp" off at the surface of the ground, but its attack was quite distinct from the above. This latter is caused by another

minute depredator, known as *Stilbum vaporarium*, B. and Br., belonging to the same general order, but quite a different family. It was the subject of a note in a former paper to this Society. Sulphur here again is of no avail. Light, air, and a decrease of temperature are uniformly efficacious.

Leaf Blights.—Among the fungi properly known as leaf blights, there is a class of plants which never penetrate the tissues, but live upon the surface, deriving their nourishment in some way by simple contact. The most of these belong to the old genus *Oidium*, but are now known to bear other fruit bodies, which place them in the family *Perispriaceæ*, the supposed Oidium plants only being a first stage of the latter, as the caterpillar is the first form of the butterfly, yet evidently the same individual, and so, most certainly the same species. If caterpillars laid eggs, and thus gave origin to other caterpillars, as well as changed to butterflies, the example would be more appropriate.

Rose Blight.—Rose leaves are often covered by a white, cobwebby mildew or mould, and the tender stems are frequently distorted by the same parasite. After the latter has attained some age, it becomes a tough felt, which can be separated from the leaves, leaving the latter perfectly whole, showing pretty clearly the *surface* character of the fungus. The felted mass of threads is very white and clear, under the microscope appearing of a pearly luster, often branching, and giving rise here and there to upright filaments, which gradually change their form to a necklace-like chain of spores, by constriction at regular intervals of the walls. The uppermost ones become perfectly oval, and, soon falling off, germinate anew, perhaps on new territory. This is the Oidium stage; it is shown at A, Fig. 2. Later, little dark specks may be seen by the unaided eye upon the same white threads. The specks are less than the period mark on the printed page. Magnifying these, we find they are globes with a cellular or network-like surface, and bear numerous white arms or heavy threads distinct from the mycelium of the plant. Placing one or two of the globes between two pieces of glass, and pressing slightly upon them, they are easily broken, and a thin, transparent sack, called *spore case* or *sporangium*, is squeezed out, containing numerous spores. Some idea of the appearance of the specks (peridia) may be inferred from B, Fig. 2, and of the spore case with spores from C, Fig. 2. The spores of the first kind seem to be for the immediate propagation of the plant; the second for passing the winter. The name is *Sphærotheca parrnosa*, Lev.

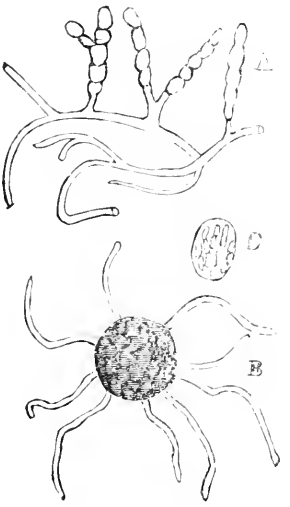

Fig. 2. Rose Mould.

Pea Mould.—Garden peas and beans, in autumn, often suffer from *Erysiphe Martii*, Lk., a plant allied to the above. Not a garden in Illi-

nois, it may be safely said, in which late peas grew, was free from this fungus this year. A representation of the fruit speck (peridia) is given in Fig. 3. The spore cases are four to eight, each having four to eight spores. The leaves and stems have a white appearance, as if coated with thin whitewash.

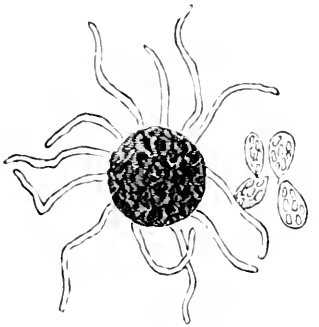

Fig. 3. Pea Mould.

Fig. 4. Verbena Mould.

Verbena Mould.—All who have attempted to propagate verbenas know how liable they are to be attacked by "mildew." Though so well known to the florist, I do not find mention of this plant in the books upon parasitic fungi, and do not know that it has ever been studied, though it could hardly escape the numerous eyes that have searched for such things. It too is, in its first stage, an *Oidium*, and is represented in Fig. 4. The spores are one-fourteen-hundredths of an inch by one-eight-hundredths, and are more or less granular or figured within. I have searched diligently for the second form of fruit without success, but as the plants mostly examined have been in-doors after the cold weather, it may be circumstances were not proper for their development. We have, however, a wild verbena (V. hastata) growing abundantly in open woods and pastures, whose leaves were conspicuous for their whitened appearance during the autumn months. This plant grows erect two to six feet high, branched above, bearing long spikes of seed pods and small flowers. The mildew in its Oidium form is very similar if not identical with that upon the cultivated plant, and the globular fruit bodies are very numerous after November 1st. This strengthens the opinion that, under favorable conditions the mildew of the garden verbena is really an Erysiphe quite similar to that affecting the pea. The sporangia or spore cases from the wild plant are about four in each globular conceptacle, and have uniformly eight spores. The arm-like appendages are yellowish in color, and much crooked and twisted. It may be called sometime *Erysiphe verbenæ*, if really found to be without a name.

Lilac Mould.—The common lilac is almost universally afflicted in the latter part of the summer, with a parasite of this class, the leaves appearing as if covered with whitish dust from the highway; indeed, few per-

sons would suspect the coating was any thing but dust, yet a moment's glance through the microscope would convince them of their error. Here again we have the two kinds of fruit, the first of which has nothing essentially different from the above described; but the second differs in the remarkable and beautiful appearance of the projecting filaments or arms. It is roughly represented in Fig. 5; but one needs to see the coloring of the ball with its reticulations, the crystalline purity of the curiously-forked appendages, and the regularity and beauty of the curled tips, to appreciate how fine an artist Nature is, even in her lowest expressions. The fungus belongs to the genus *Microsphœria*.

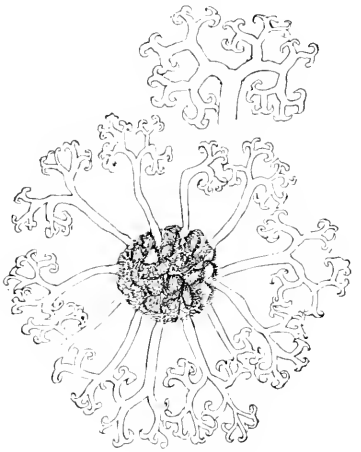

Fig. 5. Lilac Mould.

All of these leaf parasites belong to the same family (*Perisporiaceæ*) and all grow upon the surface of their host without *penetrating* the tissues, and in consequence are easily destroyed wherever external applications can be made. Nothing is probably better than sulphur dusted upon the affected parts. The grape mildew (*Erysiphe tuckerii*) belongs to the same group of plants, and has long been treated in this manner.

In the greenhouses, the thick-leaved plants, as lemons, oranges, camellias, ivies, poinsetteas, etc., are often preyed upon by quite a different fungus, a species of *Antenaria*, whose full history is still debatable, but agrees with the foregoing in being confined to the surface. The leaves appear to be coated with soot, or a black, brittle felt which may be scraped or peeled off, leaving the surface clean and green. Under the microscope it is seen to be composed of closely interwoven threads, jointed in a bead-like fashion, with here and there upright filaments whose joints readily separate and disseminate the fungus. It may be destroyed by sulphur, or brushed or washed off. Let alone, it spreads from plant to plant, causing slow but sure disease.

LANDSCAPE GARDENING.

Dr. J. M. GREGORY, Regent of the Illinois State Industrial University, Committee on Landscape Gardening, was unable to be with us, but sent the following essay, which was, at the request of the Secretary, read by Mr. STARR, in an appreciative manner:

I have already, on a former occasion, had the honor to lay before this Society some views on landscape gardening, or rather on the ornamentation of home grounds. In obedience to your request I come

forward again to contribute some thoughts which may at least serve as the annual reminder to the Society of the existence of such a department of your field of inquiry.

It is a most noticeable feature of the times that the art spirit is on the increase among our countrymen. The multiplication of art galleries, the enlarged proportion of the fine art departments in our annual fairs and expositions, the introduction of art instruction into the public schools, the floods of chromos and pictures of all sorts in the market and in our homes, the appearance of so many new names among our artists, and the increased taste for the beautiful shown everywhere—in houses, carriages, dress, ornaments, and even in our implements of industry, all tell with an unmistakable emphasis that the era of art life is beginning for us as a nation. The hard, stern utilitarianism which was a virtue in our pioneer life, when nothing but the most rugged industry, bravely persisted in, against all temptations, could serve our need, has begun to yield to the softer and finer, if not nobler feeling of love for the graceful, the beautiful and the agreeable. Let me not be misunderstood as undervaluing the brave old spirit of manly independence, which, seeing its work before it, bent itself to its task with a stalwart purpose to be content with its lot, and treating with honest indignation and contempt the disposition to dress with an unbecoming finery, and to give to untimely refinements the brain power and hand power which were required to meet the grander wants of life. When serried ranks move over the battle-field, and charging columns rush to the terrible encounter, it is the music of cannon and musketry, and not of flutes and violins, which cheers the men. So when an earnest people are engaged in a work such as fell upon the pioneers of the land, there is but little time or taste for the delights of beautiful things. Bread for the stomach, money to meet the tax collector, schooling for the children, and religion for the soul, were the grand aims of life.

But the time was sure to come when nature in man would reassert its neglected attributes, and demand for all its fundamental needs. And one of these needs is that of gratification of the taste for the beautiful and the agreeable. This taste is as essential an attribute of the human soul as is the desire for knowledge, the conscience for truth or the appetite for food. Even in our food we seek as much for agreeable savors as for its nourishing power; and in our dress, pleasant colors and fashionable styles are as much prized as comforting warmth or durability of fabric.

It is not needful to undertake any comparison of natural needs, or to defend the utility of one at the expense of another. As the eye can not say to the hand, "I have no need of you," so one part of the complex passional nature of man can not assert any essential superiority of right or utility over another. The hunger of the stomach may be the more pressing, but the hunger of the heart is equally human, and perhaps nearer the angelic and divine.

I know full well that none of this argument is needed to justify before this Society the ornamentation of our grounds, or even landscape gardening on a grander scale; but my essay, like your labors, is meant in part

for the people beyond, and most of all for those whose lives are spent on the farms. It has been mine, as you know, to work in one of those great national schools provided by our Government, chiefly for the benefit of of the farming population of the country, and whatever affects the character or interests of the farmer has engaged my most serious thoughts. I have studied with the utmost care the difficulties amid which they struggle, the obstacles which lie in their path, the circumstances which affect their lives, and the causes of frequent discontent which leads them to send their children, when possible, to other pursuits, or induces those children sometimes without their parents' consent, to desert the farms for life in towns and cities. Without denying or seeking to diminish the other difficulties and disabilities which surround the farmers' toils and hinder his career, I have the best authority for the assertion that it is the dullness, and too often the dreariness, of the farmer's home which constitutes his most serious drawbacks, and sends his children from their native fields and firesides to find in other spheres the gratifications which their natures crave, but which farm life does not furnish. I do not affirm that the planting of ornamental shrubs and flowering plants for the making of lawns and landscapes would remedy this evil, but I fully believe that wise attention to Nature's higher wants, her cravings for the ideal, the agreeable, the beautiful, is intimately associated with those other qualities of mind and heart, and those other amenities of life which are so often wanting in the farmer's home. The very effort to shape his surroundings into more agreeable forms would awaken many a farmer into thoughts and feelings which would be fruitful of results over every acre of his farm. With new and higher needs would come fresh energy, more inspiriting ambition, quicker and broader perceptions, and a capacity for better plans and truer economies.

One of the grandest discoveries of modern science is that all of nature's forces are so related that each may be transmuted into the other. Light, heat, electricity, magnetism, chemical affinity, gravitation, and perhaps even vital force—all are but so many varying forms of nature's one indestructible, never increasing and never diminishing energy. Heat is but a finer form of motion; light is but the transformed heat, and the flashing electricity is only another shape of this protean energy, while the affinity that binds together the chemical unions, and the magnetism which points the polarized needle, and the world-building gravitation which gathers matter into masses, and holds the worlds in their orbits, are among the disguises which this universal energy wears and discards by turns. From one of these forms to another it passes with endless activity, but without ever losing a particle of its original amount, or increasing in the least the exact measure of its original power. Its disappearance in one form is but a transformation to another. The self-same energy which burns in fire beneath the boiler, becomes steam within the boiler, and a moment later this identical force is transformed into the motion of wheels, the rush of the locomotive and the movement of the cars.

So, among the forces which make up the spiritual power of man, is there not also a co-relation, or something analagous to it, by which a

joy in the heart may become a thought in the mind, and the kindling of a gratified taste may be transformed to strength in the volition, stoutness in the purpose, and activity in the perception of truth or the performance of work? If there be any such intimate or vital relation between the several parts of our nature, then surely he who suppresses or fails to properly cultivate one element, diminishes his sources of power, and robs the remaining parts of his nature of their natural supports.

It is an established fact of the new physiology that the pleasant emotions increase the nerve and brain power, while the dull and depressing passions diminish it. Exhilarating feelings favor all healthful nutrition; their opposites exhaust and waste the energies. These facts may not seem to the careless thinker, who is unacquainted with the sources of all power, to be of any serious account. Men are so wonted to the belief that the will itself can give power, that they are inclined to neglect all care for their recruitment or conservation of their energies. They are inclined to laugh at such views as the foregoing, as if they were mere idle speculations or dreams. But nature can not be cheated, and, out of the millions of her heedless and unbelieving children, only a few rise to any grandeur of achievement, or win even the commoner measures of success.

Prof. BURRILL stated that the essay just read was the presentation of only one part of the subject, and that the Doctor would, if desired, prepare the other portion and furnish for publication. It was voted to request Dr. GREGORY to complete his essay for publication.

REPORT ON METEOROLOGY.

Prof. J. B. TURNER, of Jacksonville, Committee on Meteorology, read the following essay, entitled:

CAUSES OF CLIMATIC CHANGES AND THEIR PERIODS.

The past season has been quite remarkable for its extremes of heat and cold, rains and droughts: while the rains and cold were general, extreme, and unusually destructive. They destroyed, over wide areas, nearly all the fruits and great amounts of the staple crops of the West.

In view of these results, Boss Tweed's far-famed question, "What are you going to do about it?" is at once pertinent and easily answered. We can do nothing with such results, except to anticipate and guard against them by either learning to foresee their approach or reserving products to tide us safely past them.

We have but three practicable means of foresight: knowledge of signs, of periods, and of causes.

Meteorology is a science in about the same sense that metaphysics, geology, theology, mesmerism, phrenology, spiritualism and finance are sciences. Almost every man of us knows he thinks, feels, and wills somehow; that he stands upon some sort of an earth, has some sort of brains in his head, some sort of a soul in his body, and there is some cash in the

world, whether he has any in his pocket or not; also that we have some sort of weather nearly every day. And the few things we do not know about any of these subjects, by a stupendous excess of courtesy to ourselves and to our own wisdom, we call our science of this, that, or the other; and so, among the rest, we have the science of meteorology.

But whatever scientific knowledge of meteorology we have, we have, of course, derived either from our knowledge of signs, or of periods, or of causes.

Our knowledge of signs of changes in the weather is very meagre; that of fixed recurrent periods still less; and that of causes least of all. The difference between these is this: Real causes never fail of their results, nor real periods of their return—like day and night, summer and winter—while true and real signs may sometimes fail, even when we least expect them to do so, and thus mislead even the wisest observers. In medicine, signs are called symptoms, and we all know that the best of doctors sometimes miss the mark, and kill the patient instead of the disease.

It may be of little practical, immediate interest to horticulturists, in their money-making schemes, to discuss either the periods or the causes of the changes of the weather; still we should never forget that the intelligent hortitultural man is greater than any of his products, and whatever stimulates him to renewed observation and thought, is the most valuable of all his products. Besides, I think that this Society, by admitting such discussions, has gained in dignity, character, reputation, and power for good, both at home and abroad. Its readiness to contribute its mite, however small, to the general progress of human knowledge, widens its esteem and influence among men.

On former public occasions I have spoken of the signs of the changes in the weather; and among these of the effect of wide regions of hot, dry earth in the late autumn, in determining the character of our winters and springs.

This sign, though in itself a powerful cause, in so far as it really exists, is so liable to be over-estimated as to its real breadth, and is so often interfered with and held in check by other powerful causes, as to sink down to the level of a mere sign, which sometimes fails, though it generally succeeds.

I propose at present to say a few words more particularly upon the causes of climatic changes and their resultant periods.

If, in view of the present controversies extant on meteorology, originating, in part, in this Society, I go back, in this paper, further toward the final analysis of being itself, and the axioms of all possible science than would be appropriate to a mere spoken address, I trust my most thoughtful hearers will in the end see and appreciate my reasons.

In all possible physical sciences we have generically and primarily but two simple things to deal with: First, matter, or that which is capable of receiving and manifesting to our senses form, motion, color, temperature, and its inertia or inherent resistance to change, either of form or motion; and, second, force, or that universal cause which produces all the changes in the forms, motions, colors, or temperature of matter, and overcomes its innate inertia whenever or wherever it is overcome at all.

The general forms of matter are three: solid, liquid and gaseous; and the forms of motion and force are also three: mechanical, or motion by masses, chemical, or motion by atoms, as in all chemical attractions and organic growths, and trilling, or vibratory, as in the force and motions supposed to produce color and heat, electricity, taste, smell, physical sensations, etc.

We have no reason to suppose that there is more than one essential, ultimate thing or cause of form called matter; or but one single thing called force, or cause of motion, in existence, though we give the forms made out of matter, and the motions produced by force, an endless variety of names to suit the endless variety of phenomenal forms, motions, actions, and reactions which they produce. Hence, we have whole groups of distinct names for the varied animal, vegetable, and mineral forms produced out of matter; and whole groups of distinct names for the varied manifestations of motion by force, either mechanical, chemical, vibratory, or organic. For example, we speak of the force of an engine, or a lever, or a canon ball; the force of crystallization, growth, life, heat, light, electricity, magnetism, polarity, etc., etc., only meaning, if we know what we are talking about, that wholly unknown cause which produces all the varied manifestations of motion, whether mechanical, chemical, or vibratory and atomic, and not the motions and manifestations themselves.

It is a great though common blunder to confound the phenomena of motion, heat, light, electricity, polarity, etc., etc., with the force or cause which produces these manifestations, in all cases alike.

The producing cause or force is one thing; the complex phenomena produced, or the effect on matter, is quite another, even though cause and effect have the same name. But there is no such force as the assumed force of cohesion: what is so called in our books is simply the innate inertia of matter itself, or its inherent tendency to resist all changes in its present form, motion, or color, or actual condition, until impelled to such change by some new force originating wholly outside itself, or of the masses or atoms to be moved. Still it is a great mistake to suppose that matter can be anywhere actually at rest; no single particle of matter at rest has ever yet been discovered.*

*For the sake of completeness, and to guard against misapprehension, it should be added that, wholly outside of all physics, and wholly unaccounted for by any of its possible researches, lie, also, the three modes of known life:

1. Vegetable life, so called, or that unseen power which organizes forms and motions, and propagates them in specific kinds.

2. Add to this the power of perceiving form and motion, as merely agreeable or disagreeable, and we have what we call animal life.

3. Add to this again the power of perceiving or idealizing what we call instinct, spirit, and causation, and moral good or evil, and we have what we call human, rational, or spiritual life.

If our animals, or our philosophers, can not perceive this last mode of life or being it is no fault of ours.

Thus, by last analysis, if we admit that color, heat, etc., are mere modes of motion, all of known being is found to revolve harmoniously around only six simple elemental things, all alike manifested to our senses through, or by means of, simple form and

I have been thus particular in these definitions of the necessary elements of all possible physical science, because without some clearness of thought in our first starting points, in all science alike, confusion must follow us all the way through, and we will everywhere deceive ourselves by our own words and terms. Whenever a man or a child has learned the absolute simplicity of these elements of nature, he has already learned the best half of all we know about it.

With so few simple primary elements to deal with in mere physics, it would seem as though the race might at least thread their way through the complex movements, actions and reactions, of systems, suns, stars and worlds, skies, storms and clouds, until at last the entire philosophy, amity and harmony of being shall appear as simple as are the materials and forces which manifest and move it. But this is the work of more than one horticultural session. Whoever holds constantly and clearly in mind these few primal axioms, definitions, and distinctions, which lie at the basis of all possible science or philosophy, or human reason, is prepared to investigate and scrutinize facts and phenomena as no other man can.

Thus all meteorological phenomena must be produced by motions of gasses or vapors, such as air or clouds; or of fluids, such as water; or of solids, such as meteors, snow, or hail. And all motion in physics is produced by that cause, wholly unknown to sense, which we call FORCE, attaching some other epithet to it to designate its phenominal mode of manifestation or of action; but if all forces, so-called, are not one and the same, they are now known to be interchangeable into one and the same force, which amounts to the same thing. Which of these so-called modes of force—whether that of heat, so-called, or light, or gravity, or polarity, or magnetism, or electricity—plays the dominal or primal part in meteorology, or whether any one of them ever acts, or can act without the other, no man can as yet tell. Some ascribe greater meteorological power to heat, and some to electricity. Some make the one and some the other the primal cause of our changes of weather; but in a world in which we ourselves can not walk across the floor without producing changes of both in heat and electricity, it is hard to see how storms and tempests could sweep the skies and rock even the mountains without a continued

motion, taken either as facts of phenomena or as symbols of suggestion and of reason, namely: The direct exhibition or presentation of form and motion in matter to our senses; the indirect presentation or suggestion of causation through force, and of organization, perception, and reason in the three above-defined modes of life to our higher rational and spiritual capacities. He who accounts for nature or being as a whole can leave out no one of these six totally different essential elements of known being. Mere physical science knows nothing of even elemental matter outside of form, and can do nothing whatever with any thing but the first two, viz., mere form and motion and their order, or "law," as it is often very pompously called—just as though dead matter, or mere motion, could make any laws in any proper sense of that term—while all philosophy, in its proper sense, is based wholly on the remaining elements.

Were I talking on moral subjects I would add, there is nothing that Christ ever really taught, or sanctioned, or favored, that contradicts, infringes upon, or even disparages one single fact or principle as yet known to us, or even supposed to be known in physics, Darwinism not excepted.

manifestation of their presence and power. So in all possible storms these two modes of force always appear and manifest their power in one way or another—not apart, but simultaneously and together. Indeed, it is doubtful if any motion, or any change whatever, can ever take place in nature without them, either in manifest or unappreciable degrees. For myself, I have long been inclined to think that that mode of force which we call *heat* is mainly manifested and efficient in determining the general onward course of all winds, storms, cyclones, and tornadoes, while that mode which we designate as *electricity* is mainly manifest and efficient in all the interior motions, whirls, condensations, and terrific manifestations of local power in these phenomena; while still the general course of their line of advance is determined by the more genial and gentle action of heat along the line of the general surface currents towards the equator, or the higher return current toward the poles, or borne by some local whirl or eddy produced by the inevitable impulses of these two constant currents. Indeed, it is a fair question whether these necessary and continued impulses and eddies of these regular currents do not in all cases first set the electric forces at work; or better still, whether there is or can be anywhere more than one and the same force, acting under different conditions, and in different ways, and producing different manifestations, somewhat like the force of the axe which chops wood one minute and splits it the next; or like the force of the steam engine, which leaves the train still one minute, runs it forward the next, and backward the next, thus producing different phenomena, though but one and the same force; or as the same force of heat, producing all its infinitely varied phenomena.

Professor Tice's inquiries and suggestions on these topics are exceedingly interesting and valuable, but they can never be received by our modern scientists so long as they adhere to their old theories of force, heat, light, and electricity, no more than our American doctrines of toleration can be logically received by the true adherents to the papal syllabus—the one necessarily destroys the other. His fundamental idea of these storm-producing forces seems to be that they result from the natural and necessary action and reaction of the planetary masses or spheres upon each other, precisely in the same manner as gravity is now supposed to be the simple action and reaction of two or more masses of matter upon each other, and can have no existence where such opposite masses of matter do not exist.

So those other modes of force called light, heat or electricity, or what not, on this theory have no existence except as they are produced, or excited, or set in action on the surface and surroundings of the planets themselves by their mutual, reciprocal, and exactly proportional action and reaction (as in the case of gravity) upon each other; and though I am not aware that Professor Tice anywhere states this theory, he must admit it before his teachings, or indeed any other teachings based simply on facts, can be received.

The old theory of the books and schools is based wholly on the idea —the perfectly bald assumption—that the light and heat of the sun and

of other stars must flare abroad at random on all sides, away up in the infinite voids throughout all space, where there is no known or thinkable matter either to excite, attract, need, or reciprocate them, much as they do here on earth, where there is always matter—solid, liquid, or gaseous—to reciprocate and attract them; and they even imagine auras and ethers as a sort of ladders to help heat and light to climb away off from the sun, in all directions towards infinite nothingness, for no conceivable end or purpose under heaven.

The utter waste of such a patent out-door furnace for warming and lighting the universe, and the total destruction, on this theory, of the great law that "action and reaction are equal," the basal law of all physical science, never for once seemed to occur to these theorists. Amid this utter loss and waste of heat and light, coupled with the admitted difficulty which the planets must find in trying to force their way along their orbits, amid their fancied auras and ethers and contrivances to help light and heat away to nothing and for nothing, that the planets should begin to falter in their course, all worlds and all being begin to lack heat and freeze up in their own tracks, or plunge into the sun in a last effort to keep warm, and that the sun himself should at last freeze up, and all being perish together, by no means scares our philosophers out of their theory. They boldly and frankly admit it.

You will here permit me, gentlemen, to say that I admire their pluck far more than I do their philosophy or their fancy or their good sense.

Suppose we admit the existence of their auras and ethers as a means of helping mere force of any kind to climb out into vacant space or from planet to planet. Unless the particles of their ether absolutely touch, and the ether itself is, therefore, considerably more solid than cast iron, we shall still need other auras and ethers to help force to climb from particle to particle or from atom to atom, just as much as we now need them to help it along from planet to planet or from sun to sun.

When we are ready to give up the false assumptions and theories with which mere schoolmen and dogmatists have filled our books, both of science and of faith, and brush away the fogs and the fancies with which they have filled and darkened both the natural and the spiritual heavens, we shall begin to see each of these alike in all that magnificent simplicity as well as infinite variety in which God Himself has truly revealed them unto us; and Professor Tice, or any one else, may propose whatever new facts he chooses, without fear of their being overturned by mere moonshine, and we shall begin to build up some rational science of meteorology.

So far as we now know, force acts in accordance with its own methods or laws, wherever it can find opposite matter to act upon, through spaces of utter void, however wide, not only with no media or intervening means through which to act, but in spite of whatever media should seek to arrest its natural and necessary mode of action. It may be diverted, or its mere modes of action changed; but it can never be annihilated or detained from moving matter in some form, and that, too,

without the help of skids, or bridges, or fogs, or auras, wherever matter exists, or across any vacuum whatever; while still it is impossible that there should be any manifestation of force where there is no matter, for force becomes manifested through form and motion alone.

If any doctrine of physics is settled by the facts, it would seem to be this: That matter, phenomenal in either form or motion, can nowhere exist where force is not present to mold and move it; and force of any kind can nowhere exist where matter is not present to manifest it; it needs nothing to help it move, for we have no proof that it ever moves or is capable of motion in itself. It is only capable of exciting or producing motion in matter, which is alone capable of motion; force itself has no thinkable motion or form, while it causes or excites to motion and form in all other things. The motions and forms we see; the exciting force we never see—very much as in the mortal sphere of being we, in like manner, see the man and hear his words, but never see nor hear the inspiring soul that causes them.

Among the manifested modes of force that have more or less to do with the seasons and the weather, we may mention what we call gravity, whose main function it is to keep lighter things—like vapors, gases and clouds—on top, and the heavier things—like water, rain, hail and snow—at the bottom; and it must be confessed that this old gentleman attends to his various duties, day and night, with the utmost care, steadiness, serenity and *gravity*.

Then we have a most gay, cheerful, and joyous little miss whom we call Light, who comes tripping into our windows to wake us up betimes every morning, paints, bedecks, festoons, and bespangles the whole earth with flowers in summer and icicles in winter, marking clearly the periods of night and day, and then is off till the next morning, sometimes blushing and sometimes weeping at eventide over the joys of the day she leaves behind her.

Next comes the great strategist—the Moltke of the skies—who plans out all its great campaigns, draughts all the vapors from the ocean's surface, and leads them upward to duty in higher spheres, marks down the differences between day and night; still again between summer and winter, pole and equator, keeps all the winds, and clouds, and vapors and fogs of earth and skies perpetually marshaled and pressing onward toward the actual breach in the wall, the points of lowest pressure, whether perpetually generated by the sun at the equator, or produced by temporary exhaustion elsewhere. This great strategist of the skies, the earth, the ocean, and the air, we call "General Heat." Whoever, in calm or storm, by sea or land, in sunshine or in rain, by night or by day, in the end outwits or outgenerals him will find their hands full.

Next we have what rough old soldiers would call a "hell of a fellow," a renowned cavalry rider and crusader, who can ride round the globe in less than no time, and gleam and flash, and tear and rend, and thunder and lighten, and get up more desperate cavalry charges here and there, in the shape of thunder storms, hail storms, snow storms, cyclones, hur-

ricanes, and tornadoes in five minutes than all his old fogy companions by their slow methods could in as many years. This furious cavalry rider and charger, this Murat of the skies, we call "Electricity." We have lately been trying to sober him down to the arts of peace—making him run of errands around the continent, and over and under the seas; but I don't see that we have made much impression upon him: he is still just as turbulent and as saucy as ever, every little once in a while.

Then there is another very grave old fellow, somewhat like gravity, who seems to stand in perpetual twilight, holding a "pole" in his hands with which he keeps all atoms and masses and forces with their right end or motion toward the north pole, and their other end or motion toward the south pole. We call him Mr. "Polarity," but perhaps we could give him a better name if we could more clearly see who or what he is, or what he is really about. Mr. Magnetism seems to be in some way his confederate and constant bedfellow.

These are the principal causes or modes of force which have to do with the weather; and you may be sure that when there is any general row among the elements they will all be on hand, and doing, each one for himself, his level best. In calmer times Mr. Gravity and the strategist, General Heat, seem to take the general direction of affairs.

Now, what is it that occasionally disturbs these various forces, and sets them all in a turmoil and in deadly battle array against each other? Our philosophers, par excellence, will tell you "it is a law of nature;" that is, that it is so: for this is all that the phrase law of nature can mean in answer to such a question. That is: you ask why a thing is so, and your philosopher, very smilingly, and with an air of infinite self-satisfaction, replies that "it is so because it is so." Prof. Tice replies that the disturbances of force upon this planet are produced by the necessary action and reaction of like disturbed forces upon other planets. Now, if this is true, it is, at least, some rational answer; it pushes actual research back one step into the dark, and brings actual knowledge to light: its truth or falsehood can never be decided by discussion, but only by renewed observation.

Should it prove true, it will also then be true, as I understand it, that one of the greatest and most useful discoveries of modern times was first broached and discussed by him in this Horticultural Society of Illinois; and I claim for you the honor of giving him so wide and broad a tolerance.

It is too soon for either party to dogmatize or declaim in this matter. Candid men everywhere confess to me that Prof. Tice has hit the changes in the weather, beforehand, by some means, during the past season, more nearly than any other man that has ever tried it. This looks as though a certain cause was found which is in fact master of certain periodic changes. Is it so? On any rational theory of the action and reactions and interchanges of forces no possible philosophical objection can be urged against it. On the theories of the books, which alternately roast and freeze all being, what chance is there for any other weather than polar frosts and hell fires? Undoubtedly upon this theory the best thing we

can do while we do live here is to shout at the top of our voices for the space of about three hours daily. "Great is the Diana of the schools and the philosophies!"

The records and tablets of the ancient Accadians dug up from beneath old Babylon, where they were deposited four thousand years before Christ was born, show that this people, who lived there before the race which built the more modern Babylon of Abraham's day came out of the East, from their long-continued study of astronomy had actually hit upon the same periodic cycle of the weather, within a small fraction of a year, which Prof. Tice now announces from St. Louis as entirely new to the age in which we live, and also entirely synchronous with our periodic spots on the sun. These records were carefully kept in a great work of seventy books, entitled "The Observations of Bell." They tell us that these Accadians "named the signs of the zodiac, and the days of the week, and the seasons of the year: divided the year into lunar months, and into three hundred and sixty days, with intercalary months whenever the stars required them to make an equation of time. The day was divided into twelve double hours, each hour into sixty minutes, and each minute into sixty seconds. The days of the week were named from the sun, moon, and five planets: and the seventh, fourteenth, twenty-first and twenty-eighth days, or every seventh day of each month, were termed days of rest, on which certain kinds of work was forbidden. Eclipses of the moon were regularly calculated;" but more particularly "cycles of twelve years were in use, in which the weather was expected to repeat the same successive phases:" and all this, too, before, according to our chronology, Adam himself was created. If this is true it would surely seem that the laws of nature and of God are more persistent, and reliable, and uniform, than the theories and surmises of men; and, taken with the other facts cited and predicted by him, demand for Father Tice's theory a thorough and patient examination and regard.

But before we can successfully examine this theory, or any other, we need a continuous and simultaneous examination of, and report from, all parts of, or at least some one great circle of, the globe. Nothing is more evident than that any astronomical cause might, and probably would, produce periods of change in the weather regular in two respects, and, therefore, apparently regular in no respect in any particular locality; that is, it might be regular both as to time and place, or regular in the time it impressed the earth's forces as a whole, and also regular as to its maximum point of effect in its march around the globe in lines of latitude, or other lines, but if these two regularities did not happen to coincide or complete their circles at one and the same time, the phenomena would be apparently irregular in any one single place or time. For example, if a crisis of force should incline to take place at one particular equinox, at mid-day, at the next similar equinox wholly another part of the earth might be under the mid-day line, and the same effect experienced, perhaps, on directly the opposite side of the globe. There is no more reason to suppose that these forces would affect all parts of the earth equally than that our eclipses so effect it. This holds true of all possible investigations of the weather;

and it is to be hoped that our investigators will soon be able to extend their observations over the whole circuit of our latitude, both by sea and land, for, in my judgment, no causes or periods can be fully investigated or settled until that is done.

DR. TAYLOR—It has seldom been my privilege to listen to so able a paper as that which has just been read by Prof. TURNER. I believe the public will be glad to see it in print, and I move, sir, that the Secretary be instructed to send copies of this address to the *Inter-Ocean* and New York *Tribune* for publication. Carried.

DISCUSSION ON PROF. BURRILL'S ESSAY.

DR. WARDER—I am under great obligation to Prof. Burrill, for this paper which he has read before us. The subject treated is important and full of interest to the horticulturist. The Doctor proceeded to relate a little of his experience in this matter of fungoid growths in Kentucky, but your reporter failed to get a clear understanding of this matter, and dare not venture to report his words, for fear of misrepresenting him.

MR. WIER—Some six or seven years ago I took up the study of monogamic life, and followed it up for two summers with a good deal of interest. But I found it was too big a task. I had not time to devote to the matter, and pretty much dropped it. I found out some things. For instance, I found that fungus upon the apple trees could be destroyed by the use of the sulphite of lime, and that this remedy appears to be a specific. The leaves are first affected, and I have thought for four or five years past that pear blight has its beginning in the blight of the leaf; indeed, I have never seen a pear orchard that had leaf blight, that did not afterward have the regular pear blight.

PROF. BURRILL—I have, for the past year or two, given a good deal of attention to the subject of pear blight, and its relation to leaf blight, but I have learned nothing; I am just as ignorant now as when I commenced my investigations. I have found out nothing respecting the cause of the disease, or any thing that *seems* to be a cause.

With reference to the peach rot, we know that it starts upon the leaf. If the fungus upon the leaf of the peach is put upon a healthy peach, it will soon rot it.

MR. WIER—That is the notion I have had of the pear blight; that it attacks the leaf first and afterwards the wood.

DR. HUMPHREY—I dislike the expression—that fungus *attacks* different kinds of vegetables and fruits. I think different kinds of vegetation

are so constituted that they are disposed to take on the disease, just as some persons are scrofulous. Some plants can not be affected by fungus growth; they are so conditioned or constituted that fungi will not form on them, not that they are not attacked by it.

PROF. BURRILL—Fungus does attack plants.

DR. WARDER—It attacks plants as small pox attacks a man. My pear trees have been attacked by blight, that had never seen leaf blight.

MR. GALUSHA—It was said some years ago among us, that fungus did not attack healthy vegetable tissues, but operated as a scavenger upon tissues already diseased. If this is so, we would like to know it.

DR. WARDER—I never saw such a vigorous growth as my roses had the past year, and the leaves got sick and fell off.

BEAUTIFYING THE HOME.

DR. LONG asked permission to make a few remarks upon the subject of Dr. Gregory's essay. He said:

The subject is well worth your attention. To beautify our homes is one of the first things to attend to; and nothing makes home so attractive as the flower-garden; and nothing is more in place than the flowers and ornamental shrubbery around the house. It requires but little labor to fix up around the house, and make home look pleasant; a few trees set out at the proper time, takes but little time or labor. Shrubbery, roses, and flowers, properly distributed about the place, give it a wonderfully pleasant home-look, and repays in the solid happiness that it gives the family.

I can point to the time when you could go a great ways and not see a rose anywhere. It is not so now; even our highways are ornamented with trees, and I desire to see even greater progress in this direction.

REPORT ON SIGNAL SERVICE.

DR. J. A. WARDER, from the Committee to present Resolutions relative to extending the benefits of the Signal Service, reported as follows:

Your committee, to whom was referred the consideration of the subject of the *Signal Service* and its great value to Agriculture and Horticulture, beg leave to enforce what has already been so well said by the President and others upon its great importance to the people.

Our only regret connected with the subject is, that while we rejoice at the happy results of the Service, in enabling the hardy mariner to avoid exposure to many a threatened storm, we, the agriculturists, with vast

interests equally exposed to injury from these meteoric perturbations, can not also be as well advised of their approach, in time to protect ourselves from their terrible inroads.

What is already done for us is admirable and of great utility, but we should be glad to have these benefits still more widely and universally extended wherever "the weird wires spread their magic lines."

We offer the following, which is a modification of the action of the Michigan Pomological Society:

Resolved, That this Society memorialize our Senators and Representatives in Congress so to extend the scope of the Signal Service as to give the benefits of its observations and deductions to Agriculture, by sending a warning to every telegraphic station, of the approach and probable extent and severity of such storms as may occur between April and November, and also of the cold waves, their path and probable severity. We hope, also, they will make every practicable effort to extend our circuit of observation around one entire great circle of the globe, in our own general latitude, without which no philosophic observations of the weather can be considered as in any degree complete.

[Signed] J. A. WARDER, } *Committee.*
J. B. TURNER, }

The resolution was adopted.

PROF. BURRILL called attention to a circular which he had prepared and was distributing, asking co-operation with him in making a collection of specimens of native and cultivated woods of Illinois.

He asked the members who can do so to furnish him specimens and information according to instructions in the circular.

FINAL RESOLUTIONS.

MR. JOHNSON, from the committee, read the following:

Your Committee on Final Resolutions beg leave to report the following:

Resolved, That the thanks of this convention be tendered to our President and other officers, for the able, efficient aud impartial manner in which they have performed their several duties.

2. That we tender our thanks to the officers and members of the Adams County Horticultural Society for their hospitality.

3. That we are much gratified in meeting the members of our sister State associations, who are now honorary members of this Society.

4. That we particularly commend the excellent and practical lecture on Horticultural Entomology, by Prof. Cyrus Thomas.

5. That we are much gratified with the presence and co-operative assistance of that veteran of horticulture, Dr. John A. Warder, of Ohio.

6. That the thanks of this Society be given to the officers of the following railroad companies, for the liberality extended to us:

The Chicago, Burlington & Quincy, Illinois Central, Chicago & Alton, Rockford, Rock Island & St. Louis, Burlington, Cedar Rapids & Minnesota, St. Louis & South-Eastern, Hannibal & St. Joseph, Toledo, Peoria & Warsaw, Toledo, Wabash & Western, St. Louis, Keokuk & North-Western, Quincy, Alton & St. Louis, Indianapolis, Bloomington & Western.

Also to the proprietors of Tremont, Quincy, Ætna, and Occidental hotels, for reduced rates and excellent entertainment during our session.

Also to the press of Quincy, for reporting our proceedings.

[Signed] J. W. COCHRAN, } *Committee.*
J. S. JOHNSON, }

The resolutions were adopted.

FINAL ADJOURNMENT.

THE PRESIDENT thanked the Society for the kind consideration and courtesy extended to him in the discharge of his duties. He had, he said, performed them to the best of his ability. He hoped that we might all meet again, a year hence, at Galesburg.

The Society then adjourned, to meet in the city of Galesburg at ten o'clock on the second Tuesday in December, 1876.

MEETINGS OF EXECUTIVE BOARD.

At a meeting of the Executive Board, called by the President, at the Grand Pacific Hotel, Chicago, September 4, 1875, there were present: President E. S. Hull, Messrs. L. K. Scofield, J. E. Starr, and O. B. Galusha. Ex-President W. C. Flagg, being present, was invited to a seat with the Board.

REPORT OF COMMITTEE ON EXHIBITION.

Mr. Galusha, from the Committee on Preparation for Exhibition of American Fruits, etc., by the American Pomological Society, reported as follows:

The committee appointed by you, at your annual meeting in Springfield, to procure suitable halls for the accommodation of the meeting of the American Pomological Society, in Chicago, and for a national exhibition of fruits, in connection therewith, met at the office of the *Prairie Farmer*, in Chicago, May 11–14, and thoroughly canvassed the matter; also, in connection therewith, ascertained as well as they might that very little money could be raised in the city—in accordance with the resolution passed by you at the annual meeting.

Upon receipt of a message from Hon. J. P. Reynolds, Secretary of the Board of Directors of the Inter-State Exposition, we visited the Exposition building, and conferred with that Board. The result of this conference was a proposition from them more favorable to us than the one submitted at the last annual meeting of your Board, which proposition was accepted by us subsequently (May 18th). This proposition and arrangement comprised the following stipulations and conditions: The Inter-State Exposition Board were to set aside seven thousand feet of space in the south end of the Exposition building, half upon the main floor, and half in the gallery; they were to furnish suitable tables and shelves for the fruits, gas lights in the evenings, and police force the same as in other portions of the building. The entire expense of decorating this portion of the hall, receiving, arranging and caring for the fruit, and keeping the tables in good order, was to be borne by the State Horticultural Society.

A proposition was also received from Mr. J. B. Drake, proprietor of the Grand Pacific Hotel, through Mr. H. D. Emery, Special Committee on Hotels, offering a fine hall in the hotel, fitted up to seat from three hundred to five hundred people (as needed), free, provided the hotel was made and advertised as head-quarters of the American Pomological Society, pledging also a reduction in price of board of fifty cents per day from regular rates, and offering a banquet suitable to the occasion, at three dollars per person.

These propositions were submitted without coment to the officers of the American Pomological Society, and also to the Executive Board of this Society, and approved by all, except that two members of the Executive Board did not approve the clause relating o a banquet.

On motion of Mr. Starr it was

Resolved, That this Society give a banquet to officers and non-resident members of the American Pomological Society, in accordance with the proposition of Mr. Drake.

On motion it was also

Resolved, That a committee of two be appointed to receive, allot space for, and arrange the fruits for exhibition.

Messrs. Starr and Galusha were chosen as such committee.

On motion of Mr. Scofield, a committee was appointed to procure and attend to the disposal of tickets for the banquet; which committee consisted of the following gentlemen: J. Periam, L. Ellsworth, W. C. Flagg, T. T. Lyon, J. E. Starr, O. B. Galusha, and Daniel Worthington.

SECOND MEETING OF EXECUTIVE BOARD IN CHICAGO.

The Executive Board met in the Grand Pacific Hotel, Chicago, September 7, 1875, in pursuance to order of the President.

There were present: President E. S. Hull, J. E. Starr, T. Butterworth, L. K. Scofield, and O. B. Galusha.

The President stated that he had invited the Treasurer to be present, inasmuch as funds would be needed for the expenses of the exhibition, but that he had not arrived.

The Secretary announced a telegram from Mr. Huggins, Treasurer, stating that sickness prevented his attendance, whereupon, on motion, Mr. W. C. Flagg was made temporary treasurer, and the President and Secretary were instructed, by vote, to draw a warrant on the Treasurer, payable to the order of Mr. Flagg, in the sum of $500, to be used in defraying the expenses of the exhibition.

Mr. Flagg was, at his own request, relieved from his position on Committee on Banquet, and Mr. Butterworth was substituted.

Mr. Parker Earle was added to this committee.

On motion, the Board adjourned.

MEETING OF EXECUTIVE BOARD AT QUINCY.

The Executive Board met at the Tremont House, in Quincy, December 14, in response to the call of Vice-President Scofield.

The Secretary presented the following report:

FINANCIAL STATEMENT

IN RELATION TO THE FRUIT EXHIBITION AND THE ENTERTAINMENT OF AMERICAN POMOLOGICAL SOCIETY, IN CHICAGO, SEPTEMBER, 1875.

To the Executive Board of the Illinois State Horticultural Society.

GENTLEMEN: In my own personal report I have shown a statement of all the moneys which I have received and expended throughout the year, including, of course, the time of the exhibition in Chicago; but you, and through you the Society, will wish to have a statement embracing the entire receipts and expenditures of that enterprise. I

am not able to give you a very accurate and systematic statement, for the reason that I did not have charge of the funds. Our honored President, with consent of the Treasurer *pro tem.*, disbursed the money which was placed on deposit in Chicago for the payment of expenses: and while I know with considerable accuracy the aggregate receipts and expenditures, which were all carefully made, I am not able to trace all the funds, as he could do, through the various channels taken in reaching the several items of expense. Had he not used much care and discretion in this matter, it would have been a more difficult task to arrive at accurate results than it now is, for he was called home by telegram to the bedside of his sick son before the bills were all paid, or a settlement made, and the sad event which followed has deprived us of the benefit of his aid.

The following statement is, I think, nearly or quite accurate, as you may learn by examining the vouchers and evidences at hand:

There has been drawn from the treasury, for expenses of the exhibition, warrants Nos. 64, 66 and 67, amounting to $692, which amount has been diminished by $104, which has since been returned to the treasury, making the net amount of the State fund used directly for the expenses of the exhibition, $588. This amount will be increased by the payment of a small balance still due, which the Secretary has paid on this account—extra postage and expressage, and a little extra traveling.

The amounts paid out are as follows:

Daniel Worthington's first bill (see acc't)	$146 56
" " second bill "	119 20
Paid Robert Douglas' bill "	66 00
" A. R. Whitney's " "	15 00
" for express and material (by O. B. G.)	49 18
" for labor, paid by "	75 50
Remaining in Mr. Worthington's hands	9 99
Paid J. E. Starr's bill	36 75
" G. H. Baker's bill (check No. 67)	23 50
" J. B. Drake, board of Executive Board	95 00
	$636 63

The amount collected by subscriptions, collections, and sale of tickets	$416 00
Received from sales of fruit, etc	119 20
	$535 20
The amount paid Mr. Drake for the banquet was	500 00
	$ 35 20

It will be seen by the above that an amount* more than sufficient to pay the expenses of the banquet was raised without encroaching upon the funds in the treasury, many of the owners of fruit donating it to be sold for this purpose.

Allow me to congratulate you, fellow-members of the Executive Board, upon so favorable a result financially, as well as in all other respects, of this most magnificent exhibition of fruits and satisfactory entertainment of our honored guests.

All of which is respectfully submitted,

O. B. GALUSHA, *Secretary.*

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*This amount has since been increased by payment of $11, and will, doubtless, be still further increased by the payment of $25, still due on subscription.—SECRETARY.

The reports of the Secretary and of Daniel Worthington, relative to the receipts and expenditures of the exhibition, were received, approved, and commented upon as altogether satisfactory.

On motion, the Board adjourned to meet at the call of the President.

SECOND MEETING OF EXECUTIVE BOARD IN QUINCY.

The Executive Board met at the Horticultural Hall, Quincy, December 16, 1875.

The President was instructed to draw warrants on the Treasurer as follows:

One to the order of O. B. Galusha, for balance due on settlement, $291.17.

One to the order of C. E. Southard, for bill of printing, $19.75.

One to the order of Louis Miller, for express, and for fires for meeting of Executive Board, $4.

The Secretary was instructed to issue postal-card circulars to County Superintendents of Schools, offering surplus copies of the Society's Transactions to School District Libraries; and also to distribute, at his discretion, to supply libraries of Grangers and Farmers' Associations.

The Board then adjourned to meet at the call of President Hammond.

MISCELLANEOUS PAPERS.

REPORT OF FRUIT COMMITTEE FOR ILLINOIS TO THE AMERICAN POMOLOGICAL SOCIETY.

Mr. President and Gentlemen:

As chairman of your Fruit Committee for the State of Illinois, I associated with me Hon. A. M. Brown, of Villa Ridge, Pulaski county, for Southern Illinois; E. Daggy, of Tuscola, Douglas county, for Central Illinois; and T. McWhorter, of Aledo, Mercer county, for Northern Illinois; and the assistance they have kindly rendered will appear below. Each gentleman was furnished with a list of items by your chairman of General Fruit Committee, P. Barry, of Rochester, New York.

Upon mature reflection, and for peculiar reasons, which will appear further on, I have decided to depart somewhat from the course suggested, and, personally, report mainly upon the present *status* of horticulture in the State, prefaced by a brief review of its

HORTICULTURAL HISTORY.

In October, 1851, the Northwestern Fruit Growers' Association was organized, and held meetings each year thereafter, excepting 1854, for discussions, addresses, etc., on pomology and general horticulture, until the year 1857. This association, though in name a Northwestern society, was almost wholly sustained by residents of the State of Illinois; and, accordingly, when, in 1857, its meeting was held at the same time and place with that of the Illinois State Horticultural Society—organized the previous year—that association, by vote, merged itself into the Illinois State Society. This Society has held meetings of four days' continuance each year since, and published its transactions annually. Previous to 1867, the proceedings were published in pamphlet form, by contributions from its members; but, in the year 1867, the General Assembly of the State made an appropriation of two thousand dollars per annum, which has been continued from that time to the present, enabling us to publish our transactions in full, putting them into book form. These volumes, entitled "Transactions of the Illinois State Horticultural Society," contain about four hundred pages each, and embrace lectures, essays, and discussions upon practical horticulture, and also upon meteorology, geology and soils, vegetable physiology, and other subjects which underlie or are directly connected with scientific and practical horticulture.

CLIMATES AND SOILS.

The extreme length of the State, extending, as it does, from the latitude of Northern Massachusetts on the north, to that of Southern Virginia on the south, indicates a diversity in climate, and consequent diversity in species and variety of fruits which can be successfully grown. But differences in soils, subsoils and exposure, are far greater; and these, in addition to the variation in climate, have long since proved to the Illinois State Horticultural Society the folly of making fruit lists for general use, as they must, if made, be yearly unmade or changed. It has been the practice of this Society, for a number of years, to procure lists of fruits from intelligent and careful fruit growers in different parts of the State, located upon different soils, which have succeeded best with them; and these lists have proved far more valuable to those about to plant trees than the previous and more general lists.

You will therefore excuse me if I do not comply with the request to give a complete "list of species and varieties adapted to cultivation in the State." I will, however, append a partial list of apples which succeed better than others in various localities and soils.

Of the different soils in the State the loess formations along the river bluffs are undoubtedly the best for growth of healthy, productive fruit trees. In many places, as at Alton, this loess is of great thickness, and of a fine, firm texture, yet sufficiently porous to admit of perfect drainage to the roots of trees. This is noticeable in cases where deep cuts for streets were made twenty to thirty years since, the walls of which still stand perpendicular. The soil of the bluffs and ridges of Southern Illinois consists of an extremely fine, comminuted clay, strongly impregnated with iron to a great depth, reaching at Villa Ridge eighty feet in thickness. So extremely fine is this soil, that it has been used, without bolting, for polishing brass and silver. In this soil the pear and the peach flourish admirably; in fact, the only drawback to profitable fruit growing in the Southern part of the State is the distance to markets, and the great expense of sending to market by express. It is hoped that soon railroad companies will be compelled to do this express business, guarantee careful handling and speedy delivery of fruits (accidents excepted), at a moderate profit for such service; and when this state of things shall be inaugurated, the railroad owners, the fruit growers, and the consumers, will all alike be benefited, and an immense impetus be given to production throughout this, one of the best fruit growing regions east of the Rocky Mountains.

The undulating timber lands of the central portion of the State also produce almost uniformly good crops of apples, hardy grapes, Early May and Morello cherries; pears, when the trees escape blight; peaches —one crop in three or four years; and abundant crops of the small fruits.

The extensive prairies of Illinois are not as surely productive of good orchard crops, though where proper attention is paid to drainage a fair crop of apples is the rule. Grapes and berries grow in abundance, and with only moderate cultivation; so abundant indeed, is the crop of

Concord grapes on the prairies, that they were sold last year (1874,) at Centralia, for thirty dollars per ton, and nearly as low at other points, for wine making.

It is well known to all who have given attention to the geology of the State, that the drift which formed its soil was from the North; and in consequence, as a rule, the farther north we proceed the coarser the substratum is found to be. Hence, in Northern Illinois the soil of quite a large portion of the territory is underlaid with gravel, which gives but little nutriment to roots of fruit trees penetrating it; hence, where the soil overlaying this gravel is only of moderate depth the trees are not long-lived, as they dry out and freeze out quicker than elsewhere, though young orchards of hardy varieties are usually productive. Much attention has been given to the Siberian apples in the North, and to the production of new varieties from seed. Among these, the Marengo and Whitney's No. 20 are generally regarded as best, though the Coral and several of Mr. Whitney's seedlings are very fine. The Tetofsky and Duchess of Oldenburg are quite popular in this part of the State.

The large commercial apple orchards of the State are generally located near or adjoining timber land; so located from the supposition, probably correct, that such lands are better adapted to healthy orchard growths than the open prairie lands.

The largest pear orchard in the State is that of Parker Earle, of Cobden, Union county, consisting of about twenty thousand trees.

Cultivation.—The opinion was quite prevalent in past years, that the soils of Illlnois were too rich in humus to favor the production of orchard fruits; and hence it was recommended to seed down orchards as soon as the trees had become well established, say in three or four years after setting, and in no case to manure orchards; as it was supposed that it would require nearly the life-time of one generation of trees to reduce the soil to a condition favorable to fruitfulness. It has been found, however, that apple "orchards in grass," especially a tough sod, become sooner diseased, are more preyed upon by bark-lice and borers, and become sooner unproductive than those which are judiciously cultivated; and when a decline is perceptible are moderately manured.

Scores of apple "orchards in grass," which had become sickly, unproductive, and unsightly, have been rejuvenated and rendered productive of fine fruit by the use of the plow and the cultivator and by enriching the soil; but as before intimated, it is impossible to make invariable rules. The expression which has been repeated at the meetings of the State Horticultural Society, that human "brains make the best manure," is verified every year by careful, intelligent cultivators, who use their brains in studying the conditions and wants of their trees, and bestir themselves in producing suitable conditions, and in supplying obvious wants.

The small fruits, especially raspberries, currants, gooseberries and blackberries, richly repay the cost of good cultivation and mulching with coarse manure.

Strawberries will bear special fertilizers, such as a mixture of bone-dust, plaster, pulverized hen-manure and superphosphate of lime. They should be mulched late in autumn, for winter protection.

Pruning.—This subject is a delicate one to approach, as fruit growers are separated much more widely in their creeds and practices upon it than upon almost any other point in fruit culture.

I will premise the few words which I have upon this point with the remark that what may be correct practice east of the Great Lakes may not be so with us, and that the "meat" eaten by Eastern cultivators "has caused" many a Western one "to offend" in this direction. This is hardly the place for a full discussion of the reasons for a careful, judicious and *very limited* use of the knife and saw in our Illinois orchards. It is sufficient to say that immense damage to our orchards has resulted from an excessive and injudicious use of the pruning-saw—probably more than from any other single cause.

It has been found that, by a careful attention to the position and direction of branches, while young—which is easily given by use of the thumb and finger, and occasionally the knife, during the first six or eight years of the life of the tree—very little cutting will be required thereafter. The point to be gained in the cultivation of apple orchards in this State is to develop an abundance of healthy foliage, evenly distributed over the tree, and not to "cut away half of the branches to let the sun shine upon the fruit."

Vine growers do not, as a rule, pinch their vines as severely or as often as in former years, having found that two summer pinchings of each fruiting branch—leaving three or four leaves beyond the last cluster at the second pinching—is, on the whole, more economical than three or four pinchings and summer prunings of each shoot, as is still practiced by some vineyardists. A renewing the vineyard by layering a shoot between the vines, once in about four years, is recommended by some, and probably a majority, of our best wine growers; as the best fruit grows upon vines from two to four years old.

The Present Status.—Three consecutive years of almost unprecedented drought, followed, in the winter of 1874–75, by long-continued cold, of an intensity almost unparalleled in this latitude, well nigh proved fatal to our fruit trees; but the copious rains of the past summer, together with the general barrenness of our orchards, such as has never before been known in the State, and which has been so deeply deplored by many, have resulted in producing a good wood-growth and preparation for future health and productiveness. I hazard little in saying that, had our orchards been as productive this year as for the last two years, and the season as dry, one half, at least, of all the orchard trees in the State would have been ready for the axman upon the recurrence of another spring; so that the apparent calamity of unprecedented barrenness will doubtless prove "a rich blessing in disguise."

I append reports from Hon. A. M. Brown, of Villa Ridge, E. Daggy, of Tuscola, and T. McWhorter, of Aledo, as before mentioned. All which is respectfully submitted.

O. B. GALUSHA,
Chairman, Fruit Com. for Ill., of Am. Pom. Soc.

FRUITS FOR SOUTHERN ILLINOIS.

BY A. M. BROWN, PULASKI COUNTY.

The species grown to a greater or less extent are apple, pear, peach, plum, cherry, quince, grape, strawberry, raspberry and blackberry.

Plums are not largely grown, on account of the difficulty of protecting them against the ravages of the curculio; and cherries of the finer sorts are not much cultivated, for the reason that the season is too long for them: the leaves mature and fall off so early that a second growth succeeds in the Autumn, and the result is that the trees become unhealthy.

VARIETIES, CULTIVATED AND RECOMMENDED.

Apples—for Summer.—Red Astrachan, Red June, Buckingham, Benoni, Virginia May, Summer Queen, Am. Sum. Pearmain, Fall Pippin, Maiden's Blush, Sweet Bough, Rambo.

Autumn and Early Winter.—Smith's Cider, Spark's Late, Rome Beauty, Ben Davis, Yellow Bellflower.

Late Winter.—Winesap, Fink, Rawle's Janet, Limber Twig.

Pears.—Bloodgood, Bartlett, Seckel, Lawrence, Beurre d' Anjou, Julienne, Madeline, Beurre Giffard, White Doyenne, Grey Doyenne, Duchesse d' Angouleme, Belle Lucrative, Buffam, Onondaga, Louise Bonne d' Jersey, Glout Morceau, Doyenne d' Alencan, Passe Colmar, Buerre Easter.

Peaches.—Hale's Early, Troth's Early, Large Early York, Old Mixon Free and Cling, President, Stump the World, Smock, Early Crawford, Heath Cling.

Cherries.—Early May (Early Richmond), English Morello, Governor Wood, May Duke.

Grapes.—Ives' Seedling and Concord—the only varieties grown for market.

Strawberries.—Wilson's Albany, Charles Downing, and a promising new variety originated by George W. Endicott, of Villa Ridge, which we propose to call Endicott's Seedling.

Raspberries.—Doolittle, Turner, McCormick (Miami), Philadelphia.

Blackberries.—Lawton, Kittatinny, Wilson's Early.

Injurious Insects.—Curculio (plum), Codling Worm, Peach Borer, Root Aphis. There are other insects that do more or less damage, but these are the most important.

Diseases.—Pear blight, rotten root in apple, pear and cherry; rotting or specking of fruit on the trees, especially certain varieties of apples—cause not known; yellow rust in blackberries, especially Kittatinny; grape rot; premature falling of the leaves on cherries and some varieties of pears.

Intelligent cultivators are, as rapidly as possible, contracting the number of varieties of all sorts of fruits, and planting only those that have proved themselves least subject to disease and most productive of salable fruit.

REPORT FROM E. DAGGY, OF TUSCOLA.

* * * In sending you the promised report I will have to tax my memory somewhat, as it is so long since we had a good crop of fruit here that it appears as though we are nearly out of the fruit-growing business. My knowledge of varieties is too limited to do the subject justice, I feel sure, but I will give the names of varieties in the order of preference, all things considered, so far as my acquaintance extends, and note any peculiarities opposite each.

There are many other sorts grown here, but I mention those that have succeeded best, except where I do not know the names, when, of course, it is impossible to report them.

Apple trees in this locality have been on the decline for five or six years, and had the dry summers continued I think the decline would have continued; but I feel that with this wet season will begin vigorous tree-growth.

Apples—Early Summer.—Early Harvest best, but tender.

Summer.—Carolina Red June, Red Astrachan, shy; Keswick Codling, tender; Sweet June, syn. High Tops; Benoni, tardy.

Late Summer.—Duchess of Oldenburg, Sops of Wine, Horse Apple, syn. Yellow Hoss; Golden Sweet, tardy; Summer Queen.

Early Autumn.—Maiden's Blush, Lowell, tender; Red Siberian, crab; Yellow Siberian, crab; Transcendent, crab.

Late Autumn.—Snow, syn. Fameuse; Cooper, Rambo, tender; Fulton, Ramsdell's Sweet, Fall Winesap, syn. Yellow Winesap; Fall Orange.

Early Winter.—Rome Beauty, Milam, Jonathan, Yellow Bellflower, on clay soil; Mother.

Winter.—Winesap, Willow Twig, Ben Davis, Pond Sweet, White Winter Pearmain, on clay soil; Minkler, Smith's Cider, on clay soil; Tolman Sweet, White Pippin, Harrison Cider.

Late Winter and Spring.—Rawle's Janet, Hoops, Gilpin, Grindstone, syn. American Pippin; Farley's Red, tender; Limber Twig.

Pears (all blight).—Flemish Beauty, Louise Bonne d'Jersey, on dwarf stock.

Peaches (all tender).—Grosse Mignonne. Seedlings succeed best.

Cherries.—Early May, syn. Early Richmond; English Morello.

Grapes.—Clinton, Concord, most popular; Oporto, poor quality; Delaware, on clay soil; Isabella, Catawba, tender.

Currants.—Red Dutch, Red Grape, White Dutch, White Gondoin.

Gooseberries.—Houghton's Seedling, American Seedling.

Raspberries.—American Blackcap, McCormick, syn. Miami; Doolittle, Purple Cane, tender (?–Ed).

Blackberries.—Kittatinny, Lawton, syn. New Rochelle.

Strawberries.—Wilson's Albany, Downer's Prolific, Necked Pine, McAvoy's Superior, Early Scarlet, Wizzard of the North.

REPORT FROM T. McWHORTER, OF ALEDO.

* * * The discouragement that at the present time hangs over the fruit-growing interests of out section of country, renders it a painful task to comply with your request for Pomological reports.

About five years ago, the Illinois State Horticultural Society took action to prosecute inquiry "concerning the causes of the failure of the apple orchards in the EAST." The tables are turned: It now devolves upon us to institute the same inquiry concerning WESTERN orchards!

While, as horticulturists we would gladly pass over these unfruitful seasons as silently as possible, it seems unfortunate for us that the American Pomological Society holds its session in Chicago at the very time to compel us to publicly face these questions.

Twenty-five years ago, with what buoyancy the Northwestern Fruit Growers' Association held its annual gatherings, and filled their long tables with the beautiful, perfect specimens that were the products of our first orchards! It will not be forgotten that we then indulged in a little pride in seeing our fruits on the tables in contrast with Eastern collections. If we were then a little vain, it may be proper that we are now in some measure humiliated.

We have passed through the same or similar experience that follows the settlement of most new countries. On the first settlement of every section of country the insects and diseases that infest the fruit trees of older regions do not at first appear; but the pests are sure to follow; fruit growing seems always attended with more difficulties as the country grows older. But the most serious disasters that for the past few years have affected the interests of fruit growing in Central and Northern Illinois, have resulted from a succession of unfavorable seasons. The most serious difficulty in fruit growing, in the whole northern portion of the Mississippi valley, is in the vicissitudes of our climate. Our fruit trees were seriously injured by the winter of '73; added to this, for three successive seasons previous to the present summer, we had an extreme

scarcity of rain, our strawberry beds wholly died out. In seasons of excessive drought, such as was the summer of '74, fruit trees can not store up the vitality required for the next crop, and no doubt the unfruitfulness of our orchards the present year is mainly the result of the excessive drought of previous years. We all understand that when trees exhaust themselves by producing an excessive crop, they are generally unprepared for a succeeding crop; and excessive droughts seem to leave the trees in much the same condition. Our young specimen orchards were seriously damaged by the winter of '73; then followed the droughts of '73 and '74, and the consequent barrenness of our orchards the present season, accompanied by a slight fall in the *barometer of our pomological enthusiasm.*

With regard to apples, it is a notable fact, that within the last decade of years, among all the new varieties that have elicited the attention of Western horticulturists, scarcely a single variety claims attention on the merits of the *quality of the fruit;* we seem to be aiming to greater *hardiness, productiveness,* or *keeping qualities,* and can hardly claim to have advanced a single step in improved quality. We are doubtless too delinquent in producing seedlings from our improved varieties.

Owing to our late, warm autumns, much loss and waste of fruit occurs from the habit many varieties have of prematurely dropping from the trees. This difficulty seems to prevail most with those which have originated North, such as R. I. Greening, Roxbury Russet, Jonathan, Wagonner, etc., and for this reason I have inclined to look to Southern kinds for improvement in keeping qualities. Several years ago I procured a collection of Southern varieties; among them proved to be several synonyms, many proved not hardy, while some small and worthless. Owing to unfavorable seasons, perhaps, none of them have yet had a fair trial. The only varieties that I could safely name, as giving much encouragement, are the Red Warrior and the Red Ox; at least these are worthy of further trial.

Pears.—Well, on the subject of pears we have little to say. The trying severity of the last few seasons with us has tended to considerable discouragement in pear culture; those orchards located in the loess soil of the Mississippi bluffs seem to afford the most encouragement, and our best success is with standard trees—dwarfs have lost all repute. The most hardy varieties seem to be the Buerre de Anjou, and Flemish Beauty.

Cherries.—Our recently severe winters have left scarcely a healthy tree of the finer varieties. Early Richmond (*E. May*, if you choose) seems the only variety of much value to us, that to my knowledge is well tested; though considerable has been said of a few other sorts. The Early Richmond produced an excessive crop last year, but no fruit this year.

Grapes.—If required to decide what one fruit of the highest value stands among the productions of the last half century, I would be compelled to say the *Concord Grape.* The last decade of years has brought forth many new, and in some respects valuable varieties of grapes, at least such as we should esteem as valuable, if we had not the Concord. We like the Delaware, but few of them find their way into

the market. We like Rodgers' No. 15 *when we can get them;* but through all the vicissitudes of our capricious climate, for the last five years, the Concord has withstood all the inclemencies, tied up to stakes, and has not failed in that time to produce a bountiful annual crop. On some exposed grounds, where clean cultivation had been continued into late summer, the surface roots of even the Concord were injured by the deep freezing of the last winter; but under any proper management the Concord grape is decidedly more hardy than our average orchards; and if nature has ever produced any fruit that will never disappoint our expectations, it seems to be the Concord grape.

LIST OF APPLES RECOMMENDED BY A. C. HAMMOND, WARSAW.

Summer.—Early Harvest, Early Joe, Red Astrachan, Golden Sweet, Sweet Bough.

Autumn.—Maiden's Blush, Mother, Fall Wine, Rambo, Bailey Sweet.

Winter.—Winesap, Rawle's Janet, Pryor's Red, Red Canada, Hubardson's Nonsuch, Peck's Pleasant, Grimes' Golden, Am. Golden Russet, Winter Sweet Paradise.

ENTOMOLOGY.

A DESCRIPTION OF SOME OF THE BEETLES (COLEOPTERA) WHICH ARE MORE OR LESS INJURIOUS TO THE HORTICULTURIST.

BY PROF. CYRUS THOMAS, STATE ENTOMOLOGIST.

O. B. GALUSHA, Secretary of the State Horticultural Society.

Dear Sir: According to promise, I hereby present you so much of the Report on Entomology as I have been able to prepare in the very limited time allowed me. As you will see, by examination, it consists chiefly of descriptions of beetles injurious to trees and horticultural products, accompanied by short statements of such remedies as have been proposed, or that I had to suggest. It is almost wholly extracted from my forthcoming Report, and, as any one will see, it presents very little relating to original research, but is simply a bringing together from various sources what has been done in order to meet, in part, a want which is now severely felt by horticulturists. I have freely drawn from the works of others, and from my own previous papers, and wish here to acknowledge my indebtedness to the works of Harris, Fitch, Packard, Walsh, Riley, and Dr. LeBaron. This is, in fact, intended more as a supplement to Dr. LeBaron's Fourth Report than as a separate contribution. I have followed his arrangement, and as that report is included in the published Transactions of your Society of 1874, the reader is referred to it for the characters of the families and genera, which will be necessary in determining species not common. I may add that I have drawn freely from my paper published in the fifth volume of the Transactions of the State Agricultural Society.

I am aware but little honor is to be acquired by bringing together what has been done by others, but my desire is to aid our horticulturists, as far as possible, to become acquainted with their insect foes, and in order to do this a work of this kind is necessary, and was contemplated by the lamented Walsh at the time of his death; and so far as the *Coleoptera* are concerned, Dr. LeBaron has admirably prepared the way by his Fourth Report, which has given a new impetus to the study of entomology in Illinois. I regret I could not complete this order, but the time allowed has been too short. Very respectfully,

CYRUS THOMAS.

The following table contains a list of the species herein described, also a reference to the places where they are figured. "LeB 4" signifies Dr. LeBaron's Fourth Report, which is found in last year's Transactions Illinois State Horticultural Society; "Riley 3," signifies Prof. Riley's Third Report, etc; "Am Ent. II." is American Entomologist, Vol. II.; "Harr." stands for Dr. Harris' Report, edition of 1862.

The list names them in the order they stand in this paper.

A LIST OF THE SPECIES DESCRIBED, WITH REFERENCES TO THE PLACES WHERE THEY ARE FIGURED.

Ips 4-signatus, Say—(*I. fasciatus*, Fabr). LeB. 4, pg. 60, fg. 22.
Platycerus quercus. Am. Ent. II., pg. 212, fg. 129.
Phyllophaga fusca and larva. LeB. 4, pg. 85, fg. 39. Riley 1, pg. 156, fg. 88.
Phyllophaga pilosicolles. Harr., pg. 33, fg. 13.
Phyllophaga fraterna.
Serica sericea.
Serica vespertina. Harr., plate II., fg. 14.
Macrodactylus subspinosus. Harr., pg. 35, fg. 16.
Anomala varians. Harr., pg. 34, fg. 15.
Anomala lucicola.
Anomala binotata.
Pelidnota punctata and larva. LeB. 4, pg. 88, fg. 40. Riley 3, pg. 78, fg. 34
Euryomia inda. Harr., pg. 40, fg. 17.
Euryomia melancholica. Am. Ent. II., pg. 61, fg. 39.
Chrysobothris femorata. LeB. 4, pg. 94, fg. 42.
Dicerca divaricata. Harr., plate II., fg. 7.
Dicerca lurida.
Agrilus lateralis.
Agrilus ruficollis and larva. Amer. Ent. II., pg. 103, fg. 69.
Amphicerus bicaudatus and larva. LeB. 4, pg. 103, fg. 47. Riley 5, pg. 103, fg. 38.
Sinoxylon basilare. Riley 4, pg. 53, fg. 26.
Ithycerus noveboracensis and larva. LeB, 4, pg. 136, fg. 61. Riley 3, pg. 57, fg. 20.
Epicaerus imbricatus. Riley 3, pg. 58, fg. 21.
Pandeleteius hilaris.
Magdalis armicollis. LeB. 4, pg. 139, fg. 62 (of M. Olyra).
Hylobius pales.
Pissodes strobi. LeB. 4, pg. 139, fg. 63.
Balaninus nasicus. LeB. 4, pg. 140, fg. 64.
Athonomus quadrigibbus and larva. LeB. 4, pg. 140, fg. 65. Riley 3, pg. 30, fg. 10.
Athonomus prunicida. Riley 3, pg. 39, fg. 13.
Conotrachelus nenuphar and larva. LeB. 4, pg. 142, fg. 68. Riley 3, pg. 11, fg. 1.
Conotrachelus crataegi. Riley 3, pg. 37, fg. 12.
Analcis fragariæ. Riley 3, pg. 42, fg. 14. LeB. 4, pg. 143, fg. 69.
Scolytus 4-spinosus and larva. LeB. 4, pg. 146, fg. 71.
Saperda bivittata and larva. LeB. 4, pg. 157, fg. 77.

INTRODUCTORY REMARKS.

For a general outline of the arrangement and characters of the larger groups of the order, and also for an explanation of the terms used, the

reader is referred to Dr. LeBaron's Fourth Report.* I will here add some general statements which may assist somewhat in finding the names of species, or determining whether they are injurious or not.

The descriptions here given apply almost exclusively to the perfect insect; but the readers of such papers as this and of our entomological reports, often, when they find a larva injuring some plants, are desirous of ascertaining what remedies are recommended, and take up the reports to find, if possible, what it is, but are at a loss to know how and where to search. As this is very often the case, I will give some general directions which will aid in this matter. It is impossible to do more than give general directions by characters founded on the larvæ alone, but as a general rule, if we can trace them to the family to which they belong, we can form a tolerably correct idea of their habits; and if we can do this, a little search through the descriptions of the species of the family may enable us to find it if mentioned in the work we are examining. For the purpose of further aiding in this search, I have added a table of plants injured, naming the species herein mentioned which are known to depredate upon them.

First, then, we may take it for granted that a larva which is a grub, maggot, caterpillar or slug, or that can be considered worm-like, whether long or short, thick or thin, with feet or footless, with or without a true head, smooth or spined, flat or round, can not belong to the *Orthoptera* (grasshoppers, etc.) or *Hemiptera* (bugs), as the larvæ of the species belonging to these orders are like the perfect insects, except that they are smaller and without wings.

In the second place, if it is injurious to vegetation, we may exclude the *Neuroptera* (dragon-flies, lace-winged flies etc.) This leaves but four orders, still a broad field over which to search. If it has feet we may exclude the *Diptera* (two-winged flies); also all the *Hymenoptera* (wasps, bees, etc.), except the *Tenthredinidæ* or saw-flies, and *Urocerida* or "horn-tails." But the reader must not infer there are no footless larvæ except in the *Diptera*, as there are many even among the *Coleoptera*. This leaves two orders, *Coleoptera* (beetles), and *Lepidoptera* (the butterflies and moths), and the two families of Hymenoptera mentioned. If it has any thick and fleshy legs on any of the segments between the first three segments, which bear the true legs and the last, we may conclude it is the larva of a lepidopterous species or of a saw-fly. But if it belongs to the latter it will have from six to eight pairs of abdominal or prolegs, in addition to the true legs; whereas the lepidopterous larvæ never have more than five pairs, though they often have less. Thus, step by step we may obtain a tolerably correct idea where it belongs, and be enabled to determine something in reference to its habits, and what the perfect insect will be.

As the present paper is limited to the *Coleoptera*, I will give some general statements in regard to the larvæ of the larger groups which contain injurious species.

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* This will be found in the eighth volume of the Reports of the Illinois State Horticultural Society.—EDITOR.

The larvæ of the stag-beetles (*Lucanidæ*) and leaf-chafers (*Melolonthidæ*, *Rutelidæ*, and *Cetoniidæ*), are thick fleshy grubs with a distinct head, which is usually dark or brown, with strong jaws. As a general rule they are more or less enlarged toward the hinder extremity, the last segment usually being the largest; the back is generally wrinkled transeversely. They have but six feet, situated two on each of the first three segments behind the head; the body is generally more or less curved, and they usually lie on one side, in which position they feed. As a matter of course they and all other larvæ vary in size according to the species and the age at which they are observed. Some, as those of the stag-beetles, are found in rotten or decayed wood and are seldom injurious; others, as those of the May-beetles, June-bugs, vine-chafers and leaf-chafers generally, reside in the ground, living upon the roots of grasses and other plants. The common "white grub" is an example of this group.

Here I must warn the reader against making a mistake in supposing no other larvæ except these have this form; but the foregoing is given simply to inform him that, when he finds a larva of the character named, feeding upon the roots of grass, strawberries, etc., in all probability it belongs to this group, and thus assist him in his search for the species.

The larvæ of the saw-horned wood-beetles (*Buprestidæ*) are sometimes called hammer-headed larvæ, from the great development of a segment immediately behind the head. The whole body is usually slightly flattened, especially the large segment. They are footless grubs, and are found boring into timber, canes, vines, etc. The flat-headed borer of the apple tree (*Chrysobothris femorata*) is a familiar example. There are other wood-boring larvæ which somewhat closely resemble the Buprestian larvæ. These belong chiefly to the *Lamiides*, a sub-family of the long-horned wood-borers (*Cerambycidæ*). They are rather more cylindrical than the Buprestian larvæ, and the front segment, although often somewhat enlarged, is not so much larger in proportion to the other segments as in the flat-headed borers; and they are also generally nearly cylindrical in form, that is, not flattened. The round-headed apple-tree borer (*Saperda candida* or *bivittata*) is an example of this sub-family. The larvæ of the other long-horned wood-borers, at least those of the sub-families *Prionidæ* and *Cerambycides*, are similar in form, but have six minute legs situated on the first three segments. Belonging to the latter is the locust-borer (*Clytus* [Cyllene] *robiniæ*). In all these wood-boring larvæ the head is smaller than the first segment.

The larvæ of the elaters, snap-jacks or snapping-beetles are elongated cylindrical worms, generally quite slender, with the divisions between the segments not strongly marked—with six small legs. They are usually brownish, or marked above with brownish. Some of the larger ones are found in rotten logs and stumps, but the larger portion, including the injurious species, reside in the earth, eating the small and tender roots of plants, especially of the grapes, cereals, etc. They are generally known as "wire-worms," and belong to the family *Elateridæ*.

There are certain very small larvae, found sometimes boring into wood, especially the hickory, in oak and hickory furniture, etc., while

others similar are found boring into books, stale bread, dry natural history specimens, etc., which are true grubs, in form resembling the white grub, except they are not enlarged posteriorly. They are bent or curved, and have six small feet placed on the first three segments. These belong to the family *Ptinidæ*.

There is a large group of beetles, generally known as weevils or curculios, whose larvæ almost always inhabit plants, and especially the fruit in some of its various forms, as seeds, nuts and pulpy fruits, doing much injury to the horticulturist. These are soft, white, footless grubs, of small size. A few, as the pea-weevil and grain-weevil, belong to the family *Bruchidæ*, but much the larger portion to *Curculionidæ*, or true snout-weevils or curculios. Some of the latter gnaw galleries under the bark of trees, especially the pine; some form galls on the stems and leaves of plants; some form knots and galls on the roots; some reside within the stems or canes; but the greater portion live in the seeds, nuts and fruits of plants. Among the latter we may mention as examples the plum-curculio (*Conotrachelus nenuphar*), the apple-curculio (*Anthonomus 4-gibbus*), the nut or acorn weevils (*Balaninides*), the strawberry crown-borer (*Analcis fragariæ*), etc. All of these larvæ are very small, few reaching half an inch in length, while many are less than one-fourth of an inch long.

There are certain wood-boring larvæ which very closely resemble the weevil-grubs, and, except by their habits, are difficult to distinguish from them, as they are also white, footless grubs, of very small size. The absence of feet will distinguish them from the *Ptinidæ*, before mentioned, and their wood-boring or mining habit will distinguish them, as a general rule, from the weevil larvæ. They belong to *Scolytidæ*, a familiar example being the hickory-bark miner (*Scolytus 4-spinosus*), which forms the numerous furrows so frequently seen on the inside of hickory bark.

The leaf-eating beetles form another very extensive group, which, as Dr. LeBaron has done, may be united in one family (*Chrysomelidæ*). The larvæ are generally short, thick, fleshy, convex or hump-backed grubs, usually found lying upon the surface of the leaves on which they feed. They have six true legs, placed on the first three segments, and usually a terminal proleg, and they are often brightly colored. As examples, we may mention the larvæ of the Colorado and three-lined potato beetles.

There are certain small, flat, oval-shaped, strange-looking larvæ, frequently found feeding on sweet potato and other convolvulous plants, sometimes in company with brilliant gold-colored, turtle-shaped, small beetles. These, which may be known by the prickles along the sides, belong to the *Cassidæ*. The larvæ of the lady-birds (*Coccinelidæ*) somewhat resemble these, but may usually be distinguished by having the spines barbed, more numerous, and placed upon the upper portion of the body as well as upon the sides. These, which are often mistaken for enemies, especially when found collected in masses, as is sometimes the case, on the twigs of cultivated pines, should be left undisturbed, as they are one of our most efficient aids in destroying plant and bark lice.

Without further introduction, I will proceed at once to a description of such species of *Coleoptera*, found in Illinois, as are known to be injurious to orchards, nurseries and ornamental trees. I would call the attention of the reader to the fact that, when a character is given under a general heading as that of a family or section, it is to be understood as applying to all the species belonging to that section or family, and will not be found in the description of the species.

As an aid in searching species, a list with the names of the plants each injures is given at the end of the paper, so far as mentioned herein. By referring, in the general index at the end of the report, to the name of the species, the reader can at once find it and determine whether it is the thing he is in search of or not.

In speaking of the width in the descriptions, the broadest part is always to be understood; the length in the curculios does not include the snout. By *Spec. Char. Imago* is meant the more exact description of the perfect state or beetle.

Order COLEOPTERA, (Beetles.)

Family NITIDULIDÆ.

Ips 4-signatus, Say.

This little beetle, which is the only one of the family known to be injurious, is only about one-fifth of an inch long, and may be known by its flattened body, shining black color, which is varied by four yellow spots on the wing-cases, two on each case; and by the antennæ which have a knob or club at the end.

I received, last fall, some specimens of this species from a gentleman in Iowa, who states that it has been troubling his apples this season, principally the early varieties: "They puncture the skin, and eat their way toward the center, sometimes dozens of them being found in a single apple, always taking the ripest and richest. The appearance of the fruit at first sight is that of having been pecked by birds. It has also been detected eating the calyx of the pear and cutting its way into the fruit."

So far it does not appear to have been troublesome in Illinois, although found here. As a rule, it attacks only over-ripe or decayed fruit, the case given being an exception; hence proper care in removing decayed fruit, and gathering carefully that which is ripe will probably prevent any injury by this species if it should ever become troublesome, which is not likely. The preparatory states do not appear to be known.

Specific Characters of Imago (or perfect insect.)—Body oval, deep, shining black. Antennæ 11-jointed, with an oval club at the tip composed of three joints; the first or basal joint much larger than those which follow it. Body much depressed or flattened; thorax nearly or quite as broad at the posterior margin as the elytra. The joints of the tarsi, except the terminal one, very short. Each wing-case rounded at the tip so as to form between the two, when closed, a slight notch, leaving the extremity of the abdomen exposed. Head and thorax marked with small regular punctures. Each wing-case with two yellow spots, which are sometimes slightly tinged with red; the one next the front margin or base is curved so as to enclose the black point of the shoulder; the posterior one is behind the middle, and is transversely oval; under side black; length about one-fifth of an inch.

Family LUCANIDÆ. (Stag-beetles.)

Platycerus quercus, Web.

This species, which is much smaller than the common stag-beetle, (*Lucanus dama*), being only about two-fifths of an inch long, is distinguished by its thickened jaws, which are obtuse and many-toothed at the tip. It is of a dark reddish brown or black color, with a brassy tinge; the wing-cases are marked with longitudinal punctured lines.

It has been observed by Mr. Ayers, of Villa Ridge, eating out the ends of new shoots and buds of young pear trees, and in this instance doing considerable injury; but it is not abundant, and this case appears to have been an unusual one. The larva is unknown, but probably resides in decaying wood.

Spec. Char. Imago.—Antennæ with the first joint elongate, at the end of which they are elbowed or bent, terminating at the tip with a kind of club composed of four or five joints, which are enlarged on one side, somewhat resembling a comb; mandibles thickened, obtuse, and many-toothed at the end; general color blackish or dark reddish brown, with a brassy tinge; mandibles as long as the head, a robust tooth on the inner margin near the base, armed at the tip with about six small teeth; exterior edge with a rounded lobe at the base, and an elevated angle near the tip; elytra obsoletely striate, the striæ or lines punctured; anterior tibiæ with more than ten unequal very acute teeth; length, about two-fifths of an inch.

Melolonthidæ. Leaf-chafers, May-beetles.

These beetles have the antennæ short, with a distinct club at the end composed of three plate-like joints, which open like the leaves of a book. The tip of the abdomen is always exposed, the extremity of the wing-cases not curving down behind to cover it. As a general rule the species are oblong, more or less cylindrical in form and fleshy, so that they fly heavily, the abdomen hanging down. They are generally of a uniform chestnut brown color. The claws of their feet are notched or split at the tip like the point of a pen.

In the perfect or beetle state they feed upon the leaves of fruit and other trees, often doing serious damage; their split claws admirably adapting them to this mode of life. As evening and night is their usual time of flying and feeding, the cause of the injury they do is often overlooked by those unacquainted with their habits.

The larvæ, or worms from which they are produced, are thick, fleshy, white grubs, with dark or brown heads; they are generally enlarged more or less towards the posterior end, the last segment being the largest and marked with an indentation across the tip; they have the usual six thoracic legs, or legs on the first three segments; their usual position is on the side, and coiled in a semicircle; the back is transversely wrinkled. These have generally received the name "white grubs." Some of the species remain in this state for three years, feeding upon the roots of grasses and of other plants, such as strawberries, corn, vegetables, and even nursery stock.

Phyllophaga fusca, Fröhl. The May-beetle.

This very common species is of an almost uniform chestnut brown color, though the head and thorax are sometimes darker brown or almost black; the breast is covered with paler silken hairs. The wing-cases, though bearing two or three very slightly elevated flattened ridges, are not grooved. It varies in length from three-fourths to nearly one inch, the width across the widest part being about one-half the length. It is not hairy above, as is the case with another very similar species which is quite common in some parts of the State.

The beetles generally make their appearance in the latter part of May or in June, according to the season and latitude; in the southern or central portions of Illinois they sometimes appear in the early part of May. In April, when the ground is being plowed or spaded, often hundreds of them are cast out already in the perfect state, but then they are of a pale, creamy color. They usually emerge from the ground about dusk in the evening, and, as soon as their wings are sufficiently dried, take to flight, which often continues until late in the night; and if caught at this time and examined, they will be found paler than I have described them. Sometimes they move in large swarms or bodies, making a buzzing noise as they pass along just overhead.

Their term of life in the perfect state is short, not extending more than two or three weeks; having paired, they deposit their eggs in the ground and die. Yet, when they appear in large numbers, as is sometimes the case, they prove quite destructive to fruit and ornamental trees, by denuding them of their leaves; and as they hide during the day and feed at night, the agriculturist is often at a loss to divine the cause of the injury.

But it is in the grub state that they prove most injurious to vegetation, attacking the roots of meadow grass sometimes to such an extent that the sward may be turned up like a carpet. It has, in several instances in this State, proved quite destructive to strawberry plants by eating their roots; young corn is also subject to its attacks.

Remedies.—Although subject to the attacks of certain carnivorous quadrupeds, as the skunk, raccoon, etc., certain birds and domestic fowls, and the predaceous ground-beetles, no true parasitic insect was known to prey upon it until recently. Prof. Riley has ascertained that it is subject to the attacks of a certain species of digger-wasp, which he thinks attaches an egg to the grub, from which in a short time is developed a larva that attaches itself to the grub and finally destroys it. The larva of this wasp forms a small egg-shaped cocoon, which varies in length from half to three-quarters of an inch, and is of a pale brownish or buff color. During the present season several of these cocoons have been sent to me from Iowa, accompanied by specimens of *Ligyrus gibbosus*, Say, (a beetle belonging to the same tribe as the one now under consideration), the person sending them asking what relation one had to the other. This wasp, *Tiphia inornata*, Say, varies in length from a little less than half to three-fifths of an inch, and is of a jet black color; *the wings smoky yellow* or *dusky*. A full description will be found below.

The grub is also sometimes destroyed by a parasitic cryptogamic plant or fungus, which grows out from one or both corners of the mouth in the form of an elongate, narrow, somewhat flattened, woody stem, sometimes attaining several inches in length. This often greatly astonishes persons unacquainted with its history, who suppose it is a plant springing from a seed taken into the body.

Shaking the beetles from the trees every evening and destroying them has been recommended, and in some instances numbers have been caught and destroyed in this way. Dr. Harris says the best time for shaking trees on which these beetles are lodged is in the morning, as then they do not attempt to fly. But it is evident that this remedy is of very limited application. Applications of salt and ashes upon fields, especially meadows, infested with the grub has been recommended, but this can be of no service unless applied in sufficient quantities to thoroughly saturate the ground and destroy the vegetation. Applications of gypsum, or something of that nature, calculated to assist the growth of the plant, may do some good. Alkalies prove speedily destructive to the grubs, but they reside so deeply in the soil that it is impossible to reach them by any reasonable surface applications. Hogs and domestic fowls are fond of them, and, so far as we will give them an opportunity, will assist us in destroying them. I am satisfied the most effectual remedy, not only as against this grub but for all larvæ that attack the roots of plants, such as corn, wheat, grass and vegetables, is winter plowing. Turn the soil to a sufficient depth to bring them to the surface, where exposure to the frosts and cold of the season will destroy them.

Spec. Char. Imago.—Anterior tibiæ with three spurs on the outside, counting the one at the tip; club of the antennæ with three leaflets; claws of the tarsi, strongly bifid or split at the tip; one tooth standing above the other; body convex, sub-cylindrical; anterior coxæ not prominent; elytra not striate. (These are generic characters). Head minutely punctured; front margin roundly notched, and the edge slightly turned up. Thorax with large scattered punctures; the sides distinctly curved outward at the middle. Elytra not grooved or hairy, but a ridge along the sutural or inner margin of each, which gives the appearance of a single groove on each wing-case; two or three indistinct flattened ridges on each. Scutellum rather broader than long; punctured at the sides.

Almost uniform chestnut brown, head and thorax generally darker than the other portions; abdomen varies from reddish brown to black; breast covered with yellow silken hairs.

Length varies from seven-tenths to nearly an inch; width about one-half the length.

When the insect first appears the color is usually much lighter than given above, but deepens with age, becoming in some cases almost black.

Tiphia inornata, Say.—General color jet black, unspotted, sometimes with a faint bluish tinge; wings yellowish, fuliginous or smoky. Head punctured; antennæ piceous, paler toward the tip; mandibles piceous, blackish at the tip. Thorax punctured, wing-scale and posterior margin of the first segment impunctured; the metathorax with three longitudinal, slightly elevated, lines. Feet hairy; abdomen hairy, especially behind. Size varies from two-fifths to three-fifths of an inch.

Phyllophaga pilosicollis, Knoch. The Hairy May-beetle.

This species is rather smaller than the preceding, being only about half an inch long. It differs from that species in the following respects: It is generally paler; the head and thorax are reddish brown and covered with long, pale, yellowish hairs; the wing-cases are pale reddish yellow and covered with hair, and the body is rather more completely cylindrical.

With these exceptions, and some anatomical differences mentioned in describing the specific characters, it agrees in its general features with the preceding species.

It makes its appearance in the central and southern portions of the State early in May, as a general rule. It appears to be much more abundant in the southern section than the former species; in fact, I have observed it here in certain seasons in large numbers, whereas the other species is of somewhat rare occurrence. The *P. fusca* appears to be replaced in the southern section by *P. fraterna*.

Spec. Char. Imago.—Antennæ, tibiæ, claws, coxæ and form of the body as in *P. fusca*. Head and thorax reddish brown, covered with long pale, yellowish hairs. The head has the front margin entire, not notched, rounded, slightly turned up and punctured. The lateral margins of the thorax suddenly dilated in the middle. Scutellum triangular, rounded at the tip, and hairy. Elytra pale reddish yellow, or pale reddish brown, covered with hair, the inner or sutural margins generally a little darker red than the other portions. Breast hairy; under side a bright reddish brown. Length about half an inch.

Phyllophaga fraterna, Harr. The Kindred May-beetle.

This is very similar in form, color and markings to *P. fusca*, and will scarcely be distinguished from that species by the unscientific observer, nor is the distinction very material in a practical point of view, as the habits of the two, so far as known, are the same. It agrees with that species in color and in the absence of hairs on the back, but is considerably smaller, varying in length from a little over half to three-fifths of an inch, and the thorax is not so distinctly and suddenly enlarged at the sides. I find that most of my specimens taken this season (1875) in Southern Illinois, which I at first thought belonged to *fusca*, in fact belong to *fraterna*, while those taken in the vicinity of Bloomington, in the central part of the State, are generally specimens of *fusca*.

Spec. Char. Imago.—Antennæ, tibiæ, claws, coxæ and form of the body as in the preceding species (*fusca*), very similar in color and appearance to *P. fusca*, from which it chiefly differs as follows: this is smaller; the front margin of the head is more sharply notched and rather more distinctly turned up; the thorax is not so distinctly dilated on the lateral margins, and the punctures are also more minute and less distinct. Body not hairy above. Under side usually of a lighter color than the preceding species. Length varies from a little over half to three-fifths of an inch.

There are other species of this group found in the State, but as these are the most common and most injurious, and their general appearance and habits so nearly alike, it is unnecessary to mention any others. During the months of June and July they often fly into the room at night,

where there is a light, with a low buzzing sound, and striking the wall or some other object fall to the floor; if not disturbed, at length they rise again, and ascending to the ceiling continue to buzz around the room until striking something they again fall to the floor.

In the beetle or perfect state, all the species are leaf-eaters and have been known to attack the leaves of various oaks, Lombardy poplars, elm and maple trees, apple, cherry and other fruit trees. It would appear, therefore, that all deciduous trees are liable to be injured by them, and in prairie sections, where trees on comparatively few and grasses abundant, they are likely to do considerably injury to fruit and ornamental trees.

The remedies mentioned under *P. fusca* are equally applicable to all the other species belonging to this group or genus, which are found in this State.

There is another group or genus, closely allied to those just mentioned, which contains some species that occasionally prove more or less injurious. This genus, *Serica* (silky leaf-chafers), as its name indicates, is distinguished by the soft, silky pubescence with which the body is covered. It agrees with *Phyllophaga* in the general form of the body, which is oblong and sub-cylindrical, also in the characters of the antennæ and claws, but differs from that genus in having the wing-cases distinctly grooved or furrowed lengthwise, and in the size of the species, which are smaller.

Serica sericea, Knoch. The Silky Leaf-chafer. (*Omaloplia sericea*, Harr.)

This is a small beetle, about one-third of an inch long, varying in color from a light brown to almost a black, with a silky lustre, changeable like satin, and, when living, reflecting the colors of the rainbow in favorable light. The head has a few hairs upon it.

Spec. Char. Imago.—Antennæ, tibiæ, claws and form of the body similar to *P. fusca*; hind coxæ very broad, varying in color from a light brown to almost black, with a silky lustre, iridescent. The head has a few hairs upon it, is densely punctured; the front margin slightly notched and slightly turned up. The thorax with numerous small and somewhat equally distributed punctures; lateral edge not dilated in the middle. The scutellum longer than wide, triangular, punctured each side. Elytra distinctly striated; the striæ or grooves confluently punctured.

Length, from one-third to nearly two-fifths of an inch.

Serica vespertina, Sch. The Evening Silky Leaf-chafer

Is similar in most respects to the preceding species. The head and thorax are reddish brown; the wing-cases rather more of a reddish yellow, with rather more distinct or deeper grooves than the former species. This is the *Omaloplia vespertina* of Harris.

Spec. Char. Imago.—Similar to *S. sericea* in every respect, except as follows: head and thorax reddish brown, elytra paler; head truncate in front, with a minute notch or scallop at each side near the tip, front margin slightly reflected. Thorax with deeper punctures; scutellum punctured and rounded at the tip. Grooves of the elytra dilated, shallow, and punctured; the intermediate ridges narrower than the grooves and strongly convex. Under side a dull reddish brown.

Length, from three-tenths to four-tenths of an inch.

I do not find that any serious complaint has been made against either of these species of *Serica* in the West, and, so far as my observations extend, they do not appear to be very common. Dr. Harris states that, in the perfect or beetle state—that is, the *Imago*—they attack the leaves of the sweet briar, on which they are often found in profusion, of an evening in the latter part of June. I have generally found them, in the southern part of Illinois, on low shrubbery and about blackberry patches. I think it quite probable their attacks are confined to one group of the *Rosaceæ*. I am not acquainted with the larvæ, but they are, doubtless, similar to those of *Phyllophaga fusca* in form and general characters, and also, as we may safely presume, in habits.

Macrodactylus subspinosus, Fabr. The Rose-bug.

This well-known species belongs to the sub-family of beetles now under consideration, and possesses the same general or family characters, that is, having short antennæ with a three-leaved club at the tip, and split claws. It is only about one-third of an inch long, and much more slender in form than the May-beetles and leaf-chafers heretofore mentioned, having nothing of that fleshy, heavy appearance they present. The joints of the feet are very long, which give rise to the generic name, *Macrodactylus*, which signifies long-toed.

Spec. Char. Imago.—Although differing very materially from the preceding species in form, yet the antennæ, number of spurs on the anterior tibiæ, and the claws are similar in character. The form is much more slender than the preceding; the body is broadest across the middle of the elytra and tapers forward; the thorax is angularly expanded at the middle of each side, and its length exceeds its width. It is covered with buff-colored scales or down, which give it a browish yellow appearance; but if these are rubbed off, the head, thorax and underside will appear black and the elytra brown. The antennæ are brownish yellow, black at the tips; nine-jointed, including the three-jointed club at the end. The legs are slender and of a pale reddish color; the joints of the tarsi are tipped with black and are very long.

Length about one-third of an inch.

As this insect has not been troublesome in the portion of the State in which I reside, I have had no opportunity of studying its habits. I therefore give the following statements in reference to it, chiefly from Dr. Harris:

The beetles come forth (in Massachusetts) in June, or about the time the damask rose blossoms, and remain about thirty or forty days. The female lays about thirty white and nearly globular eggs from one to four inches below the surface of the soil. These are hatched in about twenty days, and the young larvæ begin at once to feed upon the tender roots within their reach. Like the grubs of the chafers already described, when not eating, they lie upon the side, with the body curved, so that the head and tail are nearly in contact. They attain their full size in autumn, being then nearly three-quarters of an inch long, and about an eighth of an inch in diameter. They are of a yellowish white or cream color, with a tinge of blue toward the hinder extremity, which is thick and obtuse; a few short hairs are scattered over the surface of the body; six short legs are situated

on the first three rings behind the head; the head is of a pale rust color. When winter approaches they descend below the reach of frost; here they remain until spring, and having passed the pupa state come forth in the perfect or beetle state in June.

It is in the latter state that they prove most injurious by eating the blossoms and leaves of shrubs and trees, in this way often inflicting much injury on the horticulturist. In its normal condition the rose blossoms appear to form its favorite food, but when it appears in vast numbers it seems to be an indiscriminate feeder; the grape-vine, in particular, is liable to suffer, but cherry, plum and apple trees are also often very materially damaged by it. Nor do they stop with these, for in some instances forest trees, corn, grain, grass and garden vegetables have been laid under contribution to their voracious appetites; even elder, which is generally supposed to be obnoxious to insects, is freely eaten by them. The worthless ox-eye daisy (*Chrysanthemum leucanthemum*), according to Dr. Fitch, is a favorite with them.

They do not appear to be uniformly distributed, but confined to somewhat limited areas, only one or two of which, so far as I am aware, are found within our State; another one, including three or four counties, is found in Kansas. But it is quite likely that, in favorable seasons, they will appear in different localities. According to Prof. Riley, it has been ascertained that it has a strong predilection for the Clinton grape and its close allies, and that it will often gather upon that variety and leave others unmolested; it is also stated that it does not molest the cinnamon rose. Its attacks upon the apple trees are directed chiefly against the fruit, at least such appears to have been the case where it has appeared in orchards in this State; but the leaves are also laid under contribution when the supply of fruit begins to fail.

Remedies.—I am not aware that this insect has any specific parasite of its own class which preys upon it; the large dragon-flies and other predaceous insects seize and devour more or less of them, and assist in keeping them in check when not excessively numerous. Insect-eating birds and domestic fowls devour them freely, but, when they become unusually multiplied, these natural checks are wholly insufficient to prevent their injuries.

Jarring or shaking upon sheets and hand-picking are the only remedies of any value which have been recommended, as no application which can be made appears to have any effect. If the ground in which the grubs reside can be ascertained, it would be well to dig or plow it up in the winter to such an extent as to expose them, and thus destroy them; it is possible that, in those localities where they appear to be annual visitants, this might aid in destroying them, if it can be thoroughly done.

Fortunately, this pest does not appear to have visited our State very extensively; but, as the amount of shrubbery and number of orchards in our State is rapidly increasing, we may expect them before many years.

RUTELIDÆ. (The Vine-chafers.)

Somewhat closely allied to the May-bettles are certain species of beetles which have a similar habit, in the perfect state, of eating the leaves of woody plants, especially those of the grape-vine, often doing much injury to the cultivated varieties. Like those of the last-mentioned family (*Melolonthidæ*) they possess short antennæ with a club at the end, composed of leaves or plates which open like the leaves of a book; but they are chiefly distinguished by having one claw on each foot thicker and stouter than the other, and the wing-cases more or less grooved lengthwise. The larvæ of but few species are known; but, as they are injurious to the horticulturist only in the perfect or beetle state, no further mention of these will be made than what will suffice to indicate their general character.

Anomala varians, Fabr. The Variable Vine-chafer.

This species, which is scarcely one-third of an inch long, is of a broad, oval shape; one of the claws on the anterior and middle tarsi or feet is cleft. The wing-cases are faintly grooved and punctured in the grooves; the thorax is plain and nearly or quite hairless. The head and thorax, especially of the male, is a dark olive or greenish black, margined with yellow, and thickly punctured. The wing-cases usually dull yellow, but occasionally variegated with brownish or black, so as to form two imperfect bands.

Anomala lucicola, Fabr. The Light-loving Vine-chafer.

This species belongs to the same genus as the preceding, has the same general characters, and resembles it so closely that it is difficult to distinguish one from the other—if, in fact, they are distinct. It usually has the top of the head and thorax black, and Dr. LeBaron states that specimens of both species occur entirely black. The wing-cases are rather more distinctly and deeply punctured than in the former, and are not usually marked with the blackish spots or bands. Size same as the preceding.

Anomala binotata, Gyll. The Two-spotted Vine-chafer.

General characters as to form, claws, antennæ, etc., as in the two last species. The head is black and thickly punctured, front margin rounded and slightly turned up. Thorax greenish black, slightly punctured, and smoother than the head; scutellum dark brown. Wing-cases dull yellow, with indistinct furrows and lines of punctures, and an irregular, rather large, blackish spot on each side, a little in advance of the middle; each case (elytron) is margined all around with a narrow black border. Size same as the preceding.

We are unacquainted with the preparatory states of these species, but the larvæ are doubtless six-footed grubs, somewhat similar to the white grub, or grub of the "May-beetle," but as a matter of course much smaller.

It is in the perfect or beetle state alone, so far as we are aware, that they prove injurious to the horticulturist; they attack the cultivated grape-vines, denuding them of their leaves, upon which they feed. Dr. LeBaron, in his First Report, pg. 54, gives an account of the injury done by *A. lucicola* to the vineyards of Judge Brown and Mr. Ayres, of Villa Ridge, in the extreme southern part of the State. From this account it appears that their attack in this case was directed more particularly against Norton's Virginia, while the Concords and Ives remained comparatively exempt. Mr. Ayres states that when just discovered, about sundown, "they were flying close to the ground in a zigzag style, and in such numbers as to sound like a swarm of bees." Dr. LeBaron, to whom some of the injured leaves were sent, states that "they resemble a piece of coarse, irregular net-work, all the larger veins, and a part of the smaller ones, being left." From the facts in this case it appears that this species is really a night-feeder, notwithstanding the general opinion to the contrary.

Their time of appearance at Villa Ridge was in the latter part of June; and in that instance they continued their operations but one or two nights, and then descended a few inches into the soil, where, according to Mr. Ayres, they paired, and the females doubtless deposited their eggs.

Remedies.—As they appear very suddenly, operate rapidly and disappear as suddenly, it is very difficult to devise any special method of counteracting them. As they readily drop from the vines when disturbed, shaking them into a sheet and destroying them, so far as this can be done after night, may possibly afford a partial means of checking them. Where they remain during the day, when in such numbers, is not known; ordinarily I have found them in fields, on weeds, blackberry bushes, and other low shrubs. Dusting the leaves with lime, or syringing with some obnoxious fluid, has been recommended, but to be effectual, if at all, they must be detected when they first appear, and the application made at once, or in advance if there is reason to anticipate them. Proper, careful culture, and especially cultivation of the soil will probably assist greatly in preventing their increase; but, fortunately, they seldom appear in destructive numbers.

Pelidnota punctata, Linn. The Spotted Vine-chafer.

This is a large oval-shaped beetle, about one inch long and half an inch, or a little more, in width; of a shining, brownish yellow or clay color above, with a small black spot on each side of the thorax, and three similar spots on each wing-case; of a deep bronzed or blackish green color beneath. The broad, straight, flat face has no cross-line or mark dividing the lower portion from the upper, as is usual. The claws are not notched in any of the feet, but one is always larger and more robust than the other; the antennæ have a leaf-like club at the tip, as the preceding species.

Prof. Riley, who first described the larva, says it is a large, clumsy grub, bearing a close resemblance to the common white grub of our meadows, from which it differs chiefly in being wrinkled, in having the skin more polished and of a pure white, and in the distinct heart-shaped

swelling on the last segment. It appears to feed chiefly on the decaying roots of different trees, and, so far as known, is not injurious to vegetation.

The beetle, which is found throughout the State, but more abundantly in the central than the southern part, flies and feeds by day, and is most generally found in July and August. It attacks the foliage of grape-vines, upon which it chiefly subsists, the Virginia creeper being the only other plant it touches, so far as known.

Although so generally distributed, it usually occurs in such limited numbers that the injury it inflicts is small. Being day-feeders, of large size, and rather slow in their movements, they can easily be gathered by hand when they appear in sufficient numbers to threaten injury to the vines; and as this is a specific it is useless to seek for or try any other.

Spec. Char. Imago.—Claws simple, not cleft, but one on each tarsus larger and stouter than the other; the antennæ as in the preceding species; elypens not distinct from the face, there being no transverse indented line or mark between the two. The front of the head, the broad, flat face, is usually yellowish or bronzed, while the posterior part is greenish with a coppery lustre, the middle portion sometimes brownish yellow. The thorax brownish yellow or clay colored, and marked with a black dot on each side. The elytra colored as the thorax, and each case is marked with three black dots, which are ranged nearly in a longitudinal line on the outer half; the scutellum is green.

Is large and oval-shaped, about one inch long and half an inch or more in width, smooth and shining; the under side deep bronze or blackish green.

Family CETONIID.E.

Very closely related to the last family are certain metallic-colored beetles which, from certain structural differences of minor importance, have been brought together under the above family name. The claws of the feet are simple and of equal size, not split; the anterior coxæ, or pieces by which the front legs are attached to the body, are conical and prominent; antennæ with a club composed of leaf-like joints, as the previous species.

Euryomia inda, Linn. The Indian Cetonian.

This species, which varies in length from a little over a half to nearly two-thirds of an inch, is of a dark, coppery brown color, sometimes of a dark olive green with a coppery lustre, with yellowish hairs, and sprinkled with black dots. It makes its appearance in the latter part of spring or early in the summer, from the latter part of April to the first part of June, when it may be seen often in considerable numbers about groves of trees, on hedges, and on the shrubbery and weeds in fields. The second brood makes its appearance in the southern part of the State as early as the middle or latter part of August, but somewhat later farther north. At this time it is frequently quite abundant on the flowers of various weeds, especially the golden rod.

It is chiefly injurious in the beetle state, eating into fruit, especially peaches, of which it is particularly fond, and to which it sometimes does considerable injury.

Spec. Char. Imago.—The scutellum distinct, its length exceeding its width; on the outside of each wing-case, at the base, between it and the thorax, is another small, distinct, triangular piece, which may be call the humeral or shoulder-piece. Each wing-case is suddenly expanded at the shoulder, and has two longitudinal ridges along the middle portion, which come together near the tip. The tip of the abdomen is exposed. The head and thorax dark coppery brown, thickly covered with yellowish hairs; elytra yellowish brown, reflecting metallic tints and shades, and sprinkled over with small irregular black spots. Under side black and hairy, with the edges of the segments and the legs usually of a dull reddish color.

Length varies from a little over a half to nearly two-thirds of an inch.

Euryomia melancholica, G. and P. Melancholy Cetonian.

This is a smaller species than the preceding; and may be known by the dark olive and almost black color of the thorax and wing-cases, and by the transverse, waving white lines on the latter. The specimens taken in Southern Illinois this season (1875) vary somewhat from the typical characters, and appear to approach very near to Say's *vestita*, a species which Dr. LeConte says he is unacquainted with; some of them have the white lines more or less obliterated.

It has been observed eating into and injuring apples in this State, and appears to take the place of the preceding species in some sections, and may there occasionally prove equally injurious.

As neither of these species has been traced through its transformations, the only remedy known, in case they should become injurious, is to gather and destroy the beetles. But it is not probable our horticulturists will often be troubled with them to any serious extent.

Spec. Char. Imago.—Similar in form and general characters to the preceding species. The face is somewhat elongated and without any cross ridge or line; is strongly deflexed or nearly perpendicular; front margin turned up. Thorax, breast and upper part of the head covered with hair. The scutellum triangular, longer than wide, the posterior angle elongate and acute. The shoulder pieces between the elytra and thorax small and triangular, the side next the elytra being slightly curved. The elytra with two medium ridges, as in the preceding species; the sutural or inner margin in both species is somewhat, raised so as to form a middle ridge when the cases are closed; tip of the abdomen exposed. Color, a dark olive green, the elytra having a brownish or coppery tinge and sometimes dark reddish brown, the ridges being rather darker than the other portions of the elytra. About seven abbreviated and more less interrupted whitish bands cross the elytra; these are narrow and appear to be made up of transversely elongated dots.

Length about three-eights of an inch; width a little over half the length.

Family BUPRESTIDÆ. (Saw-horned Wood-borers.)

These insects may be easily recognized by their peculiar form, which is somewhat like an elongated narrow shield; the antennæ, which are slender and not clubbed at the end, but of equal size throughout, and furnished on one side with minute saw-like teeth; by the spine-like prolongation of the hind margin of the front breast; and by their metallic colors. The head is usually immersed in the thorax to the eyes.

The larvæ are of two forms, which are quite different from each other. One is a footless grub, more or less flattened, and having the segment immediately behind the head much enlarged in width, while the

remaining segments are much narrower. The other form does not have the first segment unusually enlarged, the whole body being somewhat slender and tapering posteriorly, and each of the first three segments with a pair small legs set wide apart. These larvæ are true wood-borers, yet, as a rule, they appear to attack in preference those trees which are suffering from some disease or impaired vitality, but yet not in absolute decay. Still they do not appear to be confined to these, but are often found boring into those which are apparently perfectly sound ; some species also bore into the canes of raspberry bushes, etc.

Chrysobothris femorata. Fabr. The Flat-headed Apple-treee Borer.

This species is of a dark, dull greenish or dark grayish color, with a strong coppery lustre ; the whole upper surface having the appearance of being sprinkled with ash-colored powder ; the underside and legs of a brilliant coppery color ; the feet green. The head is immersed in the thorax to the eyes. The size varies considerably, but the length is usually about half an inch.

The larva is usually about seven-tenths of an inch long when full grown ; soft, flesh-like, and of a pale-yellow color. The head is small and deeply immersed in the following segment ; the jaws are black. The second segment is very broad and large, being nearly twice the width of any of the posterior segments ; it is rather broader than long, having on the upper side a large oval, callous-like elevation, covered with numerous brown raised points.

The eggs are pale yellow, and irregularly ribbed or corrugated, ovoidal, with one end somewhat flattened, and about one-fiftieth of an inch long ; they are usually glued by the female under the loose scales or in the cracks and crevices of the bark, either scattered singly, or, as is often the case, several of them together. The young larvæ hatched from these gnaw their way through the bark, and gradually, as they grow, extend their broad and flattened channels next the bark, girdling the smaller trees ; at length, when the larva has grown stronger and its jaws firmer, it bores into the more solid wood, working upward until about to undergo its transformations, when it cuts a passage to the outside, leaving a thin covering at the surface, through which the beetle afterwards forces its way. The beetle usually makes its appearance in May or June.

It is subject to the attacks of several parasites, some of which, though not specifically determined, belong to *Chalcididæ*, an extensive family of small four-winged wasp-like flies, which probably deposit their eggs in the larvæ, and from which small white grubs, about the tenth of an inch long, are produced, which finally destroy the borer infested by them. Prof. Riley mentions two other parasites belonging to the *Ichneumon* family, also wasp-like insects ; one, which he names *Bracon charus*, is about one-third of an inch long, exclusive of the ovipositor which is a little longer than the body ; the abdomen, the rest black, the wings being a deep smoky color, with a faint zigzag clear line across the middle from the stigma. The other species is the *Cryptus grallator* of Say, in which the

general color is brownish yellow, the wings being marked with two dusky or smoky patches on each. Length of the body about half an inch, of the ovipositor scarcely a third of an inch. When ants can penetrate into the burrows of the borers and reach them, they usually succeed in destroying them.

Although the flat-headed borer appears to select the apple, yet its operations are by no means confined to it, as in its native state it appears to select the oak, especially the white oak; it also attacks box elder, mountain ash, peach, pear, plum, beach, cherry, soft maple and hickory.

Remedies.—As it has been shown quite satisfactorily that, as a rule, this borer attacks first those trees which have their health in some way impaired, it follows as a natural consequence that keeping the trees in a healthy condition is one of the best methods of preventing its attacks. Trees which are wounded, unduly pruned, and those which are transplanted when above the proper age, are more liable to the attacks of this borer than those which do not suffer a loss of vitality in this way.

An excellent preventive is coating the trunks and large limbs with soap, in the latter part of spring, and again in the middle of the summer; as it is not only obnoxious to the female beetle, but as it gradually runs down to the roots in the form of soap suds, it nourishes the tree, and perhaps does as much good in this way as any other. Whitewashing; painting with a mixture of soap, lime and Paris-green; applications of kerosene and axle grease; applications of coal tar; injecting various pungent liquids into the burrows; plugging in camphor; running in wires; cutting out with a knife, etc., form some of the various remedies which have been used against this troublesome insect.

Let the trees be properly cultivated and carefully pruned when necessary; let lime or ashes be mixed with the mulch next the trunk; in other words, follow that course which will give healthy, vigorous trees, with natural, smooth bark. If a tree commences to decay or decline, and is attacked by the borer, it should be cut down and burned as fuel.

Spec. Char. Imago.—A dark, dull, greenish color, with a strong coppery lustre, deepest on the forehead and tips of the elytra. The head immersed in the thorax to the eyes; the obtuse front is clothed with fine whitish hairs, and is furnished with a pit or depression for the insertion of the antennæ; on the top of the head is a short, smooth, raised black line. The thorax is wider than it is long, its length being about equal to the width of the head; it is convex, and has a slight longitudinal indentation in the middle; is punctured, and somewhat uneven. The elytra are broader than the thorax; the sides are parallel a little more than half their length; from thence they taper backward to the tip; on each wing-case are two irregular, oblong, impressed, transverse spots, which are generally of a deeper green or copper color than the surrounding surface; these sometimes appear double. The whole upper surface of the insect appears as if it had been sprinkled with an ash colored powder. The under side and legs are a bright copper or bronze color.

Length about half an inch, but there is considerable variation in size, which has given rise to a number of specific names for what are now supposed to be only varieties of this species, of which Mr. Crotch, in his "Check List" enumerates the following: *C. alabamæ*, Gory; *C. 4-impressa*, Gory; *C. Lesueuri*, Gory; *C. soror*, Le C.; *C. mesilla*, Le C.; *C. fastidiosa*, Gory; *C. obscura*, Le C.; and *C. semisculpta*, Le C.

Dicerca divaricata, Say. The Cherry-tree Borer.

This species is of a bright coppery or bronze color throughout, varied only by a few small, oblong, raised, black points on the wing-cases; the head and thorax are somewhat roughened or granulated; the wing-cases are elongated, tapering much behind, this portion being elongated, suddenly cut off at the tips, where the two cases are separated or parted from each other. The length varies from seven to nine tenths of an inch; the width is rather less than half the length.

The larvæ, so far as I am aware, have not been described, nor have I had any opportunity of examining them; but we may reasonably presume they are similar in form to those of *Chrysobothris femorata*. Their attacks appear to be directed chiefly against the wild and cultivated cherry trees; they are also found occasionally boring into the peach tree, and Dr. Le Conte adds the beech.

The perfect insects are to be found, from June to August, basking in the sunshine on the limbs of these trees. It is found in Illinois but rather sparingly, as I have not taken a single specimen in the southern part of the State.

Spec. Char. Imago.—Of a shining bronze or copper color throughout, rather deeper beneath than above; head and thorax coarsely punctured, so as to give them a granulated appearance; the thorax is slightly furrowed in the middle, and has the posterior lateral angles acute. Elytra striate; marked with some oblong, raised, black dots, arranged somewhat in lines parallel with the striæ; elongate, acuminate posteriorly, the extreme points truncate and separating from each other. The breast is furrowed; the males are furnished with a little tooth on the under side of the middle tibiæ.

Length varies from seven-tenths to nine-tenths of an inch; the width about three-tenths of the length.

Dicerca lurida, Fabr.

This species so closely resembles *D. divaricata* that it is difficult to distinguish one from the other. This is rather darker than the former and of a less brilliant metallic lustre; the black points on the elytra more numerous; the tapering portion of the wing-cases not so elongated, and the tips, which are blunter, are each furnished with two little spines, which point backward. The length is rather more than half an inch.

The larvæ of this species appear to confine their operations to the hickory, in which they burrow; but, as a general rule, I think such trees only are infested by them as are already in a state of decay.

Spec. Char. Imago.—Very similar to the preceding species, but is rather darker above, being a dull, dark, brassy color; the black dots on the elytra are more numerous; the thorax is not so coarsely punctured and is smoother, yet apparently very finely granulated. The elytra are not so distinctly striated; acuminate posteriorly, but not quite so elongated as in *divaricata*; the tips rather blunter, and each furnished with two sharp little spines, which point backward, separating slightly at the tips.

Length varies from a little less than five-eighths to three-fourths of an inch; width one-third the length.

I am not aware that either of these species of Dicerca have proved injurious to any considerable extent in this State; if they should become troublesome, I presume the remedies used against the flat-headed borer (*Chrysobothris femorata*) would be equally effectual against them.

Agrilus lateralis, Say.

The genus or group to which this belongs is easily distinguished from other Buprestians by the elongate, slender and cylindrical body, and small size, the largest species being less than half an inch long.

This species, which I have found in considerable numbers in the southern part of the State, is a pretty little insect, very narrow, sub-cylindrical, and about one-fifth of an inch in length. The front of the head is a dark, dull, coppery color, and the thorax of a dull, brassy color throughout. Wing-cases narrow, nearly parallel, and black.

I have found it in considerable numbers on white and post oak bushes, also on various wild flowers; but I have not been able to identify the larva. Dr. Harris says that the larvæ of the species, belonging to this genus, are similar in form to those of the slender, cylindrical *Saperdas*, and that they have the same habits, living in the center of stems and devouring the pitch. It is very probable, therefore, that this, when its transformations are carefully traced, will be found similar to the following species.

Spec. Char. Imago.—Hind coxal plates but little widened at their inner extremities. Thorax angulated behind. Scutellum distinct. Body not hairy. Prosternum without grooves for the reception of the antennæ. General color black; head and thorax dull, brassy—the former canaliculate, the latter with a posterior dorsal and anterior lateral indentation.

Body elongate, black, scabrous. Head dull, brassy, superficially punctured; a profoundly impressed line, abbreviated before. Antennæ blackish. Thorax dull, brassy, somewhat scabrous; a round, indented spot behind the middle, and an oblique, profound, oblong one each side, at the anterior termination of which the thoracic edge is dilated; basal edge sinuous. Scutel black, sub-triangular. Elytra scabrous, entire, slightly indented at the base. Tail rounded.

Length, one-fifth of an inch.

Distinguishable by the dilation of the lateral thoracic edge.

Agrilus ruficollis, Fabr. The Raspberry-cane Borer.

This is a small, slender, sub-cylindrical species, about one-fourth of an inch long, and scarcely more than one-fourth as wide. It has received its name, *ruficollis* or red-neck, in allusion to the brilliant coppery color of its head and thorax; yet there are some varieties which have the thorax of an obscure green, while in others it is of the same dark color as the wing-cases.

The following are the distinguishing characters: Head and thorax of a brilliant coppery color. The head is quite broad as compared with the thorax, which it equals, but the length is scarcely more than a third the width, deeply immersed in the thorax. Form of thorax and body similar to the preceding; the head similarly indented. The elytra are somewhat rough, and at the tips are serrate; black or tinged with a dull coppery color. There are some varieties which have the thorax of an obscure green, while in others it is of the same dark color as the elytra.

Length about one-fourth of an inch; width but little more than one-fourth the length.

The larva, which has been described by Mr. Walsh, is of a pale yellow color, about one-half an inch in length and very narrow, the diameter scarcely exceeding one-tenth the length; somewhat flattened, especially at the sides; the joint next the head is about one-fourth wider than any other, and has a somewhat horny yellow heart-shaped patch above; joints two and three are each about half as long as number one (the broad one), and about half the length of the following joints until we come to the eleventh, which is also short. The head, which is quite small, is brown, the jaws black. A somewhat reddish line runs along the back. The posterior extremity ends with two brown thorns, each with three blunt teeth on the inner edge.

The larvæ sometimes prove quite destructive to raspberry and blackberry plants, by producing a kind of gall or swelling at the point where they work their way into the pith. This swelled part, which is usually an inch or so long, is split up into numerous short, rough, brownish, longitudinal slits. These are placed over the burrow of the larva, which generally runs around the axis of the cane, in which or in the pith the borer may be found.

In Southern Illinois, in the latter part of April, but later in more northern latitudes, it penetrates to the pith, probably to find a more secure retreat from its insect foes, and also on account of the hardening of the wood of the canes. The beetle comes out in June and July, and the female probably deposits her eggs on the young canes a week or two later.

The only remedy which has been suggested, and in fact the only one needed if attended to properly and in time, is to cut out all the infested canes in the spring, and burn them carefully before the beetle has emerged from them. If this is done, it will prove as near a specific as any remedy which can be applied to insect pests.

Mr. Miller, of Anna, Illinois, says these borers infest the Philadelphia and Doolittle raspberries and the Wilson blackberry, but are seldom found in the High-bush or Royal-cane varieties. Prof. Haldeman found them in the Antwerp raspberries also.

Family PTINIDÆ.

The only species of this family to which I shall refer belong to the old genus *Bostrichus*, under which all the characters necessary to determine the group will be given.

Bostrichus (Amphicerus) *bicaudatus*, Say. The Twig Borer.

The group to which this belongs is distinguished by the oblong, cylindrical body, the thorax being about as broad as the wing-cases; both extremities blunt, the head being hid beneath the blunt and rounded thorax, which extends forward, so as to cover the former somewhat after the manner of a hood.

The antennæ are rather short, and terminated by three enlarged joints. The larvæ are white, fleshy grubs, furnished with six thoracic feet; are

wrinkled on the back, and curved in a semicircular form when feeding or at rest; they are generally a little the largest in front, tapering slightly and gradually posteriorly.

This species in the perfect or beetle state is of a reddish brown color; the thorax being quite dark, almost black in some specimens. The head is small, not extending in front of the hood-like thorax. The thorax has the anterior half, especially the frontal slope, covered with spine-like points. The wing-cases are slightly granulated, paler than the thorax; the tips are suddenly bent downward, and from each, in the males, extends backward a sharp spine; in the females, instead of the sharp spine is a smooth prominence.

The under side is a very dark brown color. The length is usually a little over a third of an inch.

These insects, in the perfect state, gnaw into the twigs of trees, always selecting the axil of a bud or little branch as the point of operations. They generally bore downwards and in the wood of the previous year's growth, but this is not always the case. Although their attacks in this stage appear to be directed chiefly against apple trees, yet they are sometimes found depredating on grape-vines, pear, peach, and other trees. It is thought they prefer certain varieties of apples, such as Benoni and Red June, and will not attack the crab, but this has not yet been satisfactorily determined.

The preparatory states of this species are yet unknown, although they are doubtless similar to those of the following species (*B. basilaris*). There is reason to believe it sometimes, at least, passes its larval state in the grape-vine. I am inclined to think the larva works in hickory: that it is a borer can not be doubted; and I have found a larva working in hickory limbs which most certainly belongs to this genus, and does not correspond in its operations to the following, which also bores in the same tree.

Spec. Char. Imago.—Antennæ dusky red, rather short and slender, terminating in three enlarged and somewhat serrate or rather head-like joints. Dark reddish brown, almost black on the thorax. Head small, not advanced beyond the hood of the thorax; the mouth furnished with a fringe of yellowish hairs. The thorax is suddenly bent down in front and somewhat so behind; the anterior half, especially the frontal declivity, is covered with spine-like points, which next the lateral front angles become recurved spines. The elytra shagreened, paler than the thorax; the shoulders have an external, smooth prominence on them; the tips are suddenly bent or curved downwards, at which point, in the males, extends backwards a sharp spine from each case; in the females a smooth tubercle. The under side is very dark brown.

Length varies from about one-fourth to a little over three-eighths of an inch; width about one-third of the length.

Bostrichus (Sinoxylon) *basilaris*, Say.

This species, which is closely related to the preceding, and from which it is chiefly distinguished by the large red spot on the front of the wing-cases, is one of the principal enemies of the shagbark hickory. But it does not confine its attacks to this species, as it has been found boring, in the grub state, in grape-vines and also the trunks and main branches of apple and peach trees.

The only method of getting rid of these insects which has been suggested, is to burn the infested wood. Fortunately it does not appear to have attracted any notice in Illinois by its depredations.

Spec. Char. Imago.—Antennæ head and thorax similar to the preceding species; tarsi apparently four-jointed. Thorax sharply tuberculate in front, concealing the head in the hood-like extension. Body black, eyes prominent, antennæ and palpi reddish, scutellum minute and round. Elytra with large dense punctures, which are more dilated toward the tip; a large reddish spot on the middle of the base; tip retuse, with three teeth at the outer corner; wings black; tibiæ and tarsi dusky red. Length about one-fifth of an inch.

Spec. Char. Larva, Riley.—Color yellowish. Body smooth, arched or curved, and wrinkled transversely. Thoracic joints much enlarged, the first being slightly horny at the anterior margin above. Six slender bristle-like legs, carried forward close to the body, the first pair being bent closely under the head, the second pair longer and straight, the third pair short. Head small, horny, rounded, rather darker than the body; antennæ conspicuous, three-jointed; epistoma dark brown, not as wide as the labrum; labrum dark brown, rounded, covered and fringed with stiff hairs; mandibles stout, jet black, triangular, edges entire; maxillary palpi with two indistinct joints. Length about three-tenths of an inch.

Spec. Char. Pupa, Riley.—Yellowish and elongate, worm-like, with all the parts of the future beetle distinct; the hood-like thorax very apparent, and the head at right-angles with the thorax; the last pair of legs, except the tarsi, hidden under the wing-sheaths. Length three-tenths of an inch.

Section III. Tetramera.

Apparently four joints in all the feet; the joints dilated and brush-like on the under side, with the next to the last joint usually two-lobed. This section contains a very large number of injurious species, in fact more than belong to all the other sections combined. To this section belong the snout-beetles or weevils, the long-horned wood-borers, the short-horned wood-borers, the Chrysomelians or plant-bettles, the flea-beetles, tortoise-beetles, etc.

Family Curculionidæ. (Snout-weevils or Curculios.)

This family is one of the most numerous in species of any belonging to the order, all of which are more or less injurious to vegetation. Their bodies are always of an oval form, never being very much elongated or depressed. The front part of the head is more or less elongated into a distinct snout, sometimes short and broad, but sometimes it is as long as the body and almost as slender as a hair. Their feet are clothed on the under side with a dense brush of stiff short hairs, and the next to the last joint is distinctly divided into two lobes. Usually the antennæ are bent or elbowed, the first joint being much longer than the others and forming an angle with them.

The larvæ are soft white grubs, destitute of feet, with minute heads, and usually lying in a curved position. They usually reside in the fruits, seeds or nuts of plants, or in galls formed on the stems or roots, yet there is no part of the plant which is wholly exempt from their attacks.

When the female is about to deposit her eggs, she first makes a puncture with her snout.

The family has been divided into two sections, which are distinguished from each other chiefly by the character of the snout and position of the antennæ.

Section I. *Brevirostres.* Short-snouts.

Snout short and broad, seldom much longer than the head; the furrows on the sides of the head for the reception of the antennæ extending to the end of the snout; antennæ inserted at or near the tip of the snout.

Section II. *Longirostres.* Long-snouts.

Snout usually much longer than the head, narrow and cylindrical; furrows rarely reaching to the tip; antennæ usually inserted at a greater or less distance from the end, generally near the middle and sometimes at the base.

BREVIROSTRES. (Short-snouts.)

Ithycerus noveboracensis, Forst. New York Weevil.

This species is the largest weevil found in our State, being rather more than half and sometimes five-eighths of an inch long, including the snout. The snout is short and slightly widened at the tip; the antennæ are straight, not elbowed as usual in this family; the thorax is much narrower than the wing-cases and cylindrical. The general color is a dark ash-gray with faint whitish lines; on the wing-cases there are numerous raised sharp black points.

In the perfect state it occasionally troubles the horticulturist, killing the twigs by gnawing off the tender bark in the early part of the season before the buds have put forth, and, as stated by Prof. Riley, later in the year it destroys the tender shoots which start out from the old wood by entirely devouring them. It eats the buds and frequently gnaws off the leaves after they have expanded. It appears to prefer the apple, but also attacks the peach, plum, pear and cherry in the same way.

Prof. Riley has ascertained that it breeds in the twigs and tender branches of the burr-oak, and probably in those of the pig-nut hickory. The larvæ, soon after hatching, are usually of a pale yellow color, head brownish.

As they drop readily when disturbed, they may be collected by jarring the trees and catching them in sheets. But it is not likely they will ever prove very troublesome.

Spec. Char. Imago.—Front of the head and snout strongly deflexed, but not vertical. Snout narrowest just in front of the eyes, widened at the tip; a distinct, somewhat sharp, carina or ridge along the middle, which divides near the tip, and is a smooth shining black. The thorax is cylindrical or barrel-shaped, wider than the head, but much narrower than the elytra, width about equal the length; thickly punctured and finely granulate. Elytra squarely truncate at the base, the shoulder almost right-angled; sides nearly or quite parallel two-thirds their length; striate, regularly and deeply punctured in the striæ or grooves, of which there are ten on each wing-case; on each case there are from twelve to sixteen black spiny points or sharp tubercles. The general color is an ash-gray, which is given it chiefly by an ashy down with which it is covered. On the thorax there is a faint median line of white, also on each side next the posterior

margin two oblique lines of the same color. On each wing-case there are three or four more or less distinct whitish lines, occupying interstriate spaces. These whitish lines are sometimes almost obsolete. The under side is dark, but thickly covered with short whitish hairs which give it an ashen color. Length as given above.

Epicærus imbricatus, Say. Imbricated Snout-beetle.

This species, whose general color is a dull silvery white, with brown or dark markings, is confined chiefly to the west side of the Mississippi river. As it is frequently found in Missouri and Iowa, I have introduced it here that our orchardists may know it if they should meet with it. Its history is not known, as it has never been traced through its transformations. In the perfect state it sometimes does more or less injury to apple and cherry trees, and to gooseberry bushes, according to Prof. Riley, by gnawing the twigs and fruits. I have not observed it at any point in this State, yet I presume it will be met with occasionally.

Spec. Char. Imago.—Body covered with dense, minute, somewhat imbricated scales, without intervals; above, dusky brassy or blackish, punctured; head with a profound puncture between the eyes; rostrum with a dusky line in the middle; thorax a dorsal, slightly impressed, punctured line, and several dilated, indented punctures covered with scales; a dilated, cinereous, dorsal line; elytra with very slightly impressed striæ, containing profoundly impressed punctures; sides and tip white, the latter exhibiting an undulated outline above; three subequidistant, equal, white spots each side of the suture, and another at the middle of the base; an oblique line from behind the humerus terminates at the middle.

Length three-tenths of an inch.

This species varies in depth of coloring, and the cinereous, subsutural spots are sometimes confluent with branches from the margin, so as to form three cinereous bands, but I believe that the spots at the base are always insulated.

Pandeletius hilaris, Herbst. Gray-sided Curculio.

According to Dr. Harris, this is a little, pale brown beetle, variegated with gray upon the sides. Its snout is short, broad and slightly furrowed in the middle; there are three blackish stripes on the thorax, between which are two of a light gray color; the wing-covers have a broad stripe of light gray on the outer side, edged within by a slender blackish line, and sending two short oblique branches almost across each wing-cover; and the fore legs are much larger than the others. The length of this beetle varies from one-eighth to one-fifth of an inch. The larva lives in the trunks of the white oak, on which the beetles may be found about the last of May and the beginning of June.

LONGIROSTRES. (Long-snout Beetles.)

The species belonging to this section are distinguished by the elongate snout, which is cylindrical, and decidedly narrower and longer than the head, and by having the antennæ inserted near its tip. The body is generally elongate and almost cylindrical, and covered with a fine dust or powder, usually of a bluish or orange color, which is easily rubbed off.

Magdalis armicollis, Say. Elm-tree Curculio.

This species, which is of a reddish or rusty color, is about one-fifth of an inch long, and is distinguished chiefly by having small spines at the front angles of the thorax. The larva inhabits the elm, but farther than this nothing, so far as I am aware, is known of its history, but it doubtless is similar to *M. olyra*, Herbst, which inhabits the oak, burrowing beneath the bark, where, according to Dr. Packard, it may be found in May in all its stages. The larva of the latter species, which is probably similar to the former, is a footless grub, as are all the larvæ of the curculios, with the first three segments somewhat larger than the others.

Spec. Char. Imago, Say.—Body rufous; anterior thoracic angles with small spines. Body reddish or rusty, punctured; head punctured; an obsolete impression between the eyes; a dilated, impressed, abbreviated line over the insertion of the antennæ, sometimes obsolete or wanting; thorax with much dilated confluent punctures; a polished longitudinal line near the middle; anterior angles with small, erect spines, of which the anterior one is the largest; posterior angles slightly excurved, anterior and lateral margins dull rufous; elytra light rufous, profoundly striated; striæ with approximate punctures; thighs with a robust spine beneath, near the tip.

Length from the eyes to tip of the elytra one-fifth of an inch.

Thorax, and beneath, excepting the feet, black.

Very closely allied to *Magdalis barbita*, Say, a species which is entirely black, whereas the elytra of the *armicollis* are always rufous.

Hylobius pales, Herbst. Pales-weevil.

This species is of a deep chestnut brown or black color, with whitish spots or partial bands on the wing-cases, and about one-third of an inch in length. The thighs are toothed on the under side, and the snout, which is about as long as the thorax, is bent down, perpendicular or nearly so.

The larvæ, which are similar to those of other weevils, live in pine trees, beneath the bark, burrowing into and devouring its inner surface and the tender, newly formed wood, often doing much damage in pine forests. Wilson, the ornithologist, who has described the destructive operations of this species in the forests of South Carolina, suggests the protection and preservation of the wood-peckers as a means of counteracting it, as they hunt for and destroy vast numbers.

Spec. Char. Imago.—Snout nearly straight, directed perpendicularly downwards; slender, cylindrical, and nearly equal in size throughout, very slightly enlarged at the tip. Antennæ with the basal joint as long as the rest of the antennæ; strongly elbowed, and the club at the end somewhat globular; inserted near the tip of the rostrum. Thorax cylindrical, smaller in front than behind, expanded and dilated in the middle, slightly narrower than the elytra; distinctly and closely punctured; a slight median line visible. Elytra slightly rounded at the shoulders; striate with large, regular punctures in the striæ, of which there are eleven on each wing-case. Tibiæ with a distinct spur or spine at the tip. General color a dark brown, almost black, with three obscure, interrupted, oblique, whitish lines on each wing-case, which run from the inner margin, behind the middle, outward and forward toward the outer margin; there is also an indistinct, whitish line in advance of these, which runs from the middle of the anterior line mentioned, forward and inward toward the inner margin; these lines are more or less interrupted, and appear to be made up of quadrate, whitish dots. Under side dark, with numerous minute, short, pale hairs.

Length about one-third or three-tenths of an inch; width about one-third the length.

Pissodes strobi, Peck. White-pine Weevil.

This is of a rusty brown color, the thorax being darker than the wing-cases, with a minute white dot usually present on each side; there is a grayish white spot on each wing-case behind the middle; length one-fourth to one-third of an inch. The snout is rather longer than the thorax, and curved obliquely downward. This species often proves very destructive to pine trees. The eggs, according to Prof. Peck, are deposited upon the leading shoots of the pine, probably immediately under the outer bark. The larvæ hatched therefrom bore into the wood, in which they reside during their preparatory stages; just before entering the pupa state, they gnaw a passage from the interior to the outer bark, through which the beetle may escape. These make their appearance during September and October. This is its method of attacking the white pine, to which it proves most injurious; it also attacks other pines in the same manner as the preceding species.

The most effectual remedy against the increase of these weevils, according to Prof. Peck, is to cut off the shoot in August (perhaps it would be better to do this somewhat earlier, about the last of June or the first of July) and burn it.

Prof. Riley says it is not met with in the West, but I find it in my list of Illinois species in the fourth volume, Transactions Illinois State Agricultural Reports, under the name *Pnemorensis*, Germ., which is a synonym. I have therefore inserted it. as it may possibly be found injuring cultivated pines.

Spec. Char. Imago.—Snout quite slender, cylindrical, equal in size throughout, directed downward nearly perpendicularly, slightly curved, and a little longer than head and thorax. Thorax cylindrical, much narrower in front than behind; dilated in the middle; with a depression each side near the front; posterior portion nearly as wide as the elytra; a minute median carina. Elytra squarely truncate in front; sides nearly parallel for two-thirds their length, abruptly depressed near the tip; striate, and punctured in the striæ, of which there are ten on each wing-case; the inter-spaces between the second and third, fourth and fifth, and sixth and seventh striæ or grooves (counting from the suture outwards) are rather broader than the others, and elevated, and the sutural margin is elevated, forming slight longitudinal ridges. Head and thorax dark brown; elytra brown, with two rounded yellowish brown spots on each wing-case—one near the base and the other near the middle—also a white spot on each, behind the middle, near the inner margin. Brown beneath, and covered with white down.

Length as given above; width about one-third the length.

Balaninus nasicus, Say. The Long-snouted Nut-weevil.

This species is readily distinguished from any of those already mentioned, by its long, slender snout; this is as slender as a bristle, and about as long as the entire body; in the one now before me it is only about twice the length of the thorax, and is distinctly and somewhat strongly curved downward toward the tip.

It is a dark brown color, but the thorax is sparsely and the wing-cases densely covered, especially toward the tips, with yellow hair, thereby giving it a rusty yellow appearance.

This is supposed to be the weevil that attacks the hazlenut, in which it spends its larval state.

Spec. Char. Imago.—Snout very long, nearly equal to the length of the body, and very slender and cylindrical, almost as fine as a bristle, strongly curved, somewhat deflexed. Thorax cone-shaped, much narrowed in front, and slightly dilated in the middle; considerably narrower behind than the elytra. Elytra broadest in front and tapering posteriorly; the shoulders very prominent; striæ numerous and very slender, punctured very minutely. Posterior tibiæ suddenly enlarged at the tip. Snout dark reddish brown, naked; thorax and elytra covered thickly with short depressed rusty yellowish hairs, palest near the posterior extremity. The length, exclusive of the snout, is about one-third of an inch; width across the base of the elytra about half the length.

Anthonomus quadrigibbus, Say. Apple-curculio.

This curculio is readily distinguished by the following characters: It is usually of a uniform rusty brown, but occasionally the thorax and front portion of the wing-cases are ash gray; four tubercles on the wing-cases, two on each, situated on the posterior half, on a line nearly parallel with the middle suture; the snout varies in length from half to the length of the body, according to the sex. Length, exclusive of the snout, from a little over one-twentieth to two-twentieths of an inch. From Prof. Riley, who has studied the preparatory states of this species, we learn the following facts: The female punctures the fruit with her snout, enlarging the incision at the bottom, and having deposited an egg thrusts it to the bottom, I presume as does the plum-curculio, with her snout. This egg is about four-twentieths of an inch long, the diameter being about one-third the length, and of a yellowish color. As soon as the larva is hatched it usually goes to the heart of the fruit and feeds around the core, producing a rust-red excrement. When fully grown it is about two-fifths of an inch in length, soft, and white, curved, and transversely wrinkled, longest in the middle; head almost perpendicular, yellowish brown with darker mandibles; it has no bristles, like the larva of the plum-curculio, except a few weak ones on the first joint beneath; a blueish line is sometimes visible along the back; is footless.

Unlike the plum-curculio, this species undergoes its transformations in the fruit it inhabits, which does not prematurely fall, as is usual with that infested by the plum-curculio, or the codling-moth worm.

The wild crab appears to be its favorite fruit, but it also attacks the cultivated apple occasionally, doing considerable injury; the pear also appears to be subject to its attacks.

It appears to be more common in the southern part of the State, than in the central or northern portions.

It winters in the perfect or beetle state, and makes its appearance and commences work about the latter part of May, and from that time probably until July.

So far no sufficient experiments appear to have been made in reference to remedies suggested, to enable us to decide in regard to their

value. If the infested fruit could be gathered and destroyed, this would probably afford the most effectual remedy, unless it can be ascertained that some varieties are not subject to their attacks.

Spec. Char. Imago.—Snout long, nearly equal in length to the body, slender and cylindrical, and apparently slightly striate above; antennæ, which are elbowed and clubbed at the end as usual, are inserted in front of the middle of the snout. Thorax narrowed in front, widest behind, slightly expanding in the middle, narrower behind than the elytra. General color a dull rust color varied with whitish. Three indistinct longitudinal whitish lines on the thorax, one median and one on each side. Elytra with double series of punctures, the interstitial lines alternately elevated, the two inner ones on each wing-case have on them two or three compressed elevations or tubercles, of which the posterior one on the inner line is generally the most prominent, but the specimen now before me has the one next the last the largest; the posterior depressed portion, paler than the rest. The anterior thighs two-toothed, the posterior tooth prominent. Length of body about one-eighth to one-sixth of an inch.

Anthonomus prunicida, Walsh. The Plum-gouger.

This may be distinguished from other weevils by its ochre yellow legs and thorax, its brown wing-cases, which have a dull grayish tint and are without tubercles. The snout is not much longer than the thorax; the length, exclusive of the snout, ——.

Mr. Walsh, who first described this species, has given in his first report a very full account of its habits, of which I give the following summary:

It appears to be a western species, very generally distributed throughout the Mississippi Valley, and although found in considerable numbers at certain points is much less injurious than the plum-curculio, for which it is often mistaken.

The perfect insects make their appearance about the same time as the plum-curculio, but continue to deposit eggs only while the stone, which they puncture, is soft and tender, hence the time for depositing is much more limited with this species than with the other. The mode in which this is performed by the plum-gouger differs very materially from that adopted by the curculio, and enables us at once to distinguish the puncture of one species from that of the other.

Instead of forming a crescent slit, the female eats through the skin, forming a cylindrical hole the size of her snout; this she enlarges at the bottom in the same manner as the previous species.

Having deposited an egg, she thrusts it with her snout into the orifice below the surface of the skin, but not to the bottom. As soon as the larva is hatched it penetrates to the stone, the shell of which is yet soft, through which it bores to the kernel, where it remains until it is full grown. It is now about one-eighth of an inch long, curved in the usual semicircular form, of a milk white color, without the glossy lustre, or rust red stomach of the curculio larva; the head yellowish white, mandibles tipped with brown.

Having completed its growth, it cuts a round hole through the stone, which by this time has become hard, and then returns to the inside, where it undergoes its transformations into the beetle state, after which it escapes through the opening made for its exit.

The principal differences between this species and the plum-curculio are as follows: The latter is streaked and spotted with black and white, and has two shinning black humps or tubercles on the wing-cases, while the gouger is clay or ochre yellow in front, and a dull lead or clay color behind, and without any tubercles.

The curculio cuts a crescent slit wherever it deposits an egg, while the gouger bores a round hole; the larva of the former resides in the fleshy part of the fruit, while the latter resides in the kernel; the curculio leaves the fruit and goes into the ground to undergo its transformations, while the latter remains in the fruit: the curculio is two-brooded annually, while the gouger is, probably, single-brooded: the fruit stung by the curculio usually falls prematurely, while that infested by the gouger remains on the tree, but ripens prematurely.

Remedies.—The striking similarity in many respects between this species and the apple-curculio, with which it is congeneric, will be noticed from the particulars here given, hence any remedy applicable to one is likely to be applicable to the other. Thus far nothing feasible has been suggested, unless it be jarring the trees to bring down the prematurely ripened fruit, which may then be gathered and destroyed. I am not aware that the experiment has been tried, hence it is uncertain whether this will prove of any practical value.

Conotrachelus nenuphar, Herbst. Plum-curculio.

This is undoubtedly the most destructive weevil with which the orchardists have to contend; in fact, its operations have become so extensive that the raising of plums has been almost abandoned in some sections of the country. It is of a dark brown color, variegated with spots of white, ochre yellow and black; the snout is rather longer than the thorax; the surface of the latter is uneven; the wing-cases have two shining black humps or tubercles on them, one on each case about the middle, close to the suture; behind these is a broad band of dull yellow and white; each thigh has two little teeth on the under side. It varies in length from a little over one-eighth to one-fifth of an inch. When disturbed, it has the habit of drawing up its legs and bending its snout under its breast, when it is easily mistaken for a knot or wart on a limb, or fragment of bark.

This species has been so long and so well known it would seem no part of its history could be left in doubt, yet there are points in regard to which there still appears to be some difference of opinion. I shall, therefore, first give its history as far as it appears to be universally agreed upon, and then mention the disputed points.

The beetles usually come forth from their winter quarters in May and June, some appearing in southern parts of the State as early as April, and from that time on during the season as late as June, according to the latitude and the season. The female, when about to deposit her eggs, makes a minute cut with the jaws at the tip of her snout, and thrusting her snout into this enlarges it sufficiently for the reception of an egg; then turning round she drops an egg into the opening, which she afterwards thrusts to the bottom of the cut with her snout; then cuts the crescent around one

side of the orifice. One egg only is deposited in an opening, which is elongate-oval in form, about three-hundredths of an inch long, the diameter about one-third the length; it is of a pearly white color. Each female is supposed to have a stock of from fifty to one hundred eggs, and to deposit from five to ten in a day. While those which appear earliest begin this work about the middle of May, it is continued by others which appear later, until the last of June or the first of July; thus extending the period of egg depositing to about two months.

The larva which is hatched from the egg is a little footless worm, somewhat maggot-like, except that it has a distinct head, and is less attenuate at the extremity; is of a glassy, yellowish white color, but partakes more or less of the color of the flesh of the fruit in which it resides; there is a lighter line running along each side of the body, with a row of minute black bristles below and a less distinct one above it; the stomach is rust red, or dark brown; the head is yellowish, or pale brown. Length, when fully grown, about two-fifths of an inch.

The fruit containing this grub does not usually mature, but falls to the ground before it is fully ripe, and before the grub is quite full grown. When it has completed this stage it leaves the fruit now on the ground, and burrows a few inches into the earth, where it passes the pupa state. This requires about three weeks, when it comes forth in the perfect or beetle state.

Whether it is single or double brooded is one of the questions long in dispute, and in regard to which there is yet considerable difference of opinion. Prof. Riley, who has tested the matter by inclosing a tree so that none could escape or enter, found those enclosed single-brooded, the exceptions amounting to but one per cent. As this accords with what might naturally be expected from its history so far as positively known, from the fact that its normal habit is to pass the larval state in the flesh of a fruit that scarcely continues long enough to allow for two broods, and from what is known of other closely allied species, we may take for granted as pretty well settled that it is single-brooded. This conclusion, connected with the fact that it usually passes through the pupa state in about three weeks, would appear, if well established, to settle the point that it passes the winter as a beetle, which is another point about which there has been much dispute. Dr. Hull, who had much experience with this insect, concluded it was single-brooded, but was inclined to believe it passed the winter in the preparatory state in the ground; but Prof. Riley's experiment appears to have indicated pretty clearly that this is not the rule, but that it hybernates as a beetle.

As is now well known, it attacks plums, nectarines, apricots, cherries, peaches, apples, pears, and quinces; but it does not so readily mature in the apple, as this fruit appears to be too juicy for it; it also deposits in the black knot on plum trees.

Usually the fruit in which it resides drops to the ground before maturity, but the cherry appears to be an exception to this rule.

Remedies.—When alarmed the perfect insect folds up its legs close to its body, bends its snout under its breast and drops to the ground; this

habit has suggested jarring the trees, and thus causing them to fall into a sheet or other contrivance for securing and destroying them, which is the most efficient remedy against them so far as known.

A number of ingenious devices for jarring trees and securing the beetles have been invented, which greatly facilitate the operation and lessen the labor. A description of these to be understood by the reader would require more room than can be given to them at this time.*

Another means of destroying them consists in destroying the fruit which drops prematurely, but to make this effectual it must be gathered soon after it falls before the grub leaves it to enter the ground, otherwise no advantage is derived therefrom. Hogs and poultry, if allowed to run in the orchard, will greatly assist in this matter.

Spec. Char. Imago.—Snout about as long as the head and thorax, slightly and regularly carved, and turned under the breast when at rest; cylindrical and very nearly of the same size throughout; head round and deeply immersed in the thorax, which projects slightly forward on the upper side. Thorax cylindrical or barrel-shape, slightly narrowed in front and somewhat enlarged in the middle; a very slight median carina, each side of which there are two minute tubercles, one in front of the other (a glass is necessary in order to see these); width about equal the length, considerably narrower than the elytra, being to the latter as two is to three. The elytra, when closed, present a shield-shaped figure, broadest at the shoulders, which are prominent and somewhat tuberculate; there is a slight sutural ridge or carina; on the inner half of each wing-case there are about five long sharp tubercles, arranged in two longitudinal rows; the inner row next the suture has three in it, the middle one being the largest; the outer row has two in it; outside of this there is also an interrupted carina or ridge, in fact these tubercles are but parts of longitudinal ridges which are interrupted by transverse depressions; between these ridges or elevated lines are double rows of punctures. Thighs with two small spines beneath, next the tip. Color dark ashy brown, varied with pitchy black. Head and rostrum dark reddish brown; thorax very dark reddish brown with some fulvous hairs on each side in front. Elytra similar in color with a transverse irregular band of pitchy black at the middle, which includes in it the two largest tubercles before mentioned; immediately behind each of these two tubercles is a fulvous spot formed by the massing of minute yellowish hairs. Tibiæ reddish.

Conotrachelus cratægi, Walsh. Quince-curculio.

This beetle, which is about one-fifth of an inch long, has a rather longer snout than the preceding, is very broad-shouldered, the front margins of the wing-cases being square and considerably broader than the thorax. Its general color is a somewhat uniform ash-gray, mottled more or less with dull yellow, dusky and whitish. It is without the humps on the back, but has about seven small longitudinal ridges.

This species does not make a crescent mark like the plum-curculio, but makes a direct puncture like the apple-curculio for the reception of its eggs, the hole being somewhat larger than that made by the latter, and it is similarly enlarged at the bottom. The egg, which is similar to that of the plum-curculio, hatches in a few days after it is deposited. The

*The late Dr. E. S. Hull, of Alton, has made trapping the curculio a specialty, and has invented several machines for the purpose, the latest and best of which seems to be all that can be desired. It is made by some mechanic in Ottawa, Ill., whose name we do not know. It is called "Dr. Hull's Curculio Catcher."—EDITOR.

larva produced therefrom works chiefly near the surface of the fruit, and does not penetrate to the heart in the quince. When fully grown its average length is about one-third of an inch, its diameter being rather less than one-fourth its length; it is straight; dull white, with a narrow dusky line along the back, which is usually indistinct on the front part; head reddish brown; jaws black at the tips, with two teeth at the apex.

Having completed its larval growth, it leaves the fruit and burrows a few inches into the ground, but instead of changing into a pupa it remains in this state during the winter, and does not assume the pupa form until about the first of May, according to Prof. Riley, a few days before issuing as a beetle.

This species attacks and breeds in the haw, which is probably its favorite native fruit, also the quince and pear.

Remedies.—As this species has the habit of dropping when disturbed, the same remedies applicable to the plum-curculio will be equally effectual against it.

Analcis fragariæ, Riley. Strawberry Crown-borer.

This little curculio, which is about one-sixth of an inch in length, is of a chestnut brown color; the thorax is somewhat darker, and is covered with large punctures; the wing-cases are marked with numerous lines of punctures, and are more or less covered with short, pale yellow hairs, which form, by their increased density, three indistinct bands, one at the base, one at the middle, and one near the tip; between these are darker partial bands, darkest near the outer margin of each wing-case.

This species is especially injurious to strawberry plants, in which the larva bores and undergoes its transformations. In the latter part of June and first half of July, in Southern Illinois, but somewhat later in the northern part, the female beetle deposits an egg, probably in the crown of the plant. The larva hatched therefrom bores its way downward into the pith. Here it remains until it has acquired its full growth, working into the root, and often eating its woody portions. The result is that the plant is so injured that it is unable to bear the rigors of winter, and dies.

The larva is a minute, footless grub, but the legs are represented by small tubercles; it is white, thick and curved; the head smooth and yellow, with some faint transverse lines above the mouth; the biting jaws reddish, tipped with black; a faint narrow line is visible along the back. Length about one-fifth of an inch.

Prof. Riley, from whose report the above account of this insect is taken, is inclined to think, from all the facts known in reference to its history, that it is single-brooded, and that it passes the winter in the perfect state; but this has not yet been positively ascertained.

Remedies.—Dr. Hull says the crown-borer goes into the top of the plant, and thence into the crown; then he is beyond our reach and we have no means of arresting his progress. Mr. Miller, who has had expe-

rience with it, says that all plants infested by it die. It appears, therefore, to be the chief enemy of this plant, and beyond the reach of any direct remedy; hence the only feasible means of counteracting it which has been recommended, is to destroy the old bed and plant a new one. In order to make this effectual the plants must be taken up soon after they are done bearing—June or July—and completely destroyed, in order to kill the larvæ, which may be killed.

Spec. Char. Imago, Riley.—Color deep chestnut brown, somewhat polished; the elytra somewhat lighter. Head and snout dark and densely punctured, and covered with short, coarse, yellowish hairs. Antennæ ten-jointed, rather lighter toward the base; second joint longest; clubbed at the tip. Thorax dark, cylindrical, slightly swollen at the middle, uniformly punctured, with a few short, coarse, yellowish hairs. Elytra yellowish brown, broader than the thorax, rounded at the shoulders, and roundly tapering posteriorly; each wing-case with about nine deeply punctured striæ, though the grooves themselves are sometimes indistinct or obsolete; more or less covered with coarse, short hairs, which form by their greater density three bands, as before stated; on each case, between the second and third band, is a smooth, dark brown or black spot, and behind this sometimes another, smaller and less distinct. Length one-sixth of an inch; width about one-half the length.

Family SCOLYTIDÆ. (Short-horned Wood-borers.)

For the family characters the reader is referred to Dr. LeBaron's Fourth Report.

Scolytus 4-spinosus, Say. (*S. caryæ*, Riley). The Hickory-bark Borer.

This is short, oblong and nearly cylindrical in form. The antennæ very short and terminated with a club; the thorax is quadrate in form and very large, almost equal in size to the part of the body behind it. Length one-fifth of an inch, or little less. Color either entirely black, or black with brown wing-cases.

The female beetle, selecting the trunk or larger limb of a hickory tree, bores through the bark and forms a vertical chamber next to the wood, from half an inch to an inch in length, on each side of which she deposits her eggs, varying in number from twenty to fifty. The larvæ when hatched feed on the inner bark, each one forming a track of its own, thus forming the radiating burrows so common on the under side of the bark of hickory trees.

The larva is a soft, yellowish, footless grub, much like the larvæ of some of the curculios, and from which it can not easily be distinguished, except by its habits; it is very small, not exceeding the fifth of an inch in length when fully grown.

The eggs are deposited during the months of August and September, and the beetle issues about the latter part of June or first of July. It attacks the bitter-nut, shell-bark, and pig-nut hickories, and probably the pecan.

No practical remedy is known, nor is there much probability of any extensive experiments being made until forest timber becomes more valued than it is now.

Spec. Char. Imago.—Entirely black, or black with brown elytra. The head is depressed above, and marked with abbreviated longitudinal lines; deeply inserted into the thorax; surrounded with a coronet of long, incurved, yellowish hairs on the margin. Antennæ pale reddish. Thorax nearly or quite as wide as the elytra, sub-quadrate in form, somewhat rounded in front; the length, which exceeds the width, is almost equal to that of the elytra; punctured dimly on the disk, but more distinctly on the sides. Elytra with about ten striæ, irregular on the sides, but regular above, composed of small deep punctures; inter-spaces, with a few minute indistinct punctures. Venter obliquely truncated, black, opaque, and with four conic-acute spines, placed three on one segment and one on the following, though sometimes some are found on the segments in front of the one with three.

Length varies from about one-sixth to one-fifth of an inch; the width equals about one-half the length.

Family CERAMBYCIDÆ. (Long-horned Wood-boorers.)

As I have time to mention but one species of this family, which contains quite a number of injurious species, the reader is referred to Dr. Le Baron's Fourth Report for a description of the family characters.

Saperda candida or *bivittata*. The Round-headed Apple-tree Borer.

This species is easily recognized by the following characters: It is long, and narrow; the length varying from about three-fifths to three-fourths of an inch, the width across the shoulders being about one-fourth the length; the antennæ are nearly as long as the body, slender, and tapering; there are two very distinct white stripes running from the head to the tips of the wing-cases, between three rather broader cinnamon brown stripes. These stripes are so distinct and well marked that they are sufficient of themselves to distinguish the species.

It makes its appearance in the beetle state in May and June, but as it remains quiet and hid during the day, and flies only at night, it is seldom seen except by those who search for it. During the month of June, or first part of July, according to latitude, the female deposits her eggs, one in a place, upon the bark of the tree, low down on the trunk or near the ground.

In about a fortnight, from each of these eggs is hatched a minute footless grub, of a whitish color, with a yellowish head, which eats its way directly downwards in the bark. For the first year of their lives they live upon the inner bark and sap wood, forming flat, shallow cavities, which are filled with their sawdust-like castings. Although their operations vary somewhat, yet, as a general rule, on the approach of winter it descends toward the ground, and probably remains inactive until the following spring, when it commences to cut a cylindrical passage upward in the solid wood. The latter burrow or hole runs slightly inwards, towards the centre of the tree, and then outwards, terminating at the bark. Having done this, it stuffs the upper end of its burrow with the sawdust-like castings, and the lower part with small woody fibres, after which it rests from its labors and enters the pupa state. According to Dr. Fitch, it remains in the tree two years from the time it is hatched; but according to Prof. Riley, three years.

The larva, when fully grown, varies considerably in size, but is usually nearly an inch long, and about one-fourth of an inch in diameter at the broadest part. It is cylindrical in form, which distinguishes it from the flat-headed borer; the segment immediately behind the head is considerably larger and broader than the others, with a tawny yellow spot of a somewhat horny consistency on the upper side. The head is a shining chestnut brown, the jaws deep black. The body is soft and fleshy, and of a very pale yellow, or whitish color. The two segments immediately behind the larger one, are much shorter than the others; on the top of the last six or seven segments is a double wart-like elevation.

Although its attacks are directed chiefly against the apple tree, yet, according to Dr. Harris, it is also frequently found injuring the quince, mountain ash, hawthorn and other thorn bushes, the June-berry or shad-bush, and other kinds of *Amelanchier* and *Aronia*.

Remedies.—The chief remedies in this case are, in fact, preventives, and consist, first, in keeping rubbish cleaned away from the base of the trunk during the spring and early summer months, especially May and June; second, in applying soap to them during the month of May and first part of June. For this purpose soft soap should be used, and should be rubbed on the lower part of the trunk and in the axils of the lower limbs, as the female sometimes lays her eggs at these points. It would be advantageous to place a mixture of soil and ashes around the base or collar of the trunk.

Mr. Wier, who has had much experience with this insect, says that, if watched carefully and taken in time, the larvæ can easily be cut out with a knife. This should be done from the first to the middle of September, at which time they can easily be detected by the refuse cast from their burrows.

Spec. Char. Imago.—Head vertical, about as broad as the front part of the thorax; eyes large; antennæ nearly as long as the body, tapering, first joint much thicker than any other. Thorax cylindrical; sides parallel; narrower than the elytra; somewhat longer than wide. Elytra long and narrow, slightly widened in front; shoulders rounded; not furrowed, but smooth. Face white; eyes black. The coloring of the thorax and elytra consists of five stripes, three of which—the two outer and middle one—are cinnamon brown and rather wider than the two intermediate ones, which are white; each of these stripes is very distinct, and all extend from the head to the tip of the elytra. Under side thickly covered with white down. Legs and antennæ dark ash color.

Length as given above.

A LIST OF THE PRINCIPAL SPECIES HEREIN DESCRIBED, WITH THE NAMES AND PARTS OF THE PLANTS THEY INJURE.

*b. *Ips 4-signatus* (*fasciatus*). Fruit of apple and pear.
*b. *Platycerus quercus*. Twigs and buds of pear.
*b. *Phyllophaga fusca*. General leaf-eater.
*b. *Phyllophaga pilosicollis*. General leaf-eater.

* NOTE.—*b.* denotes that the species operates in the beetle state; *l.* in the larva state.

b. Phyllophaga fraterna. General leaf-eater.
b. Serica sericea. Leaves of sweet briar.
b. Macrodactylus subspinosus. Leaves of rose, grape, cherry, plum, apple, and forest trees; flowers of the rose, grape, etc.; fruit of the apple.
b. Anomala varians. Leaves of the apple.
b. Anomala lucicola. Leaves of the grape.
b. Pelidnota punctata. Leaves of the grape.
b. Euryomia inda. Fruit of the apple and peach.
b. Euryomia melancholica. Fruit of the apple and peach.
l. Chrysobothris femorata. Bores into the trunk of the apple, peach, pear, plum, cherry, soft maple, white oak, box elder, mountain ash, beech and hickory.
l. Dicerca divaricata. Bores into the wild and cultivated cherry trees, peach tree, and beech.
l. Dicerca lurida. Bores into the hickory.
l. Agrilus ruficollis. Raspberry and blackberry cane borer.
b. Bostrichus (Amphicerus) bicaudatus. Bores into the twigs of the apple, grape, pear and peach.
l. Bostrichus (Sinoxylon) basilaris. Bores into hickory, apple and peach trees, and grape-vines.
b. Ithycerus noveboracensis. Twigs of the apple, peach, plum, pear and cherry.
b. Epicaerus imbricatus. Twigs of the apple, cherry and gooseberry.
l. Pandeletius hilaris. Bores into the white oak.
l. Magdalis armicollis. Elm-tree bark-miner and borer.
l. Hylobius pales. Pine-tree bark-miner.
l. Pissodes strobi. White pine shoot-borer.
l. Balaninus nasicus. Hazel-nut weevil.
l. Anthonomus quadrigibbus. Apple curculio; pear, in the fruit.
l. Anthonomus prunicida. Plum-gouger—the fruit.
l. Conotrachelus nenuphar. Plum-curculio; fruit of the plum, nectarine, apricot, cherry, peach, apple, pear and quince.
l. Conotrachelus crataegi. Quince-curculio, fruit.
l. Scolytus 4-spinosus. Bores into various hickories.
l. Analcis fragariae. Bores into strawberry plants.
l. Saperda bivittata. Bores into the apple tree.

AMERICAN FRUITS.

An extract from the address of President WILDER, before the American Pomological Society in Chicago, September 8th, 1875:

And now, for a moment, permit me to call your attention to the consideration of the question, "How shall we obtain varieties of fruits which may be adapted to the various latitudes of our immense territory?"

The great loss sustained in the importation and trials of trees from foreign shores and even from different quarters of our own country, which are not adapted to our location, suggests the answer that new varieties must be produced from seed, and to the manor born, to remedy this evil.

The adaptation of plants to various climates, and their distribution over the earth, involves a study so profound that few have any definite knowledge on the subject. Why some are suited, by their constitution, to a wide extent of territory, and are able to adapt themselves to almost any altitude or latitude or temperature without material change, while others are confined to a narrow limit, and will not prosper elsewhere; or why a fruit may succeed in one location, and a few miles distant fail entirely; why some are aquatic and thrive in arid soils, while others are parasitic, are mysteries which mankind has not yet been able to solve. The human constitution will frequently endure the change of country and climate; but the extent to which plants can bear these changes is fixed by an immutable law; therefore, all attempts to acclimate such as are not naturally congenial will fail in the end, except it be within very narrow limits—not, however, that a tree or plant may not sometimes endure greater degrees of cold or heat than it is subject to in its native climate; but no one should suppose that time will produce a physiological or constitutional change in it.

It is, however, sufficient for us to know that we can produce from seed fruits which, by their constitution and habits, are capable of enduring the cold and heat, the drought and moisture, and other vicissitudes of the region we inhabit; but the idea that we can accustom a tree or plant to conditions not consistent with its laws of being, is a chimera of the imagination. The only acclimation that we can rely on for obtaining trees and plants of stronger constitution is the production of new varieties from seed hybridized by the hand of man, or naturally cross-fertilized by insects of the air. Whatever opinions may have been entertained, to this we must come at last, that for the acquisition of hardy, valuable fruits, adapted to the various locations of our vast territory, we must depend mainly on the production from seed. Thus I have discoursed to you for many years—thus have I promised to do while I live.

Much has already been accomplished by the production of new varieties of American fruits from seed, but how little compared with the results

obtained in other lands by the art of hybridization in the vegetable kingdom. To this art we are mainly indebted for the numerous fine varieties of grains, vegetables and flowers, introduced in our own time, and the same success will reward similar efforts to produce new and valuable fruits suited to our own climes. Says Prof. Gray, in his admirable essay at our last session, "Most of our important fruits have not so much been given to man, as made by him, and man's work in this respect is mainly to direct the course or tendency of nature." The success which has attended the American florist in the production of new and fine varieties of the camellia, the rose, and other plants which rival the choicest varieties of the Old World, is indeed remarkable, and it will indeed be far greater when the same scientific knowledge is applied to the production of native fruits.

The laws which govern the procreation of species by cross impregnation are now so well understood by those who have scientific knowledge, as to leave no doubt of success. Thus the farmer, as well as the florist, is producing results which, as to form, habit, color, proportion and beauty, surprise the operator himself when he sees how kindly nature co-operates with his efforts to bring forth the object of his desires. There may be disappointments—these are the lot of humanity—but the philosophical principle is correct, and the results of practice are now universally acknowledged; and although the improvement sought for may not be realized in every instance, experience has taught us that it will come at last. But my object is to encourage our cultivators in the belief that, by the sowing of the seeds of our best varieties, and by cross impregnation, there is a wide field open for improvement, and that all other attempts at acclimation are fruitless. And have you ever thought, my friends, of the many fine fruits which you might have raised by the sowing of seeds which you have carelessly thrown away? Not that I would discourage the planting and proving of the new varieties from other regions, holding fast such as are suited; and where they do not succeed in one location, it is possible they may be adapted to another. This is especially true with regard to the varieties of strawberries. While one cultivator can not grow the variety bearing my name, another declares he will grow no other; and thus with the Hovey's Seedling, which, after forty-two years of existence, has this year carried off the highest prize offered by the Massachusetts Horticultural Society for the strawberry.

HORTICULTURAL BIOGRAPHY.

JOSEPH CURTIS—THE PIONEER NURSERY-MAN OF ILLINOIS.

The following biographical sketch has been kindly furnished, at the request of several of the older members of this Society, by B. O. CURTIS, of Paris, Ill., a son of the pioneer nursery-man:

Joseph Curtis was born in New Jersey, May 29, 1786, and removed with his parents, when a boy, to near Manchester, Adams county, Ohio, where he lived fifteen years. He then made an experimental nursery and orchard, devoting much of his time to fruit raising and experimenting in a horticultural way. He raised new varieties of apple from the seed, and tested both in nursery and orchard the best varieties that could then be obtained. He grafted and budded on young seedling trees (which was the usual way of propagating the fine varieties at that time) standing in the nursery rows; but not having as many stocks as he wished, he thought, why not graft on pieces of roots? and adopting this mode, found that the grafts did well. So far as he knew, this was an invention of his own, having never seen or heard of it. He continued to practice this for many years, and also to graft small trees at the collar.

Neither of these modes, *i. e.*, grafting on pieces of roots and on small trees on the collar, had ever been practiced in the nurseries of the United States until after his introduction of them. A man, whose name I have forgotten, learned root-grafting of him in this country at an early day, and took it to the Eastern States and sold it as a secret art, charging one hundred dollars each for individual rights.

Another mode of raising trees, that originated with him, is that which he styled propagating by genuine roots. To obtain these roots the grafts were planted a little deeper than usual, or the earth drawn up to yearlings, either of which would cause the cion to put out roots freely. These grew stronger than the seedling roots below, and were esteemed genuine, and preserved to multiply the varieties. Pear grafts thus managed did particularly well, and in three years made good sale-trees on their own roots. Early in April the surplus genuine roots of both apple and pear sale-trees were cut off and planted in borders six feet wide, by laying them flat on the surface and covering with two or three inches of soil. The following spring they were taken up, divided, and the sets planted in nursery rows four feet apart and one foot in the row. Two-year old trees were also layered in this manner to obtain the genuine roots. A large supply of these roots once obtained, he cut them in lengths of four or five inches and planted them upright in nursery rows, with the tips of the roots barely above the surface of the ground.

Having heard the glowing accounts of the beautiful and fertile prairies of Illinois, early in the year 1817 he determined to push farther west, to

make his permanent home. At this time steamboats did not run on the Wabash river, nor was there any public conveyance or roads of any sort leading west. The most common mode of transportation was the sluggish keel-boat. Accordingly he manned his own boat with hired boatmen, dropped down the Ohio river, propelling with rope and oars up the Wabash to Fort Harrison, near Terre Haute, Ind., where the Government maintained a garrison for the protection of the surrounding country.

A part of his first cargo was two hundred bushels of dried apples, which he had dried the previous season, from the orchard of his raising and in a kiln of his own construction. This fruit found ready sale in the village and settlement at three dollars per bushel. Here he abode the remainder of the season and through the winter, selecting a fine tract of prairie and timbered land eighteen miles northwest of Terre Haute, Ind., in what is now known as the North Arm of the Grand Prairie, in Edgar county, Ill., and four miles east of where Paris was laid off seven years later. A log cabin was erected, some fencing, breaking, and other improvements made, and some of his nursery stock brought over and heeled-in here late in autumn. There were but four families who preceded him in this North Arm settlement. He came over in March, 1818 and began farming and planting a nursery and orchard.

This was the first nursery commenced in the State of Illinois, and the first orchard of grafted trees planted in this county and perhaps in the State. This small collection of fruit, particularly the apple, some twenty-seven varieties of which he brought from Ohio, and which he had been some fifteen years gathering together and testing there, proved to be very valuable here. Some of these varieties are now superior to any of those he subsequently introduced, though hundreds were received and fruited. From 1835 to 1840 he received from the East, and from various States of the Union, a very large collection of apple, pear, cherry, peach, plum and other fruits, many of which, when put on trial here, were found to be of far less value than in the locations from whence he obtained them.

Under all the discouragements and inconveniences of a frontier settlement, he continued to plant nurseries and orchards, and to experiment with an untiring zeal and love for horticulture. He did more to furnish trees to the State and the Northwest than any other half dozen nurserymen of his day. Years ago, when a great part of this State was unsettled and its now large and valuable nurseries were unthought of, he was sending out trees and plants by the hundred thousand annually, far and near over the country.

For many years he peddled the trees. There were no railroads; steamboats reached but a limited portion of the country, and although men frequently came fifty and even one hundred miles to the nursery to make purchases, he found it a necessity to haul trees to the distant settlers to dispose of his accumulated stock. But it was the greatest blessing to the purchaser to have the choicest grafted fruit trees brought to his door at nursery prices, and without the least fear of being imposed on in quality of tree or fruit. Had it not been for this medium, many farms would have been treeless until the advent of the rail-car. How little our young

friends of to-day know of the toil and privation of the early settlers in planting and building up the country, making the wilderness blossom with the rose, and luxuriate in the golden fruits of civilization!

The demand for trees being greatly on the increase, in 1841 he grafted two hundred and seventy thousand root-grafts—the largest amount that he had put up in a single season. The grafting was usually commenced in January, and continued till the season of planting.

In the year 1843 his collection numbered three hundred varieties of apple, ninety of pear, twenty-eight of cherry, twenty-five of peach, thirty of plum, twelve of grape, and three of quince; and a good assortment of small fruits, ornamental trees and shrubbery.

My father was raised by quaker parents, but early in life he joined the Methodist Episcopal church. In 1812 he was ordained and sent out by the Ohio Conference as a traveling minister, in which capacity he labored one year and declined further work in the itinerancy. Through the remainder of his life he was a local preacher in that church, laboring on the farm and in the nursery through the week, and ministering to the people of his and surrounding neighborhoods on the Sabbath. He was a man of exceedingly industrious and persevering habits, and a hard laborer in the pulpit, in the class-room and in the Sabbath school, and in private as well as in public he labored zealously to promote the interest of the church and community. The toil and exposure through which he passed as a pioneer, and the zeal with which he pursued every enterprise in which he engaged, at last undermined his almost iron constitution, and made the last few years of his life years of peculiar affliction. In 1845 he gave up the management of his nursery to his four sons, but although health and strength had greatly failed him, through the remaining years of his life he took much pleasure in conversing with horticultural friends on this favorite theme to which his life had been devoted.

During the last few months before his death he seemed to feel confident that his pilgrimage must soon terminate, but constantly testified that all was well. Conscious and happy to the last, on the 19th of February, 1852, in the sixty-sixth year of his age, he bade farewell to earth, in full hope of his heavenly inheritance.

NORTHWESTERN FRUIT GROWERS' DISTRIBUTING ASSOCIATION.

The following is an extract from a circular issued by the Secretary of the Association:

The Northwestern Fruit Growers' Distributing Association was organized in Chicago, January 5th, at which time there were present about four hundred of the leading fruit growers from Illinois and Michigan. The cause of the organization of this Association, as set forth in the preamble to the constitution, is:

WHEREAS, The fruit-growing interest of the Northwest has assumed such magnitude as to require careful attention; and

WHEREAS, The plan which now exists for handling of fruit, from the grower, through its transportation and commission men, to the consumer, is attended with very small profit, if not an entire loss to the grower; and

WHEREAS, It is especially desirable to adopt some system whereby the grower may be better informed as to the supply and demand, and that said information may be spread before the people at as early a day as practicable, therefore we, the undersigned, unite, etc.

Article 2 of the constitution sets forth the object as follows:

Its object shall be to collect all possible information pertaining to the sale of fruit in the Northwest, and publish in some suitable form for distribution to the members, to enable them to more readily reach a market for the products of their farms and gardens and to make any other regulation regarding the sale of fruit deemed necessary and advisable by the Association.

After adopting the constitution, of which the above is a part, the following officers were elected:

President, Dr. M. M. Hooton, Centralia, Ill. Vice-Presidents, A. S. Dightman, South Haven, Mich.; T. P. C. Lane, Mattoon, Ill.; W. P. Robinson, Carbondale, Ill. Recording Secretary, O. S. Willey, Benton Harbor, Mich. Assistant Sectetary, T. A. E. Holcomb, South Pass, Ill. Corresponding Secretary, W. C. Flagg, Moro, Ill. Treasurer, O. E. Moore, Chicago, Ill. Executive Committee, W. Corner, Fennsville, Mich.; — Galbreth, Jeffersonville, Ill.; O. L. Barler, Alton, Ill.; A. R. Nowlan, Benton Harbor, Mich.; S. P. Bingham, Makanda, Ill.

February 25th, Mr. Moore resigned the office of Treasurer, and the Executive Committee elected T. D. Randall, of Chicago, to fill the vacancy, who has accepted the trust and filed his bond with the Secretary.

The Executive Committee found that the chief difficulty in the way of perfect unanimity between grower and seller, arose from a lack of confidence in each, or in other words, while there are many of both classes

who aim to do a straightforward and upright business, and are entitled to the confidence of all, still the great number of fraudulent shippers and sellers makes it necessary to throw about both certain restraints. As a safeguard to both, the Executive Committee, at a meeting in Chicago, February 24th, 1875, adopted the following rules of the Northwestern Fruit Growers' Distributing Association, adopted by the Executive Committee of the Association:

SPECIAL RULES.

1. The fruit sellers in this Association shall be organized into a Guild, which shall consist of not more than one section in each town or city.

2. Any member of this general Association may become a member of the Guild (if he sustains a good reputation for honesty and fair dealing, and is responsible for all liabilities likely to be incurred), under the rules hereafter prescribed.

3. Sections may be organized in any city or town where suitable members may be found, who are willing to enter into the organization, in the same manner as is prescribed for the city of Chicago.

4. In the city of Chicago the Executive Committee of the General Association shall designate a number of commission merchants who have been well tried, and have proved competent and reliable, who shall enter into an organization with President, Vice-President, Secretary and Treasurer, who together shall constitute an advisory committee, and their several duties shall be as hereafter set forth.

5. All applications for authority to organize sections of the Fruit Distributors' Guild shall be made to the President of the General Association, and shall be approved by the officers before the organization shall be valid: Provided moreover that, by a unanimous vote, the Executive Committee may authorize an agent to organize sections of the Guild, to be afterwards approved.

6. All applications for membership in any section of the Guild must be made to the Secretary of the section, and be approved by the Advisory Committee before it can be voted on by the section, after which a two-thirds vote may admit to membership. But the application shall be made at the regular meeting previous to the one at which final action is taken, and the vote shall be by ballot.

7. All applications for membership shall be accompanied by a fee of —— dollars for each member of the firm, or for each person applying, and an annual fee of the same amount shall be paid, provided that no one firm shall have more than two memberships.

8. The President and Vice-President of each section shall perform the duties usually devolved on such officers in like societies.

9. The Secretary, in addition to the ordinary duties of his office, shall promptly report the name and postoffice address of each person or firm admitted to membership, and shall collect and forward with said name to the Secretary of the General Association the sum of two dollars for each person so admitted, as the membership to the General Association, and shall also collect and forward the annual dues on the first day of January of each year, or as soon thereafter as possible.

10. The Treasurer shall receive and safely keep all money of his section, and shall pay out the same only as directed under the rules of his section.

GENERAL RULES.

1. Any member or members of this Association who shall be guilty of dishonesty, or shall knowingly violate the laws of fair dealing, either as consignor or consignee, or who shall fail to promptly pay the proceeds of sales to consignors, or who shall make false representations in regard to sales of fruit or other produce, consigned to them by any member of this Association, shall be suspended, expelled, or otherwise punished as his section or the General Association may consider just after a full hearing.

2. Whenever any member or members are guilty of any misdemeanor referred to in the foregoing section, he or they shall be forthwith reported, with all the facts in the

case, to the President of the General Association, who shall cite them, if members of the Guild, to their section for trial. If members of the General Association only, to the nearest member of the Executive Committee, who shall invite two members to sit with him in the trial of the case, and who shall promptly report the result of their investigations to the President for his approval.

3. All charges against any member shall be made in writing, and shall be open to inspection by the accused or his counsel.

4. Whenever any member of the Guild is suspended or expelled, the Secretary of the section of which he was a member shall immediately notify the Secretary of the General Association, who shall forthwith notify every fruit shipper in the Association.

5. All members of the General Association found guilty under these rules shall be suspended, expelled, or otherwise punished, and each section of the Guild forthwith notified of the action.

6. Any member not satisfied with the result of any investigation herein provided for, shall have the right to appeal to the General Association at its next annual meeting. But if the sentence involves expulsion, the notice shall be given of the sentence and of the appeal, the same as if final.

7. Concealing rotten or gnarled fruit in the middle of a package, and covering the outside with fair fruit, shall be considered *prima facie* evidence of dishonesty in all investigations under these rules.

8. Any section of the Guild may make such rules for its own government as a majority of the members may desire, not in conflict with these rules, or the constitution and by-laws of the General Association.

9. All transactions of the several officers of this Association involving the expenditure of money must first be ordered by the General Association, or by the Executive Committee, unless it be in the discharge of the special duties of their offices.

10. All fruit shipped by the members of this Association shall, as far as possible, be strictly graded, as follows: First, "Good," which shall have none but sound fruit in it, and shall be strictly of the same general grade throughout the package, provided that some of the very finest may be denominated *fancy*. The second grade shall be constituted of such *fair* fruit as will pay for shipment, but which is not guaranteed perfect, although it is entirely sound.

11. On all of first grade—"Good" and "Fancy"—the shipper's name is to be put on each package in plain letters, and is a guarantee of its perfection, or the sale is invalid.

12. All of second grade is to be sent into market without brand, and sold on its merits. But in all cases all parts of the package are to be of the same class of fruit throughout.

With these special and general rules as a guide, or basis of action, the Executive Committee met with twenty-four of the leading commission firms of South Water street, and organized a Fruit Board of Trade, or Guild, which the Association will indorse. It is proposed to organize similar Boards in all the principal towns in the Northwest, as fast as the officers appointed can accomplish their work. A list of these Boards, or Guilds, with the names of the men composing them, together with the list of members (fruit-growers) of the Association, will be published in pamphlet form for the benefit of the members. We trust that every one who is interested in fruit growing will forward to Mr. Garland, or hand to one of the officers, the membership fee, only two dollars, with his name.

O. S. WILLEY,

BENTON HARBOR, Mich. *Recording Secretary.*

Galesburg Horticultural Society.

REPORTED BY A. G. HUMPHREY.

OFFICERS FOR 1875.

President—A. G. Humphrey.
Vice-President—Hon. T. J. Hale.
Secretary—Dr. F. A. Kemp.
Treasurer—Mrs. Prof. Standish.

Executive Committee.—Prof. J. V. N. Standish, Mr. G. V. Dietrich, Mr. R. W. Hunt, Mrs. Captain Fuller, Mrs. Judge Kitchell.

ANNUAL MEETING.

The annual meeting was held at the residence of T. J. Hale, the first Tuesday evening in March, 1875.

The Treasurer's report was read and adopted, from which it appears that there was on hand a balance of $57.95.

The meteorological report for the month of February was presented by Dr. Kemp, as follows:

Mean thermometer 13°.91; mean maximum 22°.39; mean minimum —0.43. The lowest thermometer —20°; the highest 45°. There were fourteen days in which the thermometer was below zero. The range for the

month was 65°. The snow-fall was ten inches, and the rain and melted snow one inch. The mean barometer, corrected for temperature, was 29.289.

For February, 1874, the corresponding items were: 26°.40, 34°.46, 18°.11, —6°, 55°. Two days in which the thermometer was below zero. The range was 61°. The snow-fall was eight inches, and the rain and melted snow 1.58 inches.

The February of 1873, although cold, was not so cold as that of this year. The mean thermometer was 20°.32; the mean maximum 27°.39; the mean minimum 11°.61. The highest was 44°, and the lowest —15°. The snow-fall was 7.30 inches; the rain and melted snow 1.80 inches.

This has been the coldest February ever known in this region.

It was agreed that the subject for consideration at the next meeting should be, "The Preparing and Planting of Vegetable Gardens, including Hot-beds and their Uses," the meeting to be held on the 6th of April, at the house of Mr. D. SANBORN.

APRIL MEETING.

This Society met on Thursday evening, April 6th, at the house of Mr. D. SANBORN, Dr. HUMPHREY in the chair.

The subject for discussion was

THE PREPARING AND PLANTING OF VEGETABLE GARDENS, INCLUDING HOT-BEDS AND THEIR USES.

Prof. STANDISH introduced the subject by stating that he felt like a beginner every time he thought of the subject of planting his garden. In discussing such a subject as this we must repeat our past experiences. In the first place, the ground should be well cultivated, compost put on it in abundance, either in the spring or the past season. Well rotted compost is not sufficiently prized in horticulture; our ground has a tendency to pack, which can only be prevented by the use of compost and sand. He would not plow the ground, but use the spading fork and pulverize thoroughly. He spoke of certain vegetables he had tried: First, the *Bush-beans;* the best of which are the Fejii, which is early and good; a little later and equally good are the Early Valentine, Early Rachel, Dwarf White Wax, and the Black Wax. Of *Pole-beans,* Giant Wax, and Large Lima are best; the last can be used

at all seasons. The next class is that of *Beets*. He recommended the Early Bassano, although when planted early it is not a good keeper. The Egyptian is one of the best of beets; it is good, handsome, and early; the Early Blood Turnip is also an excellent market beet. Another very good one, in that it does not readily become stringy, is Henderson's Pine Apple. He had planted twelve varieties of beets last year, but these he found the best.

In planting, he put the seeds in rows one foot apart, sowed thickly and thinned out for early use, so that the plants stood four inches or more apart. Does not plant very deep—half an inch to one inch in depth.

Of *Cabbage*, he would recommend the Early Wyman. The Early York was apt to decay if not used at once when ripe, but the Wyman has not this tendency. The Early Winningstadt was good, but better than all was the Ulm Savoy. The Ulm Savoy, Drumhead Savoy, and Stone Mason are later cabbages.

The next class is *Celery*. He had a good lot of this vegetable last year, some bunches weighing five and six pounds, and three feet in length, but they had all spoiled in the cold frame. His method of planting was to dig a trench eight inches deep, and put in six inches of compost; set plants four or six inches apart, cover them with boards during the day, taking them off at night, and give them plenty of water. He had tried seven kinds, and could recommend the White Solid, Turner's Incomparable, Laing's Red Mammoth, Sandringham, one of the best; Boston Market, and Carter's Crimson are not inferior to any. He had sent for the following varieties: Cole's Crystal, White Dwarf, White French, a self-blanching kind, and Sutton's Sulham Prize. After plants have made some growth, say about September first, he would hill up moderately, and continue to do this three or four times.

The next class is *Corn*. He recommended the Early Minnesota, but said the Dwarf Sugar is not worthy of cultivation. Darling's Sweet, Moore's, Crosby's, and Evergreen Sweet are among the best.

The next class is *Cucumbers*. The Early Russian, Early Green Cluster, Early Frame (best for pickling), Early White Spine, and an improved variety named the Boston Market, said to be a superior cucumber, may all be recommended.

Of *Lettuce*, he had tried three varieties: the Early Curled Silesia, the Simpson, the Neapolitan and the Large White Stone Cabbage; the third he thought the best. As to planting, the seed should be planted as shallow as possible, in well prepared ground. For early use it should be

planted in the fall, and, if planted at different times, may be had during the whole season. He proposed to try the Hanson Lettuce, which was highly recommended.

Of *Water Melons*, he recommended Phinney's Mountain, Sweet Sprout, and Citron for preserving.

Of *Musk Melons*, the largest and finest in appearance was the Casaba; Skillman's Netted was smaller but good; Ward's Nectar was superior, and Henderson's Pine Apple excellent. He was going to try the Christiana, Sill's Hybrid, and the Hackensack, all of which were highly spoken of.

Of *Peas*, Waite's Caractacus was one of the very earliest and best; Carter's First Crop and Laxton's Alpha were also early. For later crops, McLean's Little Gem, and Blue Peter, larger than the Gem, were the best. Drew's Dwarf, a large and branching pea and a great bearer, and Laxton's Prolific Early Long Pod might also be recommended. Of a third later class he recommended the Champion of England for quality and fruitfulness; Hair's Dwarf Mammoth, Laxton's Supreme, and Napoleon are all excellent. As to planting, he put the rows about a foot apart, the seed about five inches deep, used a large quantity of seed, and rooted up the superfluous plants.

Of *Potatoes*, the Early Vernon keeps well; the Peerless, Snowflake and Early Rose were all good. The beetle was the only discouraging circumstance in potato culture.

Of *Radishes*, the Early Scarlet Turnip, Long Scarlet, and French Breakfast were all good.

Of *Squash*, the Summer Crookneck, Hubbard, and Boston Marrow were the best.

Of *Tomatoes*, the General Grant, the Trophy and others might be recommended. The Trophy may be kept and cared for by tying the plant with strong twine to a stake from time to time. As its growth advances it fruits more in this way than in any other.

Mr. T. J. HALE said that he would discourage the idea of plows in garden cultivation. If the plow is used, the garden fork should be used after it, to turn up the hard soil. In all cases the ground should be thoroughly prepared—even trench spaded, if possible—and well fertilized. Our soil having a clay basis needs sand and compost to prevent baking.

As to *Peas*, he would prefer McLean's Little Gem as the best of peas; Tom Thumb and Dan. O'Rooke he would not plant; and he would plant all his peas at one time. All seeds should be planted as early as possible in our climate with our dry summers.

As to *Celery*, he recommended that it should be planted early. He did not think celery so easily grown as corn; it needs a great deal of water. If ground is moist, there is no difficulty, if once started. In planting cucumbers, beans, etc., he was in the habit of making a miniature hot-bed for each hill, and covering it with glass.

Mr. HUNT accused Prof. STANDISH of stealing his thunder, and approved generally of his recommendation. Hot-beds are not always necessary for starting seeds. The use of the hot-bed was simply to start the seeds early, protecting and nourishing the plants till they can be placed out of doors, thus gaining time. The method of making hot-beds was well known. In this country they should not be put below the surface, but on the surface, otherwise our heavy rains would destroy them. Different kinds of seed required different amounts of heat; cabbages required little, tomatoes a great deal. From the fifteenth to the twentieth of March was early enough to make hot-beds; this year he made his on the seventeenth of March. If made earlier, he found that the plants needed to be checked in their growth before it was safe to plant them out, and that this injured them. He made his manure heap just the size of his frames, and from twelve to fifteen inches deep, with six inches of earth. The glass he put close to the earth—the closer the better; otherwise the plants are too much drawn out.

Of *Beans*, he thought the Early Fejii tough, the Dwarf White and Black Wax good, but the Giant Wax not productive enough for market purposes; the Large Lima was the best of all, while the Small Lima was the more certain; Egyptian he preferred for earliness.

In *Cabbages*, he had given up the Early York; the Early Wyman was far before it in every respect; the Winningstadt was good, but the Potter's Improved Drumhead was the best for a market cabbage. He recommended, along with the others mentioned, the Orange *Water Melon*.

To plant all the *Peas* you want at one time he thought the best way. They thus get well started before dry weather comes. There was, he thought, no certainty in late planting. He planted about five or six inches deep, and for early sorts covered only two or three inches and worked the earth around them as they grew; he never staked or bushed his peas. For the large sort, such as the Champion of England and others of like growth, he planted them in a single row three feet and a half apart, and let them grow. In this way they covered the ground, kept it moist, and gave a larger yield than those that were staked, as he found by actual experiment. He recommended the Valparaiso *Squash* as the best of any.

In *Tomatoes*, he had the General Grant for two years, but declined to give it a *third term*. The Trophy was good, and the Canada Victor equally so and a little earlier.

Mr. G. DIETRICH presented to the Society some Ben Davis, apples to show how well they had kept up to this time. They were in fine condition.

W. A. HOOVER also surprised the members by presenting some grapes that had been put up in Price's grape jars. They had not been put in in the best condition—till after the first frost of last year—but they were as fresh and rich in flavor as the day they were pulled. They were some variety of the Rogers. These jars are large and flat, holding about a quarter of a bushel, and absorb and probably retain the moisture. They are placed one on top of the other, and the uppermost covered with a cloth and board. They promise to be invaluable for the keeping of some sorts of grapes.

Dr. KEMP presented the following meterological report for March, 1875:

The mean temperature was 30°.03; the maximum 78°, and the minimum —4°; range 82°. For the corresponding month in 1874, the mean was 34°, the maximum 70°, and the minimum 11°; the range 59°. For 1873 the mean was 33°.45; the maximum 63°, and the minimum —7°; the range 70°. Not since 1869 have we had so cold a March. The mean was then 26°.60.

The snow-fall for March of this year was nine inches, and the rain and melted snow gave 1.60 inches. For 1874 the snow was 1.40 inches, and the melted snow and rain 1.10 inches. For 1873 the snow was four inches, and the water 1.45 inches.

The prevailing winds for this year were N. E. and W. The barometer reduced to freezing point was 29·179.

The Society adjourned to meet at the residence of Mr. A. S. HOOVER, April 13.

SECOND APRIL MEETING.

This Society met on Tuesday evening, April 13, at the house of Mr. A. S. HOOVER.

In the absence of the President, Captain FULLER was called to the Chair.

The Committee on Sparrows made no report, and requested to be continued, which was granted.

Mr. T. J. HALE introduced the subject of lawns and flower gardens by saying that he had previously spoken on it at some length, and he could, however, give his experience of last winter. He had just been employed in repairing his lawn. The lawns looked patched this spring. The severe winter has specially killed the white clover, and blue grass to some extent. The lawn needs constant renovation and care. After going over it with the wooden rake, and sowing the blank spots, he hoped that in a few weeks it would recover from the effects of winter. His success in lawn culture has been gratifying. His preparation of the ground gave him grass earlier than in most lawns. Hunnewell has proved that in this country and our climate a perfect lawn can be secured. He does this by making up alternate layers of brush and earth and setting the brush on fire, and thus burning the seeds that are in the earth; he then uses the earth as a top-dressing for his lawn, which prevents the introduction of foreign seeds. This is a difficult process, yet the perfect lawn can not be otherwise secured. Some try turfing, but this is a failure. A true surface and a pure grass can not thus be obtained. Some seedsmen sell a mixture of what is called lawn grass seed, but such mixtures are not favorable. Pure blue grass—*Poa pratensis*—is the best seed for a lawn. A good lawn, however, can not be obtained in one year. If the year is moist, and otherwise favorable, the lawn may look well the first year, but this is not commonly the case. A few years of care and an occasional restoration are necessary, but when a good turf is once secured it can be retained by moderate care; winter-killed patches should be sown early, and on the surface, and may or may not need to be raked. Dandelions and plantains should be exterminated, which may be done by cutting below the crown of the plant. Some think that we are making too much of lawns, but such small things make up the comfort of living in cities. Were all our houses to be surrounded with nice lawns, Galesburg would become one of the most beautiful and pleasant of cities. How little there is, generally, about houses in town or country that is beautiful or pleasing. In this city the taste is manifestly improving, doubtless under the influence of the Horticultural Society.

Prof. STANDISH agreed with the last speaker in thinking that nothing is so beautiful as a well-kept lawn. It is like a carpet of good colors and forms; the green of the lawn is the most pleasing of colors. As to his own lawn, it was injured by allowing persons to walk over it. Last winter, while the ground was frozen, he allowed a man to wheel coal across his lawn, not thinking that it would do any harm, but it has killed the grass

two feet in breadth. Plantains and other noxious weeds can be killed out by once cutting, about three inches beneath the soil, with a sharp knife. Blue grass is the only thing fit for a lawn; he did not like white clover, much less red clover. A little over a year ago he was at Hunnewell's. His lawn is the most attractive thing he has. It was in mid-summer, and a man was watering it with profusion, and in this way the lawn is kept fresh. In the same neighborhood there are other large and fine lawns. He proposed in future, late in the fall, to cover his lawn nearly an inch in thickness with compost, broken small, and leave it all winter, and in the spring rake it off. He thought this would prevent winter-killing. As to the flower garden, we should not plant to any extent seeds or annuals. They do not pay. A few only may be recommended. The asters may do well, but they require shade and plentiful watering: they come in the fall when there are few other flowers. He liked also the pinks and the drummond phlox. He did not care about petunias, but if wanted it was better to bed them than sow the seed. Some balsams are very good; a few of the pansies are beautiful; the double portulaca is also very good. Of all the garden flowers he would recommend the geranium, especially the General Grant, which is one of the best of bedders. It costs little to keep a few such plants, and it is not difficult to propagate a sufficient number for ordinary use. The acaranthus is also a good bedder, and can be got at a moderate cost; especially would he recommend the *A. Lindenii.* The golden coleuses are also fine bedders; they should be planted in a clump, not scattered. Some design in the way of planting is necessary for beauty. A dwarf variety of the feverfew he would particularly recommend; some of the dwarf lantanas were also good. He would urge the planting of a group of cannas. They have a tropical character and beauty. Alternantheras are also very desirable. He could not say much for dahlias; the Tom Green and the Little Hermon he would, however, recommend. Verbenas he thought as desirable as geraniums; he would not recommend seedlings; the mass of verbenas raised from seed were worthless; it is best to get the plants. Of lilies the *L. Candidum* is the best, and can be raised with a little care; they bloom in July, and have both beauty and fragrance. Tulips and crocuses may also easily be raised, and they come early; and especially would he recommend the choicer varieties of the gladiolas.

Mr. HUNT said he had no lawns and did not think he ever would have. His difficulty was with the ground. He was grateful to find that the dandelion and plantain could be destroyed by once cutting. He had

a bed of horse-radish which troubled him; it was hard to exterminate. He prepared his ground, secured the best seed, but that with excessive rain and drought he had not yet succeeded in getting a lawn. As to its beauty there can be no question, and though difficult to keep, it is yet worth having. The lawn, he thought, might be covered during the winter with a light litter of straw. Sod will certainly not make a good lawn, this he found by experience. He intended to persevere and hoped to succeed. Surfacing with fine compost was a good idea. As to planting flowers, he thought we were bringing things up too high; he preferred that we should extend our recommendations to such things as are within the reach of ordinary people. A great many of the annuals are much admired and raised with success by those who could not get the more costly plants. The design of the Society should be to elevate the tastes of the community by gradually bringing them up to a higher standard, and this could only be done by encouraging the raising of the familiar and easily obtained flowers. Of these there were many that were very beautiful, and might be successfully raised with a little care.

Prof. KEMP agreed with those who thought lawns beautiful; the rich green was very refreshing to the eye. They also afforded a fine ground color for flower beds. Nothing can be finer than the contrast of green and the bright colors of flowers. The difficulty of obtaining good lawns greatly enhances their value, and the possibility of success should encourage efforts to secure them. For lawns no better grass could be used than our blue grass. It is very prolific, spreads by stolons, is fine in texture, and is improved by mowing. He agreed with Mr. Hunt in thinking it desirable to encourage the cultivation of our well-known annuals, biennials, and perennials. They were cheap, and easily procured, and gave great pleasure to many people; we should not decry them, nor discourage their cultivation. If we could even get some people to relieve the barrenness of their yards by growing sunflowers, better that than nothing, or the coarse weeds and grasses that crowd neglected ground. He would decidedly recommend peonies, hollyhocks, larkspurs, monkshood, petunias and other familiar garden flowers. They can be planted or sown almost anywhere, and with a little care in preparing the soil and watering would greatly beautify our cottages.

The Society adjourned to meet in the house of Capt. FULLER, on Tuesday, April 27, the subject of discussion to be "The care of Small Fruits and their Varieties."

THE WELL-WATER OF GALESBURG.

REPORT TO THE HORTICULTURAL SOCIETY BY DR. KEMP.

Our wells are, for the most part, comparatively shallow, and range from fifteen to forty feet in depth. They are all, so far as I know, sunk in the clay beds that overlie the carboniferous limestone that so extensively predominates in the geological features of the State of Illinois. The water contained in these wells must be considerably affected by the surface drainage, as in many of them it rises and falls in accordance with the amount of rain-fall. The depth to which a well is dug may affect the quantity of water which it yields, but does not appear to have much influence on its quality. One might suppose that, the clay bed from which the water is obtained being apparently the same everywhere, there would be no difference in the character of the water contained in the wells. This is, however, not the case. There are differences in the water of different wells, that can only be accounted for by differences in the bed through which the water passes. These differences are not, however, very material. In some cases they are only of quantity, but in others they are of quality as well.

Nothing can be more important to a community than the purity of the water it uses for ordinary purposes. It is so necessary an article of diet, and is so largely used by every one, either directly or indirectly, that if it is impure it can not fail to be more or less prejudicial to health. The question may be asked, What is pure water? The answer may be given that it is water free from any foreign elements of any kind. Its own composition is well known to chemistry, in which it bears the name of hydrogen oxide, and is represented by the symbols H_2O. Any thing else than the water itself, either in chemical or mechanical solution, is an impurity, and it may be a detriment. Any such solution in water more or less interferes with its appropriate use as an article of diet, as it constitutes so large a part as seven-eighths of the entire human body. This is apparent when we consider that water is not decomposed and digested as other parts of our food are. It remains unaffected by all the processes through which it accompanies our food. Wherever, therefore, it goes in its wonderful wanderings, it will carry with it what it holds in solution, and, it may be, by the presence of unknown re-agents, deposit its foreign elements in some of our organs or tissues, where they are neither needed nor desired. This fact is well known to physicians. Multitudes of diseases are due to impure water. It is often the cause of disastrous epidemics. All the more advanced communities of the world are therefore very solicitous about the purity of their water supply.

My attention has been directed to this subject as a matter of simple curiosity. I wanted to know what I was drinking; and seeing that wine and beer and cider, and such like pernicious drinks, had to be abandoned to the use of the wicked, it was only natural that I should be anxious to know that the water I used was pure. As drawn from the well, it seemed very clear, cold, and even sparkling; and, for the most part, it was

pleasant to the taste. I soon learned, however, that a smiling countenance in water was no more a test of its goodness than it was of the goodness of heart of some people whom one meets with in the world. Nay; I even found that the purest-looking water was often, on trial, found to contain the largest amount of impurity.

To make a quantitative analysis of water I had neither time nor opportunity. I therefore contented myself with a qualitative analysis; and even this I have done but imperfectly. I got hold of Dr. Danchell's tests, which are accepted by physicians in England as ready means by which to detect impurities in water, and by means of these I have examined the water of about thirty wells in various parts of the city, and will now give you the result:

I. THE NEGATIVE RESULT.

I found no trace of iron or lead or magnesia, and what is very gratifying, none of any organic, that is to say, vegetable or animal impurity, excepting, it may be, in one case, and that manifestly arose from the well being open to offensive surface drainage. A trace of ammonia I found only in three instances, and with these few exceptions may say that our wells are free from this substance.

II. THE POSITIVE RESULTS.

1. Bicarbonate of lime I found in small quantities in some cases, but it is not a feature of our well-water.

2. Lime phosphate was present in almost all the wells, and in some of them in considerable quantities; more especially was it found in old wells, and in those near stables and sources of impurity. I believe it to be contained to some extent in the clay through which the water percolates, but I suspect that it affords some slight evidence of the beginning of a process by which our clay beds in or near the old residences of the city are becoming saturated with the impurities of our cess-pools. I do not positively state this, as I am in doubt about it, only I suspect the excess of phosphates in some of the wells to be due to this cause.

3. There seems to be traces of sulphuric acid in some of the wells, but of this I will not speak positively. I think I detect it, and it is not by any means unlikely.

4. Lime sulphate abounds in many of our wells. The amount varies. In some I discover only a trace, in others a considerable quantity. This makes the water hard and unsuitable for washing purposes.

5. Calcium chloride is also found abundantly in very many of our wells. In some it is in excess. More or less of it seems to be present in all. It is quite remarkable how much chlorine seems to be contained in the water of some of the wells of our city that are regarded as the best.

These are the results of my inquiries, and they show us that we have an impure water, and that it is largely calcareous, with considerable quantities of chlorine, sulphur and phosphorus. I do not say that these are by any means poisons, or in themselves hurtful to health. What effects may

spring from them by long use I am not physician enough to say. Perhaps if taken by themselves they would be harmless, or it may be healthful. Still, it may be doubted whether they are altogether innocuous when taken in chemical solution in water.

As bearing on the interest of horticulture, there can be no doubt that the water of our wells is good for watering plants, better, I should think, than even rain-water. Although rain-water contains, when recent, a trace of ammonia, and sometimes sulphuric acid, it yet soon loses them, and in no case does it contain so many elements that are stimulating to vegetable growth.

The fact that the clay on which our city is built is being slowly but surely impregnated with our surface impurities, opens up the question of our sooner or later requiring a water supply for our city better and more abundant than can possibly be obtained from our wells. Where, it may be asked, can this be obtained? From our creeks, rivulets, or springs, it is certainly hopeless to expect it. We must look to the clouds for it. Our annual rain-fall is sufficient, if properly conserved, to afford an abundant and never failing supply of the purest water. From this source alone the city of Jacksonville, in this State, has created a lake covering about forty acres, which is estimated as sufficient to supply a city of one hundred thousand inhabitants. The water is twelve feet in depth, and at the present time is sufficient for a two years' supply. For $150,000 these magnificent and effective water-works were constructed. In a subsequent paper I shall give an estimate of our annual rain-fall, and show to what extent it may be relied on for a supply of water.

THE CLIMATE OF GALESBURG AND ITS VICINITY IN RELATION TO HORTICULTURE.

BY PROF. A. F. KEMP, LL. D.

[Read before the Galesburg Horticultural Society, and published by request.]

The materials available for a satisfactory treatment of this subject are neither so ample nor so perfect as I could wish. All that I can hope to accomplish is an approximation to the actual facts of the case. I have been favored by Prof. Livingston with his observations, according to the Smithsonian schedules, from 1861 to 1870, lacking 1863 and 1864. My own observations include 1873 and 1874. I am thus able to review the climate for a period of ten nearly consecutive years.

From these data I shall endeavor to present to the Society, in a generalized form, as accurate an idea of our climate as I can for guidance in horticultural pursuits. I do not expect to say much that is new or of any great practical value. Those who have attended in any degree to horticulture for a series of years are already experimentally familiar with the special characteristics of our climate. What I may hope to accomplish is to give that definiteness to your knowledge which actual observation over a series of years is able to afford.

In the first place I shall give the means of our meteorological phenomena for the ten years which I have specified, in the order in which the observations have been taken.

1. *The Themometric Conditions of our Climate.*—Our average temperature may be regarded as 48°.58 Fah. The highest average was in 1874, being 52°; and the lowest in 1873, being 45°.50. Taking the winter months from October to March, the mean was 33°; and the summer months from April to September, it was 64°.64. The lowest winter temperature was in 1872–3, when the mean was only 28°.60; the highest winter temperature was in 1873–4, being 35°.60. In no other instance during that time did the mean temperature fall below 31°. The lowest summer thermometer was that of 1866, being 62°.83; and the highest was 1870, being 69°.04. The averages are taken from the three daily observations at seven, two and nine o'clock. From six years of maxima and minima observations—1861 to '66 and 1873–4—it further appears that during these years the lowest annual minimum was 35°, in 1866; and the highest was 42°, in 1874. The lowest maximum of these six years was 56°, in 1873; and the highest 63°.40, in 1873. The lowest winter minimum was 18°.10, in 1873, and the highest 27°.10, in 1874. The lowest winter maximum was 37°.27, in 1873; and the highest 50°.63, in 1861. The lowest summer minimum was 48°.48, in 1866; and the highest 53°.05, in 1873. The lowest summer maximum was 72°.45, in 1862; and the highest was 75°.56, in 1873. The lowest temperature for the ten years was 28°, on January 29, 1873, and the highest was 101°, on September 1, of the same year. July is decidedly our warmest month, and January our coldest.

The range of the temperature is coming to be regarded as an important feature in climate, and as having some influence on both animals and plants. For the six years referred to of maxima and minima observations our highest monthly range was that of March, which gives a mean of 64°.66, and the lowest was that of August, giving a mean of 43°.83. The range of the winter months from October to March does not vary much from year to year, and amounts to 61°.46. The mean summer range is 49°.75, making a difference of 11°.75 in favor of summer. The mean of both seasons is 55°.61. The highest observed range occurred in February, 1866, and was 82°; the lowest in August, 1862, and was 35°. This is probably the worst feature of our climate. We are not, however, so badly off as the people in Kansas, where the range at Manhattan, for 1874, was from 110° to —6°, or 116°. With us the average range varies very little from year to year, and may be regarded as constant at the mean of 55°. At Washington, D. C., the mean range is 53°.5; Rochester, N. Y., 48°; New York, 43°; Key West, 26°; Keokuk, 56°; Cincinnati, 51°; Chicago, 57°; Boston, 48°; Breckenridge, Minn., 60°; Mobile, 39°; Montreal, 46°; Denver, Col., 62°. The range thus diminishes to the east, and especially to the south, and increases toward the north and west.

A final point in regard to temperature is our late and early frosts. These can be given from the maxima and minima observations, which however extend only to six years. In five of the six years we had frosts

in April, ranging from the 4th to the 29th of the month, and from 31° to 11° of the thermometer. In 1874, the temperatures on April 29 fell to 28°. In two years of the six — 1861 and 1866 — we had frost in May, and that as late as the 17th, and the lowest temperatures of this month in these years were 30° and 31°. It would thus appear that in our region frost in May is not common, but that it may occur as late as the middle of the month. A more extended series of observations are, however, needed to enable us to arrive at any definite conclusion on the point. As bearing on horticulture, it may here be noted that the depth to which frost penetrates into the ground will vary from year to year, according to the severity of the winter and to the amount of snow that falls. There can, however, be no doubt that in ordinary winters it reaches to the depth of from 2½ to 3 feet; and that in ordinary soils it does not altogether disappear till about the beginning or middle of May.

From temperature, let us now pass to rain-fall and snow. For the ten years of my observation we have an average of 90½ days of rain and snow to the year; the maximum being 131, and the minimum 44. Our average snow-fall is 22.07 inches; the maximum being 35.35 inches, and the minimum 11 inches. This affords us a mean of 2.20 inches of water. Only rarely have we snow either in April or October, and then only in small quantities. January and February are our snow months. Our average annual rain-fall amounts to 34.05 inches (including melted snow). The maximum was 42.84 inches in 1862; and the minimum was 20.35 inches in 1870. Of this total the largest amount falls in the six summer months, from April to September, namely, 22.52 inches; and the smallest in the winter months, from October to March, namely, 11.62 inches. The rain and snow days in winter are 38, and in summer 52. Compared with other places, our rain-fall is about an average. In Chicago it is 23.73 inches; Davenport, 25.21; Keokuk, 29.97; Boston, 46.76; New York, 42.45; New Orleans, 72.41; Key West, 29.58; Cincinnati, 36.50. Our mean barometer, corrected for temperature and elevation, is 30°.031.

These averages, while of service as affording general characteristics of climate, do not avail much in determining the special conditions which affect the growth and health of plants. To obtain a knowledge of these conditions, it is necessary to leave averages and come to specific facts. This will be obvious when we consider that the average annual rain-fall of England is only twenty-five inches, while ours is thirty-three. Yet who can doubt that the climate of England is greatly more humid than ours? Were one to form an opinion on these averages as to which climate was best suited for horticulture, he would not hesitate to prefer Illinois to England; and yet, in fact, we know that the special conditions under which rain falls in England renders that country greatly superior to ours for horticulture. By this example we are warned not to trust much to averages for our determinations of climate in relation to the growth of plants. Any approximation to certainty can only be reached by a careful consideration for a series of years of the daily observations of the several months of summer.

It will, perhaps, be enough for the purpose of illustration to select

the year 1874, of which we have the best remembrance and fullest record, and show by it the not unusual conditions of climate under which we have to sow our seeds and set out our plants.

With this view, I will begin with the month of April, the first of our spring months, and endeavor to exhibit its meteorological phenomena as they bear on the interests of horticulture. In this month of 1874 we had twenty-three days on which the thermometer fell during the night below the freezing point. Our mean minimum for the whole month was as low as 28°.23. In such circumstances our maximum temperatures, which ranged from 42° to 75°, are of little avail. On the principle that nothing is stronger than its weakest point, our attention must in spring be directed to our lowest rather than to our highest temperatures. Under such conditions as these, it can not be safe or any real advantage to plant in ordinary undrained soil any but the hardiest of our seeds and roots. Again, in that month we had six days of rain and snow. Thirteen inches of snow fell, which with the rain gave us four inches of water. This seems a good amount of moisture, and so it is; but when it is considered that we had twenty-four days of dry and, in a great measure, cloudless, sunshiny weather, the value of at least four of the days of rain was completely neutralized. The rain of these days had scarcely fallen when it was licked up by the thirsty sun. Only on two, or at most three days had we moisture that penetrated to the roots of plants. Considering these things, I am sure you will be disposed to regard April as of little value for actual horticultural purposes.

Now take May, in which for 1874 there was no frost, and the thermometer did not fall below 41°, and rose to 92°, standing for three days at the nineties. So far as temperature is concerned, last May was, on the whole, a favorable month; but then we can not always trust May. As late as the middle of it we are liable to have frost during the night. Then, again, our ordinary seeds—such as peas, beans and garden seeds—will not germinate at a lower temperature of the earth than 40°; cereals and corn require 50° at least; tomatoes require 60°; and cucumbers and melons about 65°. Here is another difficulty: The frost is deep in the ground and requires time to thaw. The soil is thus kept for a time colder than the atmosphere, and than is necessary for vegetation. Hence those seeds that require to be planted deep stand a poor chance for early sprouting in ordinary soil. Then, further, we had only four days of rain during the month, the total of rain-fall being only 1.10 inches, the whole of which, I am certain, was licked up by the sun before it had penetrated an inch below the surface of the ground.

Now take June. On this month we had a minimum temperature ranging from 46° to 70°, and a maximum from 66° to 93°. We had nine rainy days, and a total rain-fall of 2.95 inches. We had besides about sixty per cent. of cloudiness, and very dewy nights. This was a fine month for vegetation. Any thing better we could not reasonably ask. Still, considering that we had twenty-one days of dry weather, neutralizing at least three of our rainy days, and evaporating more than half of our moisture, there was, after all, not much in June to boast of.

In July we had a minimum temperature ranging from 51° to 75°, and a maximum from 69° to 100°. We had also five rainy days, and a total rain-fall of 1.80 inches, with no more than forty per cent. of cloudiness. There were thus twenty-six dry and very warm days. Excepting on two days at the beginning of the month, the rain-fall was licked up before it reached the roots of the plants. On these two days we had good, drenching showers, that were the salvation of our gardens.

In August we had a minimum temperature ranging from 51° to 72°, and a maximum from 61° to 95°. We had also nine days of rain, most of which were at the close of the month, and a heavy rain-fall on the 28th. The total rain-fall was seven inches. This was a good supply, but it came too late to be of much use to our gardens or our fields. The greater part of this month was dry and clear.

September gave us a minimum temperature of from 40° to 66°, and a maximum of from 60° to 89°. We had ten rainy days, and a total rain-fall of eight inches, most of which came about the middle of the month. We had besides about fifty per cent. of cloudiness. The soil was thus thoroughly soaked during this month, and every thing that was growing grew luxuriantly, especially weeds. Lawns and pastures were much helped and the gardens were refreshed.

Near the beginning of October we get our first autumn frost. On this month we had four days of frost, beginning with the 12th and ranging from 21° to 29°. Our maximum ranged from 80° to 32°. We had six rainy days, but the total rain-fall amounted only to 1.27. In meadows the dew froze as early as the 2d. The range was nearly 60°. In 1873 there was frost on the 6th, and we had fifteen days on which the temperature fell below freezing, and ranged from 18° to 31°.

From these data we may draw some highly probable inferences to guide us in our horticultural pursuits:

1. That only the hardiest seeds and plants should be put into the ground during any part of April.

2. That not till the middle of May should our less hardy seeds be sown, or our tender plants be set out.

3. That we can do little or nothing either in the vegetable or the flower garden without the use of hot-beds in spring and cold-beds in autumn.

4. That the raising of annuals is attended with difficulty and disappointment, and only partial success will reward unremitting labor and care.

5. That such bulbous plants as can be put into the ground in autumn, and protected during the winter, or such as can be planted early in spring, promise satisfaction; and that these, along with some hardy perennials, and the usual bedded plants, should form the staple of our horticulture.

6. That we never can depend on the dews and rains from heaven sufficiently to water our flowers and plants, but must have more or less recourse to artificial irrigation.

7. That ornamental shrubbery and grape-vines which can not stand a temperature of —25°. should not be planted at all, or carefully protected during winter.

WARSAW HORTICULTURAL SOCIETY,

FOR THE YEAR 1875.

WITH THE PRINCIPAL PAPERS AND DISCUSSIONS.

REPORTED BY B. WHITAKER, SECRETARY.

The operations of this Society for the year just closed have not been marked by any extremes, either in the advanced progress of discussion, or a want of zeal to keep up with the progress of the times.

The work laid out at the commencement of the year has been followed up; the regular meetings, except that for September, have been held. It will be noticed that occasionally incidental and agricultural subjects have been discussed; many of the members of this Society being farmers, such subjects are to them of special interest. The reasons are obvious: Agriculture is the paramount interest; Hancock county produces five million bushels of corn, more than half a million tons of hay, besides improved stock, fat cattle, and hog products. These interests are paramount to horticulture; hence, occasionally, their discussion, as of interest to nearly all. In the absence of any agricultural organization in the county, this Society has occasionally lent its influence and aid in promoting the interests of the farmers. The Society represented the interests of Hancock county in the election of officers of the State Board of Agriculture, and have for many years distributed the reports, premium lists, etc., of the State Board, in this county. Notwithstanding, however, this apparent digression, the Warsaw Society is *strictly a horticultural society*, and so acknowledged in all its operations.

As intimated above, there has been no particular advancement made, neither has there been any apathy, nor cause for discouragement, more than the result of a limited yield of fruit, which was also experienced in all parts of the State. A few instances of partial and entire destruction of orchard and vineyard fruits by hail storms have occurred within the limits of the Society. The season has been one noted for heavy rain-falls, sometimes almost assuming the nature of water-spouts, pouring down immense quantities of water, and deluging the fields, washing away fences, etc. The results of a wet season have been beneficial to deciduous trees, nursery stock, and small fruits; fruit buds are abundant, and the outlook all that could be desired for an abundant yield the ensuing season; fears are, however, entertained that the peach buds may be too much advanced, by the mild weather of December and early part of January, to withstand the winter's cold.

The hope is entertained that the future of the Society may be marked with increased usefulness; that such a desire pervades the minds of its members is not doubted; that the intellect, qualifications and experience necessary to insure progress also exist, is not doubted. Being under the eye of the President of the State Society, the coming year, there will be new incentives to us, as a Society, to put forth our best efforts.

The discussions following will show more particularly the work of the Society for the year ending December, 1875.

JANUARY MEETING.

The January meeting of the Society was held in the rooms over Stroh & Roth's store, the 12th inst.

"Pruning Fruit Trees" was the subject for discussion.

CAPT. HATHAWAY, the essayist, was prevented by sickness from having an essay on that subject. The day being inclement, there was not a usual attendance. He said, however, he had trimmed old trees in March and June, and did not observe any difference in results, except the water-sprouts were more feeble on those pruned in June. He had noticed the flat-headed borers (*saperda*) in dying and decayed trees, but not in healthy ones.

DR. HAY inquired if the *saperda* sought places as high as the forks of the trees.

MR. HATHAWAY—They do.

MR. MCCUNE had not noticed them in sound, healthy trees.

MR. WHITAKER said the real seat of the flat-headed borer was on the sun-scalds; that young trees were liable to sun-scald from want of protecting foliage.

MR. GROVER—The less trimming, as a general rule, the better. The best time is after the trees have completed their terminal growth, usually in June.

MR. HAMMOND said frequently there were two growths, one in the latter part of the season. He inquired if the terminal growth is completed as early as June.

MR. GROVER admitted that there was, sometimes, a second growth as large as the first, but the natural habit of trees was to make but one growth, and then go into a state of rest till spring; the second growth does not leave the tree in a healthy condition. Winter pruning, he thought, hurt the trees.

MR. MCCUNE preferred to prune in February and March; limbs necessary to be taken off can then be seen best. He had not seen any difference in those pruned in March or June, except that those pruned in June were more apt to bleed. The sap blackens the bark by running down the tree, causing decay and rot.

MR. HATHAWAY—Sap oozing out causes borers to seek such places.

MR. MCCUNE—I never saw borers in healthy trees.

MR. B. G. GROVER—His experience was, that February and March was the best time—he had tried various modes. Where trees leaned, sun-scald was common; borers attacked the tree on the sun-scald. He recommended boards for trees exposed.

MR. MCCUNE said wounds made in pruning would heal quicker by sawing close to the tree; he also mentioned his young trees, set out two years since, as not doing well. Others concurred in the poor success of trees set out then.

A recess was taken to test fruits laid on the table by members. President HAMMOND had a number of very fine-flavored apples. A very fine Lady's Sweeting from the orchard of W. F. BARNES. Cider and vinegar on the table were not reported to the Secretary.

Agricultural papers were laid on the table and distributed to members. Also the November and December report of the Agricultural Department.

The President presented a communication from the President of the Iowa State Horticultural Society, inviting this Society to attend the annual meeting to be held next week, in Burlington.

The meeting adjourned to meet at the same place, the first Tuesday of February, when the diploma and silver medal awarded this Society at the State Fair will be exhibited to the meeting.

FEBRUARY MEETING.

The February meeting was held in Warsaw on the 2d instant. The usual papers were laid on the table, and also apples and cider by President HAMMOND, wine by WM. BAUDER, cuttings from fruit trees by Messrs. ANDRUS, SPITZE and WHITAKER, showing but few live fruit buds.

Dr. HAY presented the medal and diploma awarded the Society at the State Fair for the best collection of fruits exhibited. The medal is inscribed with the name of the Society and the award for which given.

On motion of J. S. JOHNSON, it was ordered that the Treasurer have the diploma framed and presented at the next meeting.

The following interesting communication from W. O. HOFF, Wataga, Knox county, Illinois, was read, and ordered printed with the discussions. It will be seen that Mr. HOFF does not claim that his list of fruit would exactly suit this or any other locality. Yet all the varieties named are grown here, and most of them among our standard fruits. The communication is valuable to fruit growers, as to varieties and their adaptation:

* * * "My experience with fruit and fruit trees, which you referred to, is small compared with John R. Tull's. In fact, I am indebted to him to a great extent for many of the practical ideas that have been of use to me.

"Hancock county seems like home to me. The first practical efforts I made in horticultural pursuits were there—now over sixteen years ago. Being acquainted with all your localities, I am, and shall continue to be, specially interested in your horticultural record and efforts.

"I have planted, and owned in part, three pear orchards of about one thousand trees, in different localities; have seen them grow up to be beautiful trees, and then as beautifully vanish away.

"I think Dr. Hull's method of root-pruning is one of the surest ways of saving the life of the tree; but I am persuaded to believe that the Pacific Railroad will furnish a more practical and constant source of supply of pears, especially if we can obtain a competing line to California. I would as soon tell a man to "go to Texas" as to advise him to plant a pear orchard for profit; and yet I have some trees almost perfect, bearing from year to year, of Clapp's Favorite, Howell, Flemish Beauty, Louise Bonne de Jersey, etc.

"The hard winter of 1872-73 has not changed the list of apples for hardiness; those varieties that had a record for hardiness for several decades before that winter may be considered as hardy still. The winter was exceptional, therefore a calamity—a disaster, against which no entirely safe preparation could be made, and to which we will ever be liable, though we may not ever experience the like again. Generally speaking, trees of all varieties, old and young, were more or less injured, though some

may live fifty years yet of imperfect life, and yield imperfect fruit, while the same trees might have lived seventy-five or eighty years with favorable circumstances, producing fruit in its best estate. Some few trees escaped injury; they were not always of the most hardy sorts either. Their preservation, in some cases, was due more to favorable growth and local influence than from any constitutional hardiness.

"I have several hundred young apple trees that are just commencing to bear, but would hardly dare to recommend any particular variety as a favorite; for what to me might be *par excellence*, to some one else might not be quite as good as a first-class potato. Yet, if a family desired a selection for table use, I would recommend choice eating apples, even if they did not bear so full, or regularly, or keep so long as some others of coarser grain; while, for general market, I would seek those varieties most hardy, and that would bear full, regular crops of large-sized, showy apples, and long keepers if for winter use. I would take coarse-grained apples for this purpose, provided there could be no fine-grained apples found to fill the bill. All large sized and late keeping apples are more or less tasteless, especially if they will keep for a year. "The best go first;" and, when these points are considered, I think each one in his own mind has already made selection of his favorites.

"No man would be wise to invest his capital as a dependence in a variety for market that was not quite sure of yielding an income. Other varieties might be used as a supplement. It has not been my intention to present a radical view, but rather to suggest the general principles that may be of use in every locality in making selections. The theory, the observation, the experience of no one man is sufficient to establish a rule for every latitude; and here will be observed the benefit of the association of different ideas and views—that by an interchange of these views we may learn tolerance, and obtain that width and depth of mind and heart that we are capable of.

"I might venture to mention some varieties that have been fruited for a long number of years in our locality, and are still in good request. The following is only a partial list. There are many others in bearing that have their special friends:

"*Summer Varieties.*—Red Astrachan, Early Harvest, Red June, Sweet Bough, Sweet June, Jersey Sweet, Early Strawberry, Summer Queen, Summer Rose, Summer Sweet Paradise, Golden Sweet.

"*Fall Varieties.*—Autumn Strawberry, Duchess of Oldenburg, Dyer, Maiden's Blush, Lowell, Knox County Rambo, Fall Wine, Fulton, Fameuse or Snow.

"*Winter Varieties.*—Jonathan, Domine, Yellow Bellflower, Yellow Newtown Pippin, Hays' Winter Wine, Kaighn's Spitzenberg, Esopus Spitzenberg, Seek-no-further, Smith's Cider, Tolman Sweet, Janet, Ben Davis, Northern Spy, Fallawater, Wagener, Lady Finger, R. I. Greening, Roman Stem, Westfield Seek-no-further, Ladies' Sweet, Winesap, Willow Twig, Eng. Golden Russet, King of Tompkins County, Newtown Spitzenberg, White Winter Pearmain, Peck's Pleasant, Baldwin, Stark, Green Sweet.

"The above list of varieties is not all recommended for any locality, and it contains only about half the varieties that have been fruited in different orchards here. The only object I have in presenting the above list is to show the need of system in selection for general planting. And this evil of an unending list can be remedied in part by organized effort.

"The Wythe apple is certainly worthy of a place among the good apples. In eating I noticed the aroma you mentioned."

DR. HAY thought the experience in Mr. Hoff's locality differed some from ours. Yellow Bellflower, Red June and Spitzenberg did not do so well here.

PRESIDENT HAMMOND mentioned that White Winter Pearmain, Lady Finger, Kaighn's Spitzenberg, Yellow Newtown Pippin, Tolman Sweet, etc., are not doing well in this locality.

J. P. WALKER—There are other kinds not so well adapted to our bluff soils as to the black soils of the prairie.

DR. HAY said that experience had proved that some varieties had proved best on our bluffs, while others had done best on the prairies.

MR. WALKER said the Red June was a good bearer, but was small and not marketable.

MR. HAMMOND—Don't the apples scab?

MR. WALKER—They do not with me.

MR. HATHAWAY—Young trees manured produce large fruit.

MR. HAMMOND said the Red June was furnished with numerous fibrous roots, hence manures had a more immediate effect with this tree, while with the Bellflower the roots run farther.

MR. SPITZE—If Red June trees are mulched and properly managed they produce good apples.

MR. JOHNSON had seen fine specimens in this locality.

MR. HOFF's communication was referred to a committee of Messrs. Spitze, Hathaway and Hammond, for subsequent report.

PRESIDENT HAMMOND said he would plant three or four hundred apple trees in the spring for profit, and wanted the members to tell him what to plant.

Of course the members took pity on him; he has three or four thousand trees in bearing, and his experience was so limited in horticulture, it was unanimously agreed to advise him. He was also referred to the forthcoming essay on that subject at the next regular meeting, when the point in question comes up for discussion.

MR. JOHNSON inquired, what of the Wythe apple?

PRESIDENT HAMMOND gave its history. Last season the original tree bore thirty bushels. It is a late bloomer, the fruit a good keeper, and first rate apple.

DR. HAY wanted to know the experiences had with the Rambo, Pryor's Red and Red Astrachan.

MR. WALKER said, in his father's old orchard Rambo did well for eight or ten years; as the trees got old, the fruit was smaller, and there was a tendency in trees to decay.

J. S. JOHNSON said that his Pryor's Red and Rambo trees, planted in 1859, had a tendency to die out and drop their apples.

PRESIDENT HAMMOND—Red Astrachan bears only every other year; fruit tender in handling, salable and profitable. Sops of Wine was a good early apple. Pryor's Red had not done well with him; the trees were injured by the cold winter.

MR. HATHAWAY spoke of trees of twenty years old being in their prime.

MR. SPITZE would have to replant many trees which are decaying in the heart; Rambo, Fallawater, Fulton, and others, being more or less affected.

MR. JOHNSON—When is the best time to prune apple trees?

MR. HATHAWAY—Any time up to June 20th; rubbing off the water-sprouts two inches long is a good way.

MR. SPITZE—June is as good as any time.

MR. WALKER said it was a saving of labor to rub off the water-sprouts.

MR. HATHAWAY—The sprouts decrease in proportion to being annually removed.

MR. WALKER said sprouts abstracted strength from the tree and fruit; they will never cease to grow: the best plan is to rub them off when young.

MR. JOHNSON—Will it answer to trim hedges in winter?

MR. WALKER had done so with old hedges, with good results.

MR. JOHNSON asked the question for information. If winter time would do, time and labor could be saved; he had trimmed in summer five feet high on the sides, then hacked the canes, and bent down to make a tight hedge. He had tried some without clipping, simply hacking the canes, then running over with a log; the last mode does not make as good a hedge as that with which more pains is taken. When the top is all pruned off the hedge don't do as well. He had made other experiments with hedges with varying results.

MR. HAMMOND had trimmed at all times of the year; he was having it done now; he cut the old wood in winter and the new in June; he aims to keep the hedge in proper symmetrical shape, the beauty of a hedge being no inconsiderable item. Ornamentation is easily promoted in pruning.

MR. HATHAWAY agreed with the old adage, "Prune in winter for wood, in summer for hedge."

MR. WALKER favored winter trimming, when the sap was dormant.

MR. JOHNSON thought winter best, for the reasons stated; besides, there was more time, and labor was cheaper. He wished to inquire what kind of evergreens are best for ornamentation and protection.

DR. HAY said Austrian pine and Norway spruce.

Some one asked, what about pruning evergreens?

DR. HAY did not favor pruning any.

MR. JOHNSON spoke of ornamentation; thought trimming improved the looks of evergreens; geometrical figures set them off, and helped to

beautify the scenery; could not agree with the Doctor about not trimming any. Some persons did not like to have their hair cut; long untrimmed hair is unbecoming; cutting it improves the looks. So with hedges and evergreens; trimming ornaments and improves their looks.

MR. SPITZE—Evergreens sometimes die from pruning; the ground under them should be shaded.

MR. HATHAWAY—It is best to follow nature; evergreens shade themselves in their native forests, the superabundance of limbs die and drop off; in their cultivation the roots should be mulched or shaded.

MR. ELDER spoke of the beautiful appearance of evergreens, especially in the winter, when the eye was relieved by the dark green mantle of foliage so grateful in contrast with the nakedness of winter. To his fancy, trimming them in shape improved their appearance. He instanced some yards ornamented with evergreens, and commended the planting of evergreens.

MR. JOHNSON instanced several farms where evergreens enhanced the value and beauty of the surroundings; his mode of trimming was to trim in pyramidal form.

MR. HAMMOND would recommend first Norway spruce; it is easily transplanted, and should never be pruned. Next, Scotch pine. Arbor-vitæ without pruning is shabby, with pruning it is one of the most beautiful things in nature. The European larch he also commended.

ISAAC BLISS spoke of the benefits of evergreens; of their ornamental character. He did not favor trimming them; he said let them go, and recommended the Austrian and Scotch pines and balsam fir. He thought of surrounding his place with them for protection against the bleakness of wintry winds, as well as for their economic and ornamental benefits.

MR. BLISS inquired what is the proper distance to set evergreens for a hedge?

MR. HATHAWAY had seen arbor-vitæ hedges set sixteen inches apart in the cemetery.

MR. HAMMOND recommended Norway spruce for wind-break; for screen or low hedge, arbor-vitæ.

MR. WALKER was not in favor of trimming out the lower branches.

DR. HOLLOWBUSH was on docket for an essay on "Supply and Demand," but was absent. Several speakers recommended international conventions for considering and regulating supply and demand.

The subject of the influence of forests upon rain-fall was discussed, most of the speakers conceding that forests increased rain-fall, and

especially had a favorable influence upon its distribution. Some predicted famines in future ages, unless the destruction of forests is arrested, or tree planting engaged in.

MARCH MEETING.

The meeting for March was held in Warsaw, in the rooms of Col. MARSH, on the 9th inst., J. L. PIGGOTT, Esq., presiding.

The usual papers of correspondence were laid on the table. The diploma awarded the Society at the State Fair was presented by Dr. HAY, Treasurer, neatly framed.

About a dozen packages of seeds and grain from the Department of Agriculture were laid before the meeting and subsequently distributed among the members; also the annual report of the State Board of Agriculture, and reports of the State University at Champaign; seed catalogues and other papers and reports were distributed.

Apples of different varieties were laid on the table, by President HAMMOND, and Messrs. WILLIS, MCCUNE, HATHAWAY, SPITZE and DARNELL. A new apple from Mr. DARNELL promises to attract attention from fruit growers. It is already suggested that this apple will find a place at the head of the list for a market apple. A fine specimen of the Fallawater, from Mr. SPITZE, in sound condition, proved that this apple keeps longer than has generally been accorded to it. Grapes—Ives Seedling, from Dr. LYONS—very nice and in excellent condition. Wine and cider by Mr. WILLIS and others.

PRESIDENT HAMMOND was then called upon for an essay on Commercial Fruits, and read the following before the meeting:

COMMERCIAL FRUITS.

There is no department in rural life in which there are so many unsettled questions as in that of horticulture. Many of these questions are of vital importance to our success in business, and we have earnestly sought their solution, but as yet both the men of great scientific attainment and vast practical knowledge have been unable to answer them.

If I had been asked ten years ago to write an essay on this subject, I should have felt that I was master of the subject, and considered it an easy task. But during that time I have learned some valuable lessons. Floods and droughts have visited us; we have endured extremes of heat and cold fearful to contemplate, and insects and diseases heretofore unknown are now at home in our orchards. In addition to all these

drawbacks, some of our popular varieties are in danger of losing their reputation, and will be bought sparingly by our home dealers next season. I shall, therefore, be compelled to approach the subject with caution and treat it in a less positive manner than I should have done at that time.

Apples.—The only summer varieties that I should plant would be Early Harvest, Red Astrachan, and perhaps, after further trial, Sops of Wine. The Early Harvest is unproductive and subject to scab, but should be cultivated in a small way on account of its earliness. Red Astrachan is reasonably productive, a large, beautiful fruit, but transient in character, and requires careful handling. It is our most profitable summer apple. Sops of Wine is a large, attractive apple, and bears rough handling remarkably well, but is only second rate in quality.

Maiden's Blush comes nearer to perfection in both tree and fruit than any thing with which I am acquainted; the tree is, however, short-lived —twenty to twenty-five years being about the limit of its profitable life. I would plant no other fall variety.

Ben Davis has for several years been our leading winter variety, and has been large and handsome, but of such poor quality that consumers are beginning to avoid it. It has also, during the past winter, failed to sustain its reputation for keeping, and dealers who held them for the spring trade have lost heavily. This apple has probably reached the zenith of its popularity, and the time may not be far distant when it will be as unsalable as the Romanite.

Willow Twig is another prominent candidate for public favor, but the tree is only a biennial bearer, and is subject to blight; the fruit often scabs and is unattractive in appearance. It is not altogether satisfactory.

Winesap was at one time our most popular apple, but of late it has suffered from spur-blight, which has seriously injured its productiveness; the fruit also scabs badly, and as the tree grows old it becomes too small for market.

Rawles' Janet also has its imperfections, among which are its habits of bearing only alternate years, scabbing and cracking in wet seasons, and the small size of the fruit.

Pryor's Red is a strong, hardy, rapid growing tree, and is about the only one of a hundred varieties in my orchard that passed through the winter of 1872–73 uninjured. The fruit is best in quality, of good size, and handles and keeps well. The tree does not appear to be adapted to our black prairie soil, and is tardy in coming into bearing under all circumstances. In my own orchard they have, at eighteen years of age, produced very little fruit, while Mr. McCune finds them, at twenty-eight years of age, his most profitable trees. The man who plants for posterity should plant Pryor's Red.

Red Canada is another apple of good size and appearance, and the best quality, but drops badly from the tree, and must be marketed in the fall.

Hubbardson's Nonsuch is one of the few eastern varieties that succeed better west than on its native soil. It is good in quality and always large and handsome, but the same objections apply as to the Red Canada.

But, asks the seeker after knowledge, if so many objections may be urged against these standard varieties, where shall we find perfection, and what shall we plant? In reply to the first question, we say perfection will never be found in this imperfect world; and to the second, plant them all, but with the expectation of meeting many obstacles, and suffering many failures and disappointments.

The experience of another year has confirmed the good opinion heretofore entertained of the Wythe, and if the trees could be procured I should plant quite a number this spring.

There are other varieties that, under certain conditions, on peculiar soil, or with special culture, may be made profitable, but time will not permit of even a reference to them at this time.

Peaches.—It has been practically demonstrated that we can make peach growing a success by planting varieties to the "manor born." And fortunately we have a number of varieties that are in no way inferior to the best of those named and described by horticultural writers, and giving a succession from the last of July to the first of November. Perhaps this Society has been derelict in duty in not naming and describing some of the most valuable of these peaches. Is not here an opportunity offered for some of the local nursery-men to attain fame and fortune?

Pears.—Commercial pear growing is now scarcely thought of, but it is not wise to abandon the cultivation of this fruit altogether. By a judicious selection of varieties, and special culture, we may in time partially succeed.

Cherries.—We have no reliable cherry but the Early May, and the expense of gathering absorbs too much of the profits. It will not pay to grow them in commercial quantities.

Plums.—It has been found practically impossible to successfully resist the ravages of the curculio; plum growing has, therefore, been almost abandoned. I believe, however, that by patience and perseverance we may finally succeed with some of our native varieties.

But the question may be asked, should we, under any circumstances, recommend the planting of commercial orchards? Are not the drawbacks greater than the incentives? In view of the experience of the last few years, may we not conclude that a general system of farming will, taking a series of years, be more profitable than fruit growing? We unhesitatingly reply that the man of skill, and patience, and indomitable will, who makes horticulture a specialty, may expect to succeed; but the ordinary farmer who plants a commercial orchard, with the expectation of profit, will probably be disappointed.

The exceptional crop of last year, when almost every thing in the shape of a fruit tree produced heavily, will probably stimulate excessive planting by unprofessionals, and the result will be, in many cases, a lamentable failure.

Capt. Hathaway said that the essay had rather a dark outlook for us.

DR. LYONS said Benoni, not mentioned in the essay, was a good apple, better than the Maiden's Blush.

Several members spoke of the importance of utilizing fruits by drying and making cider.

PRESIDENT PIGGOTT spoke of some excellent cider from Winesap apples, and remarked that if the same pains was taken as with wine we might have better cider.

MR. WILLIS said he had no secrets about his mode of treatment, and described his process; good, sound apples was the first prerequisite.

THE CHAIR announced a recess; when the apples, cider, wine, etc., etc., were duly tested.

The meeting was then called to order, when the CHAIR announced the subject of, "The proper size for Apple Barrels," and stated that the Quincy Society had adopted two and a half bushels as a standard, and asked the action of this Society on the subject.

PRESIDENT HAMMOND gave his views favoring that standard.

After further discussion, upon motion of JOHN S. JOHNSON, two and a half bushels was adopted as the standard for apple barrels.

The following preamble and resolution, by President HAMMOND, were adopted:

WHEREAS, We have been informed that the office of State Entomologist is about to become vacant, and realizing the importance of having the position filled by a man who combines scientific and practical knowledge with executive ability; therefore be it, by the Warsaw Horticultural Society,

Resolved, That his Excellency, Gov. Beveridge, be requested to appoint to that office Dr. E. S. HULL, of Alton; as we know of no other man whose researches and reports would be of such practical value to the agriculturists and horticulturists of the State.

On motion, the meeting adjourned to meet at Hamilton, the second Tuesday in April.

APRIL MEETING.

The April meeting was held in the City Hall at Hamilton, J. L. PIGGOTT presiding.

The usual papers were laid on the table and distributed. A communication from W. H. SCHUYLER was read, which treated on utilizing fruits by the Alden process, which elicited an increased interest in the subject of dried fruits. Samples of dried fruits from Mr. SCHUYLER were exhibited, which were perfect—without a chance of improvement. Green corn, cured in the ear, was among the samples.

Varieties of apples were on the table from L. CALKINS, 'Squire RUGGLES, Dr. HAY and others. Winesaps from Mr. BOLT, near Lima, were noted for their size and high color.

MR. GREGG spoke of the injury to nursery stock caused by the extreme dryness of the ground.

DR. LYONS corroborated; said the surface fibrous roots of grapes were injured.

MR. WILLIS said raspberries and strawberries appear to be sound; dwarf pears and young trees injured; currants, gooseberries and plums were injured. He did not think frost alone had caused the injury; the conditions of the atmosphere and the extreme dryness of the soil were the causes.

MR. HATHAWAY—Frost took out the moisture from the roots.

DR. TAYLOR was called on for his views as to the theory to account for the disasters to the wheat and the young trees. He said that Mr. WILLIS had given his views; the ground, being very dry, absorbed moisture from the roots, leaving them in this condition subjected to long continued cold; also the freezing, extending deep, may have deprived the roots of the necessary sustenance, chemically considered, which is necessary to sustain vitality.

DR. LYONS and Mr. DARNALL thought that the amount of wheat killed would equal an area of one hundred miles north and south, by fifty to eighty east and west.

The citizens of Hamilton did themselves credit in furnishing their spacious hall with ample accommodations for the Society's meeting, as also in the generous lunch furnished to the meeting.

There were other subjects spoken of and discussed, interesting to local fruit growers and farmers, among which was the statement that the chinch-bug was considered nearly all killed; also the codling-moth. Mr. WILLIS said out of five hundred he had examined he had found but one live one.

On motion the meeting adjourned to meet at G. P. WALKER'S, the second Tuesday in May.

MAY MEETING.

The meeting for May was held at the residence of Mr. G. P. WALKER, the 11th inst., President HAMMOND in the chair.

The following papers were laid on the table and distributed: Reports of the Agricultural Department, *Prairie Farmer*, *Colman's Rural*

World, Galena Advertiser, Colorado Farmer, Western Agriculturist, California Farmer; also apples by HAMMOND, CALKINS, HATHAWAY and MCCUNE, among which Lady's Sweeting, Canada Red, Wythe, Ben Davis, Pryor's Red and others were noted for their sound condition, size and excellence; also cider of harmless qualities, very pleasant.

The minutes of last meeting were approved.

MR. W. N. GROVER announced the death of Mr. CHARLES WILLIS, a member of this Society, and spoke of the deceased as one of its most efficient members, in precept and example. At the close of his remarks he offered resolutions, pending the adoption of which several of the members, among whom were Dr. HOLLOWBUSH, Messrs. PIGGOTT, TAYLOR, B. G. GROVER, HATHAWAY and WHITAKER, added their testimony to the moral worth, industry and efficient labors of the deceased.

The appropriate resolutions adopted upon the occasion corresponded with the sentiments of the preamble.

ESQ. PIGGOTT, the essayist, said he had not had time to commit his thoughts to paper, on account of pressing duties and the funeral of Mr. WILLIS. He was more and more convinced that land, continually taxed with heavy crops taken from it, required fertilizing. The idea that our soils are inexhaustible must be given up; the application of manure, clovering, grass, and some system of rotation, were among the modes recommended. With him corn and hay were the most profitable crops.

MR. GROVER inquired of him what was a full yield of corn.

The answer was sixty, while the general average was thirty.

The discussion, by Messrs. GROVER and PIGGOTT, took a general range upon practical agriculture, when Mr. HATHAWAY made the following remarks:

At our last three monthly meetings the subjects for discussion have been virtually ignored. A great variety of subjects were broached, interesting and more or less profitable no doubt, but I think we should first dispose of the subject set for the meeting especially.

Now, I think that we need not go for commercial fertilizers for our county; clover and salt are all we need to make our soil as rich as we desire. Sow clover on our winter wheat in the early spring, say March, with one bushel of salt to the acre, and three months after the wheat is harvested you have an abundant crop of grass to turn under, that will fit your land for a good crop of corn, if you choose, or any other crop you may desire the next season. By this process you not only keep up, but increase the fertility of your land.

One word for clover—it being a perennial, with a strong tap-root penetrating deep into the soil, decaying leaves a hole by which light,

heat and water, three necessary essentials to vegetable growth, are freely admitted into the soil; no other cereal has the same fertilizing properties.

Salt, at this distance from the ocean, is our most available as well as economical fertilizer for all kinds of fruit trees. Nothing so stimulates a rapid and healthful growth, besides being destructive to insects in the larval state, especially our plum destroyer, the curculio. For grass also, two or three bushels to the acre has proved equal to a fair top-dressing of barn-yard manure.

MR. MCCUNE inquired of Capt. HATHAWAY how high clover would be at the time of turning it under the first year?

MR. HATHAWAY—About six inches.

MR. MCCUNE thought that it would not amount to much as a fertilizer till the second year.

MR. GROVER—Clover mellows the land and is a subsoiler. Rotation may produce favorable results; five years is too long to keep land in pasture. Selling hay exhausts the land; feeding it on the farm is very different. I don't want to be understood as saying that any land will not deteriorate; land will wear out unless renewed.

MR. HATHAWAY—Meadow land will not fail if the aftermath is left on.

MR. GROVER—The crop taken off tends to impoverish; vegetation of any kind has the tendency to enrich, if left on the land or restored to it.

MR. HOLLOWBUSH—Land needs rest; when so treated it has the inherent properties of recuperation. Clover is one of the best fertilizers.

The benefit of mulching was brought up by several of the members. It was claimed that mulching, rest and exclusion from light enriched land.

DR. TAYLOR said that such a covering prevents in a measure excessive exhalations of moisture, which would allow the gasses to escape which accumulate beneath the mulch, and promote the decomposition of vegetable matter.

The utility of salt suggested by Capt. HATHAWAY was questioned.

DR. HOLLOWBUSH said the soda remaining might, to some extent, have a beneficial effect, the hydrochloric acid and chlorine would be given off in gasses.

MR. CALKINS—Is it best to put manure on meadows or on plowed lands?

MR. GROVER said the most perceptible benefit was on meadows.

Several gentlemen testified to the benefits of top-dressing grass land with manure.

THE PRESIDENT inquired what per cent. of the usual amount of bloom the apple trees showed.

MESSRS. MCCUNE and GROVER thought there was as much as last year in their orchards.

MR. WALKER thought there was more than last year in his orchard.

MESSRS. HAMMOND, HATHAWAY, WHITAKER, WINANS, and others, reported about an average, while Messrs. ELDER and CALKINS had not an average amount of bloom.

From the general testimony, it appeared that the apple bloom is nearly as good as last year; early cherries showed very little bloom; peaches bloom sparsely, and plums and pears indifferently.

By invitation the company looked through Mr. WALKER'S orchard, which showed a large average of bloom. His Hale's Early peaches had some good-looking blooms.

A sumptuous dinner, with the unremitting attentions of the host and hostess to make all enjoy the occasion, added another evidence to the social feature of the Society's meetings, and which was suitably appreciated by the company present.

On motion, the meeting adjourned to meet on notice from the Secretary.

JUNE MEETING.

The June meeting was held the 15th inst., at the residence of Mrs. WILLIS. President HAMMOND in the chair.

The table was graced with the emblems of love and innocence, in the tasteful bouquets of flowers, contributed by Miss WILLIS, Mrs. LYONS and Mrs. B. E. SLATTERY.

The present meeting, having been appointed in the life-time of Mr. WILLIS, with his approval, Mrs. WILLIS and daughter wished to have the meeting held in accordance with the programme. In view of Mr. WILLIS having been an active member, foremost in aiding in every way to promote the interests of the Society, there was a unanimous feeling to manifest in some way the Society's high appreciation and cordial friendship to the family. Therefore, a resolution was unanimosly adopted making Mrs. SUSAN WILLIS a life member of the Society, with all its privileges. Subsequent to this action, Mrs. WILLIS, through Dr. TAYLOR, expressed her thanks for this evidence of the Society's esteem, and her intention of being an active member in endeavoring to promote its interest.

THE PRESIDENT called on Mr. GROVER for an essay on "Orchards," to which he responded, treating on orchards, their culture, treatment and adaptation. He reduced the varieties for commercial orchards down to four: Maiden's Blush, Ben Davis, Winesap and Rawle's Janet. The essay has not been furnished us for publication.

J. S. JOHNSON spoke of some kinds of trees being subject to sun-scald more than others. Winesap was mentioned. The leaning of the trees was the cause. Several said that the flat-headed borer never got into a tree till sun-scald invited him.

MR. GROVER believed in keeping trees healthy and vigorous; should be cultivated carefully for four or five years.

MR. PIGGOTT said hard-pan in the subsoil had much to do with unhealthy trees. Grass was poor on such soil, but trees were more or less affected by the extremes of the late winters.

Other remarks on the root-killing elicited the following from Mr. BROWN, a practical nursery-man: That one-year old trees were about all killed; two-years, one in twenty might grow, and of the three-year old one-fourth would live. He narrated his experience with root-killing of young trees the past winter. The extreme dryness of the ground, and absence of moisture from the atmosphere, connected with the peculiar conditions of the winter, seemed to be the causes, and yet in the same rows, or an adjoining row, some trees were uninjured, apparently, while others were dead in the roots, the tops invariably being uninjured; in depressions in the ground the trees were less injured.

MR. GREGG said the nursery-man had done what he thought was right; he had not shrunk from making known that his stock was mostly killed, while others were claiming to be all right. The injury was not realized at first. He mentioned a load of trees from a distance on the way to Missouri that were all dead, but the fact was not discovered till they got to Hamilton.

W. N. GROVER—Is it the best policy to wait for a new quantity of trees for future planting, or plant the injured ones?

THE PRESIDENT and Messrs. TAYLOR, PIGGOTT and GROVER expressed the opinion that it is a wiser course to wait for trees to grow, rather than plant those now in nurseries.

The injury to orchard trees was spoken of by members generally as in many instances more or less effected by the extremes of the past few years.

It was conceded that there was, in the spring, ninety per cent. of the average apple blossom, and the fruit set moderately well; but "Oh!

what a falling off, my countrymen," of the apples! Aside from the Ben Davis, which is reported half a crop, one-tenth of a yield only is anticipated.

It was stated that the root-killing has prevailed on peach trees extensively.

MR. CALKINS, just returned from Nebraska, presented a bottle of the destructive grasshoppers, alive, and longing for liberty. They were examined with much interest by all. There were several admonitions: "*don't let them out!*" Indeed, they looked guilty.

MR. WALKER presented a communication from the State Entomologist, on the subject of injurious insects, which elicited some discussion.

MESSRS. WALKER, PIGGOTT and CALKINS were appointed a committee to represent the conditions of insects in this locality, and report to the State Entomologist. There were other interesting questions before the meeting, of which the limits assigned prevent notice.

Potato-bugs are scarce in comparison to last year, and chinch-bugs are also less numerous.

The thanks of the Society were voted to Mrs. WILLIS and daughter for the sumptuous entertainment given, consisting of a great variety of the good things of this life, mingled with unfeigned hospitality. Lastly came the good wine and cider, which, as at the marriage in Cana of Galilee, was saved to the last. Its quality was unsurpassed.

JULY MEETING.

At the July meeting, held at the house of Messrs. DADANT & SON, extensive bee-keepers near Hamilton, President HAMMOND was in the chair.

Apples of last year's growth and samples of Early Harvests were on the tables, presented by Capt. HATHAWAY; samples of McCormick Raspberries also, by Mr. DENNIS.

MR. GREGG was on the books for an essay, which he read, confining himself mostly to the subject of small fruits. He said he had grown some very small, as his neighbors could testify. He spoke of raspberries and strawberries as paying crops; that the labor incident to corn culture was all that was required to attain a yield of one hundred bushels to the acre at the second year's growth.

MR. DENNIS said that the McCormick (Mam. Cluster or Miami) was more profitable variety than Ohio Everbearing, ripening its fruit more uniformly. He sustained Mr. CREGG's estimate of the yield.

MR. PORTER said some of his plants, upon gravelly bottom-land, had frozen out, while those on clay soil were in fair condition. He preferred the McCormick.

MR. GREGG said different varieties require different treatment; he also spoke of shortening in the canes when two and a half feet high; they would then branch out and yield double the quantity of fruit.

MR. HATHAWAY favored a timbered soil, rich in vegetable mold, for raspberries.

MR. J. T. JOHNSON spoke of horticulture in relation to the farm. That too much general farming interfered with success in any of the small fruit productions for profit; that for profit they must be made more of a speciality. He said peach trees in his locality were worse root-killed than in the prairie.

MR. DADANT invited the company down to the City of Bees, where, in a miniature city, its thousands of industrious workers gather the wasting sweets from nature's unlimited fields. Box after box was opened, showing the colonies at work, and the movable-comb system.

Much valuable information was gained by the members from the interesting remarks of the Messrs. DADANT.

It is inferred from what was learned, that two hundred stands of bees will find subsistence four miles apart. At this rate, eight hundred stands would find subsistence in one township, six miles square, and at a moderate estimate would store twenty-four thousand pounds of honey annually. Nine-tenths of this liberal provision in nature is lost, which the reflective reader will readily perceive might be secured for the comfort and happiness of the people; but some would say good-bye to the small fruits, if so many bees were kept. To the objection that bees injure fruits, it is alleged that they are a positive benefit, and do not puncture fruit, nor use it till punctured by other insects; they only use the wasting exudation, or feed where other causes have ruptured the skin and exposed the pulp.

MR. HATHAWAY inquired what plants and flowers were best for bees?

MR. DADANT said buckwheat, alsike and white clover, the linden, mustard and fruit blossoms generally. As to bees puncturing fruit, he said he had tempted them with grapes, which they never used unless first punctured.

MR. BROWN spoke of evergreens, stating that some varieties were injured the past winter.

MR. WALKER said we must bear in mind the two winters past have been unusual.

PRESIDENT HAMMOND said the mission of the Society was to encourage horticultural production among the people; that more evergreens should be planted for ornamentation; the Norway spruce was among the best; arbor-vitæ, although ragged naturally, bears shearing, and is ornamental.

Discussion on grapes was introduced. The Clinton was represented not doing well, while the Delaware was in the ascendant—diametrically opposite to former experience. Other varieties were generally doing well, with varying experience.

On motion, the meeting adjourned to meet at Mr. E. MCCUNE'S, at such time in August as may suit.

AUGUST MEETING.

At this meeting an essay was read by the Secretary, on the subject of "Fairs," giving a history of their rise and development, and showing their value in improving the live stock, implements, fruits, etc., of the agriculturists.

Quite a large assortment of apples was exhibited by different members, and ripe Ives' Seedling grapes by Dr. LYONS.

The summer apples exhibited were nearly or quite as fine as those of the same season last year.

Tomatoes, weighing one pound each, were exhibited by Mr. HOPPE.

The Secretary was instructed to make a collection of apples to compete for the $100 premium offered by the State Board of Agriculture.

The usual routine of distributing papers, partaking of a good dinner from a table tastefully decorated with flowers and loaded with good things for the inner-man, was passed through, with the usual general delight and satisfaction.

NOVEMBER MEETING.

The November meeting was held at Dr. HOLLOWBUSH'S office, the 16th inst. President HAMMOND in the chair.

Nineteen varieties of Siberian crab apples, from Hon. JOHN GRINNELL, of Iowa, (omitted at last meeting,) were laid on the table. Apples by Messrs. HAMMOND, GROVER, WALKER, HATHAWAY, and others, embracing standard market apples and some favorites for family use.

The meeting was called to order at 11 A. M.

DR. TAYLOR, who had been assigned the duty of preparing an essay on the "Advantages of Rural Life," was called on, and read the following essay:

THE ADVANTAGES AND DISADVANTAGES OF RURAL LIFE.

To write of country or rural life is to transcribe nature. The field for cultivation is extensive. Were the subject confined to the mere relation of money-making, we might narrow our vision and in a few moments write its history; but we desire the whole domain in which to roam. Nature is full of interest, knowledge, life and death; and the country is the place to find her out. If we desire to know man, we must daily walk with him; and so it is with Nature, we must be by her side, listening to her murmuring brooks, cascades and warbling songs. We must contemplate the wonders of the storm, and meditate in the solitude of the moon. We must examine the earth and penetrate its mysteries. Every thing that creeps, flies or swims, that grows or lies dormant, should attract our attention. There is nothing to be seen or heard but tells of the great advantages of study. We find locked in its own bosom the history of the earth. It relates a beautiful tale of the past; of the original elements; of plant and animal life; of convulsions and changes within, and flooding and disturbance without. Our minds are exalted with the mystery of the mountains, and the bursting forth of volcanoes fills us with awe. The power of the cyclone and the hand of lightning are written on every forest.

Plant life yields its secrets of growth and decay to the ruralist. He can command the violet, rose, vine and jassamine to unfold their structure and their requirements of growth. He may breathe their perfume and sip their life-giving properties. By the leaf, in early life, he may discern the qualities of the fruit, and know what kind of soil and climate is necessary for its production. The earth, in its life-giving properties, is made to reveal its secrets to him. Not only the elements may be told, but even the quantity necessary to plant-life.

The animal kingdom awakens in him a deep and profound emotion, for with it he is related and intensely interested. So closely is it allied to vegetable life, that it is almost impossible to draw the dividing line.

He may know that the life of the insect not discernible to the naked eye is essential and instructive, and plays its parts in the economy of the universe as much as the leviathan that plows the deep. Their structure, life, production and disease excite in him consideration and emotion. From the lower animals may be gained the most important facts in relation to ourselves. In the animal economy, as in the vegetable kingdom, are found many things in common. So strongly and strangely true is this, that there is a time in the embryonic period when it is impossible to state whether a snake or a chick, a Darwin or a monkey, is to spring forth. As in the growth of shrubs, physiology and chemistry have removed the vail of mystery that once hid from his view the growth of the animal. At an early period in life may be observed the marks of the Durham, Morgan and Merino, and their habits and requirements described with accuracy.

In the study of man he finds much to interest and instruct. His sociability, integrity, capacity and polish are constantly before him. In his rural capacity he may be surrounded with every thing that enlightens and ennobles the mind. In early morning the merry lark awakens him, and in the evening he is soothed to slumber by the nightingale and whip-poor-will. He has every thing in the height of perfection for the nourishment of body and mind. His food consists of fresh fruits, vegetables and meats, with a good well of sparkling spring water to slake his thirst. He is strengthened with the pure air of heaven by day and recuperates in it by night. In the sunlight he beholds his strength. Teachers, private and public, special and general, physical and metaphysical, may fill his library. And his leisure evenings and days should be given to acquiring a knowledge of them. He may marshal around him the bright lights of every age and profession. His mind may have the best training the masters afford. * * * * The sciences, arts and professions are laid before him. He may visit workshops and offices and penetrate into the halls of church and State.

It is the product of the soil that has built our cities, made our canals, caused our railroads to be built, telegraphs to be run, and ships to be constructed. The farming community is the nation's security. If properly conducted, agriculture is an exhaustless treasure; most other kinds of business are more or less dependent on it. The farm is a fixed home, eternal as the hills. Whether there be rising or falling in the market, it is still the home, and furnishes the comforts and necessaries for the fireside. The farmer can, with rare exceptions, raise every thing that is essential or desirable, so that he may truly be considered the most independent of business men. If we glance for a moment at the merchant, we find that he is dependent not on the amount of goods on hand, but on the profit and rapidity of his sales—he must sell to live. And the manufacturer must find sales with a margin, that his family may be supported. And so it is with every class that does not draw its supply directly from the soil. The learned professions are entirely dependent. The doctor, attorney and theologian must find patients, clients and followers, in order to furnish their table with the necessaries of life.

Farming is honorable and lucrative. The history of the world shows that it pays. Our own community proves it. Look at the substantial, and, in many instances, magnificent residences that stud the once wild prairie. In farming, man is necessarily confined to certain fixed and known laws. Speculation is scarcely known to the farmer; that belongs to men whose business is uncertain, who are dependent on the whims and fancies of the world, and is confined principally to men of rash and impetuous natures. So far as work is concerned, all men that succeed are hard workers, either by brain or hand, or both. They must show enthusiasm and love for their work. The man who plucks the luscious fruit, and he who saves his client from perishing, must labor earnestly. If the farmer thinks that mental exertion is easy, let him try to lift the load necessary to success.

Every trade, business and profession has its disadvantages, and rural life is not exempt. No matter what calling a man may choose, he will find drawbacks—times when every thing goes wrong. This is sometimes due to an interference with his plans by natural laws, but generally to a lack of knowledge. If a man persists that his farm needs no renewing, and is as rich and productive without as with fertilizers, he will meet with defeat. If twenty-five acres of grain is cut when ten is all that can be secured from storm, it is a disadvantage. And so if the corn crop can be increased from thirty, the average, to fifty bushels per acre by an outlay of one per cent. If the swine are allowed to burrow and wallow around the well, family and stock suffer. It is a disadvantage to have a greater supply than the demand calls for. Usually only a part of the country has a surplus, and, if the products be wisely stored, no disadvantage accrues. Millions more bushels of grain and fruits are used than forty years ago, and yet the demand is greater and prices higher. One can remember when a bushel of corn was not worth a shilling, and when homespun was the pride of the husbandman, and pork, hominy and beans his regular diet, and when he returned from market fifty miles away with a hand-basket of merchandise for his summer's labor. Those who consume the products of the farm are too far away, necessitating a loss through shipment. We have need of home manufactories and insurance companies. There is a lack of enterprise in calling in manufactories and artisans, thereby failing to increase the number of consumers that would otherwise be near, and sustaining a loss by being obliged to send grain and receive merchandise and implements by rail and boat.

Unfortunately, farmers are deprived of often meeting the man of science and attending with frequency our institutions of learning, of hearing the eloquent and learned in pulpit, college and state, and coming in contact with all kinds of business men. It is not common or convenient to meet in consultation in reference to crops, animals and the bearing of seasons. Storms of hail, wind and rain come when no mortal can set their time and place of birth, when many months' labor and hundreds of dollars are in an hour destroyed. The severe winters can not be moderated, and fruit trees and grain must perish in consequence. Extremes of

wet and dry are uncontrollable disadvantages. The weevil, beetle and grasshopper appear, and the field, beautiful to-day, is to-morrow desolate and dead; pestilence and death visit the stock; late and early frosts and disease may destroy grain and vegetables. So rural life has its thorns as well as roses, shade as well as sunshine, disaster as well as success. But with application, enthusiasm and energy success is certain, health is assured, and an honorable position attained.

W. N. GROVER criticised the essay as rather predominating in the poetical and imaginative. The latter part of the essay, treating on some of the backsets of the farmers' experiences, compensated somewhat for the flowery view taken. He would like to see it published. Mr. G. dwelt at some length, contrasting the conditions of rural with city life.

MR. HATHAWAY said there were two sides to the question. Happiness was not confined either to the city or country. Men leave the country and go to the city to acquire wealth, get rich, then go to the country for enjoyment. The business men of the city work more hours than those in the country. It was the disposition, talents and acquirements which conduced to happiness.

DR. HAY commended the essay. He agreed with Mr. Grover as to its poetical character. Unalloyed pleasure was not to be expected in any profession. He liked the view taken to have a good share of enthusiasm, and quoted Dr. Franklin's father, who constantly urged his sons to be diligent, "For he that is diligent in his calling shall stand before kings;" and Dr. Franklin fully illustrated the proverb. He said any man, with a good constitution and well-balanced mind, may attain respectability in any calling, but most men like to retire to the farm and mingle with the scenes of rural life—as Clay, Webster and others. The tendency to rush to the city is wrong; there is not as much enthusiasm in rural life as there should be.

MR. PIGGOTT admitted the essay was a little flowery, but what was any thing worth if not well executed and painted? To enjoy rural life it was not necessary to be rich. Intellect finds a congenial home on the farm; brain work is just as necessarily required on the farm as in commercial pursuits; he knew many cases where men commenced poor, without a dollar, that were now worth twenty or thirty thousand dollars, —it was brain work that had done it. Rural life affords the finest opportunities for the development of the man.

W. N. GROVER commended 'Squire Piggott's remarks, and said the prizes were few, but that a limited number reached the top.

PRESIDENT HAMMOND inquired if the *pro rata* of success were not in favor of those engaged in rural pursuits?

DR. HOLLOWBUSH said all conditions of life have some advantages or other; ruralists labor under disadvantages; they develope muscle—city and commercial pursuits, intellect. An education was an advantage in the commencement of any pursuit; he liked the country, had longed to be a farmer. There were many advantages for enjoyment in rural life. Almost every farm hand becomes the owner of a farm. There is no country equal to ours in inducements to young men for pecuniary success as well as elevating themselves socially.

MR. HATHAWAY said this country of all the world offered the best facilities to the farmer.

MR. HOLLOWBUSH admitted that the poor man in this country possessed the best advantages of any country in the world.

Delegates were appointed to attend the meeting of the State Horticultural Society, at Quincy, in December.

DECEMBER MEETING.

The December meeting was held at Dr. HOLLOWBUSH'S office, on the 11th instant, J. L. PIGGOTT in the chair.

The eleventh volume of the reports of the State Board of Agriculture was laid on the table, also the following papers: *Prairie Farmer, Colman's Rural World, California Farmer, Colorado Farmer and Western Farm Journal.* Varieties of apples, for exhibition at the State Society's meeting at Quincy, were also exhibited.

THE VICE-PRESIDENT called on Mr. HAMMOND for his address on the experience of the year. The address was listened to with marked attention, and, on the close of the reading, commended by Mr. GROVER and others.

The following is the substance of the address:

PRESIDENT HAMMOND'S ANNUAL ADDRESS.

About ten years ago, a dozen men who were more or less interested in horticulture, met at the residence of Prof. Worthen, and organized the Warsaw Horticultural Society. It was indeed "the day of small things;" our members were few and the fruit interest in its infancy, and

many were the predictions that it would die before the return of its first birthday. But, in spite of these evil predictions and the indifference manifested by some who should have stood shoulder to shoulder with us, and the almost entire lack of aid from other business interests, we have safely passed the dangers of childhood and youth, and stand in the full vigor of early manhood.

Perhaps we may, without egotism, speak of the work we have accomplished, and the success achieved; and, if the harvest has not been as bountiful as we hoped for, we may comfort ourselves with the reflection that we have sown some good seed, made many suggestions that prove to be of great value; and we confidently hope that the harvest is yet to come. Although we may feel gratified that much has been accomplished, yet, when we look forward to the work to be done, we are appalled at its magnitude and our lack of skill to perform it. The more we study and investigate, and strive to acquaint ourselves with the mysterious operations of nature, the less confidence we have in our own knowledge. The operation of this principle may be seen not only in the realms of horticulture, but in every branch of business. To illustrate: Said Hans to Pat, as they sat one evening by the railroad track, listening to the wind playing among the telegraph wires, causing that peculiar, solemn sound so often heard, "Do you hear the news whistling along?" Had these men been asked what they knew of the principle of telegraphy, or the science of electricity, they would have replied, "We know all about it; we have lived all our lives by the telegraph line, and seen the operator receive and dispatch messages a hundred times;" thus, in their ignorance and stupidity, supposing they had mastered a science which the greatest minds of the age have not yet been able to fully comprehend. Ask the boy upon the river-bank what he knows of the principle that propels the mighty steamer that daily sails past his father's house, and he will tell you he is thoroughly conversant with it; he has seen the water pumped into the boilers, and the fuel put into the furnace, and the delicate machinery in motion, and why should he not fully understand it? thus, in his blindness, supposing he had reached a point which Watts and Fulton vainly sought, by a life-time of diligent research.

So with the tyro of the pruning-knife. Ask him if he is thoroughly conversant with the art of horticulture, if he understands the conditions necessary to success, and can give you a list of trees that will be reliable for commercial purposes; and he will ask in amazement, "Have I not read all the standard authors, and attended the meetings of horticultural societies? Have I not visited many of our prominent horticulturists, witnessed their operations, sat by their firesides, and listened to the words of wisdom that fell from their lips? Strange it is that such questions should be asked."

He will glibly run over a list of fruits and tell you that Warder, Downing and Thomas recommend them; that the horticultural societies generally concur, and that from actual observation he knows they succeed in Mr. So-and-so's orchard, failing to remember that in other orchards they fail disastrously.

But the man who has given the subject attention and thought, and carefully studied and experimented, distrusts his own ability, and feels that he has only entered the vestibule of horticultural knowledge. What a field of research is before us! Why do certain varieties succeed in one orchard, and in a neighboring one fail? That there are certain partly understood conditions of cultivation and general management that will necessarily prevent the pear blight, no one doubts. Why have they not been fully determined? Who can explain why certain varieties of peaches reproduce themselves, while others fail to do so entirely? What are the deductions? Simply that there are certain conditions of soil, cultivation and growth that produce these varied results, and when we fully understand these we shall be on the high road to success.

Horticulture is both a science and an art. Science is knowledge arranged and so made available that it may be applied to useful purposes. Art is science harnessed to the various practical pursuits of life. The former is a creature of the head—"it teaches us to know;" the latter of the hand—"it teaches us to execute."

The mysteries of vegetable and insect life, with which we are surrounded, make the former absolutely necessary to our success. Nor can the latter be ignored with safety. It is therefore evident that the horticulturist must be both a scientific and practical man, or he will make a disastrous failure. Here the question arises, how can this science be attained? In no other way so readily as through the instrumentality of horticultural societies. Here our knowledge is thrown into a common stock, and we enjoy the benefit of the accumulated experience of the entire membership.

How to enlarge our borders, and increase our membership and usefulness, is a question that may well come before us for consideration. We have, it is true, achieved a position among our sister societies, of which we may well be proud, yet our membership has been mainly from the western portion of the county, while it should include many of the intelligent, cultured farmers, from all parts of the county. If they only knew—if we could only make them understand—that to make life pleasant for themselves and their families, and to cause their children to love their homes and be contented with rural life, they must not only give them all possible social and intellectual advantages, but make their homes neat and attractive by cultivating fruits in abundance, and trees and shrubs and flowers, they would realize the importance of the work in which we are engaged, and be more ready to give us their aid and influence.

In conclusion, it becomes my duty to pay a passing tribute to the memory of a faithful co-laborer, who, since our last annual meeting, has passed to the spirit land. We have lost a valued friend and co-worker, but his family have lost a loving husband and father, and to them we would extend our heartfelt sympathies.

Charles Willis died at his residence near Hamilton, on the 9th of May last, after a brief but painful illness. Mr. Willis was a man of earnest application, and untiring energy, and had by many years of experience

and careful observation gathered a vast store of practical knowledge, and was, therefore, one of our most valuable and highly esteemed members, and one whose loss will long be felt.

For the first time in the history of our Society our ranks have been broken by death, and while the All-wise Father has ordained that all men must die, and we therefore feel that it is in infinite wisdom, yet we instinctively shrink from the darkness that broods upon the mystic river, and feel that without a Divine Guide, we shall fail to moor our frail bark upon the stormless shore of the beautiful land that lies beyond. And while it is natural to hope that the messenger may not come, as it did to our brother, in the prime of manhood and the midst of usefulness, but only when the "almond tree shall flourish and the grasshopper become a burden," yet come when it may, may death be to us, as we believe it was to him, but the messenger that should summon us to a brighter and better world—to a land where the "wicked cease from troubling and the weary are at rest."

The Committee on Orchards made the following report:

REPORT OF THE ORCHARD COMMITTEE.

Your Committee on Orchards, after long silence, assume with some reluctance the duty of submitting a report on the subject assigned them. The members of this Society do not need to be reminded of the severe ordeal through which our orchards have passed during the past three or four years. To sum the matter up briefly, it may be said of orchard products that the years 1872 and 1874 were years of plenty, of both apples and peaches. In the former year, however, a very large portion of the fruit was scabby and wormy, but in the latter year, exceptionally sound and fair. In 1873 and 1875 the peach crop was an entire failure, and the apple crop very light, many large orchards hardly producing enough for family or home use. These alternate heavy and light crops are to a considerable extent due to the tendency of many fruit trees to overbear and then take a year of rest; but this tendency has been aggravated in our vicinity, by the exceptionally severe winters following each of the above mentioned years of full bearing. Many peach orchards have been nearly destroyed, and perhaps all badly injured. Apple trees have borne the trial better; but many orchards, particularly the older ones, make a sad showing of frost-split, sun-scalded trunks, and limbs broken by storms, and insect depredations. Nursery-stock has suffered perhaps worse than established orchards. Last spring it was almost impossible to get sound, healthy trees to plant. What shall be said for the future? It is bravest, and we trust you will say with us best, to look forward hopefully. Let us take care of such of our trees as are worth saving, dig up the dead and dying and unprofitable, and replant with healthy, well-tried varieties, and go on our way rejoicing in hope.

The fact that this Society has for the last two years taken the first premium for apples from our State Agricultural Society, has led orchard-

ists in other sections of the State to believe that we are either favored in locality, or zealous in our endeavors to raise good fruit. Whatever may be our own opinion upon the first proposition, our continuing in credit abroad will depend mainly upon the intelligence and persistence of our efforts to deserve the prominence that has been awarded us.

Will orcharding with us pay? Badly managed, no! Well managed, yes! All departments of life have their vicissitudes and reverses, against which no human foresight or prudence can protect, and the wisest efforts will sometimes end in shipwreck. The man for any business is the man who has faith in his business and in himself. If you have this double faith, hold on to your orchard and plant more trees; if you have it not, you have probably made a failure of it already.

We will not here discuss the question of varieties, but take occasion to state as a fact, that by general, indeed we may say by almost unanimous consent, the Ben Davis has established itself as our most popular winter apple among our apple dealers, and sells more readily and at higher prices than any other variety. It is also generally conceded to be among our very best producers, and is being much more largely planted than any other variety. It is but just, however, to add that we hear frequent doubts expressed of its continued popularity.

So far as can be judged from present appearances, the prospect for next year's crop is fair. Trees of all varieties which were sound and healthy have made a good growth and are well budded, and have gone into winter in satisfactory condition.

WM. N. GROVER,
A. C. HAMMOND, } *Committee.*
E. McCUNE,

THE CHAIRMAN then announced the election of officers for the ensuing year.

A. C. HAMMOND was elected for President by acclamation; J. L. PIGGOTT, in the same manner, for Vice-President; J. T. JOHNSON for Secretary, and Dr. HAY for Treasnrer.

On motion of W. N. GROVER, Messrs. HAMMOND, McCUNE and WALKER were constituted a standing Committee on Finance.

The first meeting for the ensuing year will be called by the Secretary, Mr. JOHNSON, when the standing committees will be appointed, and arrangements made for a programme of business.

JACKSONVILLE HORTICULTURAL SOCIETY.

OFFICERS FOR 1876.

President—JUDGE E. SCOTT, Jacksonville.
Vice-President—B. H. CHAPMAN, "
Cor. Sec'y—DR. H. W. MILLIGAN, "
Rec. Sec'y—A. L. HAY, "
Treasurer—MISS M. CATLIN, "

TRANSACTIONS FOR THE YEAR 1875,

PREPARED BY A. L. HAY, SECRETARY.

During the year just passed this Society has held meetings monthly, at which the different branches of horticulture have been discussed with interest and profit to its members.

The proceedings have been published by the press, and well distributed throughout the county, and the result may be seen in an increased planting of fruit, shade and ornamental trees and shrubs, a more careful selection of varieties, and more thorough cultivation.

The Society's library is gradually increasing, and at present contains about two hundred volumes of the most reliable horticultural and agricultural literature in the land.

Since the organization of the free reading-room, the Society has subscribed for a number of the leading horticultural publications, which,

together with the library, have been placed in the reading-room for the benefit of the public; and from the managers we learn that both the books and papers are read by many.

A very successful exhibition was held during the year; one result of which was to make the people better acquainted with the different varieties of fruits, the comparative merits of each, and their adaptation to cultivation in this climate.

During the summer of 1874, Messrs. Cassell & Goar, enterprising grocers of this place, offered a beautiful terra-cotta lawn vase as a premium for the best preserved five pounds of grapes, to be exhibited at the January meeting of the Society. Quite a number of entries were made, and Mr. B. H. CHAPMAN, of this city, was awarded the premium. He exhibited the Concord, Clinton, Isabella and Ionia; all of which were nearly as perfect in every particular as when taken from the vines. His process of preserving them is a very simple and inexpensive one, and I give it for the benefit of any who may wish to try it: "After carefully cutting well-developed and well-ripened bunches from the vines, and removing all imperfect fruit, if any, from the bunches, they were loosely packed in six-gallon stone jars, without other material. The jars were then sealed closely with paper, and placed in a cool situation until freezing weather, when they were removed to the upper part of the house and covered with loose material to prevent freezing; where they remained until wanted for exhibition." Grapes that had been kept in the ground had lost much of their flavor, and had decayed considerably.

MR. CHAPMAN is one of the most extensive and successful grape growers in the county, having nearly five acres of vines in bearing.

At this meeting he stated that he last year sold fifteen hundred pounds of Concords from one-third of an acre of land. His vines are set eight by ten feet apart, trained to wire trellis with posts forty feet apart. He fruits from three to five canes, about five feet long, renewing each year. He does but little summer pruning, thinking that a good growth of foliage protects the fruit from the ravages of birds, and from sun-scald, and that it is in other ways beneficial to the vine.

After trying many different varieties, he had discarded a great number as worthless, many others as unprofitable, and gives the Concord the first place in the list for profit, with Hartford, Ives, Delaware and Clinton to complete the catalogue. Mr. CHAPMAN had been attacked with "grape on the brain," but he thinks a little experience will effect a cure for most persons suffering from a like disease.

MR. MASON called the attention of the Society to the recommendation of some scientific vineyardist, to practice a thorough system of root-pruning the vine. He would not go under the ground for the purpose of doing good, it was contrary to nature.

PROF. TURNER would not follow nature's plans in the cultivation of the grape; nature's plan was to fruit the vine at from fifty to five hundred years of age, and he would not live to enjoy its fruits. He would cripple it, root and branch, and shorten its natural life, that he might reap the the benefit of his labors.

In regard to trimming, he was not so positive what course to pursue; his own vines he considered remarkably lazy, as they were crawling around over the ground wherever they chose.

MR. CHAPMAN would prefer two-year-old vines from cuttings, rather than layers, for setting; he would recommend the manufacture of pure, wholesome wines, for the purpose of superseding adulterated liquors as a beverage.

MR. MASON would feed grapes to hogs before he would mauufacture wine.

MR. COLLINS would can grapes the same as other fruit, and so dispose of an over-production; and, for general cultivation, would recommend the vines that give the highest yield.

A member presented several specimens of apples, attacked with the bitter rot, and asked for a remedy.

PROF. TURNER thought the disease was caused by the decay of the inner wood of the tree. He would not recommend setting a new orchard upon ground occupied by an old one, but would select a new site.

MR. BALDWIN exhibited a new apple—a seedling from the Rambo. It is much larger than the latter variety, somewhat similar in flavor, and of about the same season. The tree is perfectly hardy, fruits annually—bearing heavy crops—and is considered a great improvement over that old favorite. It originated with a Mr. Deploge, an old and highly respected citizen of this county, and, by request of the Society, he gave it the name of the Deploge's Seedling.

MR. RICE reported that trees of the Willow Twig and Orange apple were badly damaged by blight. He had learned from experience that it was profitable to cultivate young orchard trees.

MR. BALDWIN was a strong friend to the birds. His orchards had been stripped of their leaves by the leaf-roller, and he thought that a good supply of birds would prevent such depredations on the part of insects.

MR. KING was also a lover of the dear little birds; but he would prefer them dead and manufactured into food; they not only destroyed all his small fruit, but his apples and peaches.

MR. CHAPMAN would protect the birds, and encourage them by building nests for them.

MR. RICE had learned that the apple-tree borer was a regular bore, especially when he got to boring good trees. He had suffered considerable damage from borers, but had found that soft soap and sulphur, applied to the trunks of the trees, proved a preventive.

MR. BALDWIN exhibited three varieties of apples—Royal Red, Jersey Sweet, and a seedling; also a sweet apple, originated by J. B. Ketter, of this county, which, when compared with the two former varieties, was pronounced superior to either. The fruit is of medium size, color bright green, keeps until March. The tree is hardy, a good grower, bears good annual crops, and by the Society was considered a desirable addition to the list of sweet winter apples.

There are in this county a great many seedling fruits worthy of a more extended cultivation, yet they are unknown, except in the neighborhood where they originated. The reason to be given for this is that there were a great many farmers who settled in the county forty or fifty years ago, at a time when grafted fruits were comparatively unknown, who planted orchards of seedlings, and many of them have been growing seedlings ever since. They found the fruit good enough for their use, and occasionally succeeded in producing a variety superior to many of the leading ones of to-day. Of late years our local nursery-men have been grafting from the best of them, and sending the trees out under local names. In time, good reports will be heard from them, and they will be more thoroughly disseminated. This is not only true of apples, but peaches, grapes and small fruits of different kinds.

At the July meeting an exhibition of small fruits and vegetables attracted quite a number of people, and all were pleased with the collection of each.

MR. FRANK DOAM exhibited one of the largest cauliflowers ever seen in this market. It was the Half Early Paris variety, grown from seed sown March first, in hot-bed; plants set first week in April; land thoroughly prepared, with table-spoonful of bone-dust in each hill. The after cultivation was thorough, with occasional dustings of bone-dust laid in around the plants. Upon offering it for sale at the close of the meeting, and receiving a bid of five cents each, he declared that his ideas of

profit in the cultivation of the cauliflower for the Jacksonville market had experienced a decided change!

MR. R. H. ROBERTS exhibited one pint of cherry currants, for which he was offered $1.50 by some eastern tree peddlers present, who could not procure such specimens at home.

MR. TICKNOR exhibited the Turner Seedling, Miami, Golden Cap, Ohio Everbearing, Purple Dulcet, Philadelphia and Seneca raspberries. He considered the Seneca the best black-cap for general cultivation. He had sold seventy-five dollars' worth from a single row, ten rods long. He considered it superior to the other black-caps in size and flavor.

MR. BALDWIN would recommend the Davison's Thornless for cultivation in every family garden; with him it fruited heavily and a week or ten days earlier than any other variety he ever cultivated, which made it a leading market variety. Mr. Baldwin is the disseminator of the Turner, a red variety originating with Prof. Turner of this place. He and many others in this vicinity had been remarkably successful in its cultivation. It has proved much more hardy here than any other of the red sorts, much more prolific, and the fruit is firm enough to bear shipping to St. Louis or Chicago in good condition. He has fourteen acres now in bearing, and finds ready sale for all the fruit, by shipping to St. Louis, Peoria, Quincy and Springfield. He had never made a business of shipping to Chicago—not being able to make satisfactory arrangements with transportation companies.

A great objection to this berry, by some who had attempted its cultivation, was its remarkable tendency to throw up suckers. It is absolutely necessary that these be kept down, if a good crop of fruit is desired. This Mr. Baldwin does with a horse and plow; his plants were set eight feet apart one way, and allowed to run together in the rows; he then confines them to rows two feet wide at the base, and allows neither suckers, grass or weeds to grow between them.

Champaign Co. Horticultural Society.

REPORTED BY T. J. BEECHER, SECRETARY.

OFFICERS ELECTED IN MAY, 1875.

President—A. G. Howell.
Vice-President—F. F. Adams.
Secretary—T. J. Beecher.
Treasurer—S. Avery.

The Executive Committee consists of the President, Secretary, Mrs. Larned, Judge Cunningham, and Professor Burrill.

Meetings are held at the residences of members.*

JANUARY MEETING.

The meeting for January was held on the 30th inst., at the residence of S. Avery, Esq., in Champaign.

*Reports of but few meetings have been forwarded for publication. Doubtless, very many of the discussions of this Society, composed as it is of intelligent fruit growers, would be of interest to all readers living in the same latitude and on similar soils.

An excellent essay on "Bee-keeping," by J. G. Thompson, is omitted, inasmuch as it treats of the management of bees, and not upon honey-producing plants and their cultivation. Another article on "Horticultural Humbugs" shows up the tricks of tree peddlers, which have been often exposed in preceding volumes of reports of this Society.—Editor.

THE CULTURE OF THE POTATO

Being the subject for this meeting, Mr. BEECHER was called upon for his experience.

He said he had obtained the best results by plowing in the fall, and, as soon as the ground is in good condition in the spring, harrowing it well and laying off with a shovel-plow, and covering with the same—one furrow each side of the row—and rolling it down. As soon as the plants begin to make their appearance, he goes over them with a fine harrow, which kills all the small weeds; then works with a common corn-plow, and would work them quite often, especially if the weather was dry and the bugs troublesome, as the frequent working keeps the ground moist and knocks many of the young bugs off, and they are destroyed by the heat of the ground.

He does not practice the hilling-up process, but leaves them with the slight ridge thrown up by the plow, and thinks he gets better results than when hilled up by the hoe. If he had well-rotted manure, he would apply it in the fall before plowing, but would not use fresh manure if he could avoid it. He would prefer not to manure in the spring; but, if he did so, would apply it on the surface.

Being asked what varieties he considered best for cultivation, he said that for an early potato the Early Vermont was the best of any thing he had tried. It is very early, much better and more productive than Early Rose, which, by the way, is saying a good deal for it; but, as he raises them both, he ought to know. For a later potato the Compton's Surprise stands at the head of the list, as it is better in quality and nearly twice as productive as the Peachblow.

Excelsior is another potato of fine appearance; also the Peerless, which is one of the most productive and of very good quality—much better than when it was first introduced.

Of all the above and several other varieties, Mr. Beecher presented samples at the meeting.

In answer to a question by one of the members as to cutting potatoes for seed, he said if he had plenty of potatoes he would use the best for seed; but, if he was short of such, he would use such as he had, even quite small ones, but would not like to do that several years in succession. If seed was scarce, he would cut them in pieces of one eye each, and, if the price was very high—say one dollar per bushel—would even cut the

eyes into three or four pieces each, which can easily be done with a sharp knife, and they will all grow, and even pieces without eyes will sometimes grow and do well.

APRIL MEETING.

The meeting for April was held at the house of Mr. HENRY BEECHER, three miles south of Champaign.

At this meeting some time was devoted to the discussion of the fruit prospects for the coming season, which resulted in giving rather a discouraging outlook. Early May cherries were reported as being nearly all killed, and it is not probable that more than one-fourth of a crop will be realized. Blackberries are all killed, and some growers have plowed under their plantations.

MR. AVERY reported a few plants of the Snyder variety, growing on his place, to be in good condition. Raspberries were considerably damaged, especially on old plantations; young plants two or three years old, are not much injured. Pears were generally killed. No reports were made on strawberries, as the past two or three unfavorable seasons have greatly reduced the plantations in this locality, and the growers have but little heart to renew them. Peaches were all killed by the frosts in January. Apples were not, probably, much injured;* but, with this exception, our fruit prospects for the coming season are very meager.

An essay on "Bee-keeping" was read by Mr. J. G. THOMPSON, which was discussed at some length and ordered published.

On motion of Judge CUNNINGHAM, the following preamble and resolutions were unanimously adopted by the Society:

WHEREAS, Since our last meeting, one of our members and an ex-President of this Society, Hon. M. L. Dunlap, has been removed by death; therefore

Resolved, That in the death of Mr. Dunlap, this Society has lost one of its most active members, the science of horticulture a devoted follower and student, the farmer and agriculturist a zealous friend, the laboring man a staunch and constant defender, society an active and most useful member, the State a wise counsellor and statesman, and his family deprived of an affectionate husband and father.

Resolved, That we will cherish his memory, and endeavor to profit by his wise counsels, now hushed forever.

Very fine samples of French Breakfast radishes, and Boston Curled lettuce were presented by Mr. AVERY.

MR. CUNNINGHAM invited the Society to meet at his residence in May, which invitation was accepted.

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* A large portion of the apples dropped off when quite small.—EDITOR.

After adjournment came the usual closing scene of these friendly gatherings, in the form of a substantial repast, furnished by Mr. BEECHER and his excellent lady.

MAY MEETING.

The meeting in May was held at the residence of Judge CUNNINGHAM.

The officers for the ensuing year were elected at this meeting. See list above.

NOVEMBER MEETING.

The meeting was held at Mr. A. O. HOWELL'S residence on the 27th.

The routine business of the Society having been disposed of, Mr. THOMAS FRANKS read the following essay on

ORNAMENTAL HORTICULTURE.

The subject which has been assigned me is one which, viewed by different persons, would present as many varied aspects. One person's ideal would be grounds nicely graded and sodded, with a few good shade trees surrounding it, with perhaps an evergreen here and there by way of variety. This is certainly a very simple and effective way of disposing of your ornamental department, and is one that commends itself to every one, for it will require comparatively little after labor to keep it in order, and those whose time or taste will not allow them to spend much time or money, had better confine themselves to the above plan. This same plan must serve for the ground and frame work of the most elaborate gardens; for what would be the most gorgeous display of flowers, the chaste and elegant statuary and vases, the rippling stream or silvery lake, without the emerald green of the grass to relieve the eye, or the light and airy forms of trees and shrubs to ease and lighten the stiff and formal works of art which cast their shadows in the ever-changing waters? I say, without these two staunch friends it would be almost impossible to have gardens that we could admire without tiring the eye. It is therefore important that we have plenty of trees and grass; but how to dispose of the trees to the best advantage, and to derive the most pleasure from them, is not so easy a matter. This will require some study. A knowledge of their habits and colors at different seasons will materially aid you in arranging them in their proper places. And right here would be a good place to say a few words about planting. There seems to be but two prevailing ideas about the disposition of trees around the house and garden. They are either planted in straight rows or scattered promiscuously around the grounds. There are situations where two straight rows of trees have a

pleasing effect. They may form a vista, through which the eye may be directed to some special object in the distance, or at the termination of a long walk; the trees in this case bordering the same will make a pleasant shade in summer, and will be very grateful in our tropical months; but, as a general rule, they had better be avoided, or at any rate be used sparingly, for the same effect can be produced by planting in a more natural manner. Now for the other extreme. If straight rows are objectionable, I think the hap-hazard way of planting is intolerable. The first plan did show some attempt at art, though perhaps misdirected; but this is aimless and meaningless, and generally results in confusion and disappointment, and in a few years half of the trees have to be cut out, or the place becomes a wilderness.

Having shown you how not to plant, I will now state in general terms how to plant. To begin: I think shelter from the prevailing winds of the greatest importance, for I think, with a good belt of evergreens on the north and west sides of our gardens, we can then have many choice plants that would otherwise be too tender in our changeable climate. In planting these belts, they need not be one continuous line, but may be broken or undulating in their outlines. In planting these belts, or rather in arranging the stakes to represent the trees, it will require two persons—one with the stakes marked to represent the different trees, and the other to stand at the front door or principal front windows and direct the location of the trees: placing the tall-growing ones in the line of any object you may wish to shut out from view, always making the belt at that point wider and heavier, and planting dwarf trees and shrubs in places where you wish to leave a vista to some pleasing feature in the landscape. By this simple means you will produce a pleasing outline to your belt, shut out unpleasant objects, retain all that is desirable, and still have the benefit of its protection. This same plan should be adopted for planting on all sides—keeping the large trees well back at the sides and rear of the house, because large trees directly in front of a building have a tendency to make it look small, while at the sides and back, particularly where they tower above it, they appear to increase the height.

Having now, as it were, set your house in a beautiful frame-work of green, you may commence to put in the finer touches, the bright colors—the lights and shades of the true artist. The approach to the house is best not made directly in front, but at the corner or a little to one side. This allows of a gentle curve in the walk or drive, and clumps of choice shrubs or roses, single specimens of trees or beds of flowers, may be planted at intervals along the sides. If the surface of the ground is undulating, the walks may be made to wind around the knolls; and should it be necessary to cross a stream or valley, a rustic bridge is always a pleasing feature. These inequalities in the surface should be heightened by excavating the lower soil and removing to the higher ground. By this means a little labor on ground already broken will often make a bold and striking landscape. I would not recommend the moving of soil to produce a varied surface in our flat prairie grounds. The effect produced for the

amount of labor expended does not pay; we had better produce nearly the same effect by planting clumps of trees and shrubs of different heights. Where the grounds are large, I would plant from three to nine trees of one species, but different varieties in each clump. The effect is generally more pleasing than when there are so many different species together. There are some trees that always look best when standing by themselves. They have an individuality that prevents them from associating with their fellows. Such should always be assigned a prominent place, where they may be seen from all sides. Most of the trees with drooping heads are of this character, and many of our evergreens look best standing alone; their symmetrical forms then show to great advantage. I have dwelt on this part of my subject rather fully, because it is a very important one, and one on which the success of the ornamental garden depends. Besides, it is about the only part the male members of the household take any active part in; but if I can get them interested in this part of it, I have some hopes that they will not stop there.

It will be inferred from what has been said that there is something more wanted to complete our picture of "Ornamental Horticulture," and it is here that the ladies of our Society will be mostly interested. I refer to Floriculture. In this they have a wider scope than the mere tree-planter, for, besides lending their treasures to beautify the grounds during the summer, they still can have them during the winter to cheer and make home a very Eden. As it is now near winter, you will have planted your bulbs for next spring's flowering, such as hyacinths, tulips, etc. If you have not done so, there is yet time before it freezes up; no time should be lost to get them in. They are the sure harbingers of spring. A few planted in pots or baskets now will give you flowers before spring, if kept in a warm place. A few words of advice to you who are keeping pot-plants will not be out of place here. I find that the great trouble with ladies, in growing flowers in winter, is that they keep their plants, as a rule, too hot in the day, and not having a sufficiency of air they become drawn up or weak. A temperature between fifty and sixty degrees is about right for most plants. Give them all the sun you can at this time of the year, and not too much water. Keep clean from insects, and success will surely crown your efforts.

Perhaps the best plants for beautifying the garden during the summer and autumn months are annuals. Many of the hardiest of these may be sown on the spot where they are wanted to bloom. Care should be taken to thin out thoroughly, leaving plenty of room for each plant to develop itself perfectly. By this means you will obtain finer flowers than if left to grow without such care. The tall and stronger growers should be set back next to the fence or belts, the dwarf and delicate varieties coming to the front and around the house, where they may be easily seen. This rule will apply to all plants. A bed of mignonette near the house will always be appreciated for its delightful fragrance.

A knowledge of the habits of flowers will be indispensable to produce the best results. Some plants require a cool, shady place, others a warm, sunny side, and some a support on which to climb. These and

other peculiarities must be studied. They will not be all learned in one season, but by careful watching and taking notes a fund of useful information may soon be obtained.

Another source from which to draw a liberal supply of flowers is the herbaceous plants. These require but little care after once planting. They are best set back in the borders, however, leaving the beds on the lawn free for annuals and bedding plants.

To complete the picture, it only requires a good display of bedding plants. These are often kept over winter and planted out in May. Young plants may be propagated by cuttings in the fall and spring months, and with the successful ones enough will be obtained to fill several beds. If, however, the stock should fail, a variety of plants can be obtained for a few dollars that will add greatly to the pleasure of the garden. I have now merely sketched the most prominent features that go to make up ornamental horticulture. If, by so doing, I have awakened a desire among the members for a more intimate knowledge of the beauties that may be gathered around them, and are to be had from a bountiful Maker for a little care, I shall consider myself well repaid.

After the reading of the essay, the members of the Society were entertained with several pieces of music by Mr. and Mrs. W. MALTBY and Misses HOWELL and PALMER.

As usual, the Society was invited to partake of a bountiful repast, prepared by the host and hostess, to which all did ample justice; after which the Society adjourned, subject to the call of the Executive Committee.

SHELTER-BELTS.

THE ADVANTAGES AND DISADVANTAGES OF SHELTER-BELTS TO ORCHARDS.*

[An essay read before the Horticultural Society at Champaign, by Hon. W. C. FLAGG, of Alton.]

In endeavoring to give some ideas on the topic that has been assigned me, I labor under the disadvantage of not having had the experience of Mr. Phinney, Mr. Dunlap, and others, who, having planted vast orchards and shelter-belts on these broad, wind-swept prairies, have had an experience that I have not. But, perhaps, for the same reason, I may be able to weigh the somewhat scanty evidence we have with less prejudice, and possibly to show that different circumstances require quite different practices.

The principles of horticulture being the laws of nature, in part, are immutable; but the practices of horticulture, or obedience to these laws,

* This essay, though written prior to 1875, has been forwarded for publication. —EDITOR.

necessitate very different action at different times and places. This fact is often lost sight of in our horticultural discussions, and the result is great wrangling among the brethren, and great confusion of intellect among the uninitiated.

Climate and soil are the two great factors in vegetable production; and these vary from county to county, and sometimes from field to field, demanding corresponding variations in the practice of the farmer and fruit-grower. Even the changing seasons demand a different practice for the varying phases of the year.

So, if there is any thing we fruit growers must learn, it is modesty in generalizing from our own experience. I may assert, with truth, that the Newtown Pippin grows and bears well in my orchards in Madison county, on a white soil; but it would not do for me to assume, as a great many would, that therefore it is a variety to be recommended on the black soil of Champaign county. I must give my one or two facts, you must add yours; and when a large number of experiences are collected, and the qualifying facts weighed, we shall then be able to proceed by a careful induction to conclusions of probable value. We should, I think, be careful to remember all this in our consideration of the advantages and disadvantages of shelter-belts. The evidence on the subject, so far as I have heard it, is contradictory and needs careful sifting.

So far as the shelter-belt brings the conditions of a forest, we have pretty conclusive evidence in the French experiments of M. Mathieu, translated into the fourth volume of the Transactions of the Illinois State Horticultural Society, that they, 1st, increase rain-fall; 2d, prevent the rapid evaporation of moisture; and 3d, make the temperature more uniform. These, at least, are the immediate and local effects, although it is claimed by opponents that the local benefit is had at the expense of some adjoining region, as the rain-fall and mean temperature are constant quantities.

We have the evidence of Mr. Tice, of St. Louis, that a dense hedge of Scotch pine, along the west side of the fruticetum of the botanical garden of Henry Shaw, showed a difference of temperature of five degrees between the west and east sides, close to the hedge, and diminishing to one degree at sixty feet from the east side of the hedge. This shows that the *immediate* influence of an evergreen hedge on temperature is very considerable.

Samuel Edwards, of La Moille, Bureau county, noted as a planter of evergreens, states that pear trees among his evergreens are more productive, and that the fruit is less shaken off by high winds.

O. B. Galusha, Secretary of the Illinois State Horticultural Society, stated in a lecture at the Industrial University, in 1869, that in 1862, at the time when spring wheat and oats in the north part of the State were just past the bloom, a severe and extended storm prostrated nearly all the grain not sheltered by timber or shelter-belts, and diminished its value nearly one-half. In one locality a single line of broad and tall willows, closely planted, proved a sufficient check to the wind, so that a field of wheat adjoining it upon the east stood erect, and was harvested with a

machine, while in exposed situations the shrunken grain, if saved at all, was often gathered up by the slow and tedious process of hooking it up with scythes.

Mr. Galusha, in his *ad interim* report for 1870, qualifies his views of protection to orchards by the following statement:

"The oft-repeated views of members of this Society, that suitable protection to orchards by belts and groves of timber is advantageous, seems to be re-affirmed from year to year. I have, however, seen a few instances in which an excess of protection seems to have been given, diminishing the productiveness of the orchards. These orchards were closed in on all sides but the south by belts of trees, so dense and so close to the outer row as to prevent circulation of air through them."

He adds that a row of walnut trees, then forty feet high, planted with the orchard twenty years ago, on the east side, and twenty-two feet from the outside row of an orchard in Kendall county, seems to, in some way, gradually destroy the adjacent trees of the orchard. This is suggested to arise, in part, from the species of forest trees planted; but it seems to be a general rule that fruit trees planted in too close proximity to forest trees of greater vigor and size are robbed of their proper food, both from soil and air, as has been noticed by Dr. Hull, who left some large forest trees standing in the grounds that he planted to orchards, and is corroborated by my own experience. I may add that the black walnut, in my experience, does not seem to be more poisonous than other varieties.

Mr. Galusha continues, that "it is often remarked that in orchards which are exposed upon the west sides, the same varieties in the middle of the orchards produce more fruit than in the west row; also, that the northeastern halves of trees in the west row usually produce more fruit than the southwestern halves, owing to the greater prevalence of southwesterly winds."

Observations in Missouri, by J. C. Plumb, lead him to recommend "protection from the southwest wind for the preservation of the fruit from *excessive* winds." He implies that he would have protection for no other reason; and I have seen somewhere a statement, by a Wisconsin horticulturist, that some of the best results in fruit growing in that State were from apple trees fully exposed to the northwest and its winds.

The President of the Nebraska Horticultural Society, at its late meeting, recommended shelter-belts on all sides of an orchard, and at least one member echoed the opinion. It would probably be found that all, or nearly all, the States west of the Upper Mississippi would concur, made up as they are in large part of windy plains. The weight of this testimony is in favor of protection for orchards, and may be summed up as follows:

The advantages of shelter belts are:

1. That they mitigate the extremes of heat and cold, both of which are brought by western winds.

2. That they check the rapid evaporation of moisture, and probably increase the local rain-fall.

3. That they protect trees from the mechanical effects of winds, that would otherwise bend them over and shake off the fruit.

The sum of these advantages is a large amount. It is probable that the deterioration of trees and fruits, that many claim to take place as the country grows older, is the result not of a decrease of rain-fall or mean temperature, but of the extremes of heat and aridity, of cold and drought that come from a more naked surface, and any thing that will in any degree restore the equilibrium must be of value.

On the other hand, the disadvantages of shelter-belts are:

1. They rob the nearer orchard trees of their sustenance and prevent their proper development.

2. They prevent, to a certain extent, a proper ventilation of the orchard, resulting in an increase of fungoid disease and an unhealthy development of fruit. Even movement on the stem, our grape growers declare, is necessary for the production of the finest grapes. Many of our Southern Illinois grape growers also think it essential to provide for proper ventilation in their vineyards, by widening the spaces between the north and south rows, and having no protection on the north to prevent the free passage of the southern winds. The same is no doubt true to a certain extent of the orchard fruits.

The first of these disadvantages can be easily guarded against by leaving wide spaces between orchard-belts and the nearer trees. The second is more difficult. It amounts to this: that checking the free passage of air does at once good and harm, and we must, to the best of our ability, endeavor to get the good without the mischief. To do this we would suggest the following hints:

1. Plant shelter-belts in this State on the west sides of your orchards only. They will thus tend to break the force of the west and northwest winter winds. If the orchard or field is large, it may be well, as Mr. Edwards, of La Moille, suggests, to plant one or more north and south belts through the orchard, as has been done in the Industrial University experimental orchards. 2. If the orchard is much exposed on the north, it may answer to protect it with clumps of trees that will not entirely check circulation of air. 3. If there be hollows running to the northward, these should be each planted with a clump, to prevent the ascent of the cold air that would at times be driven up them like the ocean waters into a bay. 4. Leave the south and east sides open—the latter to be protected by your next neighbor's plantation, if at all, and the former because you wish to admit all south winds and some portion of those from the southwest.

Protection on the north involves protection on the south to your adjoining neighbor to the northward, and we should therefore be especially careful not to close up the northern ends of our farms with shelter-belts or high hedges. Low hedges and shelter-clumps on the lines running east and west, and high hedges and continuous belts or clumps on the lines running north and south, would be, to my mind, the best theory for plantation shelter.

I say nothing of the possibility of combining ornamental with shelter planting, and so adding to the advantages of utility the attractions of

landscape gardening. It is quite possible to make shelter-belts, and still more shelter-clumps, beautiful as well as useful; but I will not now trespass upon your patience further.

APPLE GROWING.

HOW, WHERE AND WHAT VARIETIES TO RAISE FOR PROFIT—SELECTION OF SOIL—LOCATION OF ORCHARD—MARKET FACILITIES.

Extracts from a paper read at the March meeting of the Champaign County Horticultural Society, by JAMES W. ROBISON, of Tremont, Tazewell Co.]

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Location and Soil.—In most parts of Central Illinois the grower must mainly depend upon marketing his fruit by car; it is, therefore, necessary to be near one or more railroad stations, in order that he may be able to place his apples in cars cheaply and with little bruising, and get good rates of freight. In the next place, his orchard should be on an elevation, so that the wood and buds may ripen properly, and allow the spring frosts to blow over and settle in adjacent low lands. In some seasons elevation decides between crop or no crop.

While almost any Illinois soil will produce apples, I would prefer a dry, rich, black-loam soil, underlaid with a red or yellow porous clay, with good natural drainage to the depth of five or ten feet. It requires the richest soil to maintain the vigor of the tree and give size and beauty to oft-repeated crops of fruit, while the clay adds to the solidity and keeping qualities of the apple.

Good surface drainage is also desirable, to carry off the surface water when the ground is frozen, and during excessive rains. Slopes to the south or east are desirable, as they usually have superior soil and drainage, and derive full benefit of the sun and gentle south winds. The most profitable shelter-belt for an apple orchard, I now think of, would be to plant another apple orchard in every respect like the first, on the side that has the best elevation and soil, without regard to the direction of prevailing winds.

Varieties.—Having selected our location, next comes the continually agitated but yet unsettled question of "varieties." This is a subject of the greatest importance to the producer who raises apples for profit.

The grower must take into consideration the adaptability of varieties to soil, and the wants of the market he is to supply. If his crop is intended for transportation to distant points, the varieties must be such as will bear shipping well. If for the South, the fruit must be red—and this is a good color for any market, not showing small dents or bruises so plainly as light colors. For summer and fall use large kinds sell best. For winter a medium sized apple is preferable, in consequence of its not bruising so badly in handling, and therefore keeping better.

Many apple growers have heretofore erred greatly in planting too many varieties, thus getting many unproductive and unsalable kinds. It may be well to avoid running to the opposite extreme of planting but one or two varieties; these could not furnish a supply during the season to regular customers, and the variableness of our seasons would sometimes cause particular apples to be non-productive, when in an orchard of more varieties some would do well. Often the causes rendering one kind of apple unproductive are harmless to another. It is very unusual, indeed, to have all of our eight or ten best varieties barren in one year, and it is equally rare to have them all produce full crops in any one year; hence, I would recommend varieties enough to give an annual crop, or as nearly so as may be possible.

I feel a hesitancy in naming varieties, and calling them best or most profitable, as the one this year doing best may do worst of all next year, and may even for a term of years do badly, and then again fully redeem its former good character. I will, however, name a few of the varieties that have recommended themselves to me by "their fruits." * * * These are, Carolina Red June, Maiden's Blush, Fameuse (Snow), Stannard, Rambo, Jonathan, Smith's Cider, Ben Davis, Winesap, Willow Twig, Rawles' Janet.* * * * * * * *

Apple Growing for Profit in Central Illinois.—For profit in a commercial orchard, the above named eleven varieties will be found to comprise most of the desirable kinds, and will furnish a succession of fruit that will be salable. But this must not be considered a list to be universally planted, even in Central Illinois. In certain locations more of one and less of another should be planted, some added, and some stricken out altogether. No one set of varieties can be best for all locations. For my own location and market, in Tazewell county, I would strike out the Rambo, and would plant one-half the orchard in Winesap and Willow Twig, equal numbers of each; and the other half I would plant in the eight remaining varieties, and least of all in the two productive and fine apples, Maiden's Blush and Fameuse, as they ripen while apples are usually cheap.

Planting.—Select good, well-grown, three-year-old or four-year-old trees; if grown near where they are to be planted, all the better. Purchase only of a careful, honest nursery-man or dealer, if such can be found. Accidental and unintentional mistakes in varieties are of equal loss in the orchard. The fewer hands the trees pass through before planting, the less liability to get varieties mixed.

In selecting trees, choose those with smooth, stocky trunks and evenly distributed tops, with the roots mutilated as little as possible in handling.

Setting out should be carefully done in the spring of the year, as soon as the ground is in good working order. Twenty-four or twenty-

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* The omissions here are descriptions of the varieties named and the peculiar characteristics of each; but as these have been often given in preceding volumes, they are omitted here.—EDITOR.

eight feet is a good distance apart, and the trees should be set two to four inches deeper than they grew in the nursery, so they may stand firm in the ground. Fill in about the roots with fine earth, only as high as the roots were covered with earth in the nursery, leaving the surface dishing toward the tree the two to four inches it was set deeper than it grew in the nursery. This gives the roots the full benefit of the spring and summer rains, dews and sun, all necessary to the growth of the tree. This hollow should be filled up in the fall, so that no water can stand about the tree.

The trees should be slightly leaned to the southwest, so they may better resist the prevailing winds from that quarter, and lesson the injury from the sun shining on the trunks of the trees during the warm part of the day.

A young orchard should be cultivated the first eight or ten years, in some crop that would give good culture to the trees early in the season, and continue culture until the first part of August, when it should cease, and allow the buds and wood to ripen, so they may stand the winter without injury. Corn is as good as any thing for this purpose.

Pruning.—Each form has its many friends, some admiring low heads, others high. I would recommend a trunk of from three to four feet in height, allowing the upright growers to branch lower than the spreading varieties. Use care in pruning the young trees, so that but few large limbs will have to be cut out in coming years, and encourage growth so as to protect the trunk and large limbs from the direct rays of the sun, and on this side the preponderance of the weight should be maintained; in fact, the side of the tree presenting the heaviest limbs should be set in this direction to begin with. The tops should be lightly thinned out annually, and no great quantity taken off at one time, just enough to admit light and air sufficient to mature the greatest quantity of good salable fruits, as that on the inside of a brushy topped tree is of but little value for any use. Three feet of trunk to an upright grower, and four to a spreading kind, with proper pruning afterward, will give room for the pickers, and allow the mowing machine bar to pass under in mowing when in clover, the only grass that is suitable for an apple orchard. When the orchard has attained eight or ten years of good, growth, it can be sowed in this grass and annually pastured with hogs, sheep and horses, in early summer, until they begin to eat good fruit. Hogs should be let in occasionally through the season, to eat the wormy wind-falls. Sheep must be well salted, and only allowed to run in an orchard while in leaf, or they will bark the trunks. Cattle are often inclined to hook the trees, and are, therefore, objectionable. The clover if not pastured off, should be cut and left on the ground. This should be done before it gets such a rank growth as to be liable to smother the roots.

The Borers.—The apple-tree root-borer, in many locations, is very injurious. The most effectual remedy is to take them out with a knife. The eggs are mostly deposited a little above the ground in the bark, during the month of June. From the first of July till winter sets in, the

trees should be occasionally carefully examined, and all eggs and young borers destroyed. The first appearance of injury from this troublesome insect is a puncture lengthwise in the bark, a little above the ground, appearing as if made with a sharp-pointed knife; in this an egg, a little larger than a timothy seed, is deposited, which in a few days hatches on the inside, where the young borer commences its depredation—first eating the soft bark, then the sapwood, upward and downward, and sometimes crosswise, and, where several are in one tree, almost girdle entirely around it. They remain in the tree nearly two years, when they emerge perfect beetles, and soon lay a new supply of eggs, which go through the same process again. The borings they shove out of the the puncture are an easy and sure guide to their lodgment.

The tent-caterpillar is another injurious insect, which should be removed while young, or, better still, while in the egg-clusters, early in the spring.

And now, in conclusion, allow me to say that apple growing, as a business for profit, where followed with energy, business tact and industry, has heretofore returned fair profits. Its danger of being overdone in the future is a matter for consideration with future planters.

Alton Horticultural Society.

THE PRINCIPAL PAPERS AND DISCUSSIONS.

REPORTED BY O. L. BARLER, SECRETARY.

OFFICERS FOR 1876.

President—James E. Starr, ... Elsa.
Vice-Presidents—D. Stewart, J. L. Blair, Alton.
Secretary—O. L. Barler, ... Upper Alton.
Treasurer—D. Stewart, ... Alton.

The meetings of our Society have been held regularly through the year, on the first Thursday in each month.

We have earnest workers, who are always present, and who give life and interest to the meetings.

The following are the papers and discussions of most value. The January and February meetings were reported in last year's report.

THE MARCH MEETING.

Society met at the office of Capt. Hollister. The attendance of members was not very large, but select, and the discussions practical and interesting.

DR. HULL presented the following report from the Committee on Orchards:

CALENDAR OF OPERATIONS—MARCH.

So various is the work which may be done this month, I can allude to only a part. It is the best of the spring months for transplanting fruit and ornamental trees. Ground should be prepared as soon as it can be worked, and the trees set, if possible, before the buds begin to swell. The sweet cherry and pear, if the planting be delayed until the buds are much swollen, hardly succeed at all. The roots of all trees should be examined and the small bruises, made in taking them up, cut out and the shattered ends of the roots cut off with a sharp knife. Have ready a large barrel, or tub, half full or more of strong tobacco-water. Into this put from a pint to one quart of soap to each bucketful of water; stir until the whole is well mixed, and then stand your trees in this two hours or longer before setting. On taking out one lot, another may be set in. I have often left trees in over night without injury. This treatment is equally good for grape-vines—in fact for all plants. Immerse vines and small plants, tops and all. Remember all plants may have lice on their roots, and this treatment will kill the last one of them. I have sometimes used unleached ashes instead of soap and tobacco, with the best results, throwing in two or three quarts to each bucketful of water. In setting the trees spread out the roots about equally on all sides, without bending them more than necessary. Cover with loose earth, and if you can tramp it in firmly without making it adhesive, do so; otherwise press it in lightly, covering the top roots, say not more than one inch deep. Then throw in about three inches of old loose manure, and cover this with earth to the depth of one or two inches; thus a double mulch is secured, which will retain both air and moisture about the roots and stimulate double the growth that a mere covering of soil would do.

I will here venture to trespass slightly on the field of the Small-Fruit Committee. We were told, at the January meeting, that the crown-borer of the strawberry always winters in the stems of the plants. If this is true, we have a sure thing on such as are in the plants we desire to set, for I have ascertained that while sprinkling them with the mixture I have described, in which to dip the roots of trees, does not seem to hurt them, yet when immersed in it for fifteen or twenty minutes it kills them. Therefore, before setting your plants, press them down into this mixture for a few hours, and it will destroy all that happen to be in the plants.

In selecting trees for the orchard, there is no objection, so far as I know, to employing such as are on dissimilar roots, as pear on quince, or pear on apple, provided the point of union of the stock and graft is planted deep enough to admit of a lip being raised on the side of the graft, say four inches below the surface of the ground, and kept open by crowding in glass. From the ends of these lips roots will push, and in a year or two they will become the main roots of the tree, and in a few years, it is often the case, the roots of the stock will disappear, when the roots and tops of the trees will be the same.

Plum trees are generally worked on wild plum stock, which they soon outgrow and generally topple over with their first crop of fruit. The surest method I have ever tried, of keeping the trees erect, was to work them on the wild plum or peach, close to the ground, and when one year old from the bud, lip them on two sides and plant them so the lower ends of the lips are at the depth before stated.

Before a selection of trees is made we should consider well what we want. Those new in the business are apt to set too many kinds; this is a great evil. Out of more than two thousand varieties of apples tested in this country, twenty for this locality will cream the entire list best, both family and market; while, for strictly market purposes, a half dozen are, I believe, quite enough, and it is more than probable that more money may be made even from four than from a greater number of varieties.

Of the long list of cherries, six well-selected will leave but little to be desired.

Can any one give the names of more than five varieties of plums, free growers, quality number one, which will command the highest figure in market?

Pears, as is well known, without special treatment and unremitting care, can not be profitably grown, and without the necessary attention our advice is to let them alone. About as many varieties of pears as of apples have been fruited in this country, and yet a selection of as few as a dozen varieties can be made that will ripen from July to May, which would probably be more satisfactory than a larger list. Indeed, for a strictly market orchard, as with the apple, I should be in favor employing no more than three or four varieties.

But how about peach trees? An examination of peach trees in this region will disclose the fact that all, young and old, have suffered very much from frost. The wood of the twigs is nearly all blackened, and the transplanting of such trees would be exceedingly hazardous. But if they are left in the nursery and cut back to healthy buds, they will probably recover during the summer. They should, however, be root-pruned during this month, or about the first of June, otherwise the trees will grow too large, and the roots become too long, straggling, and too firm to transplant well.

MR. HOLLISTER—What had best be done with old peach trees that have been injured?

DR. HULL—Usually, such trees would not be worth doing any thing with; but, as the outlook for large peach crops generally is not very promising, it will pay to take care of what may be on our trees. Such trees should have the young wood shortened back to about four inches. All, or nearly all, the live buds will be found near the base of last season's growth, and by cutting back they will be saved, and the shortening will help the tree and the fruit. To keep what peaches we have left, we must

fight for them with a determination to win. I am satisfied, from my own observation, that the curculio passes the night on the trunk and larger branches, and the bark below the branches should be scraped, so as to remove the hiding places and compel the curculio to spend the night above, where he will be caught by the catcher. It will be well, also, to whitewash the bodies of the trees, as the curculio does not like to take up his quarters on substances of a lighter color than himself, instinct teaching him to avoid such, to escape his enemies.

MR. MCPIKE—I have noticed the young growth of peach trees, and find it to have the same appearance as three years ago, when the young growth was killed.

DR. LONG—I disagree with the report of the Committee on Orchards, in the method of planting. On such soils as occupied by the gentleman, where there is thorough drainage, deep planting will do, but on retentive soil, such as mine, it will not do, and planting must be shallow. Instead of the wash recommended, I would puddle the roots with a mortar made of cow-dung, ashes and earth; this will effectually kill all insects on the roots and stimulate the growth of the tree.

DR. HULL—Having failed to get a start of early vegetable seeds, I have thought of using my sash on some strawberry beds that are very fine. How will it do? Will it make them enough earlier? and would the price obtained for them make it pay?

MR. HOLLISTER—I think it would make them earlier—if but a week earlier than the general crop, a limited quantity could be sold in this market at forty to fifty cents per quart. I think, however, it is not too late to start tomato plants. Two years ago I lost my first sowing, and made a second about the 10th or 12th of March, and was very successful; these plants did as well as others, so far as I could learn. For late sowing I would prefer the Tilden; it is still about the earliest, and the best for shipping. I think some body ought to take it in hand and try to improve it; it has some very desirable qualities, in a greater degree than some other varieties, and I think can be improved so as to be superior to any other.

DR. HULL—I would recommend any one, undertaking the improvement of the tomato, to resort to root pruning and pinching; it certainly will improve the size and quality, and would have a beneficial effect on the seed.

MR. MCPIKE—I think tender varieties of grapes are badly injured, in fact, killed. The main fruit-buds were killed, which also involves the loss of the canes. Concords and Nortons may have a half crop.

DR. HULL explained the buds of the grape-vines, and stated that though the main fruit-bud, which usually produces the crop, might be killed, there are two small buds close to it that are less developed, and often not injured when the others are killed, which will push and make a part of a crop.

The Small-Fruit Committee not being present, the subject was discussed by the members.

DR. HULL—The blackberry is considerably injured, the Kittatinny more so than the Lawton.

MR. HOLLISTER—So far as examined, the raspberry is not materially injured.

MR. RIEHL, in answer to a question, stated that the Turner, two years ago, proved more hardy than any other; very productive, quality the best, rather small, and inclined to be soft.

DR. LONG—What are we to do about the borers infesting trees? they seem to be on the increase.

DR. HULL—Soap will keep them off; but is it practical? Care must be used in pruning, not to injure the tree by improper cutting. The borers are partial to the injured spots, and injured trees; in fact, I am inclined to think perfectly healthy trees are not troubled with them. I would state that they are readily caught on the curculio catcher, and it is a fact that to succeed in growing the apple the catcher will have to be used.

MR. HUGGINS—I have never known the borer to attack healthy trees.

MR. HUGGINS then read the following report, from the Committee on Ornithology:

BIRDS AND BIRDS' NESTS.

Even in the cold, wintry season of the year, when most species of birds have retired to the sunny South, a few still remain to cheer our hearts and enliven our homes. But when the clouds of winter and its lowering storms have rolled themselves away; when the sun shines out with renewed life and vigor; when spring has come, and summer is here, and the softening breath of Heaven wafts from flowery fields and leafy woods a pleasing fragrance, it is then that we become more familiar with them. But after such a long, cold winter as the past, do we welcome the first birds of spring? Do we not all love the bluebird? and are we not anxious, each returning spring, to hear the first notes of this bird saying to us that "winter is broken," and "the time of the singing of birds is come?" Soon as the first breath of spring offers him an inducement to remain with us, he is seen cheerily about the house and along the fence, uttering his soft and plaintive warble with a degree of innocence which no sensitive heart can fail to appreciate. For the accommodation of this

bird, and the common house-wren, we put up discarded fruit cans and oyster cans, in which to rear their young, in trees around my house and throughout my orchard. The cans may be fastened in the branches of the trees by the use of a six-penny nail, driven through the corner of the can and into a branch of the tree; or they may be tied on with a string that will not soon rot and break. These cans may also be fastened to the shady side of some out-building, by placing the end of the can against the building and driving through the corners thereof two or three nails. Gourds may be tied in trees for the use of these birds. Make a small hole in the gourd, just large enough for the birds to enter. These birds are insect-eating birds, and do not eat fruit. They may be enticed around us by simply utilizing the old fruit and oyster cans in the way described.

Put them up now, soon, for the bluebird. The wren will come later in the season. May every horticulturist feel the importance of an extended study of the subjects of ornithology and entomology, and may our acquaintance with the sweet songsters of the wood, orchard and field, and with the insect world, be a means of turning our hearts to praise the great Creator of every living thing.

DR. HULL—Do the birds really do us any good? I mean such as do us no harm by depredating on fruit. Do they not destroy more of our insect friends than enemies, and thus do us more damage than good? This much I do know: Hens do us no good; they will be very busy scratching and eating worms and insects, but our real enemies in the garden, the striped-bug and the squash-bug, they will not touch. That fowls can be taught to destroy the Colorado potato-beetle I do not believe. I once shut up some turkeys for a time, and when let out there was a potato patch near which gave a meal of the larvæ, but it swelled up their crops and made them so sick they could never after be induced to touch another Colorado.

MR. HUGGINS—I am pretty certain that the bluebird catches the codling-moth, and the woodpecker eats the larvæ.

MR. HOLLISTER—I think some birds live mainly on weed-seeds, and hence are beneficial.

APRIL MEETING.

The April meeting of the Society was held in Alton, at the office of Capt. E. HOLLISTER.

The President, Capt. HOLLISTER, called the Society to order at eleven o'clock.

DR. E. S. HULL, who is chairman of the Orchard Committee, said that he had written out a report some days ago, but when, this morning,

he came to look for it, it was not to be found. They had at his house a pet squirrel, and the supposition was that "Bobby" had recognized the fitness of the thing for his own use, and so had appropriated it to make his nest!

MR. HAYDEN said that he had apple trees that were unfruitful. He had tried in various ways to bring them into bearing. He had an idea that it was from lack of some quality in the soil. He had a notion that the application of ashes would be beneficial.

DR. HULL replied that the application of ashes or other manure would probably only increase the difficulty.* The trouble already was that the tree was growing too rapidly, so much so that there were no fruit buds formed. The wood growth should be checked in some way. He would do this by root-pruning. It was folly to cut away at the top of the tree and neglect the roots. Prune both root and top, and you will get fruit.

MR. STARR—I believe in very little pruning. When I do prune I cut clear back to the body of the tree, but get along with as little pruning as possible. I would not allow a man to go into my orchard and prune in the ordinary way, if he would do it for nothing. I say, prune, but prune sparingly; and I have every year less and less faith in this indiscriminate cutting away in the head of an apple tree.

MR. HAYDEN said that he had one variety of apple that did not fruit satisfactorily. He attributed the failure, in part at least, to the fact that it had not been sufficiently trimmed. It had a very thick head of branches. The fruit was shaded out.

MR. STARR—I do not think that this is the cause of the tree not fruiting.

DR. HULL—I do not think Mr. Starr's practice agrees altogether with his teaching; for I passed his orchard a short time since, and I do not know where I have seen an orchard of apple trees in a better condition. His trees are certainly presenting a very fine appearance, and, I would say, had been very judiciously trimmed.

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* I once was looking through an orchard with the owner, when we came upon two large, fine-looking Newtown Pippin trees, standing side by side, which he said never bore more than a peck apiece. Having noticed a large pile of leached ashes near his house, I advised him to put four or five barrow loads under one of the trees, and dig it well in, as far out as the branches extended. He did so, and a year from the following autumn I again visited this orchard and found the tree which had been treated with the ashes loaded with the finest Newtown Pippins that I ever saw, while the other tree had, as usual, but few apples.

This orchard was on rich hazel land, almost surrounded by timber, and was about twenty years old. It was, on the whole, one of the best orchards, if not the best, in the county. It had been in timothy and blue grass for several years.—EDITOR.

MR. STARR—My orchard has never been severely cut.

In answer to a question in regard to the prospect of the fruit crop, Capt. HOLLISTER said: The prospect for an apple crop is good. The show for peaches is not good. In fact, I have not, as yet, been able to find any live buds on my trees.

DR. HULL said that with him the Old Mixon and some other varieties had enough buds left to make from a half to a full crop, if no late frosts should come. Other varieties would prove a failure.

MR. LYON knew of some apple orchards that would probably have no more than a half crop—owing chiefly to overbearing last year, however, rather than the cold of the winter.

DR. HULL said we had prospect of a large crop of cherries, and he predicted that we would have the cherries without the cherry-bird. It was his experience that a late spring cuts off the cherry-bird.

CAPT. HOLLISTER made a favorable statement of the condition of the vegetable market. The demand was good, and the supply no more than equal to it. The prices paid are fair. The only vegetables on the table were the Late Rose potatoes, which the committee appointed to examine them—Messrs. HAYDEN and LYON—pronounced as probably the best late potato, resembling in quality the Early Rose, and excelling that famous variety in productiveness. The potatoes showed well, and were every way desirable. They need a long season, and are giving growers satisfaction.

DR. HULL inquired to what extent vineyards are being dug up as unprofitable.

MR. HAYDEN answered that he had a talk with his neighbor, Mr. HOLLAND, recently, who is a nursery-man, and he informed him that he had sold a very large quantity of grape roots. One man in Highland was planting, this spring, seven acres, so that it would seem that vineyards were being planted as rapidly as they were being dug up.

CAPT. STEWART—The blackberries are used up with me. I find that they are generally killed—Kittatinny and all. I shall dig mine all out and put in strawberries. I intend to make a strawberry plantation of my place. It is my purpose to test all the varieties that promise well, and when I find that which is good, you shall know it. I have some new varieties that I shall fruit this spring. I have discarded the Nicanor, which with Mr. Purdy stands at the head of his list of early berries. It will not do with us; the berries lie too close to the grovnd; they do not ripen on both sides, and are not of good color. Thus far the Downing

has given me the greatest satisfaction. For Wilson and Downing berries, shipped last spring, on the same day, to the same house in Chicago, I received for the Wilson fifteen cents, and for the Downing thirty cents. But one thing I wish especially to say to all who have made new plantations of strawberries, and that is, they need your attention now. The snow and sleet of winter have packed down the mulch where it was heavy upon the crowns of your plants, and they will soon be smothered and killed if that straw or mulch is not lifted from them. Simply uncover the crown of the plant, and all will be well. There is a better stand of plants at this time than usual; I have lost scarcely five per cent. But let no one neglect to lift the mulch, and give the plants a chance to breathe. Soon it will be time to remove the straw and cultivate lightly with a square-tooth cultivator in the rows, and with a hoe-fork between the hills, and then replace the mulch, pushing the same well up to the plants. After fruiting, cultivate and mulch heavily. I always have a pile of straw to which I can go, in anticipation of a drought coming on. You can not succeed in growing strawberries without this care.

CAPT. HOLLISTER—Do you think irrigation is practical in our Western country, as is recommended in some other localities?

CAPT. STEWART—No, sir; I think good cultivation and the use of a mulch, as I have always advised, will give satisfaction, and is less expensive than irrigation.

DR. HULL—But we hear that in Colorado they are beating the world in their large yields of strawberries, by irrigation, and by this means they lengthen the strawberry season to three months. I have sometimes thought it would pay us to irrigate.

CAPT. STEWART—There is no doubt that irrigation would increase largely our crops. The strawberry needs a great deal of water. But the question is, will it pay? I do not know, after all, if it would not pay. Still what I say is, we can grow satisfactory crops by cultivation and by mulching. And for us this seems most practical.

DR. HULL showed a very neat model of his improved curculio catcher. It is strongly made, light, and can be rapidly handled by one man, the operator going through the orchard as fast as he can walk, stopping but a moment at each tree, with an ever forward movement and never a turning back. The thing needs but to be seen to be appreciated.

At this stage of the proceedings, lunch, brought in baskets, was spread, and there were taken up of fragments more than the said baskets full, which shows how liberal the provisions were.

DR. HULL reiterated his oft-repeated admonition to guard against the codling-moth, by the use of lime in the orchard. When you come to use lime, as I have told you when speaking of the lime remedy, you will be in the way of getting rid of this great pest, the codling-moth. It is a perfect remedy.

MR. BARLER—Is your idea that the lime kills the moth?

DR. HULL—No, sir. But the insects will not go where the lime has been scattered. They go away. The lime is to be thrown into the trees when the dew is on, or just after a rain. A dipper or large spoon may be used to throw the lime. But best of all is a bellows made for the purpose.

MR. STARR—I use my hand.

REPORT ON WINE.

Your committee find on the table three samples of wine from H. C. Benson—one of Catawba, very fine; two of Concord, which we think good for Concord.

D. STEWART, *Committee.*

MR. BENSON showed a fine lot of Late Rose potatoes, which the committee, Messrs. HAYDEN and LYON, said were choice, quality good. They require a long season. Mr. BENSON says they were twice as productive as the Early Rose with him last year.

MR. MCPIKE offered the following resolutions, on the death of FRANKLIN STARR:

WHEREAS, In the dispensation of Providence, death has visted our circle, since the last meeting of this Society, by removing from our midst our very worthy friend and brother, Mr. Franklin Starr; therefore be it

Resolved, That the Alton Horticultural Society, highly appreciating the practical worth and social qualities of our departed friend and member, require the Secretary to enter upon the records the date and particulars of his death.

Resolved, That we extend to the respected family and relatives our heartfelt sympathy; and shall ever cherish the warmest feelings of regard in memory of the departed.

MAY MEETING.

The May meeting was held May 6th, at Capt. D. STEWART'S, near Upper Alton, and there were the usual essays and discussions.

The prospects for fruit, from the reports made, were not very encouraging. The bloom on the peach trees would seem to indicate a half crop, but in many cases there are no leaves pushing beyond the fruit bud to support the fruit, and it is a question whether we shall have any peaches. Sweet cherries are killed; blackberries, a poor half crop; the same with raspberries; some varieties of grapes are injured, but there is a promise of a fair crop; apples have sustained little injury. In Southern and Northern Illinois the report comes to us that all fruits are much more seriously injured than with us. Letters were read from Messrs. BROWN and FORBES, from Southern Illinois, which were discouraging in the extreme to fruit men.

DR. HULL called attention to the early appearance of the apple louse—coming a month earlier than usual—and its sudden disappearance. This was the month, he said, in which to use lime in the orchard, to prevent the codling-moth from injuring the fruit. The method of use was to scatter the lime in the tops of the trees while the dew was on, or just after a rain.

Washing with soft soap, made hot, will protect your trees from the borer that infests the limbs.

The damage done to vegetables by the cold and freeze has been considerable. Peas, which should be in bloom, are scarce four inches high, and every thing is backward. There is a market for what good stuff we have, but nothing is growing to perfection.

Strawberries were not sufficiently advanced in this region to be injured much. Currants and gooseberries were in fair condition for a crop. Cultivation should now be given to young strawberry beds.

MR. F. HAYDEN finds the Kirtland raspberry the best red raspberry for early. The Philadelphia is his next choice. The Turner is a good berry for family use, but he does not value it, and would not plant it. The canes grows very strong, but the berries are few and too soft for market.

JONATHAN HUGGINS read a paper on plant-lice.

I am sorry to say that the report is not in my possession, and I am not able to secure it for publication.

JUNE MEETING.

The June meeting of this Society was held at the residence of Dr. B. F. LONG. A large gathering and pleasant meeting was had.

DISCUSSION ON ORCHARDS, ETC.

DR. HULL opened this discussion upon "Orchards." He said that the larvæ of the borer were to be found at this time upon the apple and peach trees in large numbers, and that the remedy, soft soap, or solution of potash, should be applied, else great damage would follow. In the early part of the season the apple-tree lice were very abundant, but they were suddenly destroyed, and consequently did but little damage. The remark, in the May meeting, that these lice appeared "a month earlier than usual," he wished to modify by saying they appeared in advance of the growth. He anticipated a moderate crop of apples—not a full crop.

JAMES STARR—I confess I have been disappointed in my expectations of a full crop of apples. A month or two ago the prospect was fair for an abundant crop. It is not so now—the fruit is falling. I notice one peculiarity—the leaf is full size, and of vigorous growth. Frequently we have mildew on the leaf, and causes apparent that cut short the crop. But this season, with a perfect leaf, we are short of fruit. We count on no more than half a crop. The Winesap is a failure this year; the Early Harvests have nearly all dropped off; the Red Astrachan shows some fruit; also the Red June. The one apple that has uniformly borne me the best crops is the Janet.

MR. HUGGINS—The promise in my orchard is not what it was a month ago. Apples are falling off; the cold of the 17th of April seems to have injured the crop materially. I have some varieties that are carrying a good crop; others have very little fruit. The Winesap will have, perhaps, one-quarter of a crop. The Janets that did not bear last year are full this year. The Red Canadas are uniformly full. Although we have not the promise of a full crop of apples, I anticipate quite as much profit from the orchard as usual. The fruit will be larger and finer. We shall have less work and expense, and better prices.

MESSRS. AUG. STARR, PEARSON, and others, engaged in this discussion, and the facts seemed everywhere the same.

DR. HULL said, in regard to the peach crop, it was not possible yet to determine whether we should have any fruit at all or not. He never

knew whether he was going to have any peaches until the fruit has advanced to the time of the stoning process. That is the critical condition of the peach.

The Hon. J. M. PEARSON reported on ornamental planting, encouraging the practice of ornamenting our premises with evergreens, shrubs and flowers.

DR. LONG's remarks following were only provoking him and us all to the same good work.

JAMES STARR—You are aware that I use no method of protecting my vines in winter. I leave them on the trellis to take care of themselves. A part of my vineyard has received injury from the last winter; other portions are uninjured, and the vines promise a fair crop. On the portion injured the buds started and then stopped their growth, and there will be no fruit, showing that injury has been done. I shall cut these canes away and let the roots make new ones.

MR. MCPIKE made a half-hour's talk upon the subject of "Summer Treatment of the Vine." He had the green shoots at hand to show the result of early pinching, and demonstrated, to the satisfaction of many, the advantage of his practice.

DR. HULL, Messrs. PEARSON, HAYDEN, and others, engaged in the discussion, which became quite animated.

JAMES STARR said the time was past when it would pay to plant and tend a vineyard for the purposes of wine and fruit. He would take care of vineyards already planted, but would not plant new—better grow corn, etc.

MR. HAYDEN said he had found profit in grapes, and he thought if they were put up and marketed in good shape, that it was much more profitable than growing corn, or ordinary farm crops.

CAPTAIN STEWART said he had but little to say at this time upon the subject of "Small Fruits." There is nothing now that can be done but to pick and market the fruit, and pull out the weeds that come up in the beds. Young plantations can be kept clean with the hoe. A bogus berry plant, said to be the Wilson, and coming from Willis Long, was shown. The Captain said it was not the Wilson; it was worthless, and did not perfect its berries. When this plant gets into your beds to any extent, the only way to get rid of it is to plow up the plantation.

The discussion developed the fact that the Kittatinny blackberry was much more subject to blight than the Lawton, showing that we must not be in too much haste to discard the Lawton.

The essayist of the day was Mr. FRED. HAYDEN, who read the following:

SOME OF THE MANY CAUSES WHY FRUIT GROWING DOES NOT PAY.

Without pretending to be free from many of the faults herein mentioned, I have thought this a more interesting topic than any which has occurred to me.

One of the greatest causes of failure lies in attempting to cultivate too many acres. You should carefully calculate the cost of cultivating in the best manner every fruit that you grow. No half-way culture will pay, except in rare cases. For instance, I know of a noted horticulturist who planted seven acres of strawberries. He set the plants in poorly prepared, lumpy soil; let weeds get ahead of him, and consequently lost several hundred dollars' worth of plants and labor, as he only marketed a few crates from the whole field. Had he expended one-half the labor on one acre, he might have made a fair profit. Again, I have known men to plant five acres of tomatoes, spreading the labor on five acres that should have been condensed into one, and selling only one hundred and fifty dollars' worth of fruit. Had they put the same labor on one acre, they would have sold more fruit with much less cost.

Another cause of failure is in growing inferior varieties, from want of knowledge themselves and from too credulous a belief in others, who have poor varieties that they wish to sell. Test every fruit fully before you go in deep. Out of the hundreds of new things that I have tried within the last ten years, but very few have proved valuable.

I believe that it is a great mistake, also, to plant apple, pear or peach trees on valuable land in or near Alton, with any expectation of deriving much profit from them. Those fruits should be grown on land away from town and of less value; and only the small fruits, well cared for, should be planted in or near town.

Do not hire men to work among fruit when good boys, from twelve to eighteen years of age, can be had for less than half the money, and are really more valuable than men, as they learn quicker and are more active than older hands, and the work is mostly light.

Some fail to gather and market the fruit in time, always going to do it to-morrow, until the fruit is spoiled or the market glutted. Others do not pack in the proper way, when, of course, no matter how good it is, it can not be sold for a fair price. Still others ship to dishonest commission merchants, which can be avoided by a little close inquiry.

And I say, with my friend Riehl, do not expect to succeed with any one special fruit. You may succeed one, two or even three years in succession, but my word for it the seasons will come, and often, when from some cause you will have no income or crop. Strawberries are one of the surest of fruits, yet they are subject to many dangers, such as frost, when in blossom, drought in summer, the grub, and sometimes an overcrop gluts the market; but if you have a good crop of other fruits coming on, you won't miss the strawberries.

Have a succession of fruits, beginning with the earliest possible and ending with the latest, and you may be sure of a living. I think there is a growing disposition among our fruit growers to engage in the forcing of early vegetables. I believe that it will result in failure to bring fair profit, unless among the Germans where they have large families of boys and girls, whose labor they can utilize at such work. I do not think that hired help can be used to profit in that way, to any considerable extent, except it may be in forcing asparagus or strawberries. Certainly I can do better with fruits than forcing vegetables.

I look upon it as an important point to be located in or near town, where plenty of cheap help can be procured; especially if you grow berries, it should be so that you can get any amount of it you may require at short notice. I remember a few years ago Mr. David Brown had a fine crop of strawberries, and lost many of them from inability to procure the necessary help to gather the crop. The advantage of being near the depot and the home market is also very great, for another reason, as you are often one day ahead in your knowledge of the market over those living far away.

A close, personal supervision of every detail, from the first planting to the marketing of the fruit, is absolutely necessary to any man who would succeed at it, as much so as business of the merchant, or contractor. How often we see men fail who think they can be successful fruit growers and attend to some other business at the same time. They are willing to make money by growing fruit, but not willing to have it known as their business. I remember being at the depot one evening with fruit, when a team drove up beside me to unload. Two gentlemen stood near. One said to the other, "Is this your fruit? it is your team." "Oh, no," he answered, "it is not mine; my man raises a little." I happened to know better. Such men mostly do and ought to fail to make it pay.

Much more might be said, many more faults found to correct in my own and others' practice, but I have touched some of the principal ones, and the others must go until another time.

REPORT ON FRUITS.

The Committee on Small Fruits find on the table one box of Chas. Downing strawberries, from F. Hayden, fine in size, and number one in quality.

One box of same variety, from Piasa Heights, Capt. E. Hollister, from fall-set plants. Fruit good quality, and size almost up to one-year-old plants.

Specimens of Rawles' Janet, from Aug. Starr, in good preservation.

Conover's Colossal asparagus, from Captain E. Hollister, very superior bunches, all green, of extra large growth.

May Duke cherry, quite early, from grounds of H. G. McPike.

D. STEWART.

MISS STEWART'S REPORT ON FLOWERS.

June, Flora's favorite month, has scattered her trophy over tree, bush and shrub, and invited our admiration to the beauties of the season that are so abundantly set before us. It will be hard to enumerate the half we find. Beautiful bouquets from the following horticulturists: From Lucius Hull, peonies, (in variety,) roses, valerian, and an "olive" of the Persian variety, with many other choice things; Mrs. J. Challacombe, two very fine bouquets, with choice selections; also a large round bouquet from Mr. Huggins' grounds, consisting of many varieties, conspicuous among which are the flowers and leaf of the American tulip, tree, of white wood, honeysuckle, pisturea, roses and pond lilies, and other varieties that would make a report too long.

The ladies of the house have decorated the rooms with ferns and flowers, that seem almost marvelous. A pot of native ferns from Mrs. Dr. Hull.

The following letter has been received, and was read by Capt. HOLLISTER. It comes from a "noted" gentleman in Sangamon county. The Society voted that it should be published with the minutes of the Society, *verbatim et literatim.*

Here is the letter, which speaks for itself:

May the 30 1875.

to U S agricultural Society i have found out what wil kill all insects on fruit trees all kinds of fruit, it will do just what i say it, will do. it is put in the roots of trees it flos all throw the tree it will kill all caterpillars in 24 hours, it makes trees grow livens up and makes trees hold fruit it is put in trees in Spring as the sap goes up it kills all bores in trees all kinds of insects on or in trees it makes clean swipe of bugs knot apples or a peach or a plum cherry falls off when this medicins is put in trees

i will sell this to your Society

it master of the trees of bugs all kind i never saw it beet it is worth a 1,000.000 dolars to united States

now i will sell my grate Secret for $100,000 dolars it dos it wark to a charm.

write back to me if any trade in you men. S. D. A.

JULY MEETING.

The July meeting of this Society was held at the residence of H. C. BENSON, near Upper Alton. The attendance was not large, but select—that is, the tried "old work-horses" were there, and the discussions were long and desultory, though full of interest to those present.

There were no written essays presented; it was all talk, with great freedom of speech. The members of this Society are a class of students who are inquiring after truth, as it respects successful horticulture. I think any one attending these meetings will be convinced that they are in earnest work.

The subject of "Vineyards" was freely discussed by Drs. LONG and HULL, and others. Close pruning was recommended by the best growers. If success seemed to attend a more liberal course for a time, it was argued that the folly of the course would appear by and by.

The Committee on Vegetables was absent.

CAPTAIN HOLLISTER noted the fact that he picked the first ripe tomatoes on the 26th of June, just sixteen days later than last year. On the 11th of June gathered the first cabbage, just sixty days after setting.

DR. HULL inquired what his treatment of the plants was in hot-beds.

MR. HOLLISTER replied that they were once transplanted in hot-bed, and were good, strong stocky plants. The freeze in April came upon them and changed the color of their leaves, but it did not seem to injure them seriously. They grew right along, and made good cabbage in sixty days, as stated.

DR. LONG asked what was the comparative worth of vegetables this year? Were the prices received as good as usual?

MR. HOLLISTER—They are cheaper this year than usual. The rains have delayed the crops, and somewhat damaged the same. He said that he had received a letter from the southern part of the State, and the same was true there. There were set in that part of the State some 180,000 tomato plants, but the harvest will be cut short by the rain, and bad weather, which has prevented the fertilization of the flowers.

DR. HULL passed some severe strictures on their method of growing tomatoes, and said it was strange that they had never learned any thing about growing tomatoes. They make a great round hill and plant their tomatoes upon that. The result is, they can not plow their tomatoes properly. They allow the plants to fall over and lie upon the ground. Dry weather sets in, and sun-scald and rot take nine-tenths of the crop. The true method is to cultivate level, and stake and pinch the vines. A given amount of tomatoes can be grown cheaper by staking than by this slovenly method. The Doctor went into the explanation of the habits of the tomato, to show the advantage to be gained by pinching the vines. A plant with axillary buds, like the tomato, can be put under control, and you can train it as you will. If you rub out a bud the plant has no power to replace it, and you can have buds just as many and no more than you wish. This is the true method of growing the tomato.

DR. LONG wished to know if by this treatment the fruit would be earlier.

DR. HULL—I have not sufficiently tested that matter to answer positively, but I have every reason to believe that this treatment will produce the earliest fruit.

CAPTAIN STEWART is always ready with his suggestions on small fruits, and he gave directions about cultivating the strawberry. Now was the time to attend to this matter. The fruiting season is over, the pickers have tramped the ground hard, and unless cultivation is attended to now the ground on most of our soils will dry out and crack, and in the end destroy the beds. On loose soils this may not be the result, and cultivation might be safely deferred till fall. But my advice is to cultivate *now;* remove the mulch, cultivate, and then replace it, for there is a day of reckoning coming. We are having our rains now, but I expect to see, by the twentieth of this month, dry weather set in that will try the strawberry plantations, unless attended to. He stated that we had had an unusually long picking season this year—about twenty-five days—while our usual season is scarcely over twelve days. The price of strawberries has been lower this year than ever before.

DR. LONG asked what varieties brought the best prices.

CAPTAIN STEWART—The Downing was the most productive, and paid me the best.

CAPTAIN HOLLISTER—If a man should come to you and ask you what strawberry to plant for profit, what would you say?

CAPTAIN STEWART—I would say the Charles Downing.

On further cross-examination Mr. STEWART owned that the questioners had him in a tight fix. For himself he would take the Downing in preference to the Wilson, and he thought all careful cultivators would say so, too; but the Wilson will stand more abuse, and is, after all, the "lazy man's" strawberry.

The discussion on raspberries was unsatisfactory to your reporter. Every one seemed anxious to learn something as to the best varieties, etc., but no one was able to communicate all the knowledge desired.

CAPTAIN HOLLISTER had been five years trying to get a stand of the Kirtland, and had not succeeded.

DR. HULL had discarded it years ago, yet it was a favorite with some. He showed a branch of the Turner raspberry that showed full of fruit, and of good size. This variety was a strong grower, and he thought the smaller canes should be saved for fruiting. He also showed a beetle that was very active on its legs, and was a great friend of the horticulturist. It was especially useful in the strawberry beds in destroying the grub. A

few of these, he said, would do more good in the strawberry beds than fifty dollars' worth of Captain Stewart's salt. He said, if friend Huggins were here he would like to put that bug against some of his best birds.

JONATHAN HUGGINS read the following:

FALL WEB-WORM.

The caterpillars known as the fall web-worms have already made their appearance on our quince bushes, pear trees, and on some other trees, such as the apple tree and mulberry. They are not confined to these particular trees, but are found also, later in the season, on other varieties, and the bushes and shrubs of our gardens, making them look, as the season advances, very unsightly, to say nothing of the injury done the tree or bush. Their webs, at first small, are generally enlarged until they sometimes extend over entire branches, in the latter part of summer.

The eggs, from which the caterpillars proceed, are laid by the parent moth in a cluster upon a leaf, near the extremity of a branch. They hatch in this latitude from early in June to late in August—some broods early, some late, and not about the same time, as is the case with the orchard tent-caterpillar. The young caterpillars immediately begin to provide a shelter for themselves by covering the upper side of the leaf with a web. They feed in company beneath this web, devouring only the upper skin and pulpy portion of the leaf, leaving the veins and lower skin untouched.

As they increase in size they enlarge their web, carrying it over the next leaves, eating as before, and thus continue, till finally the web covers a large portion of the branch with its dry, brown and filmy foliage, reduced to this unseemly condition by these pests.

These caterpillars, when grown, are about one inch in length. Their bodies are thinly clothed with hairs of a grayish color, intermingled with a few which are black; general color of body, greenish yellow, dotted with black; a bright yellow stripe on each side, and broad blackish stripe along the back; head and feet black.

On arriving at full size, or late in summer, they leave the trees and wander about, eating such plants as fall in their way, till they have found suitable places of concealment, where they make their cocoons, composed of a slight mesh of silk. They remain in the cocoons in the chrysalis state through the winter, and are transformed to moths early in the summer season.

The time to exterminate these destructive insects (fall web-worm, or *Hyphantria textor*) is when they are just beginning to make their webs on the trees or bushes. So soon as they begin to appear on the branches they should be stripped off with the leaves and crushed under foot. This should be done all at once, as, if you are delicate about it, the caterpillars will wriggle out of the nest on being disturbed, and be scattered over the ground, only to renew their work on being left to themselves. We must not confound this insect with other caterpillars. We have the orchard tent-caterpillar and the forest tent-caterpillar.

The fall web-worm and orchard tent-caterpillar, though living in tents, are very distinct insects. I think practical orchardists will understand the distinction and difference in the above-named insects, without their Latin appendages.

AUGUST MEETING.

The regular monthly meeting was held at Dr. E. S. HULL's, President HOLLISTER presiding.

SECRETARY BARLER being absent, J. E. STARR was called upon to fill his place.

The minutes of the last meeting not being available, action upon them was deferred.

DR. HULL, of the Committee on Orchards, reported verbally that he had received letters from several persons inquiring as to what would be the effect of the present unusual season upon orchards, etc. As it now stood, he thought the enormous weed-growth has somewhat checked the tendency to excessive wood-growth; but how are we to dispose of the weeds? If we plow them under, we are in danger of continuing the wood-growth—would not, then, plow them under. They had better be cut and left. If the wood-growth can be checked, either by drought or root-pruning, the trees will be in fine condition. Has found soap washes decidedly beneficial. This is the best time to remove sprouts and suckers, and the time of the second advent with the codling-moth. Use lime freely and drive them away. Strong soap-suds are also excellent for the same purpose.

MR. HUGGINS—Borers are less numerous than usual, owing to the absence of warm, sunny days, and the thrifty, healthy condition of the trees.

The Ornamental Planting Committee being absent, no report was made.

Vegetable Gardening, same.

MR. STARR, of the Committee on Vineyards, made a brief verbal report, on the whole unfavorable as to the present and future prospects of grape culture.

MR. SNEDEKER reported grapes rotting badly and crop small.

CAPT. STEWART—Rotting badly; condition unfavorable.

DR. LONG—Bunches dropping off.

DR. HULL—Caused by the tree-cricket.

MR. HAYDEN—Had some rot near the ground where they were very much shaded.

CAPT. STEWART reported small fruits very weedy; plants look well, but have not rooted yet; fruit-leaf badly rusted; Downing the best.

DR. HULL reported the absence of crown-borers, while a similar insect had attacked the potato to a dangerous extent.

CAPT. STEWART—Very few borers.

MR. DRAPER—Borers show a preference—they will destroy Col. Cheney, Wilson, Green Prolific, and will not injure Downing.

The Committee on Flowers reported as follows:

Your committee find in the borders of our hostess sixteen different varieties of phlox drummondii, ten of petunia, as many of xenias, several of China pinks, and a lovely bed of mignonette, with other flowers too numerous to name, which, as a whole, are ablaze with beauty from early summer to late autumn. Also several bouquets on the table, noticeable for varieties and arrangement; did not learn who the donors were.

M. A. STEWART, *for Committee.*

REPORT OF COMMITTEE ON ENTOMOLOGY.

Every student of entomology realizes the necessity of calling things by their right names. Every intelligent horticulturist should be a constant observer of insect life, and if they are careful observers they may make discoveries of great value touching the natural history of insects injurious as well as beneficial to the fruit grower. If we be ignorant of the proper names of insects, or give them names which are incorrect, or belong properly to other insects, we fail to make the result of any observations useful or truly intelligible to those who look to us for information. We present for your inspection to-day an insect of the grasshopper family, called Katy-did, from its peculiar note. Its body is of a pale green color, the wing-covers being somewhat darker. The musical organs of the male consist of a pair of taborets, formed by their membrane stretched in a strong half-oval frame in the triangular over-topping portions of each wing-cover. This insect should not be confounded with a long-winged green grasshopper, which is not unfrequently seen in our dwellings, while the true Katy-did is seldom seen. We are all familiar with its music. We are not aware that they are especially injurious. Their incessant babble makes them annoying of a summer evening when they are numerous. We also present the cicada, which is popularly called "the locust." But what do we mean by it? If we drop the matter here, you will not, can not know what your committee mean by "the locust." Here we have the dog-day harvest-fly or cicada, commonly called "the locust." This insect appears annually soon after harvest, and is familiar to all. It is never numerous or especially injurious.

But here we have "the locust" again. Now, what do you mean by "the locust?" For this insect appears only once in many years. It is called the seventeen-year locust, commonly, but in reality is no locust at all. Truly, it is the seventeen-year cicada. They appear chiefly where there is or has been timber, and are usually very numerous in this latitude once in, some say thirteen years, while others say seventeen years. The facts are, we think, that they appear only once in seventeen years in the northern portions of the United States, while in the more southern portions they appear a few years sooner. These insects are sometimes very injurious to the forest, to fruit trees, and especially nursery trees. We may expect their return here, we think, in about seven years. These true cicada are the only ones that are especially to be noted as common periodically here, while there are other cicadas not common in this region. Last spring, just the first moment the apple trees showed the opening leaf-bud, the plant-lice were there in force to suck the juices of the tender opening bud. But there are many kinds of plant lice, or *Aphides*. They are found upon almost all parts of plants—the roots, stems, young shoots, buds and leaves. Most are without wings, while there are winged plant-lice and jumping plant-lice. They differ in form, color and clothing. We have the apple-tree plant-louse, the cabbage-louse, the rose-louse. A large species is found on the pig-nut hickory. A large species is also found on the various kinds of willow. Some plant-lice live in the ground, and derive their nourishment from the roots of plants. The peach tree suffers from the attacks of plant-lice, causing the leaves, by their punctures, to become thickened, to curl, or form hollows beneath, and finally to perish and drop off prematurely. We have the woolly apple-tree louse, which is distinct from the early apple-tree louse of spring. These are enveloped in a cotton-like substance, furnished by the body of the insect. And there are still others.

Truly, what do we mean when we speak of the "plant-louse?" We speak commonly of "the curculio." Observations and experience teach us that there are many kinds of curculios. So, do we not see the importance of a correct application of names, if the observations communicated are to be of service to the body of the people?

J. HUGGINS, *Chairman.*

MR. BENSON presented two insects resembling the peach-borer, which were declared to be cannibal insects and beneficial, the larger of the two distinguished by a broad yellow band.

The Committee on Wines made no report.

REPORT OF THE COMMITTEE ON ORNITHOLOGY.

We invite the lovers of birds and bird music to take a walk with us into the fields and orchards, far from the noise of city life, and where we shall see the birds in all their native beauty, not as we see the stuffed mummies in our cabinets, but as free tenants of the air, enjoying all the

liberty in which they were created. It is a warm, bright summer morning; the air teems with the fragrant odors of the hay fields. The early riser has listened with delight to the music of the birds, who invariably hold their concerts of a pleasant morning, just at break of day; but now, at this mid-day hour, these sweet singers have retired to the deep and cooling shelter of grove and orchard. Let us seek the shade of this beautiful apple tree, near that thrifty belt of maples and cedars, where we may sit down and observe what is passing around us. Yonder we notice, in that cedar, a deserted blackbird's nest, of this season. These birds early built their nest, unmolested by man; early followed our plow, and eagerly helped themselves to the grubs and worms turned up by the plow, with which to feed their young, which have long since left the nest built so nicely by the parent birds.

But that wren is scolding us. That fruit-can just over our heads is her home. But look! In her beak we see the worm designed for the young birds.

Let us retire to the next tree and watch her motions. How active in her labors! See, she has fed her young and now is off for other insects, while the male bird cheers her by his presence and songs. That pair will yet rear another family before the season is past. In yonder fruit tree can you notice the material, of which the nest therein was built, is of a fine material? That is the bluebird's nest. They reared their young and did their share in catching millers and other insects in early spring. On yonder fence you notice the family composed of Mr. and Mrs. Bluebird and six hopeful young bluebirds, the old birds still watching for insects for their young. But let us walk further out into the orchard. So you see that chickadee go in and out of that hole in yonder apple tree, which injury to the tree was caused by an oversight of our own, in letting in a traveling, irresponsible tree-pruner; but we are half inclined to forgive him for his unskillful pruning, when we see the chickadee finds a home in our orchard in consequence. Last spring we saw the chickadee active in destroying the early apple-tree plant-louse. You now notice he is busy searching every limb for insects with which to feed the young.

But what a gaudy-plumaged bird is this within a few feet of us, so earnest after that katy-did that he does not notice us! It is the blue-jay. They are insect-eating birds, and worthy a place on the farm.

But yonder is the king-bird, vigilant and happy, master of the situation, constantly seeking insects on the wing. But time will fail us to notice and speak of all of the birds of these grounds. Let us walk home, where we see those quails on the wing. What a flock presents itself! They are our friends; let no one molest them; they are the friends of the farmer and horticulturist. But see that red-headed woodpecker, pecking away on that apple tree. One pupa of the codling-moth the less! Going home by the pond, we notice the swallows and martins are busy seeking food among the numerous insect-life there found. The birds! Do they not display the wisdom of Him who is "wondrous alike in all He does?"

SEPTEMBER MEETING.

The Society met at the residence of H. G. McPIKE, in Alton, on the second of September. There was a large gathering, and the meeting was altogether a very sociable and profitable one.

PRESIDENT HOLLISTER called the meeting to order a little before 12 o'clock. The Secretary, Mr. O. L. BARLER, coming in late, found Mr. GEORGE HILLIARD filling the duties of the office, whereupon friend GEORGE refused to proceed further.

MR. SNEDEKER, of Jerseyville, said that orchards were failures this season. We have no apples, and little orchard fruit of any kind. Apple trees are in good condition, and there is little blight among them; but there is considerable blight among the peaches; and what is unusual, the Seckel pear is blighting. We did not expect this of the Seckel.

MR. HUGGINS spoke of the apple as our most valuable fruit—one that should interest us all. He was particularly interested in the apple, and had a fine, healthy orchard, from which he was confidently expecting a full crop another year. We have had so many failures in late years he now anticipated a change from a barren to a fruitful year another season. He had the more encouragement in this direction in his own case, because of the excellent condition of his trees. But this year his orchard, as a whole, is a failure.

Quite an exciting discussion was gotten up on the subject of vineyards, in reference to the treatment which our vines should receive, one party contending for shorter pruning, and more rigid treatment than the other.

One class of growers refuse to let their Concord vines bear more than ten pounds to the vine; the other class say twenty pounds will not hurt them. They require this of their Concord vines, and get it.

MR. FRED HAYDEN read an essay upon the subject, which gave the vine freedom in its growth, and plenty of work to do. Being a practical man, he went for the facts of the case. He read correspondence which he had had with some of the largest grape growers in Ohio, which fully indorsed his position in the treatment of the vine. These growers do not pinch or summer-prune their vines; they believe it injures the vine; and they do not believe that twenty pounds of grapes are too much for a Concord vine, in good soil, to grow and ripen. They are accustomed to grow an average of that in their vineyards, without injury.

The discussion awakened deep interest and new hopes, and a feeling came over some of us—"well, after all, we may have been in error in our severe treatment of the vine." At any rate, some will be found trying the more liberal treatment.

MESSRS. HULL, HUGGINS, HOLLISTER, MCPIKE, SNEDEKER and others joined in the discussion.

CAPT. STEWART is always ready with his suggestion on Small Fruits. Between the middle of September and fruiting time next spring, strawberry beds should not be disturbed much. If weeds spring up, pull them out by hand.

Now is the time to prepare for new plantations. The last of September or the first of October is a good time to set strawberry plants. Mulch the ground soon after the first freeze, and await the harvest.

MR. HUGGINS said this wet season had been unfavorable for the propagation of insects, and he expected to be comparatively free from insect depredations next season. Mr. H. also put in a plea for the birds.

DR. HULL and others joined in the discussion.

MR. FRED. HAYDEN'S REPORT.

The following are the report and correspondence on Grape Culture, referred to above, and they will be read with interest; indicating that we have yet some things to learn or unlearn:

At our last meeting I had a few words to say in relation to grape rot, then said to prevail in some vineyards, giving you what my ten years' experience led me to believe would be a partial cure for it.

Mr. James Starr, in rather a sarcastic manner, took exceptions to it, and added further that he never could raise those big crops of grapes that Mr. Barler and others (meaning myself) told of. I did not answer at that time, because Mr. Starr is an old grape grower, and ought to know better than I about grapes. Still, I felt that I was right, and I determined to get the best authority I could to back up my position, as there is certainly no profit in a small crop of grapes, and there is a profit in a large crop.

I wrote and ascertained who were the most extensive grape growers in Ohio. Having got their names, I wrote to them for their method of training, amount of grapes raised to the vine, etc. I will read you their answers, then judge whether I am right or not:

BERLIN HEIGHTS, Ohio, August 19, 1875.

FRIEND HAYDEN: Your lines of the 13th are at hand. We grow Delaware, Ives, Concord, Catawba and Isabella. We trellis our grapes on wire—two and three wires. Where we have three wires we trim so as to tie on two, and as the vines grow we tie to

the third wire. During the summer there is no one in this section that pinches back at all; after the buds start we go through the vineyard and thin out to about what we want for a crop. I think pinching back hurts the vine. I have tried it, and have come to that conclusion. A neighbor of mine says he has picked twenty-eight pounds of Delawares from one vine; he says he has picked over thirty pounds of Concords from one vine, and the vine was not hurt by over-bearing. I have Concord vines that have over twenty pounds on this season, and they look all right.

Yours, respectfully, Z. SNOOK.

VERMILLION, Ohio, August 15, 1875.

MR. HAYDEN—*Dear Sir:* Yours received. In reply, would say that we do but very little summer-pruning. We never pinch off canes bearing fruit. We let them run, and sometimes they run ten or fifteen feet, according to variety. The most we do in the way of summer-pruning is to thin out the fruit.

Cutting off fruit-bearing canes affects the ripening of the grapes. They will not ripen as well.

In the summer I cut out canes where they are too thick, fruit and all, and very often those not bearing fruit.

I have had Concords bear twenty-one pounds to the vine on the average, and not to their injury. I have had one hundred roots do this, set eight by ten feet.

The fruit crop in this vicinity is very poor, compared with many other years in the past. Grapes are fair, but not more than half a crop. Ives, Hartfords and Delawares are coloring; have been for a week; will do, some of them, to ship the first of September. Rogers' No. 4 is also coloring, and a beautiful grape, too. I like it better than the Concord; it handles so very much better, and is a good bearer.

Yours, truly, L. N. TODD.

OCTOBER MEETING.

This meeting was held at the residence of A. A. HILLIARD. There was a slim attendance, and no papers or discussions of any thing more than local importance. It was the week of the St. Louis Fair, and much sickness prevailed in the neighborhood.

NOVEMBER MEETING.

The November meeting of this Society was held, on the 4th inst., at the residence of ISAAC SNEDEKER, of Jerseyville. The attendance was not large, but the meeting was full of life.

PRESIDENT HOLLISTER being absent, Vice-President ISAAC SNEDEKER called the meeting to order at 11 o'clock.

The presence of C. W. MURTFELDT, of St. Louis, and GEORGE H. GILL, of Kirkwood, Mo., added much to the interest of the meeting.

DISCUSSION ON ORCHARDS, ETC.

The discussion on "Orchards" was opened by A. A. HILLIARD, of Brighton, who declared that he was discouraged in his efforts to grow apples for the markets. The business had ceased to be profitable. The failure of crops, insect depredations, drought, frost and climatic changes, had rendered orcharding uncertain and unprofitable. If there was any profit, it was in the line of converting the apple into cider.

This rather radical statement brought to his feet JAMES E. STARR, of Jersey county, who thought this question of very great importance. He did not want this statement of "no profit" to go out without his protest. He knew that Dr. Long, and other large apple growers, had come to this same conclusion, that orcharding had ceased to be profitable. But this was not his experience. He believed that apples could be grown for twenty-five cents per bushel. The great trouble with our orchards is that the varieties are not well selected, and locations are not good, hence the unprofitableness of the orchard. Attention should be paid to varieties, location, general cultivation and care, and then we will not have complaints that the orchard does not pay.

Further discussion, *pro* and *con.*, was had upon the subject. The conclusion of the whole matter was, that orcharding, well followed, will pay—not otherwise.

In answer to the question, "What varieties of apples to plant?" a long discussion followed. There was a wide range of opinion, but all agreed that the following were valuable varieties to plant for profit: Smith's Cider, Pryor's Red, White Winter Pearmain, Porter, Winesap, Janet, Limber Twig, Red Astrachan. These were mentioned, but are not a complete list. The very best winter apple is the Newtown Pippin, but is not always profitable for market.

MR. SNEDEKER said that the apple called Smith's Cider was not particularly a cider apple. It did not take its name from any such supposed fact. There lived a gentleman in the State of Pennsylvania who chanced to have this seedling. It grew to be a large tree, and very productive. It stood in a convenient location, so that the owner was in the habit of rolling under this tree his cider barrels, from which fact the tree came to be known as Smith's Cider. It is a profitable apple, of fair quality.

JAMES STARR gave a glowing account of his recent visit, when in Chicago, to Drexel Park. That which excited his admiration most was

the gorgeous display of flowers, and their beautiful and perfect arrangement. The taller-growing varieties were put in the background, and so in gradations to the lower-growing varieties, which were in the front, making a perfect bank of flowers for miles in length, and kept in perfect order. He said he never saw any thing like it. He was sure that if the members of this Society could see what he saw it would stimulate them to grow flowers, and it would show them how much can be done in even a small door-yard. We are not yet fully educated in matters of ornamental planting.

COL. W. H. FULKERSON said that he saw the same thing in Fairmount Park, in Philadelphia, and was affected in the same way that friend Starr was at sight of Drexel Park. He did more. He took the names of the different varieties, and bought seeds and plants, and went home and tried to copy the park. The result was, the raggedest flower-bed you can imagine. [Laughter.] He missed the arrangement, and the tall-growing varieties and low-growing sorts were in confusion.

Inquiry was made of the Secretary if he still grew the Alton Nutmeg melon, and if it was the best variety.

The response was, "Yes." We grow no other variety. It is large, round, bears shipping well, and suits the Chicago market. We shipped fifteen car loads this season, all sold in Chicago.

MR. STARR—We should attempt to grow only such crops as are suited to our climate and soil. I have always contended for this in our State and local societies. The North is trying to grow peaches. I tell them to let peaches and sweet cherries, and such other fruits and vegetables as are not suited to their location, alone. Take that which is adapted to your soil and climate. We in this latitude should do the same. It is better all around.

MR. SNEDEKER—It is usually difficult for us to grow the Hubbard squash, but this year, on my farms in Nebraska township, I had remarkable success. They grew like pumpkins. There was the climate and soil that just suited them.

A. A. HILLIARD—I was in the State of Massachusetts this fall, and I never saw such Hubbard squashes as they can grow there. If I had a farm in that locality, I should turn my attention to growing Hubbard squash, celery and cauliflower. I believe there is money in these vegetables in that locality. They could be profitably shipped to St. Louis.

JAMES STARR—St. Louis is the very worst market in the world to sell any thing that is really nice. I am willing to go upon the record as saying that thing. When I was in the fruit business in St. Louis, we would

sometimes order and receive the choicest fruits, and they would lie upon our stands day after day. Millionaires would pass them and refuse to pay the price. Ship the same article to Chicago, and they are sold at once.

Adjourned for dinner.

At the dinner table, C. W. MURTFELDT, of St. Louis, read the following:

My Friends, and Members of the Alton Horticultural Society:

Remembering with great pleasure the many pleasant occasions when it was my privilege to meet with you, allow me to say that I am most happy to be with you to-day, and to congratulate you on the fact that you still flourish, and are, like a band of brothers, earnestly and unselfishly working for mutual improvement and advantage in the dissemination of horticultural experiences and knowledge.

But, in the language of the famous Texas Judge, "If this court knows herself, and she thinks she does," your continued existence and prosperity are due as much, if not more, to the social features of your meetings as to your perfect organization, and the systematic and practical arrangement of the discussions and papers. And in regard to the first proposition, namely, the social features, the ladies of this association are to be credited with a very large share of the general success; for they not only cheer you with their presence and smiles, and furnish the spice of your conversations with a very little cayenne or vinegar, but upon them most devolves the duty and the labor of providing for the wants of the inner-man, otherwise called stomach—certainly not a small matter when such a crowd of stalwart and hungry men as are here present to-day surround the social board, and especially if this crowd is augmented by pilgrims and strangers from over the water. But these strangers, I am happy to say, well know of the generous hospitality and the welcome awaiting them at the home of Mr. and Mrs. Isaac Snedeker, or of "any other man" of this association.

I venture to say that outside of Boston, and perhaps also of Philadelphia, no other society can be found that has met as regularly, has labored as hard and as successfully, and accomplished as much, as the Alton Horticultural Society.

And as for the charge we hear occasionally of a Mutual Admiration Society, pure and simple, it needs only a reference to the frequent mental sparrings indulged in, and of the battle of the giants sure to follow, if any untenable proposition or false teaching is ever indulged in by any member. The fact that you do glory in your stability, age and success, should not be charged to you as a fault and a crime as long as you do not *rest* on your laurels, but are raising your standard still higher, and are aiming for still greater attainments.

The fruits and vegetables which you produce and send to market are well known to be fresh, well assorted, superior and choice in quality, and of full measure; and while their excellence is due, in a measure, to the favorable locations and natural fertility and adaptation of your lands, much is to be credited to your superior skill as cultivators and fair dealers.

And my prayer to-day is, that, as a Society, your boughs may be like those of the goodly cedar, and that their fruits may be plenty and pleasant to the taste, and that you may still bring forth much fruit in your old age.

PRESIDENT SNEDEKER and JAMES E. STARR responded to the above in a pleasant way.

The Committee on Orchard Fruits reported on the following apples, presented by I. SNEDEKER:

Smith's Cider—Good orchard and market. *Yellow Bellflower*—Fine family, tardy bearer. *Ravole's Janet*—Late winter, desirable.

Pryor's Red—Fine winter, tardy bearer. *Winesap*—Favorite winter. *Lady*—Fine for family use. *Baldwin*—Not desirable. *Pennsylvania Red Streak*—Very fine in rich lands. *Newtown Pippin*—Best winter. *Gilpin*—Good keeper and for cider. *Sweet Romanite*—Unknown, good keeper, poor quality. *Willow Twig*—Late winter. *Pennock*—Salable, poor quality. *Gloria Mundi*—Not desirable. *Limber Twig*—Very late winter. *Fulton*—Good fall.

Mr. Geo. H. Gill, of St. Louis county, Mo., presented an apple for name. The apple was Huntsman's Favorite—a good late fall fruit, not particularly desirable. Respectfully submitted,

J. E. STARR, *for Committee.*

JAMES E. STARR gave an account of what he saw at the Pomological meeting in Chicago, in the line of new varieties of grapes. He spoke favorably of Rickets' Seedlings. He did not think as much of Campbell's Lady grape as some do. It is musky and not particularly desirable, in his opinion.

C. W. MURTFELDT, of St. Louis, said that he was in the vineyard of Mr. Rickets, and saw and tasted of his new seedling grapes, which he thought were very promising. He said that his neighbor, Mr. G. H. Gill, living at Kirkwood, Mo., has some experience in grape-growing, and he would like to hear from him.

MR. GILL stated that he had some sixty varieties in his vineyard. He had the California varieties grafted on our native sorts, and had hoped for success, but this season the wood has failed to ripen up, owing to the cold, wet summer, and he feared they would not stand the winter. His practice is to trim in the fall and lay down the vines, giving them some protection, except the Concord.

MR. STARR recommended the Snyder blackberry.

MR. MURTFELDT recommended Edwards' Favorite strawberry.

MR. GILL had tried a great many varieties of strawberries, and was now reduced to Cutter's for family use, and the Wilson. The Downing is the berry taking the lead in this section of the country.

MR. MURTFELDT blasted our hopes with reference to a good time coming, when the Lord would appear for our deliverance and sweep away our insect enemies without our agency. He said that time never would come. Even my friend Gill here has apples that are wormy. True, he has so much fruit that is better than the apple, that he does not look very closely after his apple orchard.

MR. GILL—I have turned my apple orchard over to Mr. Riley to take care of. [Laughter.]

MR. MURTFELDT—The remedies are at hand for heading off, for example, the codling-moth; but what is the use of prescribing remedies if they are not applied? Eternal vigilance is the price of good fruit.

DECEMBER MEETING.

The meeting of this Society for December was held at the residence of E. HOLLISTER, Esq., in Alton. There was a good attendance. The Vice-President, ISAAC SNEDEKER, of Jerseyville, called the meeting to order at eleven o'clock.

The first discussion—and, in fact, the chief discussion of the day—was upon the "Apple and the Apple Orchard."

We missed the worthy chairman of the Apple Orchard Committee, Dr. E. S. HULL, whose recent and sudden death, and that of his wife, has made a great break in our circle. Messrs. JAMES E. STARR and JOHN M. PEARSON were appointed to prepare a paper in memory of our departed friends and co-workers.

MR. PEARSON—The subject of pruning orchards has been discussed among us a hundred times; but the subject comes home to me now as it has not before, because I have got some of this work to do now. Before this I have had little to do in pruning. I wish to know when is the best time to cut large limbs—now, or wait till summer? My notion is, not to prune at all, except with "the thumb and finger," if you can help it. But we can't help it. And now I have got to saw out some large limbs. When shall I do it?

MR. HUGGINS—Do it now. If I could prune all my orchard, I would do it in June, especially if I could do it in time—when it was needed. But I can't do it all in June, and hence I prune at all times, doing the work by degrees as I can. The "thumb and finger" pruning is all right in theory, but it will not work in practice. And now, while I am up, I want to say some things upon the subject of the profits of the apple orchard. I must say I have been astonished and tried, to hear the members of this Alton Horticultural Society talk, from time to time, about there being no profit in the apple orchard! No longer ago than at your last meeting, this subject was discussed, and it was said there was no profit in growing apples. And now, lest you may think that I am full of profits, and have made a fortune from my orchard, I will say I have not

done it. But I expect to make it profitable; and it does seem to me that it goes out with ill-grace from this Society to say that there is no profit in apple orcharding. What do we come here for, but to learn how to grow apples with profit? Have we learned nothing in our gatherings? And are we now compelled, after so many years of experience and teaching, to put up our bulletin-board and announce to the world that there is no profit in growing apples? If that is the case, let us disband and go home, and never meet again; for what is the use? If that is the case, why have we not quit the business years ago, and taken up with some thing that *does pay?*

But what are the facts in the case? No doubt, many orchards do not pay. Mine has not paid me for three years, because of the failure of the crops. In fact, for seven years we have had unfavorable seasons for the most part, and for three seasons the dry summers and hard winters have been especially against us. But will this always be so? Do not other crops experience unfavorable seasons as well? Another reason why so many orchards are unprofitable is because of their age and poor quality of fruit. The varieties set twenty or thirty years ago are not now generally wanted in the markets. I have varieties in my orchard that I wish I did not have. They are unprofitable. But I have enough that are good to encourage me that I shall have profits. I admit, a man who does not know how to grow apples can not grow them with profit: but there is not a man in this Society but knows all about the business: and so I say I regret to hear gentlemen say there is no money in the orchard. Men who give no proper cultivation, and do most outlandish pruning with the axe or otherwise, as I have seen, and whose sins of omission and commission are more in number than the Decalogue, ought not to have profits, and they will get their deserts, sure. But for the members of this Society to say they can not profitably grow apples is preposterous! I regard the present as the best time to set out an orchard, and, if I were a young man, and contemplated growing fruit, the first thing I should do would be to set out an orchard. But there are some varieties I would not set: I would not set out the Early Harvest for one, because it gives me almost no fruit.

MR. HOLLISTER—Does not the Early Harvest need extra cultivation in order to do well?

MR. HUGGINS—That may be the case. At any rate, it is not valuable in my orchard, and I would not set it.

MR. PEARSON—How would you renovate an old orchard?

MR. HUGGINS—By cultivating and manuring. But possibly it is not worth saving. Then grub out and plant a new orchard on new soil.

MR. PEARSON—Do you not think that the money lies in having a better quality of fruit?

MR. HUGGINS—The money lies in the red apples. There is more money in the Ben Davis than in many other apples better in quality. Color is better than even quality in the markets. If I were planting a commercial orchard to-day, I would hardly want any thing but red apples, and then cultivate understandingly and in the light of the present day, and success will crown the effort.

JAMES E. STARR advised against planting the Ben Davis in this latitude. It does well in the central part of the State and in more northern locations than this; but it is sure to disappoint those who plant it in this section. It does well for a few years, and then dwindles in size, rots and scabs, so as to make it worthless to us.

MR. PEARSON—I noticed the report of the last meeting, and I was myself a little surprised at some of the statements. I remember, some eight years ago, a company of us—members of this Society—had been down to St. Louis, in attendance upon the Missouri State Horticultural meeting. On returning from the meeting, the discussions were upon fruit culture, and I remember the question was asked by myself, "If you were going into the fruit business, what particular branch of it would you select to make the most money?" The unanimous answer was, the apple! Some of these men did go into apple orcharding. Now, this last year, I had occasion to purchase some apples, for my orchard does not yet supply my house, and I went to one of these men for a supply. He showed me a row of Janets, from which he had taken about thirty bushels of apples from each tree. I paid $1 per bushel for my apples, and thereupon friend Pearson went home thinking and figuring up the profits of apple-growing: "Forty trees to the acre, fifteen bushels to the tree—half the above named crop—at fifty cents per bushel—half the price I paid—and, to make the thing sure, take out half of the whole amount of bushels for wind-falls and cider apples, and we have left one hundred and fifty dollars per acre!" In the light of these figures it is hard to believe that orcharding is not profitable.

In regard to my own orchard. There is no apple in it that bears like the Smith's Cider; the Benoni is my next best apple. My orchard is eight and nine years old. I have the Jonathan; it has not borne any fruit yet; the Janet has borne nothing to amount to any thing; the Pryor's

Red has not shown an apple; Newtown Pippin, Red Astrachan and Early Harvest, ditto. Tolman's Sweet is a favorite in the house. I have other varieties, but have had no fruit from any of the kinds worth mentioning, save on the Smith's Cider, and Benoni.

MR. HOLLISTER—How about the Red June?

MR. PEARSON—When you can get them free from scab and good size, they are fine, not otherwise. I would mention that I have the fruits of the black walnut, hickory, and persimmon on my place. I want, but have not got, the pawpaw; and my advice is, that when we find it unprofitable to grow the apple and other domestic fruits, that we go back to the indigenous fruits—the hazlenut, persimmon and pawpaw. [Laughter.]

DR. B. F. LONG explained his position upon this whole question. He is one of our oldest orchardists, and has large experience in the business. He had made more money out of the little Romanite than any other apple. He had made a good deal out of the Early Harvest and Red Astrachan. He said: I have in my orchard, planted in 1839, varieties like the Northern Spy, and Yellow Bellflower, that are not worth the ground they stand upon. I believe in cultivating the orchard, and the manures best suited to the orchard are lime, ashes and stable manure. Young orchards are the most profitable—can hardly fail to be profitable for a few years. But taking the orchards over the country as we find them, and they are not profitable, generally, to their owners—not that the business can not be made so, but simply it is not made so. More attention must be paid to the culture and care of the orchard, if you would make it profitable. The war upon the insects must not cease. Indeed, there must be no let-up in diligence, if we expect good fruit and paying prices.

Adjourned for dinner.

IN MEMORIAM.

Your committee, to whom you have delegated the duty of preparing an expression of your feeling from the loss of Dr. E. S. Hull and his wife, can not undertake to place an estimate upon the loss of those, so well known to the friends of horticulture. They, therefore, in full sympathy with you, submit the following brief record and ask that it may be spread upon your records:

DR. E. S. HULL.

BORN, MAY, 1816. DIED, NOVEMBER, 1875.

President of the Alton Horticultural Society, 1853, 1864.
President of the Illinois State Horticultural Society, 1859, 1875.

State Horticulturist, 1869, 1870, 1871.

Originator and earnest advocate of the theory and practice of root-pruning.

Especially successful and widely known as a grower of superior fruit.

Earnest, careful and scientific in his investigations, his reputation became national.

A thorough, practical horticulturist, full of faith in the future success of that noble calling.

Our standard bearer is gone, but the cause remains.

JANE HULL.

DIED, NOVEMBER, 1875.

A loving wife and mother—she made home pleasant and attractive. In all her husband's investigations in horticulture, she was a valued co-worker. Gentle and retiring in disposition, her influence was best seen and felt in the sweet precincts of the domestic circle.

Respectfully submitted,

J. E. STARR,
J. M. PEARSON, } *Committee.*

At the afternoon session the subject of Ornamental Planting was discussed. Mr. HUGGINS called especial attention to the fact that the shade trees upon our streets were being injured by the boxing that surrounds them. They should be removed or shifted, or death will come to the trees.

MR. PEARSON—There is a kind of fruit grown in our neighborhood called the grape. It is good to eat and easily grown, but nobody will pay any thing for it. I had, myself, a quantity of this fruit. I offered it for sale at two cents a pound, but found no takers; and I then offered to give them away, and found some takers. It is a nice fruit to have; but nobody seems to want it bad enough to pay any thing for it.

MR. HOLLISTER—I believe the grape crop has been abundant and quite remunerative in this vicinity the past season. Good packages and good packing are essential in marketing the grape. If I were situated so I could, I think I would plant a vineyard, and I would expect to make it profitable.

MR. NICHOLS—How about those jars for keeping grapes? Have they proved a success?

The experience of Messrs. MCPIKE, FULKERSON, NICHOLS and BARLER was that this device was a failure.

MR. HUGGINS had noted, with satisfaction, the fact that the horticultural journals were talking more freely and favorably of birds. It was a good omen.

MR. PEARSON—Yes; I saw an article once in favor of the crow and cat-bird. [Laughter.]

MR. LYON—Why not advocate the hog in the orchard to destroy insects?

MR. PEARSON—That is the kind of a bird I favor.

MR. LYON—Also the chickens and the turkeys.

AUGUSTUS STARR—They are the kind of birds I like to see.

"Orchard Fruits" were discussed at length, and it was so much of a repetition of the discussion in the forenoon, it will not be repeated here. It was remarkable in this, that what was one man's choice was not always the choice of another, by any means. It is evident that soil and location have much to do with the qualities of the different varieties of apples.

MR. STEWART said that now is the time to cover the strawberry beds, if it has been neglected till this time. Old straw will do to cover old beds, but new straw is better for young fall-set beds, as the straw will lay up loose and not smother out the plants. Be careful not to get the mulch on too heavy. I have had plants destroyed by a too heavy mulch. Sawdust does not make a good covering; it injures the soil by souring; leaves will blow away. Fine shavings is a good covering, but nothing is better than straw.

The discussion again switched over on the apple question. Some body wanted to know about the Stannard apple. It is grown in the north part of the State, but will not do here; comes in too early in the fall to be of use.

Questions drew out Mr. HOLLISTER to say that the demand for apples had changed from what it was a few years ago, as to varieties and sorts. The apples wanted now are the large, colored apples. He thought we should have to quit planting the Janet. We have now too many of that kind of apples.

JANUARY MEETING, 1876.

The January meeting of this Society was held at the office of Captain E. HOLLISTER, in Alton. It was the annual meeting for the election of officers, and other business, which cut short the discussions. The attendance was fair, and a good impetus was given to the work of the year.

Letters were read from Prof. RILEY, Hon. W. C. FLAGG, and others, promising to be present during the year, and present papers suited to the occasion.

The condition of fruit-buds was briefly discussed by Messrs. LONG, STEWART, WILLIAMS, J. E. STARR, and others. All concurred that, owing to the two weeks' warm weather just passed, possibly the peach buds had swollen so as to endanger the crop, should severe cold weather ensue.

MR. HUGGINS said he had never known the apple crop seriously damaged in the winter months, and he inquired if any gentleman present had ever known such a thing as apple-tree buds being killed in the winter.

DR. LONG said he had never known serious injury done to the apple in winter. When the apple tree is in blossom, then is the danger. It is then the frost cuts off the crop.

MR. HOLLISTER—I had a letter from Cairo, which said that roses had started.

MR. STARR—I had a letter from Mr. Galusha, at Normal. He says the buds of the soft maple are very much swollen.

Now is the time to select your seeds and plants, and not leave the matter till you are ready for work in the spring. Send in your orders early. Planting of trees and bulbs may be done even now, and it is well to do it now.

MR. MCPIKE—Not only well to do it now, but there are plants and bulbs that you *must* plant now, if not before attended to. It is even late to make some plantings. It would have been better if it had been attended to in the fall. But make no delay—plant at once those bushes and plants that are hardy and earliest to start in the spring. The gooseberry and currant are plants that should go out early. Bulbous roots, such as the peonies—it is even late now to plant them. I advise the planting of evergreens early—even with the ground frozen. If taken up with a frozen ball of earth, so much the better. February is a good month in which to move evergreens; they become established and ready to grow at the first breath of spring.

This was said in answer to a question asked by Mr. WILLIAMS, when to transplant evergreens, particularly the junipers.

MR. HUGGINS advised planting evergreens in the spring rather than in the winter. In his experience they did better.

DR. LONG recommended the post oak as a beautiful ornamental tree. The hard maple was his model tree, but the post oak was more than welcome in his grounds, and so also the soft maple.

MR. HUGGINS urged the importance of improving this beautiful winter weather in tree-planting, of all hardy kinds. Fall or winter planting is better than spring planting. He would echo what Dr. Long said on a former occasion: "If you must plant in the spring, plant early."

CAPT. D. STEWART said he would speak of the raspberry and currant. He placed the Kirtland first on his list of red raspberries. What he had seen of it impressed him favorably, and he gave considerable weight to friend Hayden's opinion respecting it. Some say its season is short, but Mr. Hayden says it lasts with him for eighteen days, and that is long enough. He considered that a recommendation. His objection to the Turner was that it lasted all summer, and you seemed never done picking the berries. It is desirable with the fruit grower that the crop be ripened up at once, or in a reasonably brief period. The second choice of a raspberry was the Brandywine. He had not fruited it, but it does well in Delaware and Pennsylvania, and he believed it was a berry that would suit us. He was favorably impressed with the Highland Hardy, and meant to grow them. The Turner would probably find no place on his grounds. He had hesitated long, and was in doubt. Among the black-caps he placed the Collinsville Miami, or McCormick, first. It was a little late, but it was a large berry and productive. He did not want the Davison's Thornless. It was too soft and not satisfactory.

MR. HOLLISTER—I would like to hear from friend Draper about the McCormick raspberry.

MR. DRAPER—It is a fine berry, but it is not good for market. It is a little late. It is soft, and, worst of all, it has on it a bloom that looks like mold; and purchasers are deceived by it, and will not buy it. It is a better berry than the Doolittle, which is a black berry without bloom; it will yield more than the Doolittle, but it does not sell as well in Chicago. It will sell in St. Louis, where it is known. The Davison's Thornless is even earlier than the Doolittle, and with special culture and in rich soil does well, and will far outsell the McCormick.

CAPTAIN HOLLISTER agreed with Mr. DRAPER in regard to these berries. He succeeds well with the Davison's Thornless by close trimming and high cultivation.

MR. STEWART—I have shipped the McCormick for four or five years, and I never had these complaints of it. True, the price was small—from twelve to fifteen cents. But I want to call attention to the currant. This is a fruit that is neglected, but it is one that will pay to grow and ship South—not North. I had, last year, about a quarter of an acre, and it netted me forty dollars. You must mulch your currant bushes to keep in moisture, to have them do well. They can grow the currant in the North easier than we can here, and hence it does not pay to ship North. You can grow currants easier than you can grow potatoes.

DR. LONG—I am glad friend Stewart has spoken of the currant. I have formerly tried to introduce the currant. As a medicinal fruit nothing is better. It is grateful to take, simple and pure, and is eminently health-giving. Those who eat freely of currants will never need the doctors. I have picked forty bushels of currants from one quarter of an acre. They will appreciate good culture, and yet they grow in the fence-corner with little care.

MR. STEWART—About taking currants clear—I like to mix them with raspberries, half and half. In this way it is a dish fit to set before a king.

DR. LONG recommended the Red Dutch as the best currant. He had grown them so fine and large that they were sold by commission men for cherry currants. The white grape currant is the variety for family use. The cherry currant is very large and sells well in the market.

About this time Mrs. HOLLISTER came in with a surprise, in the shape of hot coffee, sandwiches and mince pies. This revived wonderfully our spirits. For this kind office she received, on motion of Dr. LONG, the hearty thanks of the Society.

After lunch, Mr. JAMES E. STARR read an essay upon the subject of

UTILIZING FRUITS.

One of the most important and interesting questions to all engaged in growing fruits, is that of disposing of them to the best advantage, or, in other words, so handling them as to realize the most money from them. It is admitted that good fruits, well grown and properly put into the market, generally pay their way and do not cause the grower any trouble, but rather a positive pleasure; but, do the best we may, it

sometimes happens that the market becomes overstocked with perishable varieties, or the over-abundance of the crop reduces prices too low for good paying rates.

The losses to the grower are not so much from the above causes as from the large quantities of defective and poor fruit, which annually go to waste and are not only no profit but a positive injury to the grower. How shall this great loss be avoided?

I answer, first, by increasing the quantity grown. You will say this is a strange way of removing an evil by increasing it, but I think it is the true way. How is it with you here in Alton? You have some extensive growers, and many more who grow small quantities; yet, with all your boasted skill, with your advantages of soil, railroad and river facilities, you are but small growers when compared with those of other places in our State.

Quincy ships more fruit than Alton. Ipava, a small town in the interior of the State, grows more small fruits than are grown in this vicinity. Many places in your State are doing more than here, and why? Now for the remedy. At Ipava they have a canning house, owned and controlled by the fruit growers, and they find it pays. Farmers have become fruit growers, through its influence, and the business has assumed a settled, fixed character; lands have advanced in value through their success. They sell from their fields when it pays, and when it does not they can. Just so in Quincy and other places.

In several places fruit-drying houses have been erected, and have utilized that class of fruits which were a loss before. How is it in Alton? No canning house, no drying house. It pays elsewhere, why not here? It has been claimed, and I think with truth, that the soil around Alton is particularly adapted to fruit culture; one thing is certain, this Society believes it to be so, and has by long earnest effort acted upon that belief. Yet we can not say to those who are looking to this point as a place to embark in fruit growing that we are prepared to encourage them.

Canning and drying are money-making processes, and should be taken hold of at once. The want of these establishments causes annually a great loss to fruit growers. Will not some one fill this want? As it now stands we must grow more fruit, and force, by the show of quantity grown, some one to step forward and utilize it.

Reliable statements were given at the State Society meeting recently, showing clearly that a large profit resulted, in each and every case, to those engaged in the drying of fruit. I believe it would pay now, that within easy reach of your market there is enough fruit annually lost to keep a small establishment running to a good profit.

DR. LONG said the essay accorded with his notions, and he wanted to see the time come when we should have among us a great drying and canning establishment, one that would use up our surplus fruits.

MR. MCPIKE spoke encouragingly of such an enterprise.

MR. STARR—Money can be made at two dollars per dozen for three-pound cans.

MRS. HOLLISTER—Not if you sweeten your fruit.

A Voice—We don't sweeten it.

MRS. HOLLISTER—The fruit is not good if sugar is not put in at the time of canning. You can not add sugar afterward and have it good. I would not have your fruit if it is put up without sugar.

J. L. BLAIR—The canned-fruit business has become thoroughly demoralized. What are called three-pound cans contain but one pound of meat; the two-pound cans have but twelve ounces of fruit in them. This is the best standard weight. There is much that is put up that has not half of that. The consumer has become so disgusted with the manner in which the fruit is put up, that he will not buy it. My advice is not to go heavily in the canning business; go light at first. You have got to work up a trade; you must have time to work up a reputation, and demonstrate that you put up an honest package, and then you can sell your fruit. You can then enlarge your capacity and your business. When the people come to know that the brand of the Alton Horticultural Society is worth four times as much as the Baltimore brand, they are going to buy of you.

MR. STARR—That is the idea.

MR. BLAIR—I would say that drying was more promising than canning. Dried Alden-fruit can be kept for years, and there is a demand for it in the cities. I think the drying and canning establishments should go together.

The Secretary, O. L. BARLER, read his annual report, in which he referred to the difficulty in attaining a certain horticultural knowledge. What is orthodox this year becomes heterodox next year, owing to climatic or other changed conditions. When we think we have fastened a truth, and begin to glory in it, some stubborn fact obtrudes itself and upsets all our boasted knowledge, and we walk with unassured footsteps.

The essayist, recognizing the cloud that now rests on horticulture, yet spoke confidently of the successful outcome of horticultural labor, financially and every way.

The Treasurer, Mr. STEWART, reported $53.48 on hand.

The election of officers resulted as follows:

President—JAMES E. STARR.

Vice-Presidents—D. STEWART and J. L. BLAIR.

Secretary—O. L. BARLER.

Treasurer—D. STEWART.

The new President took the chair, and a vote of thanks was passed complimentary to E. HOLLISTER, the retiring President.

The following committees were appointed:

Orchards—J. Huggins. *Ornamental Planting*—J. M. Pearson. *Vegetables*—E. Hollister. *Vineyards*—Fred. Hayden. *Small Fruits*—Capt. D. Stewart. *Flowers*—Mrs. D. Stewart. *Entomology*—Major Muhleman. *Wines*—H. C. Benson. *Ornithology*—J. Huggins. *Orchard Fruits*—Dr. B. F. Long.

On motion of H. G. MCPIKE, it was voted to allow the Secretary twenty dollars for his services the past year. Also, on motion of E. HOLLISTER, the Secretary was allowed ten dollars for preparing a full report of all important papers and doings of the Society for the year, to be published in connection with the report of the State Horticultural Society's doings.

On motion of Mr. MCPIKE, and amended by J. L. BLAIR, it was voted that the Society open their meeting hereafter at ten o'clock, sharp.

Horticultural Society of Southern Illinois.

OFFICERS FOR 1876.

At the annual meeting, held in Quincy, December 16th, 1875, the following officers were elected for the year 1876:

President—J. E. Starr, Elsa, Jersey Co.
Vice-President—Parker Earle, Cobden, Union Co.
Sec'y & Treas.—Jona. Huggins, Woodburn, Macoupin Co.

The meeting of the State Society being held so far south this year, it was deemed best to have no meeting for discussions, but to join with the State Society in its deliberations.

JONA. HUGGINS, *Sec'y*

Onarga Horticultural Society.

OFFICERS FOR 1876.

President—J. B. Clark.
Vice-President—E. D. Robbins.
Rec. Sec'y—J. L. Burnside.
Cor. Sec'y—Isaac Amerman.
Treasurer—H. Pinney.
Librarian—Isaac Amerman.

Jo Daviess County Horticultural Society.

REPORTED BY ROBERT BRAND, SECRETARY.

OFFICERS FOR THE YEAR 1876.

President—A. L. Cumings.

Vice-Presidents—T. Hallet, Dr. E. D. Kittoe, Fred. Chetlain.

Cor. & Rec. Sec'y—Robt. Brand.

Treasurer—Robt. Brand.

Executive Board—A. L. Cumings, J. M. Harris, D. Wilmot Scott.

STANDING COMMITTEES.

Orchards—Fred. Chetlain, T. Hallet, Harvey Mann, Wm. Gillett.

Vineyards—J. G. Soulard, Jacob Zins, D. A. Barrows.

Orchard Fruit—Mrs. J. M. Ryan, Mrs. T. Hallett, Jas. G. Soulard.

Small Fruit—D. Wilmot Scott, T. Hallett, H. Gronner, C. Vandervate, John Leib.

Botany and Vegetable Physiology—Mrs. Sarah C. Harris, Mrs. M. A. Jennings, Mrs. C. H. Colman.

Horticulture—Dr. E. D. Kittoe, H. Gronner, Mrs. L. S. Felt, Mrs. C. Foster, Mrs. J. G. Baker, Mrs. A. L. Cumings, Mrs. E. L. Avery.

Ornamental Trees—Mrs. Jas. M. Ryan, Sarah C. Harris, A. L. Cumings, Fred. Chetlain, Robt. Brand.

Ornithology—A. L. Cumings, J. M. Harris, Jno. W. Robson, of Kansas, E. M. Bouton.

Entomology—Rev. Jos. Wassall, Prof. Henry Shimer, of Mt. Carroll, Prof. Wm. LeBaron, Capt. E. H. Beebe, of Geneva.

Chemistry and Culinary Vegetables—Mrs. E. L. Avery, Mrs. Fred. Chetlain, Mrs. T. Hallett, Mrs. Sarah C. Harris.

This Society has lived and flourished over twenty years, discussing all subjects relating to horticulture at its regular monthly meetings.

A part of its life has been spent in public halls, but the pleasantest and most successful of its meetings have and are being held at private residences.

Taking our locality (the frigid zones of Illinois), its exhibitions can not be surpassed.

This Society recommends for this county the following list:

Apples—Major, Benoni, Yellow Bellflower, Jonathan, Red Astrachan, Duchess of Oldenburg, Willow Twig, Soulard, Lowell, Domine, Maiden's Blush, Red June, Smoke House, Ben Davis and Northern Spy.

Crab Apples—Transparent and Soulard-Hybrid American.

Pears—Duchess d'Angouleme and Flemish Beauty.

Grapes—Concord, Hartford Prolific and Delaware.

Cherries—Lieb and Richmond.

Strawberries—Wilson's Albany.

Plums—Hinkley or Miner.

Raspberries—Philadelphia and Purple Cane.

Gooseberries—Houghton's Seedling.

Currants—White and Red Dutch and Black Naples.

Horticultural Society of Central Illinois.

This Society met, in its second annual meeting, at Quincy, on the 16th of December, 1875, at which time the following officers were elected:

OFFICERS FOR 1876.

President—D. B. Wier, Lacon, Marshall Co.

Vice-President—J. W. Robison, Tremont, Tazewell Co.

Secretary—T. Butterworth, Quincy, Adams Co.

Treasurer—A. G. Humphrey, Galesburg, Knox Co.

As this meeting was held at the same time and place as that of the State Society, no discussions were held or papers read upon horticultural subjects. A general and free discussion upon the management of the

Society resulted in a decision that, whenever the meetings of the parent Society are held in the limits of this Society, we will hold no separate meetings for discussions, etc., but unite with that Society.

On motion, it was voted to turn over the funds in the treasury of this Society—eleven dollars—to the State Society.

On motion of O. B. GALUSHA, it was

Resolved, That all persons residing within the bounds of this Society, who have paid membership fees to the State Society, shall be members of this Society without the payment of additional fees.

On motion, the Society adjourned, to meet in Galesburg, on Tuesday, the twelfth of December next, at two o'clock, P. M.

T. BUTTERWORTH, *Pres. for 1875.*
D. B. WIER, *Sec. for 1875.*

CRYSTAL LAKE HORTICULTURAL SOCIETY.

OFFICERS FOR 1876.

President, - - - - JOSIAH WALKUP.
Vice-President, - - - B. F. PECK.
Secretary, - - - - R. G. BENTON.
Treasurer, - - - - L. BECKLEY.

This Society is largely interested in the production of vegetables for the extensive canning establishment located here, and in which many of them are stockholders.

The number of acres in vegetables, in 1875, as reported by the Secretary, is as follows: Cucumbers, 1,205; tomatoes, 89; sweet corn, 83; green peas, 48; string beans, 20; onions, 9; martynias, 10; trophy beans, 10; peppers, 11; cabbages, 83; cauliflowers, 2; horse radishes, 15; pumpkins, 8; garlics, 1; Hubbard squash, 2. The whole number of acres cultivated in vegetables by members of this Society is 1,601, and the amount paid for the product in 1875 was $59,347.12.

PROCEEDINGS

OF THE

Horticultural Society of Northern Illinois.

NINTH ANNUAL MEETING.

This Society held its ninth annual meeting at Crystal Lake, McHenry county, in Growers' Hall, commencing January 25, 1876.

President LEWIS ELLSWORTH, of Naperville, called the meeting to order at half-past 1 P. M.

O. B. GALUSHA acted as Secretary, by request of the Executive Committee.

ADDRESS OF WELCOME.

MR. WALKUP, President of the Crystal Lake Crossings Horticultural Society, welcomed the Society in the following words:

Mr. President and Gentlemen of the Horticultural Society of Northern Illinois:

It becomes my duty, as it is also a pleasure, in behalf of the Crystal Lake Horticultural Society, and of the citizens of this and the neighboring village, to bid you all a hearty welcome.

Allow us, while thus welcoming you, to indulge in a little pride, such as the little girl feels when she points to John as her *big brother*, exclaiming, "He is a man, and I am his little sister." With pride we point to you to-day as our *big brother*, and ask you to recognize us as your *little sister*.

I welcome you as a band of self-sacrificing workers, whose labors are a blessing to thousands. It is a fact well known to all close observers, that the toil and study of the horticulturist is seldom liberally rewarded in dollars and cents, but it does receive the richer reward of an experience that "it is more blessed to give than to receive."

I welcome you in behalf of the two hundred thousand people among whom you live and labor, and who are blessed, directly or indirectly, by your efforts in the cause of horticulture.

Trusting that your stay with us may be pleasant to you, and mutually beneficial to us all, I again repeat, a hearty welcome to you all.

THE PRESIDENT'S REPLY.

THE PRESIDENT responded to this cordial welcome in a few appropriate words, substantially as follows:

In behalf of the Horticultural Society of Northern Illinois, I thank you for this hearty welcome.

Permit me to assure you, as the "elder brother" of the "little sister," we feel an attachment for and a pride in such a sister. It will be one of the pleasantest memories—this warm and hearty greeting. The family ties should be cultivated, strengthened and intensified. This promotes usefulness and happiness.

We feel an assurance that our stay will be pleasant to us; our strong desire is, that it may be beneficial, in some small degree, to you. We ask your co-operation in our deliberations. Again, we thank you, *our little sister*.

APPOINTMENT OF COMMITTEES.

On motion of Mr. SCOTT, a Committee on Programme was appointed, as follows: Messrs. Scott, McWhorter and Seeley.

The following Committee on Printing was also appointed: Messrs. Galusha, Ellsworth and L. K. Scofield.

REPORT ON PROGRAMME.

MR. SCOTT presented the following as the order of business for the remainder of the day:

1. Pruning fruit trees—to promote health of trees, bearing and quality of fruit; an essay by S. G. Minkler, of Oswego, Kendall county.
2. Discussions upon pruning.
3. Orchards—planting and culture, for home and market purposes; a paper by A. B. Austin, of Downer's Grove.
4. Discussions upon orchard culture.

PRESENTATION OF FLOWERS.

DR. ENNIS (of Clinton, Iowa,) presented a flower stand containing a collection of very beautiful flowers, artistically arranged, which was placed upon the table by Secretary SCOTT.

Upon receiving the flowers the President said:

I am grateful for this expression of your respect and regard. I do not consider it, however, as so much personal to myself as it is a tribute to the Society over which I am called to preside. I love flowers. I see

in them the smile of the All Father, who delights, through such beautiful emblems, to exhibit to us His love and beneficence. Flowers! without them how dreary the earth would seem! They are scattered everywhere along our path, to cheer us and lead our thoughts to the great Master Artist, who has fashioned and painted them so perfectly. I pity the man or woman who can look upon such things without an uplifting of the heart. Their influence is refining wherever felt. But as we often overlook or trample upon them, so in life we are too apt to overlook or fail to properly regard the many blessings strewn along our pathway, looking to the sterner, harder things—the thorns that wound us and make us uncomfortable or unhappy. This is all wrong. Let us appreciate and enjoy the blessings of life, with hearts overflowing with love to the great Creator and Dispenser of all.

The flowers of earth are faint but beautiful emblems of the flowers that bloom in the fields beyond, in that realm where the sun never sets and the day never ends.

I say to Dr. Ennis, who represents that State whose men are live men, and who contribute so largely to advance the interests of horticulture, that I thank him for his beautiful gift.

Dr. Ennis was asked if the flowers in the collection can be grown in a sitting-room, and how?

He responded:

The camellia, in the centre of the stand, is a native of China. It stands, as it always has, as the most beautiful flower in the world; it does not succeed well as a window plant, unless under special treatment.* The carnations and the primroses, which surround the camellias in the collection, are of easy cultivation, and bloom continually through the winter. Winter-blooming plants in a room add very much to the cheerful appearance of the home. The influence of flowers is felt by all the inmates, softening and refining, tending to make rude boys more gentle; and even rough men have their roughness toned down by the contemplation of these home beauties, while the pleasure which the frugal housewife takes in the care of these beautiful pets far outmeasures the labor and pains bestowed upon them.

Mr. President, these flowers are presented as a simple expression of our love for you, as individuals, and esteem for this Society. In Iowa we look upon this Society with grateful feelings. All over our State we see the work of the hand of an Edwards and a Douglas. I am prepared to say to-day, that for the delicious fruits, the beautiful flowers and trees flourishing within our State, we are indebted to the work and influence of this Society more than to any other source.

You are, here in Illinois, establishing horticulture upon a true, scientific basis, and it is to-day a more exact science than that of the profession which I have so long represented.

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*For full descriptions and modes of cultivation of camellias, carnations, primroses, etc., see Vol. 8 of these Reports, pp. 207–212.—Editor.

Mr. Bradstreet and I have have come here as delegates from Iowa. We are happy to meet you all, and hope you will meet with us at our next annual gathering.

THE PRESIDENT called upon Mr. S. G. MINKLER, of Oswego, for a paper on pruning.

MR. MINKLER—*Mr. President:* You will excuse me if I do not furnish as finished a report as some of my brethren here would do; I have not the advantages of a good education. When I was young, the boys, here in Illinois, came up almost any way; some were well brought up, but generally they came up somehow, anyhow; and some came on foot and drove the cows. I used to drive two cows—all we had—and then these died of hydrophobia, and then my occupation and resources were both gone at once, and so I came up the rest of the way in a sort of hap-hazard manner. [Laughter.] Nevertheless, I always *try* to do what is asked of me, and have prepared a short paper, which I will ask the Secretary to read, as I am at present afflicted with a cough, which prevents me from reading aloud.

THE SECRETARY then read as follows:

ORCHARD PRUNING.

Mr. President and Members of the Horticultural Society of Northern Illinois:

I feel ill-qualified for the task assigned me; there is such a great diversity of opinions upon this subject, and results not always being uniform, it is difficult to arrive at definite conclusions. I will confine my remarks to pruning in orchards, and hope, at least, I may write enough to elicit discussion, by which some good results may be reached.

Time to Prune.—Some advocate pruning in the latter part of June, some in autumn, some in winter, some in March, and some prune not at all. Some hold to the theory that all the pruning should be done when shoots first start, and with the thumb and finger—a theory that looks well on paper, but is detestable in practice.

I will have to quote other authorities to bring this subject clearly before your minds. Dr. Warder says, in his American Pomology, page 260: "When large limbs are to be severed, it should be performed late in autumn, when vegetation is at rest, because it is found that such large wounds, which can not be soon healed over by the new growth, will, at this season, dry in and resist the action of the elements better than if made when the wood is full of sap, and in active circulation." He goes on to say that the "early spring is favorable; but the work must be suspended as soon as the buds begin to swell."

Now, if this latter period is the best, what time would you have to perform the work after the frost is out of the ground and before the buds begin to swell? Then the work must be deferred till the latter part of June. This is another short period; and unless you have more men and means at command than I have, you could accomplish but little in so short a time, in an orchard of thirty or forty acres.

The Doctor also states that there is but one time when pruning should be absolutely interdicted, and that is when the wood is frozen. Then comes in the old adage: "Prune in winter for wood, and in summer for fruit."

Tyler McWhorter says, in Transactions of State Horticultural Society for 1868, page 213: "Autumn or winter pruning is bad, as severe freezing affects a fresh wound too deeply."

Summer pruning is most free from subsequent sprouting, but it gives the greatest check to the vitality of the tree.

Arthur Bryant, Sen., one of our most prominent horticulturists, recommends pruning in autumn, after the fall of the leaves. Every season has its hurry, and what can not be accomplished in a given time has to be deferred to another; and so in regard to pruning—it is better done out of season than not done at all. I have pruned in all seasons of the year, except in winter and in May.

I have been pruning during the mild weather of the present month (January), scraping off the rough bark and painting the wounds. As I stated above, it is almost impossible to prune an orchard of thirty or forty acres in a few days, at any season; and as we differ as to the best time, let us use all seasons, so that we accomplish the desired result; for pruning must be done, and severely, too, on our orchards of twenty-five years' standing—there is scarcely a sound tree to be found in them. This is a startling announcement, but it is, nevertheless, true; and the saw and the knife must be used vigorously; there are many dead branches, and the marks of the *cicada* are still visible. The extremities of the limbs should be shortened back instead of trimming them up; or, in other words, trim down instead of up; by this treatment I still have hope that our orchards may last for some years. Many varieties are sending out new and vigorous shoots, which will eventually form a new head; these should be retained rather than cut away.

Mode of Pruning.—This is a subject which should interest all orchardists. I passed by an orchard in company with a horticulturist, who asked why the owner did not cut down his trees and trim them afterward. In this orchard the limbs were trimmed up to a little tuft on the ends of the limbs, all the small branches having been cut away, and I did not wonder at the remark.

Our orchards will have to be trimmed on the renewal system, heading back and saving the new growth. Furthermore, we will have to trim up, so that the land can be plowed. This is contrary to my former convictions, but the blue grass so soon takes possession of the ground that it becomes absolutely necessary.

How close to the body of the tree should the separation of the limb take place? I visited an extensive orchard this winter, that had been trimmed in June last, and the bodies scraped; the limbs were cut off in a rough manner, four to six inches from the trunk. I asked the proprietor the reason for pruning in that manner. He replied, the trees were all injured, and by cutting in that way the bodies would not be so soon injured. I think every limb will indicate by the ring or shoulder where it should be removed; the amputation should be made close down to this shoulder.

DISCUSSION ON PRUNING.

MR. MCWHORTER—I concur mainly in the teachings of the paper just read, but can scarcely agree that one may trim at all times of the year. To be sure it is very difficult to prune thirty or forty acres of orchard in a short time, yet it is seldom necessary to prune an entire orchard in any one year, the trees are in such different conditions—some requiring immediate attention, and others not. I would prune where it needs it most—one part in one year, and another in another year. I am satisfied that pruning when the trees are at rest checks them less than if pruned when in full growth. Pruning late in autumn causes the wood to deaden in deeply, and thus cause decay; but if done in winter, say in pleasant weather in February, the wounds do not dry in so deeply before growth commences; and, besides, labor is cheaper then than in autumn. If pruning off large limbs is done when the trees are in growth, it not only checks the growth, but the wood blackens and becomes diseased. On the whole, I prefer February for the general pruning; but for cleaning out sprouts around the collars of trees, and removing water-sprouts, I prefer the last of July or first of August; if done earlier, they will sprout up more than if done about this time. I agree with Mr. Minkler, that branches should be cut off just outside the rings at the bases of the branches. Where trees have been damaged, as orchard trees now are, it is unsafe to prune in the spring; it exposes the dead inside wood to the atmosphere, and it soon begins to rot. But if pruning is or must be done at this time, you should not neglect to put a good coat or two of paint upon the wound, to exclude air and rain.

MR. MINKLER exhibited branches which had been severely cut by cicadæ, and showed that there had been little or no subsequent wood-growth upon them, and that they were very brittle. It was evident that these twigs were of little value, as they could not sustain fruit, even if it were to set upon them.

In answer to a question by the President, he said that new shoots had generally started out upon the branches just below where the damage had

been done, and he recommended heading back to these shoots, and in this way get new, healthy branches for fruit bearing. He said we must plant new orchards. All our orchard trees, twenty-five years old and upwards, are on the decline—in a dying state—and can not be productive much longer. I would plant only twenty sorts of apples, at most; we all have too many varieties. I have only just learned what and how to plant.

THE PRESIDENT—We have Mr. Heinl, from Terre Haute, Indiana, with us, and I trust he will participate in the discussions.

MR. WIER (of Marshall Co.)—I have given attention to this subject of pruning all my life, and some years since I came to the conclusion, and from which I have not since wavered, that the only way I can prune for the good of the orchard is to *not prune at all.* As has been said, our orchard trees are damaged, and I tell you we are on dangerous ground when we recommend pruning at all. Every tree that I have cut for the last six or seven years, I have endangered its life. Take the Ben Davis, for instance; where I top-grafted it—even this hardy tree was damaged by the cutting. I also take issue with the essay, as to pruning so as to admit of plowing under the trees. It is no use to plow under the trees; the true way to kill the blue grass spoken of is to mulch. This dying back of the limbs is no new thing. I saw it before these late, hard winters. I know an old orchard in which are one hundred Gilpin trees, one-third of which were killed in the winter of 1855–6; the live trees threw up water-sprouts, which made branches that have borne well ever since, and no pruning has been done in the trees.

MR. MINKLER—I would like to ask Mr. Wier if his trees, that were injured by grafting, were not grafted immediately after a hard winter? I don't see why a man should carry about with him a mutilated arm, or why a tree should carry a mutilated, worthless branch; it seems to me that amputation is the remedy in both these cases. As to plowing under trees—when the blue grass takes possession it robs the trees of moisture, and the sod must be broken up.

PROF. THOMAS recommended pruning off twigs, or small branches, having cocoons or eggs of insects upon them, during the mild days of winter.

MR. WIER—Branches badly cut by the cicada never recover, yet I see no use in cutting them off; if left on they will furnish leaves, which will support the life of the tree while new shoots are starting, and these will in time renew the tree. One of my neighbors cut off all the branches of his orchard trees, that were cut up by the cicada, as soon as the eggs

were deposited, and his trees died, because he took off nearly all the leaves in cutting. Of course no tree can live if entirely denuded of its leaves in summer; and if you take off half the leaves, you only half kill the tree.

PROF. THOMAS saw no advantage in leaving any dead branches in the trees. He also expressed the opinion that the pruning of young oaks in the forest, by the cicada, was beneficial rather than detrimental to them.

DR. ENNIS (of Clinton, Iowa,)—I seldom talk upon such subjects, but I must enter my protest against the theory and practice of Mr. Wier. A stranger coming into our meeting would say we knew nothing about pruning, we differ so much; yet there is a medium which I think is right. I once bought an orchard, which was at the time of purchase a mass of thick brush, having had no pruning since it was planted, yet it was not productive. The trees were twenty-five feet apart, and so large that they covered the ground; some of them branched at the ground. I took a saw and at once commenced a system of pruning, which I followed up from year to year. From those which branched at the ground I sawed off one or more of the main branches, leaving those nearest upright, and so on more the next year, making quite symmetrical trees out of them, always thoroughly painting the wounds made in pruning. The result has been that these trees came into bearing, and have borne ever since. An orchard near me, which was planted some ten or twelve years since, has had a moderate annual pruning every year since it was three years old, by cutting off the young shoots which appeared where not wanted, and it is one of the most healthy and productive orchards that I know; it produced five hundred barrels of apples this year. In answer to a question, he stated that it stood upon rich hazel-barrens land, and had been cultivated.

MR. WIER—*Mr. President:* I think there has been enough said upon this subject; but I wish to say that the cases cited by Dr. Ennis do not establish the theory of severe pruning. The first orchard had been entirely neglected, yet the trees had become hardy by having been left to themselves, and the bark old and thick upon them before the work of trimming was begun, and the cultivation and painting connected with it helped to promote their health, while the trimming threw them into bearing. We all know that whatever impairs the vitality of a tree will increase for the time its productiveness. We all know, too, that it is possible for trees to be in such a state of health and hardiness as to withstand an immense amount of abuse, but that don't prove that trees are not better and longer-lived with good care than under a system of abuse. I have an orchard

which has never been pruned, and has produced more apples than all others in the county; it has always borne fine fruit all through the heads of the trees—big, fair apples. There is no use in "pruning out the inside of a tree so as to get into it to pick the fruit," as some claim; the way to gather apples is by ladders, placed against the outside of the tree.

I take these positions: *That as good fruit can be grown and as much of it without any pruning at all as by any system* of pruning; and that *nine-tenths of all the pruning done to apple orchards does more hurt than good.* Dr. Hull, in his last years, had arrived at the conclusion that an apple tree may be kept from decay until a hundred years old, by simply cutting off the extremities of the twigs and thus renewing the head.

I will cite one more fact and sit down: A neighbor had an orchard of Willow Twig apple trees, which sort, you know, is apt to split down under a weight of fruit, and which he trimmed up and trimmed out on the branches near the extremities, so that all the fruit must be borne on the outside of the tree. The first heavy crop split down about one-third of all his trees. I had an orchard of this sort about the same age, which had never been pruned, and upon the same year my neighbor's trees broke down, mine produced a third more fruit and did not break down.

Mr. Heinl (of Terre Haute, Ind.)—I prune my trees to an average height of three feet, and thin out the heads somewhat in this way: In the summer I go through and shorten in the little shoots where they are not wanted; I train them while young, and then there is no necessity of cutting out any large branches afterwards. I don't cut out large limbs.

The President—This subject is important, and one upon which, as we see, there is much disagreement even among intelligent and experienced cultivators; yet I think that extremes are to be avoided—a tree may be pruned too much or too little. A gentleman in my neighborhood (now dead) once planted an orchard, and as he believed in low heads he neglected entirely to prune. I told him his trees were too close-headed, to which he replied that "God Almighty made them grow so, and he was not going to interfere." As a result his orchard was not productive. On the other hand, I know orchards in my neighborhood which have been pruned too much. Whenever a branch of any considerable size is cut off, the surface of the cut on the tree should be thoroughly coated with a paint or composition, to protect it against the action of the elements; and the best compound for wounds made in pruning is made of coal tar and

shellac: First, cut the shellac in alcohol, and then mix together, one-third shellac and two-thirds coal tar, and apply with a paint brush. This is somewhat elastic, will not crack, and will last for years.

MR. MINKLER—My essay applied to orchards that were damaged or diseased.

THE PRESIDENT—I think the practice of cutting back diseased limbs, as recommended in the essay, and renewing, is correct.

JUDGE WEED (of Peoria)—I came to Illinois in 1840, and in 1841 sent to Kentucky for apple trees, and planted them on hazel-brush land, in Fulton county; we enriched the soil some, and the trees gradually died out. In later years my experience does not agree with the observations of Mr. Ellsworth. Seventeen years since, I moved to the bluffs of the Illinois river, near Peoria, at which time I procured trees from you, Mr. President, for an orchard. You advised me to take young trees, but I took trees of five or six years old, and the next year planted five hundred more, and for a time they did well. I, however, began trimming them, and they began dying. If you begin to trim you must keep trimming. I have been converted to the no-pruning plan, by observation and from necessity. I shall plant more trees in the spring, but wont put a knife into them.

In answer to a question, he said he had cultivated his orchard, but had three acres in blue grass, where the trees were dying the same as the others. He said, I have no trees which have never been pruned, but those pruned least have done best, and are healthiest. There are two or three trees top-grafted with Rhode Island Greening, which have done as well as any.

D. C. SCOFIELD (of Elgin)—It seems to me we are not hitting the mark; there is much in location and soils. Orchards about Elgin, on prairie land, trimmed or not trimmed, are failing all alike. When we plant an orchard we should prepare each tree, never leaving a branch which will ever have to be cut off. In cultivating, never plow so as to cut the roots, because the roots need, first, light; secondly, warmth; thirdly, food—all of which they get near the surface.

A neighbor of mine planted an orchard on the prairie with low-head trees, branching at or near the ground, and when the June grass took possession of it he mulched heavily, killing the grass as far out as the branches extended, and yet some of the trees in this orchard are dying. About the year 1860 I planted nine hundred trees, consisting of about twenty varieties, on prairie soil underlaid with gravel, and the orchard has not paid expenses. In 1867 about one hundred Snow-apple

trees in the orchard bore heavily, but have never borne since. About the same time a neighbor planted a similar orchard, on sandy, timber soil underlaid with clay, which has been very profitable; he told me this fall that he had so many apples he didn't know what to do with them.

As to pruning, some varieties need it and others will do well without. Prune carefully, cutting out the small branches as needed, so as to admit of getting into the head of the trees for gathering the fruit. I hope all who give experiences or observations concerning orchards will state the nature of the soils and subsoils.

MR. WIER—Prof. Thomas thinks we are crazy because we don't agree; while the fact is, that there are some soils which will raise good trees even if they are abused, while others, as those described by Mr. Scofield, can not grow trees to a considerable age, no matter how you treat them. On some soils, too, the trees go into the winter in good condition, and the winter does not hurt them. The sandy-loess soil went into the winter of 1874 as dry as powder, and many of the trees standing in it died. We can not reduce horticulture to an exact science, because there is so much difference in soils, subsoils, and surrounding circumstances and influences. One word more on the pruning question. I have challenged members of this Society, and of the State Society, to prove me wrong on my grounds, (and I have orchards on almost all kinds of soils and exposures). I invite all to come and examine for themselves.

MR. COCKRAN (of Blue Island)—A stranger to Illinois, reading the discussions of to-day, would think we were not in an apple-growing country, and yet I think we are. I planted five or six hundred trees, eight years ago, on black prairie soil with clayey subsoil, and they have done well. A large number were Ben Davis, of which not one has died; the Duchess of Oldenburg, also, are pictures of health. Much depends upon the varieties and the treatment. I prune but very little, and surface-drain my orchard. My friends Minkler and McWhorter will give any man a list of apples which will do well on the prairies, and also a list which will succeed on timber lands.

MR. CROW (of Crystal Lake)—I make no pretensions to be a successful fruit grower, though I have planted many trees, beginning eighteen or twenty years ago. The soil of this older orchard is prairie, underlaid with gravel, and the trees are gone to blue grass, and hence are not very productive. In my travels over this county I have noticed that wherever orchards are cultivated they are thrifty and reasonably productive, but where neglected they are full of insects. I have in mind an orchard in

Kane county, which had been neglected and become barren; but when the owner commenced a system of pruning and cultivation, his orchard recuperated and became productive.

D. C. SCOFIELD (of Elgin)—Our orchards of five to ten years old, on prairie land underlaid with gravel, are healthy; but they then begin to decline unless cultivated and manured. We, on the prairies of Northern Illinois, must look mainly to timber-land orchards to furnish us with fruit. It is demonstrated that trees can't produce crops every year; they must be fed or we must wait for them to recuperate.

He cited the case of an orchard which had been sickly and barren, being rejuvenated by shallow plowing and manuring; and that a subsequent examination showed that the manure had induced the formation of a net-work of fibrous roots near the surface; these should not be disturbed or broken by plowing, as they feed the trees.

MR. MCWHORTER—In Mercer county there is not the difference between the timber and prairie lands which has been mentioned as found in this portion of the State. We have there a good depth of good soil, which is underlaid with clay; we sometimes reach the clay in digging post-holes, though the soil is often much deeper. I have observed that orchards in timber begin to bear sooner than those on prairie, but in old orchards have not observed any difference; I have, however, seen very many trees dying from effects of borers, when the owners did not know what was the matter.* In these dry years the orchards on nearly level prairie lands have fared better than those on high, rolling lands.

MR. MINKLER—Give me climate right, and I will risk the soil. My soil is prairie, adjoining timber—black clay soil, with a reddish brown subsoil, and about ten or twelve feet below the surface we strike blue clay, which goes to a depth of one hundred and thirty feet, and I do not know how much further. In some parts of the region about Oswego the subsoil is gravel, which, I find, is not as good for trees; they have dried out, and died more on these lands during the past excessively dry years than on the clay subsoil.

In answer to a question, Mr. MINKLER said that the forest trees had died more, within two or three years, than he had ever observed before.

MR. WIER—The frost line has often much to do with the bearing of fruit trees—those above the line of spring frost escaping, while those

* No doubt, the death of a large portion of the trees referred to in this and other discussions as dying is due to the work of insects, resulting from the neglect of the owners.—EDITOR.

below have their fruit destroyed. This year, I had a half crop on high bluffs, while my neighbors on low lands had none. I don't believe in Mr. Scofield's theory about the feeding roots. These feeding roots are renewed annually; it is all a mistake to suppose that the nutriment is absorbed by these small roots which live over winter. By cutting off these you multiply the feeding hairs, and it is much better that these draw their nutrition for the tree four or five inches below than at the surface, as they are less affected by drought there.

Dr. Ennis thinks that pruning brought his trees into bearing. Of course, the check given in pruning will do that very thing; so will borers; yet we would not recommend borers in orchards on this account. Always remember *that any thing which checks the growth and vigor of a tree forces it into bearing*, and remember also that this is usually done at the expense of longevity and the future value of the tree.

MR. NELSON (of Wilmington)—The statements of difference between orchards on prairie and timber lands, made by Mr. Scofield, do not hold good in Will county; I can see no difference either in the health or fruitfulness of orchards in respect to prairie or timber land. I have noticed, however, that orchards on level lands have borne better, during the past dry years, than those on rolling lands. This year of excessive rains the reverse was true, and I raised more apples in my orchard, on high, rolling, prairie land, than all the county beside. It is a rich prairie soil, and from twelve to eighteen inches thick above the reddish-brown clay subsoil. Across the Kankakee river, on a sandy soil, the Yellow Bellflower has borne profusely, while with me it does not bear much.

THE SECRETARY explained that most of the apparent inconsistencies and contradictions in the remarks of the different speakers were such in appearance only, both sides being correct very often and generally, there being so great a diversity of soils and modes of cultivation. He explained that the geological formations of the State are such that many orchards, but a short distance apart, are under entirely different conditions as to soil and subsoil, and that what would be true in one might not be true in another; hence it was of the utmost importance, in giving experience in horticulture, to state all the conditions as far as known.

THE PRESIDENT—All who have lived in this State twenty years will agree that there are occasional winters which damage our trees But this fact is not confined to the West; we find the same true, to a certain extent, in the East; yet we have a trying climate, and should study and work to so master the situation as to succeed. This we can do and are

doing. Let us take good care of our trees, study their habits and condition, and never neglect to do for them what they evidently need. Prune them moderately, not severely, and keep them vigorous.

After an exhortation from brother D. C. SCOFIELD, to report to the Secretary all the conditions of soils, subsoils, etc., of our orchards, and an announcement of the programme for the evening, the Society adjourned until seven o'clock this evening.

TUESDAY EVENING.

President ELLSWORTH called the meeting to order promptly at seven o'clock.

QUESTIONS ON BLACK HEART.

MR. MCWHORTER read the following questions, which were handed him by S. T. BRADSTREET, of Monticello, Iowa:

1. Does cutting off the seedling apple root below the cion, as usually done in root-grafting, produce "black heart" in the future tree?
2. Does "black heart," in any instance, commence at the root, and extend upward through the tree?
3. Does "black heart" increase in size, or spread by contagion to other parts of the tree? Or, to increase in size, must the same conditions follow which caused the original "black heart," thereby repeating the effects in subsequent wood-deposits of the tree?

MR. NELSON—Instead of discussing these questions at present, I move the appointment of a committee of three to report upon them.

This motion was agreed to, and Messrs. Nelson, McWhorter and Wier, were appointed as such committee.

DISCUSSION ON PRUNING RESUMED.

The discussion on pruning orchard trees was then resumed, and many members participated in it, repeating, in substance, much that had been said in the afternoon.

MR. MCWHORTER said that if you chop or cut into the dead wood in the interior of a damaged tree, and admit air and rain, rotting would ensue; but if the air and rain were excluded, in case it was necessary to cut such trees, they would live on, and, with good care, be productive.

MR. NELSON also bore testimony to the absolute necessity of following the advice of the President, in thoroughly protecting the wounds whenever necessity required the amputation of branches.

MR. WIER said that if the sap-wood was entire, the discolored or dead inner-wood was preserved intact, like the fruit in the cans on the tables before us. He now had one orchard which had been pruned, and the trees had rotted, while the unpruned ones had not.

ESSAY ON ORCHARDS.

THE PRESIDENT announced that Mr. A. B. AUSTIN, of Downer's Grove, would read a paper on orchards.

MR. AUSTIN then read, as follows:

Mr. President, and Ladies and Gentlemen:

As requested, I will make a few remarks on "Orchard Planting and Culture," and will confine myself, principally, to the apple orchard.

I do not suppose that any thing that I shall advance will be new to the older members of this Society, if to any of you, as the subject has been so well written up before; what is here said will be from my own stand-point and surroundings, in DuPage and surrounding counties.

The ground to be planted to an orchard should have a good natural drainage. This is of great importance, as fruit trees will not long survive with wet feet, or where their roots are for any length of time immersed in water. If the drainage is slow, or the ground flat, the trees should be set on the top of the ground; that is, holes must not be dug, but instead place the roots of the trees on the surface of the ground and throw loose earth over them; afterwards throw the furrows in, plowing towards the trees. This will raise a ridge on which the trees stand, the water passing off between the rows. I find orchards, even with this care on level or flat land, not as healthy or productive as those on ground rolling, or uneven enough to cause the water to run off with rapidity. Nothing answers for natural drainage. Where the subsoil is porous, the foregoing remarks on surface drainage do not apply—the water passing naturally through the subsoil. With us the light clay or barren land has produced the most fruit. The prairie or black soils make the larger and better looking trees; but with care in selections of varieties this difference will disappear. It is very important that the right varieties are planted. We may do all that is possible with our orchards; if we do not start right in this particular they will be failures.

I wish to emphasize this: *If our varieties are not right our orchards will be failures.* By right varieties, I mean those that will stand our winters and bear annual crops. A second or third rate fruit, the trees of which bear annual crops, is worth far more than a superb fruit, the trees of which bear now and then only a few specimens. We plant orchards

for pleasure and profit, and there is far more of both in good crops, so that we have plenty to use and some to spare, if they are not standards of excellence.

I am not prepared to recommend any variety for general planting, as each locality appears to have fruits peculiarly adapted to it, which, removed a few miles, are almost valueless. There a very few varieties of fruit that do well over a wide range of territory, and a few others do better by emigrating.

When we are ready to set or plant or orchard, let us go to our neighbors who have orchards (if any such) and find which sorts have done best for them; or go to our nearest nursery-man, tell him what we want, whether the orchard is intended for market or home use, and he can generally make a better selection that we can make ourselves, unless we are well acquainted with the fruit in our locality. Let the fancy lists, published here and there, alone. I would rather have the advice of one practical fruit grower than all the lists ever published. I would not recommend any certain age for trees at the time of setting, as I have seen good orchards from trees that were of different ages—from two to ten years old when set, and as perfect failures as possible from all trees of those different ages—so much depends upon location and after-culture. I prefer root-grafted trees for apple orchards, as they are as good in bearing as budded trees, and possess the advantage of uniform trunks, which add to the beauty of an orchard.

Get trees with one central stem, instead of forked or crotched trees, so that the head of the trees can be raised if desired; start with a low head, as the trunks of the trees need shading, and nothing does this better than its limbs. Thousands of trees are lost annually by their trunks being exposed to the sun. Reject all tall, slim trees, as of necessity their trunks will be exposed to the sun, and will soon become diseased—food for borers and worms—and then disappear. Much has been said about high and low heads, so much so that I will pass it by.

Young orchards should be well cultivated for several years after setting, or until they commence bearing well. It were better if the ground be not cropped, for the orchard is crop enough; yet, to insure better cultivation, by most persons it will be necessary to allow some hoed crop each year, provided as much, or more, is returned every year in shape of manures. By no means plant the orchard in grass ground, or sow small grain among the trees; the orchard may be seeded to grass after it has attained age, and is bearing well; but we must be liberal to our orchards if we wish them to be liberal to us. They should be manured every year, and with a liberal hand.

The *Scale aphides*, or bark-lice, were very troublesome a few years ago, and apple trees were much injured by them, more especially old orchards, and those in grass ground; they are disappearing, however, being destroyed by a parasite, and at present cause no anxiety. The borer is only troublesome where the trunks of trees are exposed to the sun. Shading artificially, or by means of low-headed trees, is the best remedy. The codling-moth troubles us more at present than all other insects combined, and until we are rid of them they will take a large

share of our apples. I have tried pasturing hogs in the orchard; it improved the fruit, but the hogs destroyed the trees by rubbing against them, and in many instances girdling them; this remedy is worse than the disease. Keep the hogs out of the orchards. Do not allow any animal to run in them if you wish to save your trees; we will have to wait for some efficient means of destroying the moths, or for some insect to destroy them for us. Last year the moth did much less damage than usual; what apples we had were nearly free from them. Was it the season being wet and cold, or are they disappearing? I trust some reason will be given, at this meeting, why they were not as numerous as usual.

Thus far, with the exception of the earlier seedling orchards, the cultivation of apples has not been a success—pecuniarily or otherwise. With us our grafted orchards do not bear well, and could they all be cut down to-day, with the knowledge and experience we now have, in ten years we would be farther ahead in profitable orchards than we will be under present circumstances.

We have many fine, large seedling orchards that bear heavy crops, but most of the fruit is inferior in quality, much of it only being fit for cider and vinegar. These orchards generally have one or more trees in each that produce a good quality of fruit, and bear good annual crops; and from such trees must come our future orchards, with a very few varieties we now have of propagated apples, which are worthy of cultivation. From the size, vigor and general health of these trees, we may hope for more successful orchards in the future. I believe that a brighter day is coming for the fruit culturist in Northern Illinois; that, by and by, when we have eradicated the worthless varieties, and replaced them with our best seedlings, we will not only have plenty of fruit to use, but plenty to spare.

DISCUSSION ON APPLE ORCHARDS.

MR. MCWHORTER—There is one portion of Mr. Austin's essay which should not pass without notice, namely, that in which he claims that seedling orchards are more healthy and productive than grafted ones. I claim that this is a mistake. Take such cultivated varieties as Red June, Sweet June, Ben Davis, Wagoner, Keswick Codlin, Duchess of Oldenburg, and others that I might name, and I will bet on them every time as against the seedlings.

While Mr. McWhorter was talking, several members interjected names of cultivated varieties which bear heavy crops, and are hardy.

A general discussion here ensued upon the manuring of orchards, in which nearly all the speakers agreed that manure is needed after the trees have come well into bearing. Seeding to clover, rather than any other grass, was recommended where ground was rich, after the trees had been in orchard from five to eight years.

MR. SCOFIELD (of Elgin) said that all kinds of fruit trees and shrubs, from apple trees to strawberry vines, must be fed if we expect crops of fruit. An apple tree bearing from fifteen to fifty bushels of apples annually, or biennially, takes a vast amount of nutritious elements from the soil, and these elements must be restored to the soil or barrenness will result. He cited a large tree, which was barren through neglect, and which the owner began to manure, using the strongest manures. The next year after the application it bore twenty bushels; he continued to manure annually, and the product increased until it reached fifty bushels at one time. He then sold the place; the purchaser neglected the tree and it soon became barren again. Another neighbor, to test the value of manure, manured only each alternate row in his orchard, and as a result these rows became very productive while the others were comparatively barren. After a few years he stopped feeding those rows and manured the unproductive ones, which resulted as before—those fed highly produced large crops—the trees loaded to the ground—while the neglected ones gradually became unproductive.

MR. WIER—I have grown up in a large apple orchard and observed many things; among others, I have observed a small orchard, now forty-three years old, which has never been plowed and has never been manured, yet has always been productive. The soil of this orchard is oak barrens—about as poor land as there is in Illinois. Yet this proves nothing as to the value of manure, because the soil is very porous; and though the hogs have been turned in to eat the fallen fruit, yet it is evident to me that these trees were fed by manure from the air, which is freely admitted through the porous soil. As to feeding trees, we may set it down as a rule that when trees do not make an annual growth of from six to ten inches they require manure.

MR. SCOFIELD (of Elgin)—It is probable that the droppings of the hogs fed that orchard sufficiently.

THE SECRETARY—I have considerable faith in the dust-cloud theory of Prof. Tyndall, hinted at by Mr. Wier. I have known instances of productiveness in thoroughly pulverized light soils for a long term of years, which I could account for only on the theory that the soils absorbed their fertilizing elements from the air. The experiments which have been made by Prof. Tyndall and other scientists, showing the prevalence of spores and germs of almost numberless species of vegetable life, and also the presence of manureal elements in the lower strata of the atmosphere, are interesting and instructive, and in some cases absolutely conclusive. It is always necessary to know the nature and treatment of soils pro-

ducing crops, if we would arrive at positive conclusions. We see, at least, from these discussions, that we all have much to learn, and that it will not do to "jump at conclusions."

MR. AUSTIN—It is not safe to keep hogs in orchards; they often damage the trees by rubbing against them.

MR. MCWHORTER stated, also, that they sometimes gnaw trees.

MR. WIER said that he knows a field which has been cultivated in corn for thirty-five successive years, and which this year bore an immense crop. His theory is that the frequent and abundant rains of the past season carried down manure from the atmosphere, and also dissolved much which was already in the soil.

THE PRESIDENT—I can not understand that we can take yearly crops from the soil, whether of fruits or cereals, without replenishing it. The essay says return to the land as much as we take from it, and I think this is sound advice.

MR. PERIAM—In 1849 I planted an orchard on sandy land, with a rich, deep soil, and manured it every year; and it has borne largely almost every year. It is not necessary that we manure our orchards *every* year, if we keep the soil well pulverized. The bodies of trees should be shaded, to prevent sun-scald, until large enough so that the branches will shade the trunks. The better way is to stake trees when planted, to keep them upright. In reference to the remarks about seedling orchards, I will say that I don't believe that seedlings, as a rule, bear better than the average of our grafted varieties.

MR. PLUM (of Wisconsin)—I am rather a bashful man, yet I wish to say a few words before this subject is dismissed; for, as fruit growers, we have been in the dark on this matter of cultivation. How shall we cultivate our orchards? All farmers want to take a crop of some kind—grass or cereals—from their orchards every year; hence they manure and cultivate and crop, and their trees begin to die. Then they seed down their orchards and turn in their stock to feed off the grass, and so go to the other extreme. We should avoid these extremes of cultivation and grass; yet I have almost come to the conclusion that upon our rich prairies it is better to keep the trees the most of the time in grass. I have found the best orchards on sandy lands, having a clayey subsoil. Wherever good white oak trees grow, apple orchards will flourish. In general, however, if farmers will give their trees as much care as they do their stock and corn, they will succeed. Our soil is richer than yours here, and we must treat our trees somewhat differently.

The discussion was here arrested by the announcement from the President that the Treasurer was ready to report, and the Society would listen to it.

MR. WOODARD presented the following:

TREASURER'S REPORT.

L. Woodard, Treasurer, in account with the Horticultural Society of Northern Illinois.

			Dr.	Cr.
Jan.	26, 1875.	To Balance of old account	$21.01	
"	28, "	" 59 Memberships, Mt. Carroll	59.00	
		" 6 Subsequent Memberships	6.00	
"	28, "	By D. W. Scott, per bill		$ 9.50
"	28, "	" J. Hallett, per bill		8.95
"	28, "	" Blank Book		0.35
Feb.	1, "	" Postage Stamps		2.00
Mar.	30, "	" O. B. Galusha, per Bill		30.00
Jan.	25, 1876,	" Balance on hand		35.21
			$86.01	$86.01

Respectfully submitted,

L. WOODARD, *Treas.*

MARENGO, ILL., January 25, 1876.

L. K. SCOFIELD was, by vote of the Society, chosen a committee to examine the account and vouchers of the Treasurer, and report upon it.

MR. SCOTT, from Committee on Programme, reported the order of exercises for to-morrow morning.

DISCUSSION RESUMED—CODLING-WORM.

DR. MYGATT—The essayist says that he does not know why the codling-moths were scarce last year. I examined the bark of the trees in March, and found that the larvæ in the crevices were all dead—black and soft—and, I learn, the same was observed in Michigan, and at Warsaw in this State. Probably the severe cold of last winter killed them.

MR. WIER—Probably they were killed by parasites, and not by the cold, as I have never known cold weather to kill them.

PROF. THOMAS—I think they were destroyed by some parasite, probably by an internal parasite. As a general rule, when we find such larvæ dead, we may infer that parasites were the destroyers. I think it

possible, however, that the cold in connection with some other climatic conditions, like a coating of ice or sleet, might kill them. There are, doubtless, enough alive to damage a large amount of fruit next year, and you should not relax your efforts in trapping them. I know of no better way than has been so often published—the use of cloth bands in the orchard, and hunting them in the crevices of barrels and bins in the cellar.

DR. MYGATT—I have used flannel bands, wound about my trees and tacked lightly, and have caught as many as twenty larvæ in a day in a single band. It is very little work to take these bands off, scald them, and replace them.

MR. WIER said he had studied this insect for six or eight years, and had discovered some curious things about it which are not in print, one of which is that the larva is attacked by a white, papery fungus, which begins in the puncture of the fruit, where the egg was deposited, and extends down the burrow, and finally envelops the worm, and destroys it. The larvæ brought into the house or cellar do not all hide and transform near the fruit, as I have found them in clothing and crevices in upper rooms. As the worms emerge from the fruit, they are inclined to crawl upward to seek quarters for transforming.

On motion of Mr. MCWHORTER, the Society then adjourned, to meet to-morrow morning, at nine o'clock.

WEDNESDAY MORNING.

The Society convened at nine o'clock, with President ELLSWORTH in the chair, and was opened with prayer by Rev. S. HEWS.

The Society first listened to

THE PRESIDENT'S ANNUAL ADDRESS.

I am pleased to meet at this the ninth annual meeting of the Horticultural Society of Northern Illinois, so many friends of horticulture, and its kindred interests, some of whom have been members from the first. Others, co-laborers, have come into the field at the various hours of the day. The eleventh hour of the day in horticulture has not yet come; before that hour many other laborers will enter the field, each, alike with the first, entitled to his wages, "a penny a day."

Do we realize the importance of well-directed, efficient labor, for the higher advancement of the great and *important* interests within the scope of this Society? Retrospect shows some advancement; but is that

advancement such as to yield the fullest satisfaction? What have we learned in regard to the varieties of the apple, for instance? What the best for general cultivation within the bounds of this Society, known as the Northern Horticultural Division of the State of Illinois? What, for the past decade of years, has been the increased market value of the apple crop? What the increased aggregate value of all fruits within this district?

It is too often the case that unworthy varieties of fruits receive the indorsement of horticultural and pomological societies, introduced and *recommended* by some *sanguine* individual, in which, perchance, self-interest may be the unconscious influence impelling to the *earnest, unqualified* recommendation of the "pet." This is not only a misfortune to, but a great wrong upon, the fruit growing-public. Let us guard against the recommendation of any variety without positive evidence of its being worthy.

I would recommend the adoption of such measures as will bring before this Society, at its annual meetings, an exhibition of fruits grown within our district, and by the exhibitor, accompanied with a list of the varieties, a statement of the manner of planting, and after-culture of the orchard, the character of the soil, the subsoil, whether drained or not drained, aspect, sheltered or not sheltered; if the former, whether by natural groves or planted timber-belts, or screens, deciduous or evergreens. I suggest the reference of the subject to the Executive Committee, or to a committee appointed for the purpose, with instructions to prepare a list of premiums, which, for the want of funds, must be diplomas or certificates. This list should be published and circulated. I trust this subject will receive at your hands the consideration and action its importance merits, for I fully believe that when soils, their proper preparation, with the other necessary surroundings, together with varieties the best adapted for general and local cultivation, are fully understood, there will be less complaint of the failure of fruit and loss of trees.

I ask your consideration to that great and important interest—Forestry. Its importance seems to have been lost sight of, or not fully realized or understood; or else, in the desire for immediate returns for our labor, we neglect the planting of trees for timber, and other purposes which wood is used for.

We, as a State, are far behind many of our Western sister States. Iowa alone, in 1874, planted twelve million trees—so stated by Hon. J. F. Allen, President of the State Horticultural Society of Iowa.

Governor Routt, of Colorado Territory, considered the subject of timber-tree planting of such importance that he brought the subject before the Constitutional Convention, now in session at Denver, recommending the incorporation of a provision in the Constitution to encourage and secure timber-tree planting.

Our own State Board of Agriculture, in 1873, offered premiums "for the encouragement of planting useful timber-trees"—one hundred dollars for the best one acre, five hundred dollars for the best five acres, but there was no response—not a single entry.

The forest area in the State of Illinois is annually diminishing. In my own county, Du Page, the acres in forest were several hundred less in 1875 than 1874

I would recommend the adoption of such measures as will best secure the preservation of our young timber, and increasing the area of timber lands by planting artificial groves.

This, the centennial year of our Government, is an important year in our national existence—a point from which to take a retrospect, and that a pleasant one. May our future, as a nation, be as prosperous as our past.

I suggest that, through our State Centennial Commission, we contribute specimens of such fruits grown in our district as can be collected and placed on exhibition.

Since our last annual meeting, some of our friends in horticulture have been called from their labors here to the life beyond, where fruits and flowers are ever fresh and fair.

1. Hon. M. L. Dunlap, of Champaign—long and widely known as "Rural;" one of the most popular and interesting writers on the industrial and productive interests of the country, a thorough horticulturist, a practical, self-made man.

2. William Hill, of Dundee, Kane county—a plain, open-hearted, out-spoken Scotchman, eminently practical, and "one of the olden time."

3. Dr. E. S. Hull, of Alton—an ardent, scientific and practical horticulturist. He has done much to advance that great productive interest in our State.

I trust our deliberations and discussions will be instructive, and further advance the interest we are organized to promote.

SPECIAL COMMITTEES.

The following committees were appointed:

On President's Address—Messrs. McWhorter, Periam and Ennis.

On Fruit on Exhibition—Messrs. Whitney, Nelson and Plum.

On Obituaries, as follows: On the death of Dr. HULL, Messrs. Galusha, McWhorter and Nelson; on the death of Mr. DUNLAP, Messrs. Minkler, Scott and Whitney; on the death of Mr. HILL, Messrs. D. C. Scofield, Lukins and Graves.

On Final Resolutions—Messrs. Scott, Galusha and L. K. Scofield.

REPORT ON BLACK HEART.

The following report was then read by Mr. MCWHORTER:

Your committee, appointed to consider the questions submitted by Mr. Bradstreet, will respectfully report that the subject of these questions is an old one, that was brought up and thoroughly considered many years

ago. We can fully indorse what has already been the verdict of vegetable physiologists on this subject, viz.: That "black heart" in trees does not originate from cutting off the tap-root; that when the tap-root is removed from the young seedling, the growing tree provides itself with new roots, both downward and in side directions, exactly as are needful for the good of the future tree; and that no facts have been adduced to show that removing the tap-root has ever caused any discolored condition.

We will further add, that it is a well-settled fact, where the wood that has been discolored by the severity of winter is again covered over by a good external growth, that the discoloration never extends into the subsequent growth, the line of distinction between the new and discolored wood remaining permanent and distinct.

Respectfully submitted,

TYLER McWHORTER,
W. T. NELSON,
D. B. WIER,
} *Committee.*

PROF. CYRUS THOMAS, State Entomologist, presented the following essay, which was illustrated with large colored drawings of many of the insects described:

THE BORERS.

BY PROF. C. THOMAS, STATE ENTOMOLOGIST.

Mr. President and Gentlemen of the Horticultural Society of Northern Illinois:

I am very glad to meet with you on this occasion, and trust that what I may have to say on the subject selected—*The Borers*—may at least serve to entertain you for a few moments, instead of proving a bore to you.

As most of you are aware, from my address to the State Horticultural Society, my present efforts, as State Entomologist, are directed chiefly to the arrangement of some plan by which there may be co-operation among the horticulturists of our State in their battle with insects. In order to do this effectually, it is necessary, first, to study somewhat the methods of generalizing remedies and preventives, as no consistent and practical plan of co-operation can be formed until this has, to a certain extent, at least, been determined upon. What I shall say to-day, in regard to the borers, will have reference chiefly to the methods of determining, by the general characters of the larvæ or grubs, to what order they belong; and also, how they may be grouped, according to their operations.

First, we may lay it down as a rule, which has but few exceptions, so far as applied to our State, that this work, so far as done in the orchard, nursery, and cultivated trees, is done by insects while they are in their worm or larval state; hence it follows, as a matter of course, that the perfect insects into which they are transformed must be sought in other situations, because possessing very different habits. On this account, these

insects are seldom recognized in their perfect state by those unacquainted with their history, especially those species which are shy, hiding during the day (as the *Saperda*) and coming forth only at evening.

In order to ascertain the most vulnerable point in an insect's history, we must be thoroughly acquainted with its entire life, from the moment the egg is deposited until the close of its existence in the perfect state. If we find this point to be the egg state, on account of the situation selected, exposed condition, aggregation, or other cause, then, as a matter of course, it is against this state that our efforts should be directed; and the same is true with reference to any other stage of their life which may be found to present the most vulnerable point.

By understanding these things in reference to our various injurious insects we are enabled to group together, to a certain extent, those of similar habits, and presenting the same vulnerable point, and thus generalize remedies; and if we can find a method of culture which is also at the same time a remedy, we are thus enabled to make a given amount of labor answer a double purpose.

This grouping of habits does not necessarily correspond with the grouping in the classification of insects; in fact, it may, and often will, bring together insects widely differing from each other.

As an illustration, I may mention the *Saperda*, *Ægeria exitiosa* (peach-root borer), and a species of woolly aphis—species belonging to three different orders—which operate more or less about the collar, or lower part of the trunk, of fruit trees; if we can find a method of mulching, or, to use a more general term, of cultivating this part of the tree, which will operate as a protection against these species, and at the same time be beneficial to the trees, an important point is gained; and, although it may not do away entirely with the necessity of special remedies to these different species, yet by steadily persevering in it we constantly diminish our insect foes, and render the special remedies less and less necessary.

But, as heretofore stated, in order to direct our experiments intelligently, it is necessary to know something in reference to these insects in their different stages. As we meet with the borers, when at work, almost exclusively in the larval state, it is important to ascertain whether they possess any characters in this state by which we may determine what they will be in the perfect state, and thus be enabled to trace their habits in that state, and see whether it presents any vulnerable point.

As a general rule it is exceedingly difficult to determine species in this stage of their existence; still there are characters by which we may, at least, approximate this in reference to the borers, and ascertain the group to which the respective larvæ belong, and thus gain a pretty correct idea of their habits in the other stages of their lives.

As the first step in grouping them by their larval characters, we may separate them in two divisions, thus: 1. Those possessing feet; 2. Those which are footless grubs.

The first division may be again divided into two sections, thus: 1. Those having but six feet or legs, which are true legs, terminating in a

claw, and are situated on the three front segments, immediately behind the head. 2. Those having not only the six true legs, but also ten or twelve thick, fleshy, short legs, situated on the middle and hind segments. I presume it is well known to all of my hearers that larvæ often possess two kinds of legs: first, the true legs, of which, when any are present, there are six, always situated on the first three segments behind the head, and are jointed and terminate with a claw; these are called "true," or "thoracic" legs. The others are thick, fleshy, unjointed, and usually very short legs, situated on some of the remaining segments; these are called "prolegs," or "abdominal legs."

Borers which have any prolegs, generally, and so far as Illinois is concerned we may say always, have ten of these, which, with the six true legs, gives them sixteen. The prolegs are placed, one pair on each, the sixth, seventh, eighth and ninth segments, and one pair on the last segment. These are true caterpillars, and all belong to the order *Lepidoptera*, and in the perfect state are moths. They belong to the two families, or rather sub-families, *Cassidæ* and *Ægeriadæ*.

These groups may be distinguished, so far as our insects are concerned, by their operations, as well as by the characters of the larvæ themselves. The former, *Cassidæ*, or, as Harris and some other entomologists name the group, *Hepialidæ*, are trunk-borers; the *Ægeriadæ* operate in the roots of trees, stems and canes of shrubs, or under the bark of the trunks of trees, seldom penetrating into the wood. Our only troublesome species belonging to *Cassidæ*, the locust-borer (*Xyleutes robiniæ*), when fully grown in the larval state is nearly three inches long. The larvæ of this group, or rather of this genus, which is limited to the carpenter-moths, are white, or reddish white, soft and naked, or nearly so, with brown heads, and a spot on the front part of the body alone, which is brown and hard; they are elongate and comparatively slender, cylindrical, and have the indentations between the segments deep.

The larvæ of the *Ægeriadæ* are whitish, soft, and slightly downy, and small; usually somewhat flattened beneath, and the segments not usually so deeply divided. The peach-root borer (*Ægeria exitiosa*) is a familiar example of this family.

We see, therefore, that we need to look to but two families of moths for our borers which have more than six legs.

Those larvæ which have but the six true legs may be divided into two groups, thus: Those which have a horn or spine projecting from the tail, and those which have not.

The former of these two groups are cylindrical, fleshy grubs, of a whitish color, with a small, rounded, horny head, and a pointed, horny tail, with six small legs under the front part of the body. They generally attack pines and firs; but the pigeon tremex (*Tremex columba*), which is found in the West, attacks the elm, sycamore, and sometimes the pear. These borers belong to the order *Hymenoptera*, which contains the bees, wasps, etc., and to the family *Urocerida*, or "horn-tails," which in the perfect state are wasp-like insects, but are not constricted at the waist as are the wasps.

The other wood-boring larvæ found in this State belong the order *Coleoptera*, and are beetles in the perfect state. Following the characters we have selected, these larvæ can be grouped into two sections: those without legs, and those possessing six small legs situated on the three front segments.

The footless borers belong to several widely different families, but for the most part can be placed in their respective families by their larval characters. For example, the buprestian larvæ, those belonging to the family *Buprestidæ* which contains the saw-horned wood-beetles, may be fairly represented by this flat-headed apple-tree borer (*Chrysobothris femorata*) with which you are all too familiar. The head is small; the segment behind the head is much enlarged; the body is somewhat flattened, especially the large segment; it is without feet. This raspberry-cane borer, (*Agrilus ruficollis,*) although comparatively much narrower and presenting some peculiar character, still corresponds in general characteristics with the flat-headed apple-tree borer. The beetles produced from larvæ of this kind are oblong-oval in shape, tapering behind, with rather short and usually minutely serrate antennæ; the head is deeply sunk in the thorax, and they are generally more or less distinctly marked with metallic colors.

The larvæ which most closely resemble these are the footless larvæ of the long-horned wood-beetles (*Cerambycidæ*), and belong chiefly to the sub-family *Lamiides*, of which the round-headed apple-tree borer (*Saperda candida*) is a well-known representative. These larvæ often have the front segment considerably enlarged, but it is not often so large in proportion to the other segments as in the buprestians; it is not usually flattened, but is nearly or quite cylindrical. It is somewhat difficult to fix upon any prominent larval characters which distinguish these groups from each other, and it is frequently difficult to tell to which a larva belongs, though, as a general rule, the characters I have given will suffice for this purpose.

There are other footless wood-boring larvæ, which can easily be distinguished from those mentioned by their minute size, seldom exceeding one-fourth of an inch in length, and often less than half that length; rather thick, tapering toward each extremity, and curved or arched, with numerous transverse wrinkles. These belong to two families, *Curculionidæ*, or snout-weevils, and *Scolytidæ*, or bark-miners. The boring curculios chiefly confine their attacks to the twigs, or the inner bark of the trunk, especially of the conifera. The *Scolytidæ* of our State are bark-miners; a familiar example being the hickory bark-miner (*Scolytus 4-spinosus*), which forms the numerous radiating furrows so frequently seen on the under surface of hickory bark. The perfect insect is scarcely an eighth of an inch long, and is distinguished from the curculios by the absence of a snout and the remarkably large thorax, which is nearly equal to the rest of the body.

The other coleopterous wood-boring larvæ have six, usually, very small legs, situated on the front segments. This is characteristic of the larvæ of the other long-horned wood-beetles. Those of the sub-family

Prionides are large, broad, somewhat flattened, and largest in front; one of them, the larva of the broad-necked prionus (*Prionus laticollis*), which infests grape and apple roots, when fully grown, is nearly three inches long; the legs are very minute.

The larvæ of the sub-family *Cerambycides* resemble those of the *Prionides*, in having six legs, but the body is more cylindrical, the incisions between the segments are more deeply impressed, and they are usually smaller, so far as Illinois species are concerned. They work in the trunks of various trees, or in twigs—the locust-tree borer (*Clytus robiniæ*), the ash-tree borer (*Neoclytus capræa*), and the honey-locust borer (*Eburia quadrigeminata*) being familiar examples of the trunk-borers of this sub-family, and oak-twig pruner or borer (*Elaphidion parallelum*) of those which inhabit the twigs or small branches of trees.

This hasty sketch will give you an idea of a method of grouping borers by their larval characters, which will assist you very greatly in arriving at a correct idea of the perfect state of any wood-borer larva with which you may meet which is new to you. In order to make it as brief as possible, I present it here in the form of a synoptical table:

WOOD-BORING LARVÆ.

A. Possessing legs or feet.

B. Having more than six feet; usually sixteen.

c. Large size, true caterpillar, cylindrical; boring into the wood of the trunk; perfect insect a large moth. (Ex. locust-boring caterpillar.)—*Xyleutes*.

cc. Small, usually somewhat flattened beneath; boring into the roots of trees, stems and canes of shrubs, or mining under bark; perfect insect a moth with partially transparent wings. (Ex. peach-root borer.)—*Ægeriadæ*.

BB. Having but six legs.

d. Tail terminating in a horny spine or point; boring into the trunk; perfect insect wasp-like. (Ex. the pigeon tremex.)—*Uroceridæ*.

dd. Tail without a spine.

e. Large size, somewhat flattened, largest in front, and tapering backwards; infesting the roots of grape-vines and trees; perfect insect a large, brown, flattened beetle. (Ex. broad-necked prionus.)—*Prionides*.

ee. Illinois species, medium size to small; cylindrical, sometimes enlarged in front, sometimes nearly equal in size throughout; incisions distinct; bore into the wood of the trunk, some into twigs; perfect insect a long-horned beetle, with the head not vertical. (Exs. locust-tree borer and oak-twig pruner.)—*Cerambycides*.

AA. Footless grubs.

C. Of various sizes, from medium to minute; front segments usually more or less enlarged; never enlarged in the middle so as to taper toward each extremity, nor curved.

f. Head small, the segment behind it much enlarged; body more or less flattened; bore into the trunks of trees, stems and canes of shrubs; perfect insect a saw-horned or buprestian beetle. (Exs. flat-headed apple-tree borer and raspberry-cane borer.)—*Buprestidæ.*

ff. Head small, segment behind it more or less enlarged, but not usually so much in proportion to rest as previous section; body not, or but slightly, flattened; generally cylindrical; incisions distinct; bore into the trunks, etc.; perfect insect a long-horned beetle, with the head vertical. (Ex. the round-headed apple-tree borer, or saperda.)—*Lamiides.*

CC. Minute, seldom exceeding one-fourth of an inch in length; enlarged in the middle and tapering toward each extremity; curved, with numerous transverse wrinkles; perfect insect a beetle.—*Scolytidæ curculionidæ.*

EXPLANATION.—*Xyleutes* contains the carpenter-moths; *Ægeridæ*, the ægerians, a family of moths with the wings more or less transparent, usually with blue or blue-black borders. *Urocerida* are hymenopterous, or wasp-like insects. The other families are beetles, and will be found fully explained in Dr. LeBaron's Fourth Report, which will be found in the Trans. Ill. Hort. Soc. for 1874.

In addition to this arrangement, we might classify by their methods of operating, thus: Those that bore in the roots; those that bore into the trunk; twig and cane, or stem-borers, and bark miners. This would afford some advantages, by notifying us what to look for when examining these different parts of our trees and shrubs. But I can not take time now to carry out these thoughts to their ultimate divisions.

I will now take up some of the most noted of our borers, which, as you see, I have figured on these charts, both in the perfect and preparatory states. I have also specimens here, which I hand to you for your inspection, as I talk about them.

Chrysobothris femorata, Fabr. The Flat-headed Apple-tree Borer.

[For description, habits and remedies, see pages 190, 191 of this volume. Prof. Thomas, in preparing this essay, was not aware that the transactions of this Society would be published with the transactions of the State Society, and hence did not avoid repetitions. He has, however, given instructions to leave out portions, the substance of which is to be found elsewhere in the book. References to pages where omitted portions may be found in this volume are made in all cases of omissions.

Under the head of *remedies*, the following was given in addition to what is found on page 191.—EDITOR.]

Mr. Austin, of the firm of Austin & Co., Downer's Grove Nursery, informs me that kerosene was tried in their nursery last year, with complete success, against this borer, and without injury to the trees. He expects to follow up the experiment, and will report the result hereafter.

As these insects are diurnal, it would be well for our horticulturists to learn, not only to distinguish the beetles, but also to know the time when they deposit their eggs, which, in this latitude, is the last of May and the first of June. Where the perfect insects can be caught, let them be utterly destroyed, and that without mercy; a few dimes, or, what is better, a few appropriate books, bestowed on careful children as a reward for the destruction of these and other insect pests, will not be in vain. Children are not slow in learning to distinguish species; a few times showing and noting the prominent characters will soon enable them to distinguish them.

Dicerca divaricata, Say. The Cherry-tree Borer. (See page 192.)
Dicerca lurida, Fabr. (See page 192.)

The following method of preventing the ravages of borers is given by J. T. Ford in the *Rural Alabanian:*

"You recommend the frequent washing of apple trees with strong soap-suds, to prevent the ravages of the borer. Now, this may be very well, but, in my opinion, it is far from the only and cheapest means by which we may safely combat this predaceous enemy.

"As soon as an apple tree attains the age of two or three years, the trunk, and finally the larger branches, become literally enveloped in some kind of an adnascent fungus or foreign deposit. It is beneath these fungi, and immediately with the bark, that the beetle deposits her eggs, which soon hatch and immediately commence their work of devastation. This mischief is continued from one to three years, according to the species, unless they are destroyed by man or that despised, though best of farmers' friends, the sap-sucker.

"Now, the beetle never deposits her eggs on a smooth trunk or limb, but deep and securely beneath the deposits before named. The only object to be accomplished by washing the trees with soap-suds is to remove this deposit. The alkali thus left on the tree has nothing to do in preventing the beetle from depositing her eggs. It is true this application may be beneficial in some slight degree to the tree, but not of sufficient importance to recommend its adoption.

"Experience has convinced me that any thing that will remove this deposit from the trunk of the tree is equally as efficacious as soap-suds. Indeed, all a person has to do is to examine his trees carefully in early spring, and, where he finds this deposit thickest, and especially when it has assumed a dark or greenish appearance, to remove it the easiest way he can. A common table-knife answers a good purpose, coarse sand-paper is excellent, and a very stiff brush does the work most efficiently; and, without this precaution, it is folly to expect apples, especially on old trees, that are worthy of the name."

Agrilus ruficollis, Fabr. The Raspberry Borer. (See page 193.)
Amphicerus bicandatus, Say. Apple-twig Borer. (See page 194.)
Ithycerus noveboracensis, Forst. New York Weevil. (See page 197.)
Pandeleteius hilaris, Herbst. Gray-sided Curculio. (See page 198.)
Magdalis armicollis, Say. Elm-tree Curculio. (See page 199.)
Hylobius pales, Herbst. Pales Weevil. (See page 199.)
Pissodes strobi, Peck. White-pine Weevil. (See page 200.)
Analeis fragariæ, Riley. Strawberry Crown-borer. (See page 206.)

Prionus laticollis, Drury. The Broad-necked Prionus.

This species, in the perfect state, is a very large beetle, of a long oval shape, varying in length from a little over an inch to an inch and three-fourths in length; width across the wing-cases nearly equal half the length. The body is considerably flattened; the thorax dentate on the lateral margin; the antennæ serrate. The color is almost uniform dark mahogany, or nearly and sometimes quite black.

The larva, when full grown, is about three inches long, with six minute legs; color yellowish white; head dark brown; second and third segments the broadest, the body tapering gradually from thence backward to the end; the under side flattened.

This infests the roots of grape-vines, eating out the inside until they are completely destroyed. They are found, also, sometimes boring into the roots of apple trees, Osage orange roots, and even into the roots of corn-stalks.

Careful cultivation of the soil, with occasional mulching of ashes, and gathering and destroying the beetles, will probably prove the most effectual remedies.

Chion garganicum, Fab. (*Stenocorus cinctus*, Harr.) The Hickory-trunk Borer.

This is a long-horned beetle, belonging to the sub-family *Cerambycides*, heretofore mentioned. It is of a reddish brown color, the head and thorax being darker than the wing-cases; covered throughout with scattered, pale yellow down or hairs; antennæ very long, exceeding the entire length of the body; a smooth, dark red line across the face between the eyes; thorax barrel-shaped, with a sharp spine each side near the middle; scutel yellow. Each wing-case has an oblique, yellow partial band across it, a little in front of the middle; commencing about one-fourth of an inch behind the shoulder of each wing-case, they run obliquely inwards and backwards to the suture or inner margin. On each side of these bands the color is darker than on the other parts of the wing-cases; each wing-case has, at the tips, two little sharp teeth or spines projecting backwards, the inner spine or tooth being the longest; length of the insect from seven-tenths to one inch; width about or slightly more than one-fourth the length.

The larvæ of this species inhabit the trunk of the hickory, in which they form long galleries in the direction of the fibres.

I am not aware that any remedy has been tried or suggested in reference to this particular species.

Elaphidion villosum, Fabr. The Oak-twig Pruner.

This beetle belongs to the same group as the preceeding; is long and slender; the antennæ of the males are longer than the body, about equal to it in the females; it is of a dull bay-brown color, with small, scattered, irregular patches of gray hair; eyes semi-circular; beneath the anterior corner of each is a smooth, oblique prominence; head not

furrowed between the eyes; thorax barrel-shaped, not spined, rough and punctured, some smooth prominences placed in a transverse line in front of the middle; scutel small, rounded, yellow; wing-cases punctured with large punctures, two-spined at the tips, outer spines largest; length of female, over five-eighths of an inch; width, five-sixteenths. This species appears to be found throughout the State, but not in great abundance. The larvæ live in the branches of the black and white oaks; following the pith or heart of the slender branch, they eat their way forward, enlarging as they go, until finally the branch is severed and falls to the ground. They appear here in the latter part of May and June. Prof. Peck has given an account of the operations of the larvæ of this species:

"The perfect insect lays its eggs in July," (in Massachusetts). "Each egg is placed close to the axilla or joint of a leaf stalk, or of a small twig, near the extremity of a branch. The grub hatched from it penetrates at that spot to the pith, and then continues its course towards the body of the tree, devouring the pith and thereby forming a cylindrical burrow, several inches in length, in the center of the branch.

"Having reached its full size, which it does towards the end of summer, it divides the branch, at the lower end of its burrow, by gnawing away the wood transversly from within, leaving only the ring of bark untouched. It then retires backwards, stops up the end of its hole, near the transverse section, with fibers of the wood, and awaits the fall of the branch, which is usually broken off and precipitated to the ground by the autumnal winds. Branches of five or six feet in length and one inch in diameter are thus severed by these insects. By collecting the falling branches in the autumn and burning them before the spring, we prevent the development of the beetles, while we derive some benefit from the branches as fuel."

Clytus (Glycobius) speciosus, Say.

Is found in the northern part of the State, but as yet I have captured none in this section. The body is black; head with yellow band on the front above the antennæ; antennæ black; thorax globular, with two oblique yellow spots each side, the latter being the longest. The wing-cases, when closed, appear thus: A yellow spot on each shoulder, a diagonal on each running outward from the scutel; next a zigzag line running across both, forming a W; next a narrow transverse band, then another a little wider, and finally the tips have a broad band of the same color (yellow), with a spot each side of the suture of black. The intermediate color between these yellow bands is a purplish black; length about one inch; width one-third. This depredates upon the sugar maple.

Clytus robiniæ, Foot. Locust-tree Borer.

This and the preceding species also belong to the sub-family *Cerambycides*, of the long-horned beetles. Antennæ brown, shorter than the body, inserted in a notch in the upper side of the eye; a yellow cross-band on the head immediately behind the antennæ; another band along the hind margin of the head, which borders the eyes behind, curving around and then on the cheek; thorax barrel-shaped, black, surrounded by four yellow bands; wing-cases brown, crossed by five zigzag, whitish lines, shoulders and tips margined with the same; breast and abdomen

also striped with yellowish white bands; length five-eights of an inch; width one-sixth. The perfect insect appears in the latter part of summer and commencement of the fall. The larvæ, which are hatched out in the fall, depredate upon the locust (*R. pseudacacia*), eating the sapwood and perforating the trunk. I have before me now a grub taken from a locust standing in the street. It is scarcely half-grown, as they do not finish their larval state until the next season after hatching out. It is a rather slender grub, with a reddish brown head, having a triangular depression in front and a central scallop behind, the skin of the segment rolling loosely over these posterior margins. It is of a pale yellow color, with six very minute feet.

Clytus caprae, Say.

Dark brownish purple, head and thorax darkest; head blunt with two white lines down the front; eyes nearly circular, behind them a narrow yellow border; thorax barrel-shaped, deep purple, surrounded by three very narrow yellow lines, one at each end and one in the middle; scutel yellow; wing-cases crossed by three yellow bands—first, a semi-circular band from the scutel running backwards and round up to each shoulder; then another, of similar shape, about the middle, with the circle reversed; then a straight band, and a strong spine at the tip of each; length half an inch; width one-seventh of an inch. This is quite common in Southern Illinois.

The larva of this species bores in the ash.

Ægeria exitiosa, Say. Peach-tree Borer.

This borer is very different in character from those we have been considering, as it has sixteen legs—three jointed or true legs on the first three segments, four pairs of abdominal legs on the sixth and ninth segments, and one pair on the last segment.

It is a naked, soft, white, cylindrical grub, slightly flattened on the under side, and, when full grown, measures something over half an inch long. Its head is a shining yellowish red color, marked in front with black, and at the base and middle with white; the throat is also white. There are a few scattered brownish hairs on the head and other segments. The prolegs are very short, scarcely protruding below the general surface.

When fully grown, it spins for itself a cocoon or follicle of silk mixed with the gum and excrement, wherein it passes the pupa state. This follicle is of a brown color, oval in form, with the ends rounded, and is about three-fourths of an inch long, or a little less, and about one-third as broad.

The perfect insect is a very pretty moth, the male and female differing so materially that they would be taken for different species. They are from one-half to three-fourths an inch long; expanse, three-fourths to one-fourth inch. The male is the smaller; the body is a bright, deep steel-blue, sometimes with a yellowish band on the abdomen; wings yellowish white, semi-transparent, with a narrow bordering of blue.

The female has a body of the same color, with an orange-colored band about the middle of the abdomen; front wings blue, opaque: posterior wings transparent, margined with blue.

The eggs are smooth, oval, of a dull yellow color, and about one-fortieth of an inch long. They are usually deposited upon the bark, at the surface of the ground, and the worms hatching from them work downwards, at first in the bark of the root, forming a slender, flexuous channel, which becomes filled with gum. At the distance of an inch or two below the surface, the whole of the bark of the root becomes consumed in badly infested trees, and the sap-wood is also extensively gnawed, so that the root is nearly severed.

The larger worms, in winter, usually repose with their heads upward, in contact with the outer surface of the root, generally in smooth, longitudinal furrows they have excavated, their backs covered with their castings mingled with gum and cobwebs, forming a kind of cell.

The larva enters the pupa state in the early part of summer, and comes forth in the perfect state usually in July, though there is reason to believe it often comes out in the south part of this State as early as May or June.

Various remedies have been proposed, such as raising a mound of earth around the trunk; pouring boiling water around the roots; placing around it a bed of cinders, ashes, or lime; surrounding it with a collar of mortar; enveloping the base of the trunk in matting or paper, etc., and planting tanzy around the tree.

Dr. Harris favors the mortar and matting remedy; Dr. Fitch thinks tanzy will be beneficial; and Prof. Riley recommends strongly the mounding process.

There are several other *Ægeria* which have similar habits, and are injurious to cultivated or useful plants.

Ægeria tipuliformis, Linn. Currant-borer.

This species has been introduced from Europe; in the larval state it bores into the stems of currant bushes, often doing great damage to them. The eggs are laid near the bud, and the larvæ produced from these penetrate the stem to the pith, in which they reside, forming a burrow of several inches.

The moth has the colored portion of the wings blue-black.

Ægeria pyri, Harr. Pear-tree Ægeria.

The larvæ live under the bark of the trunk of the pear tree. The perfect insect is much like the moth of the currant-borer.

Ægeria acerni, Clemens. Maple-tree Ægeria.

The larvæ burrow under the bark of the soft maple, but never penetrate deeply into the solid wood.

The perfect insect is about one-half an inch long, and expands about three-fourths of an inch; thorax, ochre yellow; abdomen, bluish black, varied with yellowish; fore wings with margins and median vein bluish black.

Whitewashing has been recommended.

Ægeria rubi, Riley. Raspberry Root-borer.

The larvæ work in the lower part of the canes of the raspberry and blackberry.

The larva attains an inch or more in length when fully grown; is of a pale yellow color, with a dark reddish brown head; dwells mostly in the root, but burrows in the cane, often several inches above the ground.

The moth has the front wings bordered with rusty brown, and the body marked with yellow and black—these colors on the abdomen forming alternate rings; expanse from one to one-fourth of an inch; it comes out in August and September.

The only remedy appears to be to dig out, in the spring, the infested roots and burn them.

Tremex columba. Elm-tree Borer.

This species belongs to the order *Hymenoptera*, which contains wasps, bees, etc.; to the family *Uroceridæ*, or "horn-tails," so called on account of the horn at the extremity of the larva, and the borer at the extremity of the female perfect insect. It is wasp-like in appearance, having four thin membranous wings similar to those of a wasp, but differs from the wasp in not having the body constricted at the waist. The body of the female is cylindrical, about as thick as a common lead pencil, and an inch and a half or more in length exclusive of the borer, which is an inch long and projects three-eighths of an inch beyond the end of the body. The latter rounds upwards, like the stem of a boat, and is armed with a point or short horn; the head and thorax are rust-colored, varied with black; the abdomen, or hinder and longest part of the body, is black, with seven ochre yellow bands across the back, all of them but the first two interrupted in the middle. The horned tail, and a round spot before it, impressed as if with a seal, are ochre yellow; the antennæ are rather short and blunt, rust-colored, with a broad, black wing in the middle; the wings expand two inches and a quarter or more; they are smoky brown and semi-transparent; the legs are ochre yellow, with blackish thighs; the borer, awl or needle, is as thick as a bristle, spear-pointed at the end, and of a black color; it is concealed, when not in use, between two narrow, rust-colored side pieces, forming a kind of scabbard to it.

The male is extremely unlike the female in color, form and size, and is not furnished with the remarkable borer of the other sex; is rust-colored, variegated with black; antennæ rusty yellow or blackish; wings smoky, but clearer than those of the female, and of a blackish color; the

other legs are rust-colored, and more or less shaded with black; the length of the body varies from three-quarters to an inch and a quarter; the wings expand from an inch and a quarter to two inches or more.

The female pierces through the bark into the wood in which she deposits her eggs; these are oblong-oval and pointed at each end. The larvæ are yellowish white grubs with six true legs; they are cylindrical in shape, rounded at the hind extremity, from which proceeds a horny conical spine; when full grown, they are about one inch and a half in length. They bore into the trunks of the elm and oak, and have also been charged with attacking the apple tree in Illinois, and Mr. Wier has noticed them boring in the sycamore.

They are subject to the attacks of two ichneumon flies—*Pimpla atrata* and *Pimpla lunator*.

So far as I am aware, they have not proven injurious to any considerable extent in the West.

Xyleutes robiniæ, Peck. The Locust-tree Carpenter-moth.

This moth belongs to section *Heterocera* or moths, family *Cossidæ*, and was formerly placed in the genus *Cossus*, but is now placed in *Xyleutes*, a genus established by Newman for these carpenter-moths. Harris places it in the family *Hepialidæ*, which is nearly equivalent to *Cossidæ*. The body is densely covered with minute hairs; the head is small; antennæ of but moderate length, and furnished on the under side with a double set or two rows of minute, closely-set comb-like teeth (*bipectinate*). The male is dark brown; the female has the abdomen dark ash brown, constricted at the base, with a mass of hairs each side at this point, which are white at base and dusky at the extremity; thorax dark brown, thickly covered with ash-colored, scaly down, leaving a narrow dark line each side, and some naked spaces on the disk; anterior wings hoary, with irregular darker reticulations, with some larger irregular discal spots of the same color; hind wings dusky with black veins, covered with paler hair toward the anterior margin; tongue or proboscis wanting.

The female is furnished with a serrated ovipositor; she is about 1.25 inches long to tip of the abdomen, and expands 2 to 2.75 inches; male expands 1.50 to 1.75 inches.

The larva of this species is a true caterpillar, possessing sixteen legs, and bores into the trunks of the locust (*Robiniæ pseudacacia*) and red oak (*Quercus rubra*), especially full-grown and old trees of the former. They perforate the tree in various directions, but mostly obliquely upwards and downwards through the solid wood, enlarging their burrows as they increase in size, and continuing them through the bark to the outside. When fully grown they measure two inches and a half or more in length, and nearly as thick as the little finger. Before transforming they line their burrows with a web of silk, and returning to the interior or some distance from the external opening, spin an imperfect cocoon, in which they assume and pass the pupa state. The pupa is an inch and a half or two inches long, of an amber color, changing to brown in front; on the

upper side of each abdominal ring are two transverse rows of tooth-like projections. By means of these, the pupa just before transforming to the moth, works its way to the mouth of the burrow, so that the perfect insect may escape; which usually occurs in the latter part of June or first part of July.

The eggs are doubtless deposited some time in July, and are of a dark brown or somewhat purplish color. The ovipositor of the female being extensile, she is enabled to place them into the deeper cracks and crevices of the bark. The young worms which hatch from them are dark brown, with large heads. They are active and commence spinning as soon as they are born.

PROF. THOMAS stated the action taken by the State Society, at its late meeting, in appointing a committee to make and present plans for concerted action among fruit growers, to protect themselves from the ravages of insect enemies.

SECRETARY GALUSHA read, from the report of that meeting, extracts showing the plan as there presented by Prof. Thomas, and solicited the co-operation of this Society.

MR. MCWHORTER moved that a committee of one or more members of this Society be appointed to act with the committee of the State Horticultural Society, in the matter proposed by Prof. Thomas.

This motion was amended by striking out the words *or more*, and Mr. McWhorter was unanimously chosen as said committee.

CORRESPONDENCE.

The following letter, from DR. J. A. WARDER, was read and ordered printed:

"NORTH BEND, O., January 21, 1876.

"LEWIS ELLSWORTH, Esq., Pres't Horticultural Society of Northern Illinois.

"*Dear Sir:* I beg you to accept for yourself, and tender to your worthy associates, (many of whom, with yourself, I am happy to call my friends,) the regrets that I shall not be able to accept your proffered hospitalities at Crystal Lake, next week.

"I have for some time been anticipating the pleasure of spending this week at Des Moines, Iowa, and had expected to return *via* Chicago, at its close, or early next week, in time to be with you, also. Indisposition, last week, put Des Moines out of the question; but I was flattering myself that convalescence was progressing favorably, and that by Monday next I should be able to travel, and had already begun to plan how I might contribute my share of your entertainment, when positive orders came from the consulting physician, in whom I have great confidence, that I should not think of talking or lecturing, much less of traveling northward or prairieward. So, you see, an embargo is laid upon my movements, for the present, at least.

"I do so enjoy meeting my horticultural friends, and had anticipated so much pleasure from these two meetings, particularly, that this medical ukase is indeed a sad disappointment to your friend, WARDER.

"Present me, most respectfully, to your excellent associates."

DR. ENNIS called attention to the fact that the cultivation of the orchids is receiving much attention; and that inasmuch as Mr. Cochran, who is now with us, has one of the finest collections of these wonderful plants in the United States, moved that he be requested to talk to us. at this meeting, upon this family of plants.

This request was made by unanimous vote of the Society, and Mr. COCHRAN consented to comply.

MR. NELSON presented the following:

Resolved, That in the discussions of this session, no member shall be permitted to speak more than twice upon any subject or question, except by vote of the Society, until all present have had an opportunity of speaking; and that each person be confined to five minutes for the first and three minutes for the second time in speaking.

The resolution passed unanimously.

MR. J. H. GARRISON, of Greenwood, McHenry county, read the following:

ORNAMENTAL TREES, SHRUBS, HEDGES, ETC.

THEIR VALUE IN HOME GROUNDS—THE BEST MANNER OF PLANTING, TRAINING AND HANDLING THE SAME—FAILURE: ITS CAUSE AND EFFECT, ETC.

The subject of planting and handling trees is an endless one, and one that requires a *lifetime* of study and practice, in order to acquire the *first rudiments* to complete success; and, with our somewhat limited experience, we find ourselves wholly incompetent to do the subject justice. Practice and observation of the experience of others, combined, may perhaps enable us to advance a few hints, beneficial to those who have given the subject some attention, but who may not have a sufficiently distinct view of many of its important points.

The question of actual profit in dollars and cents, in planting ornamental trees and shrubbery, is not to be so exactly shown as it has been with fruit trees; yet there is a vast profit herein, not limited to the immediate advantage of the planter or purchaser of the property so embellished. Who can have failed to note that, when a piece of real estate is offered for sale, its ornamental trees and plants, if well selected and properly cared for, always add a charm which finds recognized value in the increased price paid by the purchaser?

Who, in passing through a strange country, can fail to observe, as an index to the character, thrift and industry of its inhabitants, the lack or supply of its fruit, shade and ornamental trees? No person, however unobserving, upon approaching, in mid-winter, a dwelling cosily embowered within its circle of bright green evergreen screens and hedges, with its clumps of fine shrubbery, interspersed here and there with some low-growing, closely-trained evergreens, can but feel a warmth of welcome, amounting almost to that "true inwardness" of which the renowned Beecher has spoken?

Then, we ask: Does it not and will it not pay? Is there not a profit in planting and caring for good trees and plants for ornament?

Every farm and orchard, every street and highway, every public square, park or cemetery should have its ornamental planting, and all property adjacent is increased in value when it is done.

On the farm, around the orchard and fruit garden, near the house, and along the highways, ornamental (not less than useful) screens of deciduous or evergreen trees are more or less necessary as a protection from wind and storm. Any farm, orchard or vineyard, thus protected, will yield a much larger return annually, and its fruits will come earlier into ripening; consequently the value of the property will be greatly increased.

Says a certain medical writer, "A dwelling embowered in trees is manifestly more comfortable in all seasons of the year, and must be more healthful in consequence of the equalized temperature produced thereby," and, of course, enhanced in value by this important aid.

It has become a subject of common remark, and one upon which there has been bestowed much time and study—the influence of trees on climate and crops, as evinced by the destruction of our native forests by the woodman's axe. Our personal observation was more particularly called to this subject while traveling and visiting through the State of New York, a few years since. The change had been so great, within the space of twenty years that had elapsed, that we could scarcely realize that we were in the same country. Where once grew the tall and massive pines, hemlock, beach, maples, etc., nothing remained to tell the history of these giants of the forests but an occasional stump; fruit trees, which once were thrifty and bent to the ground beneath their heavy burdens of fruit, now bear the mark of decay; the peach, which once grew as it were almost spontaneously along the southern shore of Lake Ontario, had become comparatively a failure. We inquired the cause of this great change. The reply was, "Our seasons have changed since the timber has been cut off."

On our western prairies we are now beginning to see forests and groves springing up here and there, which are being carefully cultivated to protect farms and houses from the effect of storms and blighting winds, and to furnish timber for fuel. Who can tell of the great increase of value to accrue from these young groves, and from the vast lines of beautiful hedges now growing up, checkering the prairies of Iowa, Kansas and Nebraska, like lace-work, covered here and there with its clusters of beautifully-worked flowers? Every home requires its arbor of vines, its screens of evergreen trees and its beautiful hedge-rows, for the seclusion they afford, and to keep from view objects unsightly to the public eye; every porch and every approach to the home claims the grateful shade of some overhanging tree, or the welcoming smiles of plants of beautiful foliage and fragrant flowers.

The healthful effects and profits of the various fruits of the garden or field have their due importance: yet such associations of home are by no means complete, till the inviting shades of beautiful trees and sweet

scents of many-tinted shrubs and plants bespeak a regard for something beyond the pleasures of the palate or the profits of culture, and declare the bliss of contentment more precious than gold.

The importance of our subject is not limited to the planter or owner of premises; it extends to the whole community. Says a certain writer: "The constant, careful culture of good plants, whether for fruit or ornament, can not fail to exercise a healthful influence on all in their vicinity, as regards both taste and morals. It leads to gentle thoughts and good purposes. The soothing and refining influence of spreading trees, of flowering shrubs with delicate odors, of graceful climbers with drooping festoons and intertwining tendrils, betoken home affections, home comfort, contentment, and must bear profit in inspiring delicate thoughts, in ameliorating manners and in cultivating virtue."

Planting, Training and Handling.—Ornamental trees, or those intended for ornamental purposes, when first planted out are commonly quite small, and to give them their full allotted space at the commencement would appear to many a waste of ground. With the wide-spreading varieties, should the owner give them their full required space when first planted, the surface of his grounds would remain unshaded for many years; hence it has been the common practice with some to set more thickly at first, with the view of thinning out as they begin to encroach upon each other. This is all well, provided the owner will give them the proper thinning in time. There are many varieties of deciduous trees, such as the maples, elms, ash, black-walnut, linden, honey locust, etc., when taken from the nursery rows at the height of ten or twelve feet, may be set within ten or twelve feet of each other, and during the first six or eight years will not interfere with each other. At the same time an agreeable amount of foliage and shade will be afforded by them. But the difficulty is, they are quite apt to be left too long; and the full, rounded symmetry of their heads will be likely to be spoiled before they are cut away.

We not unfrequently see the largest kinds of both deciduous and evergreen trees set within a few feet of each other; sometimes we see young evergreens transplanted within a single yard of a gravel walk or drive-way; if they grow well they must soon be cut down, shortened in heavily, or suffered to close up the passage. It is therefore always best to give ample space between the borders of drive-ways, walks or plantations of trees, from the fact that their forms will always be more full and perfectly developed nearest such openings; and no one would wish to spoil the best and most beautiful portion of his trees by being obliged to cut away and lay bare the unsightly and naked branches.

If we wish our trees to grow up with perfect, rounded heads, with thick, rich foliage and broad-spreading branches, we should never plant in such a manner as to allow two adjacent trees to touch each other, even at the extremities of their longest branches.

It should be borne in mind that trees planted around buildings and on the lawn are intended to ornament the ground on which they are planted, and not to hide it. The subject of planting, training and hand-

ling evergreens is one upon which much has been said and written by many of our leading and most prominent tree growers throughout the country, giving the result of their experiences in the different soils, climates, etc., together with certain rules and instructions for planting and handling the same, with varieties, their adaptability for the various ornamental purposes, etc., all of which is well and of untold value to the inexperienced planter; but as each succeeding year brings with it the result of some new experiment, or the development of some new freak in nature, there still appears to be room for much more to be said and written.

Time will not permit us to enter into a minute or detailed statement as to the result of our own experience, nor do wish to be understood that our theory is by any means new; but, as the result of a few years of careful study and practical experience, we have found it necessary to complete success, to adopt certain rules by which to be governed in the training and handling of trees.

In the first place, a few general ideas as to the varieties best adapted to close training, for the various ornamental purposes: Among the varieties best adapted to the soil and climate of the Northwest, and most valuable for this purpose, we have selected the red cedar, common juniper, American arbor-vitæ and hemlock spruce. For close ornamental hedging, the two first-named varieties we consider the most valuable. The common American juniper, though of a prostrate, straggling habit in its natural growth, is susceptible of becoming one of the most beautiful and valuable, when put under training, of the evergreen family.

The arbor-vitæ, though it is very valuable for this purpose, yet it requires a greater amount of labor and care than with the juniper to produce the same effect. One great cause of the failure on the part of so many, in the planting and growing an ornamental hedge is, first, too large plants are used, and generally those of an inferior quality; second, they do not cultivate and shear them at the proper time.

Plants for this purpose should never exceed in height one and a half feet, using none but perfect, well-filled plants; and for the first few years constant and thorough cultivation is necessary. Shearing and root-pruning at the proper time are also very important in the growing and culture of all ornamental trees and shrubs—though writers disagree in this.

Time will not permit us to dwell upon this point longer; and we will give a few hints upon the *handling of conifers.*

In the transplanting of trees, too much care can not be exercised, especially with the coniferous species. A tree of resinous sap, with its roots exposed to the air, will die almost as soon as a fish out of water. The roots are largely saturated with a resinous gum, more particularly the bark and minute fibres; consequently a very slight exposure to drying winds or sun will so thicken the resin in the roots and spongioles as to render them impervious to water, and thus impede the free flow of sap from the soil, through the roots, to the top. The resin once set, the tree is forever dead—beyond the power of resuscitation.

Deciduous trees, or trees of watery sap, are less injured by slight exposure to the air, but with these we do not consider that it is of any advantage to allow the roots to be exposed to a drying wind and sun. Consequently, to be brief, we find it extremely necessary and important to observe strictly these plain rules:

1. Never allow a tree of any kind to be taken up in a careless manner, or torn ruthlessly from the ground, as if for its destruction instead of replanting. Never take from the ground a tree that has not been sufficiently previously root-pruned, in order to give it an abundance of fibrous roots.

Here, in our opinion, lies one of the great causes of the many failures in the planting or transplanting of trees. The root of a tree is its vital power, and to the extent to which this power is diminished or weakened will the growth of the tree be retarded or lessened.

2. A tree once out of the ground, never for a moment allow the roots to be exposed to the air and sun. If the trees are small, immediately dip them in a solution of loam or common soil in water, of the consistency of thick paste, and cover from the air.

3. Never attempt to plant out trees unless your ground is in *proper condition*. Till your ground at least one year previous to planting. If upon a lawn of stiff sod or unbroken turf, prepare the places where you design setting your trees one year previous to setting, by spading up the sod and tilling the same. Here again lies the foundation cause of the wholesale destruction of the millions of valuable trees annually slaughtered—the careless practice of planting upon ground not properly prepared. We have seen thousands upon thousands of as fine trees as the genial and warming rays of the sun ever helped to bring forth into leaf, stuck up to dry upon the prairies around Chicago, with their few dry roots crowded into a little basin-shaped hole, scooped out of the raw, wild sod, and covered with the same. *This* was called *planting* or *setting out!* When will such abominations cease? What is the result? Nurserymen are charged with carelessness, dishonesty, with selling dead trees, etc. That there are dishonest and unprincipled nursery-men we do not pretend to deny, as it would be impossible to find any branch of industry or enterprise that has not its abuses; but that nine-tenths of the mortality in the trees that die annually, in transplanting, is occasioned and is the result of careless and improper planting, we have no hesitancy in asserting.

4. As far as possible, newly-planted evergreens should be protected from the influence of the hot sun for a number of days. Avoid watering at time of planting out. If necessary to water at all, apply after the tree is set, upon the mulch.

With a few further remarks in reference to the species and varieties best suited to ornamental culture, we will close.

Among the coniferous species which we have not already mentioned, we consider the Norway spruce, the white, Scotch and Austrian pines, together with the balsams, red and mountain pines, the most valuable—the last named, especially so, as from its trailing habit it becomes one of the most beautiful of its species, under proper bud and root pruning.

For ornamental screens and shelter-belts, we prefer (if evergreens are used exclusively) the Norway spruce and Scotch pine, set in alternate rows, eight feet apart.

Of deciduous trees, we prefer the sugar maple, ash-leaf maple, white ash, white elm, and honey locust. We would also recommend more general planting of the nut-bearing trees, such as black-walnut and butternut, which answer the double purpose of shade and profit:

Time will not permit of our giving more than a general outline of ideas in connection with our subject. There are many points upon which we would like to speak more fully, but we have already trespassed upon your time and patience.

Thanking you for your kind attention, and hoping that we may be mutually benefited in our interchange of views and experience, and that we may be permitted, at some future time, to more fully present our views in regard to the subject of shearing and root-pruning, we respectfully submit the foregoing results of our observations and experience.

On motion of the Secretary, discussion on the report was made the special order for the opening of the afternoon session.

The Society then adjourned to half past one o'clock this afternoon.

WEDNESDAY AFTERNOON.

The Society re-assembled, as per adjournment, and the special order of

DISCUSSION ON SHADE AND ORNAMENTAL TREES.

Was taken up.

THE SECRETARY asked if Mr. Garrison would explain why he recommended using no water in transplanting evergreens.

MR. GARRISON said that by the use of water in the holes the earth was likely to become baked, so as to exclude the water afterward, and that if the roots were puddled they became coated with a mortar which, becoming dry, was almost impervious to water. He preferred to fill up the hole with soil, mulch the surface well, and, if the earth was too dry, put water upon the mulch.

MR. AUSTIN preferred to put in water while planting, to settle the earth about the roots and fill up all the cavities.

JUDGE WEED had best success by using water at time of planting.

MR. WIER—The essayist left out some of the best evergreens from his list; for instance, the white spruce, which is preferable to the Norway spruce. The green ash is also superior to the white ash to plant as an ornamental tree.

I disagree with the speaker as to watering after planting instead of watering at the time of setting, as pouring water upon the surface is almost sure to bake the soil, so that the rains will afterward run off, instead of penetrating it. Whenever it is necessary to water, after a tree has been planted, the surface soil should be removed, and the soil saturated as far as the roots extend, even if it takes a hogshead of water; then, when the water has soaked away, the surface soil should be replaced and left loose, not tramped.

MR. GARRISON—I have known trees to be planted—and this practice is commended by some writers—by pouring a large quantity of water in the hole about the roots, putting in a little earth, and then *churning* the trees up and down till the roots were imbedded in a porridge-like puddle; and I have dug up trees planted in this way after they had stood seven years, and found the roots in a dry, hard mortar, with no fibres except a few at the extremities, where they had penetrated the natural soil. By watering on top of the mulch the ground will not bake, as has been represented.

MR. CROW—We all know that when evergreen roots become so dry as to thicken the sap considerably, they can not recover; hence, we *must* avoid letting them get dry while removing. I make a mellow bed for planting trees, filling up all the crevices among the roots, and lose no trees. I cultivate—pulverize—the ground instead of mulching, which answers the same purpose.

MR. MCWHORTER commended the essay, and approved the practice of mulching transplanted evergreens.

MR. L. K. SCOFIELD uses water in abundance at the time of planting, mulches, and has no occasion to water afterwards.

MR. D. C. SCOFIELD wets the roots of evergreens when planting, then after putting in water enough to settle the earth among the roots, and allowing it to soak away, packs the earth firmly among and above the roots, leaves the upper stratum of soil loose, and mulches. He recommended planting belts of evergreens by planting four rows twelve feet apart, with the trees twelve feet apart in the rows. He exhorted land owners to purchase and plant now while trees are so cheap. He said, It is wonderful how trees so planted and well cultivated will grow. In fifteen years after planting, my evergreen belts are forty feet high. A quarter section of land thus belted will be enhanced in value five dollars per acre in ten years, and in twenty years ten dollars per acre. In fifteen years after planting, I cut, drew to mill, and built a house from

the lumber the trees made. In fifty years from planting, trees will be worth one hundred dollars apiece, and make lumber three feet wide!

MR. PLUM—After studying this matter of planting evergreens, I have concluded that nine out of ten of the trees which die are killed by doing too much for them, especially by planting too deep. I tell people to set their trees on the top of the ground, fill in among and put earth over the roots, then mulch, and all will live. I plant shallow and lose no trees; but always see to it that the soil is well saturated. In answer to a question, he said he planted upon the surface *on any soil*. He had taken up some trees, dead in the autumn, which were planted the previous spring, and found the upper roots ten inches below the surface of the ground, and attributed the death of the trees to deep planting.

MR. MCWHORTER—I am surprised at Mr. Plum's remarks; I don't think farmers are apt to plant too deeply. I have handled vast numbers of evergreens, and have learned to discriminate as to depth in planting according to the natural habits of the trees. Arbor-vitæ, which roots near the surface, should not be planted very deep, while the pines, which naturally root deeply, should be planted deep. I have found more mistakes in failing to pack the earth sufficiently among and above the roots in planting than in any thing else. The top soil, of course, must not be tramped.

MR. NELSON gave the results of his extensive experience in planting evergreens, which agreed with Mr. McWhorter's. He said, in addition, I often use a fork handle in tamping the earth among the roots in planting. I learned about this packing the soil among the roots from Robert Douglas, who probably plants more evergreens than any other man living. After filling up the hole I leave the surface soil loose, and then mulch thoroughly.

The discussion was continued by others at considerable length, as all appreciated the importance of correct practice in planting trees. The almost uniform testimony was in favor of thorough packing of the soil among the roots, and mulching, or thorough subsequent cultivation; and the weight of testimony was decidedly in favor of planting a little deeper than the trees previously stood, having the surface drained.

MR. GARRISON had set several thousands of Scotch pines, using water, and planting a little deeper than they previously stood, with a loss of less than three per cent.

MR. GALUSHA had planted several thousands of evergreens, of different species, from five to ten feet high, in this way, with a loss of not over two per cent.

THE PRESIDENT commended the essay. In reference to following nature in transplanting, he said this is impossible, because we can not have the *same conditions* in our open grounds as in the native forests. There the surface is shaded and mulched by the fallen leaves, and the feeding roots will naturally grow near the surface; but, if planted upon the surface in open grounds, they would be in danger of being affected by the heat of the sun, and of drying.

REPORT ON PRESIDENT'S ADDRESS.

MR. PERIAM presented the following:

Mr. President and Gentlemen:

The committee to whom was referred the address of the President, having taken the same into consideration, beg leave to report:

We heartily concur in the ideas advanced, as a whole, in relation to varieties of fruit; while we are especially glad to see the continued interest manifested in the origination of new varieties, and the great value of the principles involved therein. We would advise great care in the indorsement by the Society of any variety, until it shall have been fully tested. For instance, we regard the introduction of Grimes' Golden and Stark apples as having resulted in great loss in the extreme Northwest.

In regard to the exhibition of fruits at the annual meetings, the committee would suggest that the Executive Committee prepare suitable diplomas, to be awarded at future meetings of this association; and, inasmuch as floriculture is an important and growing feature of rural taste, we recommend suitable honorary premiums to be offered for collections of plants, bouquets, cut-flowers and floral ornaments.

We hold the recommendations of the President, relating to forestry, as of great importance, and hope that timber-growing will continue to be encouraged in the future as it has been in the past by the Society; and we hope the members will, by every means in their power, foster the endeavors of the American Association of Forestry.

With the President, we feel deep regret at the removal, by death, of our lamented co-workers in horticulture, Hon. M. L. Dunlap, of Champaign; Dr. E. S. Hull, of Alton, and the venerable William Hill, of Dundee, and would suggest that the Secretary transmit to the friends of the deceased, in advance of general publication, the action of this association thereon.

All of which is respectfully submitted.

JOHN E. ENNIS,
TYLER McWHORTER,
JONATHAN PERIAM.

The following essay was then presented by Mr. McWHORTER, who illustrated his "supplement" with crayon sketches of sufficient size to be distinctly seen by the audience:

HOMESTEAD SCENERY.

BY TYLER M'WHORTER.

If there is any one subject on which horticulturists are guilty of negligence, it is that which relates to a cultivated taste in homestead scenery.

To realize the importance of bringing our country homes up to a higher grade of culture and taste, we have but to turn our attention to the townward tendency of our American population. We can not disguise from ourselves, that this townward tendency of our rising population is because our sons and our daughters see in town life more evidence of taste and refinement. If we would restrain our children from forsaking our homes for the fascinations of city life, we must make home to them a place of more endearing attractions.

It will be my purpose, in presenting this essay, not to make it an elaboration of poetical flights, but I will endeavor to come down to the ground-work of practical ideas.

All true taste in homestead scenery must spring from an appreciation of the scenery of nature. Man can plant a tree, but nature produced the tree. The trouble is, nature is so lavish in spreading forth her beauties, that man becomes stolid and indifferent to that which greets his gaze on every hand.

With the march of civilization, native forests and charming landscapes must be stripped away to make room for cultivated fields. People become so accustomed to clearing away the natural groves and woodlands that they become insensible to the beauties of nature; they look upon all the scenery of our natural landscapes as something only to be destroyed. To the minds of some men, things do not have an aspect of civilization until the last vestige of natural scenery is cleared away, and fenced up into rectangular fields, gardens and stock-yards. They *intend* to have things nice; they perhaps have a commodious, well-painted dwelling-house, a nice little square door-yard—well fenced with a white picket fence, a straight walk leading from the front door to the gate; they even go so far as to have a few evergreens, *exactly in front of the house*. On the one side of this little door-yard is the fenced-up kitchen garden, coming up to the road; on the other side is the barn, with its appendages of feed-yards, corn-cribs, etc.—all closely and conspicuously located, so that at no time is there any lack of the familiar odors of the filth of domestic animals. To make room for these homestead appendages, the least vestige of natural scenery has been completely cleared away by the industrious proprietor.

Is it a matter of wonder that the children of this homestead are ever most happy when they can steal away to some natural grove, or to the

sylvan scenery of some winding stream? Children are good judges of beautiful scenery, and if it is not found in connection with the homestead, they will seek for it elsewhere.

Not to dwell at length on the various mistakes most commonly made in homestead arrangements, I will briefly state, people are generally too stingy of the little bit of ground around the house; they allow no grounds for shady lawns or homestead scenery; they fence themselves up in a little narrow door-yard, and then, to save steps in doing chores, they get the barn and its numerous appendages closely and conspicuously located, if not exactly in front of the house, at least so as to break the view to the road in a side direction. In short, the arrangements for the comfort, convenience and pleasure of cattle, hogs, chickens and children, are too closely mixed and commingled together.

Even people who are anxious to have every thing very nice, conceive of no way only the old, stiff, rectangular, *square rule* plans for every thing—every thing is brought to straight lines and square corners—fences all straight, gate exactly in front, a straight walk to the front door, shade trees arranged in *exact military order*. Such grounds present no pleasing variety—nothing but the tiresome sameness of straight lines and rectangular forms.

It is difficult to give any very definite rules for homestead arrangements, because scarcely any two situations are exactly alike. But, to bring the matter to your minds, we will suppose you are about to prepare for yourself a country home. You are inspired with the beauties of nature—you have listened to "the music of the pines;" and nature's picturesque scenery and flowing outlines have nearly expelled the old *rectangular, iron-square plans* all out of your mind. You first choose your building site. You do not choose the most level portion of your farm; because, for your building sites, groves, orchards, and general homestead scenery, you prefer grounds somewhat rolling; and for farming purposes you prefer the level lands.

You choose a site for your house on a rising swell of ground, some ten or twelve rods from the road. You want room in front of your house for some breadth of grassy lawn, and some pleasing diversity of landscape scenery.

You next decide on a spot for your barn, back of your house, and not too near, because you want room back of your house for garden and fruit-yard; for you know it is in bad taste to have a fenced-up kitchen garden next to the road. Having chosen the place for your barn and feed-lots off back of the house, you want a lane from these to the public highway; but you do not want this lane to infringe on the grounds of your house-yard, and you give this lane a graceful curve around your house-grounds. You border this lane with large trees—it gives a rich expression to your homestead. You plant trees of large growth back of your house, that will rise up above the house and partially screen the barn and its appendages from view. You do not commit the blunder of planting all your evergreens exactly in front of the house; because you know, though they might look well enough there at first, they will, in time,

grow to broad proportions, and even darken the light of your windows, and nearly hide your house from view. You group the evergreens mostly off in side directions, to the right and left, only allowing a few of symmetrical form and smaller growth on the grounds in front. You perhaps plant a few trees of large growth at the extreme outer border of your grounds, along the road. You avoid getting your front grounds too much filled up with low shrubbery; for you prefer that your front views shall consist mostly of a clean, grassy lawn, with only a few scattering trees to afford a pleasing play of sunshine and shadow. In short, you desire to have your largest trees back of your house, and breaking round in irregular groups towards the road, with only scattering trees in front. When your trees have grown up, your house, when viewed from the road, will appear to stand back in a kind of bay, partially encircled with a rich background of sylvan scenery, and having a breadth of green lawn in front. It is a very common error to plant too many trees in front, and not enough back of the house and off at the wings.

If a natural grove of young timber should be on the ground you have selected for your homestead, you will consider this very fortunate. The most charming situations are such as are already adorned with a growth of young timber. You will make such improvements on what Nature has supplied at your hands as good taste and landscape effect will suggest. If you can preserve a natural grove of some extent, contiguous to your building ground, you will consider yourself especially favored. Nothing could add more to the sylvan attractions of a homestead. A country that is divested of its natural groves is bereft of its richest garlands of beauty.

In planting trees and laying out grounds, you will imitate nature's rounded turns and flowing outlines, so as to make groups of evergreens and masses of shade trees present a scenery of wild diversity. The aspect of your situation, or make of ground, will suggest natural curves or rounded turns to the outside boundary of your grounds. You will determine on the place for your entrance gate—not exactly in front of the house, but off in a side direction, so as to afford a richer view of the architectural forms of the house, and also to afford more changing views in the scenery of your grounds. Perhaps a gate for footmen will enter your grounds, in a side direction, from the one side, and the carriage gate off at the other. Your carriage-drive may either pass by a graceful curve in front of your house, and thence around your house, and off back to the barn, or (what is better) it may curve up near the house, and then wind its way towards the barn. Your walks, also, should take such easy turns or windings as the make of your ground or groups of trees will suggest. There should always be some seeming necessity for such turns in your walks. It is often proper to plant groups of trees to *occasion a necessity* for such turns in a walk or carriage-drive.

Fences are obstructions in landscape scenery, and should only be built where absolutely necessary. Where a fence is indispensable, as along the public highway, it should be such as will obstruct the view as little as possible. If swine are excluded from the public highways, (as

they should be in every civilized community,) fences may be constructed in good taste, that will be very little obstruction to landscape views. Our door-yard fences should be no higher than necessary—if a picket fence, let it be of square pickets, and as wide apart as security will permit.

Do not paint your fences *white*. It is from a want of due reflection that people so often commit the error of painting their boundary fences white. A glaring white picket fence should never be placed in front of a beautiful landscape. The ostentatious *white fence* stands there in self-display, and attracts all attention from the landscape scenery beyond the fence. Let the fence be painted to some color that will harmonize with the bark of the surrounding trees, such as a sober drab, or the softer shades of brown. For objects of ornament, that stand back in some shady portion of the grounds, such as a tasty summer house, white is not inappropriate. For a small building, partially screened by trees, white is not inappropriate for the dwelling itself; but for buildings of any considerable architectural proportions, other shades of color are preferred.

Having thus rapidly presented some general principles in the arrangement of homestead scenery, we will briefly add a few suggestions on the management of grounds.

If commencing the work of preparing a homestead on wholly naked ground, it is advisable to first plow and harrow the entire grounds. Your whole plan is next laid out and staked off. Your trees are planted by experienced workmen. Knowing the importance of giving your trees a vigorous growth on the start, you decide to cultivate the whole ground for a few years. You perhaps appropriate the more open portions to some low, hoed crops. A good, steady single horse and careful driver may be employed in the work of cultivation.

After two or three years of this treatment, your trees get a luxuriant start and begin to present a pleasing aspect; and you finally prepare your grounds for seeding. This, in favorable seasons, should be done in August, so that if the August seeding is not a success, another sowing of seed can be made very early in spring. It is not very important what kind of grass seed is used, provided some blue grass seed is mixed with it—the blue grass will ultimately occupy the ground.

In preparing grounds for seeding, no labor should be spared in getting the surface perfectly even. After your grounds are seeded, it may be necessary to nurse the growth of some of your favorite trees by mulching, or by surrounding them with circular flower beds. You will not neglect the frequent and timely use of the lawn mower. What can be more charming than an expanse of closely mown lawn, enlivened by the lights and shadows of sylvan scenery? Your walks, also, must be kept free from weeds. A few of your evergreens most contiguous to the house may be kept trimmed in neat, symmetrical forms; but those in more remote portions of your grounds should be allowed to assume a free growth and natural proportions.

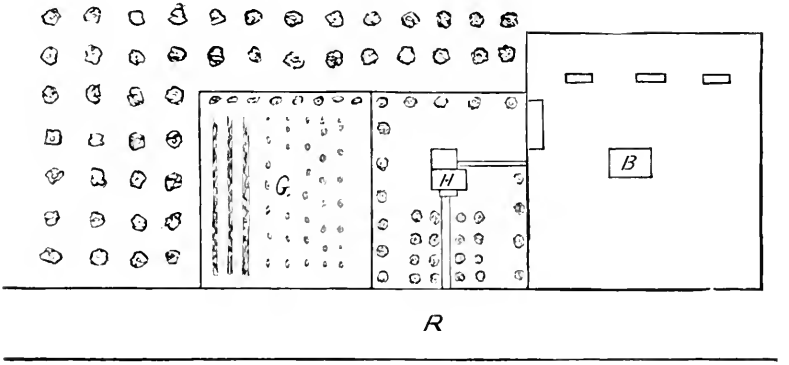
It is true, to keep grounds in order costs work; so also it costs work to keep the *inside* of the house in order. He who is unwilling to expend the work of one hand one day in a week to add to his homestead the

charms of taste, beauty and refining enjoyments, should never find fault with his good housewife for any slovenly delinquency inside of the house. It is folly to think that pleasing homestead surroundings can be perpetuated without the application of some labor.

Nature has supplied at our hands the means to make our homesteads the resorts of rural taste and endearing attractions. But there is a lack of public interest on this subject, and a still greater lack of cultivated ideas in the minds of our people. Let it be the mission of our horticultural societies to awaken interest, and educate the public mind on this subject that stands so intimately connected to the advancement of our civilization.

To further illustrate our subject, accept a few roughly-drawn sketches:

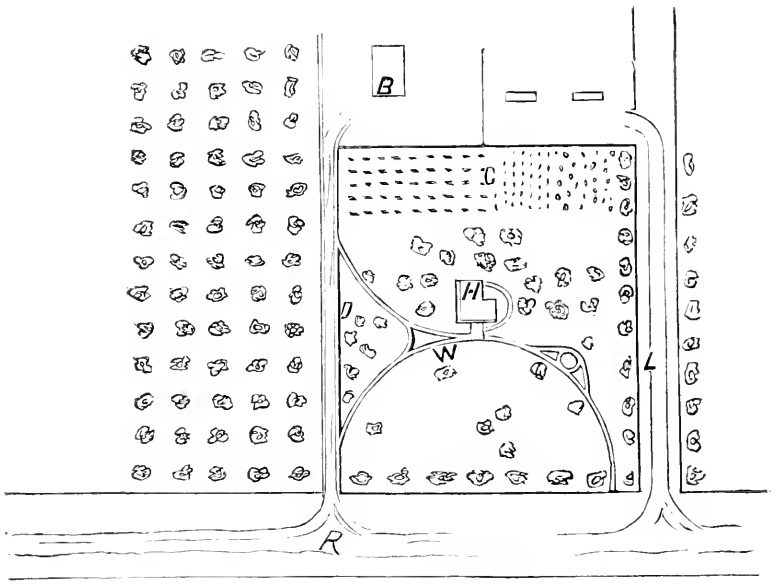
FIG. 1.



Here we have a representation of a prosperous Farmer's Home, about such as we most commonly see.

Through industry and frugality, the proprietor has acquired wealth, and has taken pride in fitting up his homestead in what he considers good style. He has a commodious dwelling, with a nice little door-yard, with its white picket fence in front, nice lot of evergreens in front of his house—standing in exact order—a straight walk from the front door to the road. On the one side we see his fenced-up garden (G); on the other side are his barn and feed-lots. His pen for his choice breeds of swine has a place near his house, for convenience in feeding—every thing as *handy as possible*. If the odors from the feed-lots *are* rather plainly manifest, they are not troublesome *when people get used to them*.

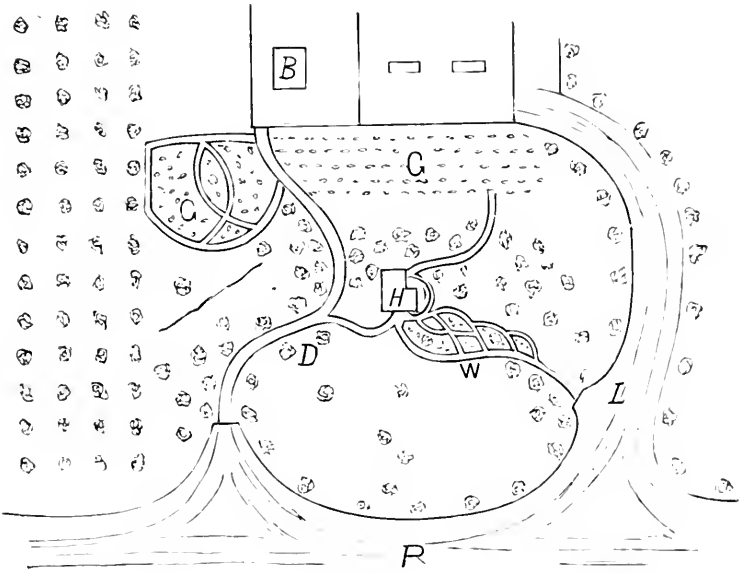
FIG 2



This Homestead indicates higher culture. We see at a glance that the proprietor of this place has more enlarged ideas, and has manifested good taste in homestead scenery; his barn, cribs, feed-lots, garden, etc., are not displayed along the public highway, but occupy a place back of the house.

His grounds are entered from side directions; his carriage-way constitutes the boundary line between his lawn and orchard; his front views are intercepted by no unsightly objects; his grounds have a generous extent, and his scenery is pleasing. But, still there is one thing with which we are not reconciled: we do not admire the *rectangular boundary* of his grounds—we would like to *round off his corners.*

FIG. 3.



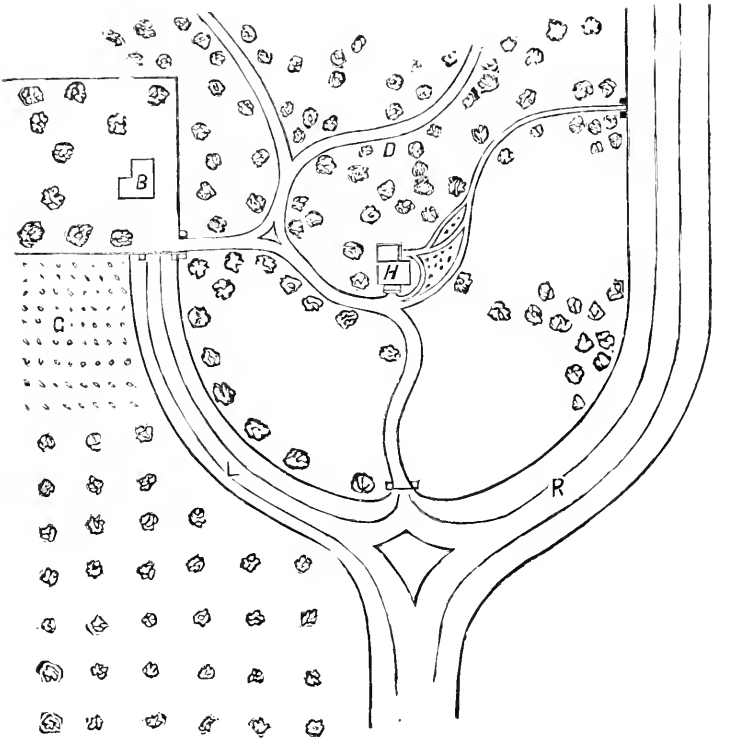
Here we see how the same situation will appear by *rounding off the corners.*

Manifestly, the proprietor of this place has an appreciation of the beauties of nature. His lane from the public highway to his barn-lots takes a curve around his grounds; his carriage-drive (D) gracefully curves up near his house, and thence off to the barn.

Here we see evidence of taste, culture, and a LOVE OF HOME. The proprietor of this place has no thought of *renting out his farm and moving into town.*

In presenting these sketches, we have supposed no natural advantages, except what every open prairie situation will afford. We will now, on closing, ask your attention to one more sketch, where the location chosen for the homestead is on more rolling grounds, and in connection with a natural grove of young timber.

FIG. 4.



The proprietor of this place made choice of a piece of high, swelling ground, with a natural grove of young timber extending off to the north and west. He preferred a southern front; and, as the road passes through his lands, running north and south, he has given the public highway a natural curve around the swell of ground chosen for his building site; by so doing, he has his southern front rather facing this bend of the road, which gives his place a very charming feature.

This place will require very little explanation. The barn (B) is seen off to the west, with the orchard and garden grounds to the southwest.

The proprietor appreciates the natural advantages of his situation. He values the grove of young timber that connects with the scenery of his grounds. This grove, having considerable extent, is cleared of underbrush, and traversed by a carriage-drive. A portion of this carriage-drive will be seen to the northwest of the dwelling, connecting with the carriage-way from the road, that passes near the front of the house, and thence to the barn.

Now, this natural situation is in no way superior to such as frequently occur in connection with our natural groves of young timber. The misfortune is, the most beautiful natural situations are wholly overlooked, or unappreciated.

After the delivery of the essay a discussion ensued upon a suggestion by Mr. WIER to have the illustrations engraved and printed with the essay. This was ended by vote of the Society to refer the engraving to the Committee on Printing, with power to act.

MR. MCWHORTER explained the difference in species of evergreens as adapted to the lawn and different locations upon it, saying each has its peculiar form and habit, and should be located accordingly. The American spruce is especially symmetrical and beautiful, and requires no pruning. The trees planted near the house should be the only ones pruned.

MR. T. MCD. RICHARDS (of Woodstock, McHenry county), being called upon for an essay, read as follows:

FARM ORCHARDS.

Mr. President:

By invitation I have hastily prepared a few thoughts upon "Farm Orchards," and will confine myself to the apple. I have been a practical farmer in this county, and lived on the same farm for nearly thirty years; hence have witnessed the rise and fall of farm orchards to some extent. My orchard was mostly planted at the date of my purchase, in area two acres. The trees grew rapidly, and to all appearance healthily for some ten or twelve years, and looked so promising that I regretted not having put out ten acres instead of two. But hard winters came, especially that one in the fifties, the borer came, the bark louse came, caterpillars came, also blight and storm, till of that early planting about one-third remain, few of which are in prime condition. Now, in addition to our past enemies, we are confronted with the canker-worm, which is laying waste whole orchards in my vicinity. These discouragements led farmers to neglect their trees; and hence we find dilapidated orchards on every hand. I must confess that, from a farmer's stand-point and thirty years' experience, I am ready to recommend small instead of large orchards; for the farmer has too many irons in the fire to care properly for a large orchard. The usual attention given to five acres would pay better applied to one acre. However, don't give up in despair, have an orchard anyway, and keep the ranks full, which you will be pretty sure to do with a small orchard. With all my discouragements and too much neglect, yet, with one or two exceptions, I have had plenty of fruit for about twenty years. I came here to learn from your experiences how to better battle with our orchard enemies, at the same time throw in my own thoughts for what they are worth. Eternal vigilance seems to be the price of fruit, as well as liberty. In nearly all our orchards of much age we find too much perishable fruit; the farmer wants only a few summer or fall varieties; at least three-fourths of his orchard should be winter fruit, and such kinds as experience teaches us do well in our immediate localities. I think our horticulturists call them "iron-clads." There is very little chance for

the farmer to dispose of perishable fall apples, while there is usually a good market for leading winter varieties. And should he desire cider for family use, November or December cider is worth much more than the early made.

We many times neglect to graft our worthless varieties into something better, hence, fail to realize any profit from such trees; we find, however, some kinds of natural fruit in most of our orchards that, especially for cooking purposes, the housewife would not like to spare. I usually have such fruit till May.

I am opposed to low-headed trees and narrow rows, preferring equanimity of temper and a clear conscience to either; hence, I would set trees thirty feet apart both ways, and trim high enough for a horse team to plow near them. The first fifteen or twenty years, I believe the orchard needs a cultivated and hoed crop, and quite often afterward; but I find orchards of trees with low heads and close setting are usually seeded down early, more to save annoyance than to benefit the orchard. I have dug up many decayed low-headed trees, and have concluded the usual recommendations in their favor do not counterbalance the inconvenience. Whether we plow an orchard or not, we should manure as often as once in four years. For a sowed crop in a bearing orchard I would recommend peas; plow them in early, and they will be out of the way in season, and do not impoverish the soil. Pasturing hogs in an orchard, if persevered in, I think is detrimental. A portion of the year, however, with jewels in their noses, they would doubtless do good by picking up wind-falls and wormy fruit; further than this, and with such precautions, I would not go. I am quite sure several of my neighbors have hastened the decay of their orchards by excessive pasturing with swine.

We have not always been careful enough in obtaining sound trees to start our orchards with, or in keeping the ranks full. The severe droughts and winters of this climate make it difficult for the nursery-man to always have on hand perfectly sound trees; and hence, we have too often put out unsound ones, which no after-culture can make healthy and lasting. Too much caution can not be used in the selection of healthy trees, remembering always that a tree without roots is worthless, even with ever so beautiful a top. I think our nursery-men deserve some censure, and roving tree peddlers much more, for palming off whip-stalks under the cognomen of apple trees.

Farmers do not consult together enough in relation to orchard culture; we should play the Yankee more, by asking more questions; and then, I am quite sure, we would have more fruit, better fruit, and more comely orchards. I once remarked to my neighbor that my Rawles' Janets grew knotty and small. His remedy was, manure plentifully and often, and I have heeded the advice with beneficial results.

A word about trimming trees: We are apt to let the orchard run on for a series of years with scarcely any trimming, and then some scape-goat is turned loose to do as he pleases; and the result frequently is, that the trees are so severely slashed that the orchard is nearly ruined. We should be cautious about cutting off too many large branches in one season; too

little pruning is preferable to excess. I am fresh from a farmers' council, held last week in the beautiful city of Bloomington, and knowing that some rambling thoughts were expected from me, I tried to open my eyes as the train rapidly traversed those beautiful prairies. A goodly portion of the distance from Joliet to Bloomington you will see a few good dwellings, with comfortable and elegant surroundings and good orchards; but the large majority of dwellings are quite small, without either shade or fruit tree to break the monotony or temper the biting blast. Why so much neglect in planting fruit trees in much of that region, which is the great corn garden of Illinois? The answer may be found in the fact that the few own the land, and the laboring many are only tenants—and many of them poor, at that. I am glad primogeniture is not entailed on our country—thanks to Thomas Jefferson and his compeers—hence, time will probably disintegrate these excessively large estates. I concluded, as the best present corrective, to come before this intelligent body of horticulturists and ask that missionaries be sent to all those beautiful dwellings, be they in city or country, where the owners of those broad acres reside, praying them to plant some ornamental trees, and at least one hundred fruit trees, about the domicil of each tenant, that he may have more of the comforts and some of the luxuries of life. A farm-house without orchard or ornament is a dreary looking home.

DR. E. G. MYGATT, of Richmond, Ill., read the following essay:

GLEANINGS IN HORTICULTURE.

I will premise by saying that I have no unfriendly feeling towards nursery-men or their business, but have often regretted that I was not trained to this noble, honorable and useful employment.

Top-grafting is an unwelcome subject to some persons; but we want facts, and must abide by them. Let our nursery-men sell to us from their selected lists, and, if farmers and orchardists can add to their crop in quality or quantity, let them do so.

My first subject is the renovation of old apple trees, by cultivation, manuring and top-grafting those which are hardy, and whose fruit is poor, like the Green Everlasting, Grindstone, etc.; for we have in our orchards a few such hardy, almost worthless trees. Such trees can be made very valuable by cultivation—plowing shallow near the tree, and a little deeper farther off—and placing over the roots about half a load of manure; and, at the proper time, when the tree is invigorated, carefully and gradually top-grafting it with choice fruit. To cut off all the large limbs at once from such a tree would be almost certain death to it. We tried that when the bark-louse was troublesome, by cutting off about three-fourths of the top at once from five or six trees, with the intention of applying remedies to the remainder, and the result was, nearly all of those trees died. The following judicious mode is copied from the *Horticulturist*:

"These trees I commenced grafting six years ago last spring. I began on the top, and grafted one-third of the tree each year; it therefore required three years to

complete the entire heads of the trees. I like this method better than any I have ever tried for grafting large trees, as it gives the grafts a good opportunity to get well started. Cutting off and grafting the top first, gives the grafts there the best possible chance, while the necessary reduction of the top throws the sap into the remaining side branches, which fits them well for grafting the following year; and, the third year, the lowest branches, being made ready in the same way, may be grafted successfully.

"By this mode it will be seen that, when the grafts are put in on the side branches, they are not shaded by the heavy shoots above them, and they have an unusual supply of nourishment to carry them forward.

"Those who have attempted to graft the whole head of a large tree at once are best aware of the great diffiulty in the common mode of getting the grafts to take on the side limbs.

"One of these large trees so treated is probably more than seventy-five years old, and has now an entirely new and vigorous head, grafted with this excellent variety. When I began with it, the fruit was only fit for cider, and it was questionable whether the tree should not be cut down. By grafting it in this manner, I have added surprisingly to its value. Two years ago (the bearing year), I obtained from it ten bushels of apples; last year eight bushels; and this year (only six years from the time I began to graft it), I gathered twenty-eight and a half bushels of excellent fruit. I consider this tree now worth one hundred dollars; the cost of grafting it was about five dollars, and the latter was all repaid two years ago—the first season the grafts bore fruit."

We also have some younger trees, very hardy, but not suited to our locality for producing fruit. The Winesap is an instance of this—a very valuable tree in Central Illinois, Missouri and other localities, but a shy bearer of small, scabby fruit in the northern tier of counties of Illinois and in Southern Wisconsin.

The White Winter Pearmain is like the Winesap as to hardiness and scabbing in our locality. The Yellow Bellflower, so choice as a pie fruit, bears but little, and so far as we have seen is hardy. The Perry and Golden Russets give us very little fruit. Trees like the above, with well-proved seedlings, of not less than ten or fifteen years old, or a surplus of Duchess and well-rooted Fameuse, or others as hardy, may be used as stocks on which to place almost any eastern kind that will bear well and not drop the fruit badly. On such trees we can top-graft the Rambo, Swaar, Baldwin, Twenty Ounce, Fall Pippin, Hubbardson's Nonsuch, Jewett's Red, Maiden's Blush, Porter, Mother, Pound Sweet, Red Canada, Roxbury Russet, Williams' Favorite, Smoke-house, Sweet Bough and Wood's Greening.

The Yellow Bellflower has the reputation of bearing, if top-grafted on some other variety.

You can get the fruit of the Northern Spy in about six years, as a top-graft.

There is in Walworth county, Wisconsin, an orchardist who has been top-grafting eastern varieties for many years. I recently visited his orchard and saw his bearing Baldwin trees, and he assured me that he had gathered fourteen bushels from one tree in one season; and his trees have gone safely through our late severe winters.

My Baldwin grafts have gone safely through our winters; also about fifty Twenty Ounce grafts, while my neighbor's bearing tree, from which I cut my grafts, root-killed.

During the latter part of August and fore part of September we generally have one or more all-day, strong, southwest winds, which nearly strip some of our trees of their fruit.

The King of Tompkins County, a tender tree, bears splendid fruit, but drops badly; so with the R. I. Greening. We have six trees, fourteen years in graft, which blossom but little; the codling-moth wants a big share, then the early fall winds take nearly all the rest, so that by the first of October we do not gather a peck of choice fruit from all the trees.

The Wood's Greening is nearly as good as the R. I. Greening—a good keeper—good for table or kitchen, hanging firmly on the tree until the first week in October: should be cultivated as a top-graft to supply us with Greenings.

In top-grafting large trees we take off about one-third when we graft, leaving one or two side limbs near the graft, rubbing off the sprouts every two or three weeks; the next spring we may see a few limbs to graft, taking off in all about one-third: another spring we remove the remainder, with this precaution: *some low limbs must shade the body.*

The grafter should wear light boots with rubbers over them, to prevent injury to the bark of the tree.

Last April a friend was visited who had one Green-gage plum tree and five six-year-old Miner plum trees. I put four grafts from the Green-gage into one of the Miner, and one graft in a sucker, all of which made a fine growth. Can we use a part of our Miner trees in that way to advantage?

I may address some farmers who wish to save their own cions. If we try to save them in our own cellars, we are apt to loose them by getting them too wet or too dry. If we wish to graft from our own trees, we may graft in April, and cut the cions as they are used until the buds open.

When I wish to save cions over the winter or before grafting, I cut them, when not frozen, in November or fore part of December, or in March or fore part of April, tie them in bundles, put them in a small box, fill the box with straw loosely, leave off the lid, dig in a dry place two feet deep or more, invert the box in the pit, and fill up with the soil and bank up. My cions, kept in that way, have always been good.

Pear and plum cions can usually be cut off in April and used immediately.

Root-killing.—When the Ben Davis and some other like hardy trees are killed, the roots are killed, as the body and top are evidently very hardy. The trouble is, our nursery friends are compelled to use seedling roots, which may be tender or hardy, as time alone can determine.

Four years ago last spring we set a few thousand apple root-grafts, and last spring found a large share of them root-killed: and we lost about forty transplanted trees, of from four to seven summers' growth, in our old orchard. Since those planted in low, moist ground came through alive, we judge that the dryness of the soil, bare surface and long-continued deep freezing, killed the roots.

Timber Belts.—How do these protect our fruit trees? That they afford a measure of protection is certain. It is perfectly manifest in my younger orchard, about twenty years old, where we have lost only two trees, by the winter, out of over one hundred. This orchard is protected by a White Willow hedge or belt on the west side, which is now, say, thirty feet high and fifteen feet wide, unpruned and unbrowsed by stock. Six rows in this orchard are south of the willows, and take the west wind without any protection; and out of these forty-two trees fourteen have been killed by our two severe winters. We can not raise such a timber-belt of white willow where cattle, horses and sheep have access; they will eat the trees as readily as grass. The Norway spruce might be better, or some other evergreen. The willow grows rapidly on common soil, but will not grow on gravel ridges.

A few days since I visited a friend in Walworth county, Wisconsin. He had a young orchard—principally Ben Davis, Fameuse, Willow Twig and Wagener, situated on slightly rolling ground, and there was nothing to obstruct the west wind for half a mile. The severe and long-continued cold of last winter killed his trees almost entirely in his west rows. One bearing Early Richmond tree and about forty apple trees, from four to seven summers' growth, were killed on the west side—few or none on the east side.

This friend thinks if he had a good timber-belt on the west side of his orchard, his trees would have been saved.

Sun-Scalds.—All of us have seen apple trees with dead patches of bark on the bodies, generally on the southwest side, sometimes on the south, and rarely on the east sides, though I have never seen it on the north side.

Trees thus injured lean to the northeast, with bare bodies without limbs to protect them from the sun. This shows us the importance of keeping our trees erect, or leaning slightly to the southwest; and here comes in the value of low heads, shielding the bodies from the sun, both in summer and winter.

Some eminent horticulturists think the damage is done by the sun during the winter.

We like much the practice of J. T. Hawes, of Dane county, Wisconsin, who protects his young apple trees from sun, mice, rabbits and sleet, by narrow board boxes, high enough to cover the bodies. He uses boot and shoe boxes, split and cut to suit, nailing three corners, and springing the box around the tree through the loose one. If then a stake were driven inside and the boxes nailed lightly to it, it would prevent the box leaning against the tree. Fence boards might be used, cut to the length of the body of the tree, and would *pay well.* This protection from the sun is of especial importance in stock-grafting the bodies of young trees, six to eight years old, when the whole top is taken off three to five feet high.

A mechanic, living in Richmond, Illinois, purchased about three acres of land in the north part of the village. About six years ago, he purchased nineteen seedling apple trees, which he planted on one side of

his land, eight feet from the fence, and some twenty feet apart in the row. These were top-grafted, standard height, taking off the entire top, and the grafts grew well, but there are only two perfect trees left. Five more are alive, with large patches of dead bark, and twelve are dead. It is probably better to wait until you can go into the limbs and top-graft, saving always the lower limbs to shade the body on the south and west sides.

Pruning.—We prefer March and mid-summer for pruning, although we can cut a small limb at any time. We cut as few large limbs as possible, and favor moderate pruning, both in the apple and grape. Some farmers attack their orchards with axe and saw on the large limbs, and professed pruners mutilate many trees to their great and permanent injury. Last fall we saw a Northern Spy tree, fourteen miles east of Kalamazoo, Michigan, which, three years before, had borne over fifty bushels of apples. Since that, a pruner took off about half of the limbs, and has greatly lessened its capacity for bearing. When limbs of an inch or more in diameter are taken off, we let the surface dry two or three days, then paint the stump with common white paint; in a few more days apply another coat. The linseed oil, being a vegetable oil, does not injure the tree. We have used it long enough to know.

DISCUSSION ON DR. MYGATT'S ESSAY.

MR. NELSON—I don't think it safe to cut plum and pear cions in the spring, at the time of grafting, as they are liable to have their vitality so much reduced by severe winter weather that they will not grow vigorously, if at all.

MR. WIER—I wish to call attention to the root-killing of trees mentioned in the essay. We have had wrong teachings upon this subject. Last winter we had a Wisconsin or Minnesota winter, with the ground very dry. In one block of trees in my nursery, upon different kinds of soil, even the Ben Davis root-killed in patches where the subsoil dried out. I had four rows of peach trees, seventy rods long, across a sandy ridge in which were depressions; and the roots were killed, except in the depressions. The tops of all the root-killed trees were alive, and some of them blossomed.

DR. MYGATT—I advise my friends to *try* cutting pear and plum cions and grafting at once. I don't lose five per cent. of them.

THE PRESIDENT—I have known the sap-wood of pears and plums to be blackened by the severe cold of winters, so that cions would not grow; yet, after mild winters, they will do well cut and grafted as Dr. Mygatt suggests.

MR. MCWHORTER—We have learned, by experience, to cut our cions in the autumn. It is not safe to trust to cutting in spring.

HEATING A CONSERVATORY.

BY GOVE WRIGHT, ROCK FALLS, ILL.

The following communication was read by the Secretary, by the request of the President:

MR. LEWIS ELLSWORTH, President, etc.

Dear Sir: At your request, I will give you my method of heating a conservatory or bay-window, which, I think, is more economical than the usual practice of warming it from another room, or putting a stove in the conservatory. Besides, it has the advantage of giving a moist atmosphere, of uniform temperature, and a constant circulation of air, without more ventilation than ordinary leakage. The plan is simply this:

Make a small cellar, the full size of the bay-window, or four by six feet, for the conservatory, by extending the foundation walls down six feet, and open a door into the main cellar. Into this cellar put a small base-burning, self-feeding, hard-coal stove, and connect it by any practical method with the chimney of the dwelling. In my own case, I ran a brick flue under a porch, twelve feet, into the main cellar, and then used sixteen feet of stove-pipe to connect with the chimney. This pipe is coated outside and inside with asphaltum varnish, to keep it from rusting. The draught will be better if the stove is connected with a chimney which is warmed by another fire. Through the floor of the conservatory (or bay-window) make two six-inch holes, and into one of them insert a pipe from sixteen to twenty-four inches long, extending *above* the floor, for a hot-air pipe; and from the other hole let a pipe reach nearly to the bottom of the cellar, for a cold-air pipe. The hot-air pipe should not extend *below* the floor, nor should the cold-air pipe reach *above* the floor. Six-inch pipes are large enough for a conservatory six by eight feet: but a greater number, or those of larger capacity, can be used for rooms of greater size. It is better to let the cold-air pipe come down near the draught of the stove; and the hot air can be directed to any part of the conservatory by means of a sheet of tin or board placed slanting above it. I use two hot-air pipes—one under the bench for cuttings, and the other under a bench for begonias, bouvardias, and other plants which require a high temperature—and I allow the hot air to escape next to the outer walls of glass. Directly under the windows, or glass walls, I made a sloping trough, to catch the cold air which falls from the frosted windows, and conduct it to the cold-air pipe. This is not necessary; but my object is to conduct the cold air to the cellar without allowing it to reduce the temperature of the conservatory. If a conservatory, or bay-window, has one hundred feet of glass covered with frost, it is equivalent to a refrigerator with an ice-box containing thirty-six cubic feet of ice; and it is cheaper to let the cold air flowing from it pass directly into the cellar, than to attempt to neutralize it in the immediate vicinity of tender plants.

Perhaps the philosophy of the hot-air and cold-air pipes can best be best illustrated by my experiments, which led to their use. When I

first constructed my conservatory, I simply cut two holes through the floor, without any pipes, and the hot air would come up, first through one hole and then through the other, or the hot and cold air would struggle for a passage through both holes at the same time without either gaining the mastery, the heated air remaining on the under side of the floor, and the cold air pressing with all its weight on the upper side. The hotter the cellar the greater was the resistance to the downward passage of the cold air, and the colder the weather the stronger was the obstruction to the hot air; and so my conservatory became a refrigerator with the hot air at the bottom. With a natural disposition to help the *under side*, I made an iron-clad passage through the stratum of cold air above the floor, by means of joint of stove-pipe in one of the holes, and in ten minutes the thermometer went up ten degrees. Then for fair play I made a similar passage for the cold air through the forces below the floor, and the battle was over. The victory was complete for both sides, but the exultation was all in the conservatory. The tradescantias, vincas and ivies felt the rush of warm air on their swaying perches, and waved their long arms in triumph. The timid parviflovas, begonias, and the modest lobelias scattered their bright petals on the stage in acknowledgment, and all the other plants nodded with pleasure. To me it was a matter of astonishment that two lengths of stove-pipe stuck into the floor—one above and the other below—should change the temperature from 40° to 60°, but I was proud of my success. My conservatory is only six by eight feet, and I used last winter one and a half tons of coal, and let the surplus heat into the dining-room, where I saved at least a ton of coal; and this winter I have no stove in the dining-room, but keep it warm by the stove in the kitchen and the heat from the green-house. I usually attend to the fire in the cellar once a-day; but I think it is better in cold weather to shake the grate twice each day, and keep the draught closed.

To smoke the plants I put some tobacco on a wire screen over the hot-air pipe, and light it with a match, and then cover it with another screen to prevent a blaze; and I keep the air moist by sprinkling the cellar. So you see I have all the advantages of a green-house, and no room occupied by heating apparatus.

How many there are who would be glad to have the dreariness of winter relieved by the culture of green-house plants, if they were sure that a cold night would not sweep them all away! But nearly half the dwellings have a porch with a southern exposure, which could be readily converted into a temporary or permanent conservatory, and the sunshine, which could be utilized in heating the adjoining room through a window or door, would almost pay the whole expense.

It is not enough that a conservatory or bay-window is kept from freezing. Those who have purchased luxuriant begonias, bouvardias, euphorbias, coleus, or other winter-blooming and decorative plants in the fall, and find them in the holidays without blossoms and nearly denuded of foliage, are discouraged in their efforts at floriculture, and think that they will content themselves with a geranium, rose and carnation, or leave their bay-windows without a winter decoration. Now, if the

bay-window could be heated in the manner I have suggested, so that the temperature would never fall below 40°, and the cellar sprinkled once a day to give a moist atmosphere, I think it would be found that it requires no more skill to keep the choicest winter-blooming plants in a healthy and vigorous condition than it now does to care for common plants which only bloom by accident in the ordinary temperature of the sitting-room. Besides, I am confident that it costs more to warm a room with a bay-window by driving the heat from the stove into the cold angles of the window, than it would to stock it with choice plants and heat it by a stove in the cellar. A bay-window costs a ton of coal extra every winter, if you keep a rose geranium in it, and, with the cellar, it will cost to warm the sitting-room and window from one to two tons less. But the most important fact is, that the dry heat from the sitting-room stove renders it almost impossible to keep choice plants in a healthy condition, while, with the cellar, you may cultivate any thing that is raised in the green-house.

The same principle could be applied to heating churches and school-rooms, with equal advantage.

HONORARY MEMBERS ELECTED.

At the close of the reading of the essay, several persons were elected honorary members of the Society. (See list of members.)

PROF. THOMAS REQUESTS INFORMATION AND INSECTS.

PROF. THOMAS—I live in Carbondale, Illinois, and ask correspondence from the members of this Society in reference to insects or their depredations. I consider myself your servant, and will be glad to respond to letters, and answer questions. You have a right to demand my services. Please send samples of insects, with statements of circumstances in which they were found.

A brief discussion upon orchard culture ensued, without eliciting any thing of special interest.

THE PRESIDENT remarked that in these discussions we are mutually teachers and pupils, no one of us pretending to have attained perfection. We have a climate which almost baffles our efforts; our soils differ so widely that the same treatment does not suit all localities, even those adjacent differing much in composition and texture. Yet we are learning every year; we know more of processes in horticulture this year than we did last year, and I am confident the time will come—perhaps not in my day—when good fruits will abound all over Northern Illinois. He recounted facts in his experience as a nursery-man and fruit grower in Northern Illinois since 1850, telling how the terrible experiences of the

winter of 1855–56, and some others of great severity, had taught him, in common with other students and experimenters in horticulture, to exercise greater care in selection of varieties and in methods of cultivation.

GRAPES IN OGLE COUNTY.

The following communication was sent by D. J. PIPER, of Foreston, Illinois, and, upon presentation, referred to the Committee on Printing:

* * * The spring was very late, but in April we had some warm weather, during which I uncovered all my tender varieties of grapes. We afterward had some very cold, freezing weather, which killed some of them to the ground, among which were Allen's White Hybrid, Israella and Adirondack. Rogers' Hybrids were not affected by frost after being uncovered; Concords, Delawares, Dianas and Hartfords also came out all right and bore heavy crops of fruit, though some of the Concords did not ripen before frost. Marthas ripened well.

Where I have apple trees set among my vines, those vines which are on the east, southeast and south sides of the trees escaped the frost and ripened their fruit and wood well; the leaves were not damaged by frost until the first week in October. There was not a Concord vine in my vineyard that was apparently injured by the winter, but all grew luxuriantly and bore heavy crops.

The soil of my vineyard is upland prairie, underlaid with clay loam, mixed with some gravel. A part of the vineyard lies toward the southeast, a part to the west, and a part to the southwest, and exposed to all the wind that blows. I find my vines with a southeast exposure bear the most fruit, but those with a southwestern exposure give the first ripe fruit.

I have now over fifty varieties in bearing, some of which are seedlings that promise to be very fine. * * *

The cherry crop was an entire failure here last year, owing to killing of the fruit-buds by the severe cold of last winter.

After the announcement of the programme for this evening, the Society adjourned until half past seven.

WEDNESDAY EVENING.

The Society convened at half past seven o'clock, and the subject of Small Fruits was taken up.

On motion of Mr. MCWHORTER, it was

Resolved, That we discuss *varieties* of small fruits, beginning with

VARIETIES OF GRAPES.

DR. ENNIS has had Eumelan for quite a number of years. The wood is short-jointed, and the vine a strong grower. He could not recommend it for the prairies.

MR. PLUM said he had received a letter from Mr. Giddeon, of Wisconsin, asking him if he cultivated the Eumelan, and saying, "It is the most glorious grape God has ever given to man;" but in his own county (Rock county, Wis.) it is not very desirable.

THE PRESIDENT—I procured my Eumelans from Dr. Grant's nursery, kept them covered, but they all killed the first hard winter.

MR. WIER said it was a total failure with him.

MR. PLUM—Have any of Rogers' Hybrids been successful in this region? The Wilder took the first premium in both the Northern and Southern Wisconsin fairs; Nos. 9 and 15 are nearly as good as Wilder. The Wilder, or No. 4, is hardy and easily controlled. All the Rogers grape-vines hold their foliage on bluffs and high, exposed situations.

MR. WIER—Rogers' grapes have won favors among amateurs, on high bluffs with clayey soil, especially the Wilder and Massasoit; one German grower has remarkable success with them. The Massasoit, however, is the only one that holds its leaves, on my sandy soil.

MR. MCWHORTER finds Martha hardy, but does not like its musky flavor.

MR. WIER finds Martha as hardy as Concord, and, when first ripe, is not much foxy; but grows foxy and sweeter afterward. The quality is not good enough for table use, and the clusters not large enough for market.

MR. PLUM, being questioned in regard to the Janesville grape, said: Cuttings of it all grow, the vines are hardy, do not need summer pruning, and fruit heavily; the fruit ripens early in the North, and is about like the Clinton in character. The vines will run on trees or anywhere, and always bear full crops.

The Wisconsin men, at the Chicago Exposition, said the show of grapes from Oshkosh, Wis., was the best there, and that it was the Rogers' Hybrids which won the laurels.

MR. WATROUS substantiated the testimony of Mr. Plum, respecting the Janesville grape in Wisconsin, adding that the bunches are compact, and about half as large as those of the Concord, that the leaves never drop, and that the fruit is good to cook, and as good as Concord to can.

MR. SLADE (of Elgin, Ill.)—I have about thirty varieties of grapes, among which are Janesville, Eumelan and Martha, on clay soil, where they are complete failures. The Janesville is very foxy, and not salable. My Delawares, on sandy soil, both with gravelly and clay subsoil, succeed well. Hartford is not as good in quality as Concord, only a trifle earlier, and not as prolific.

MR. MCWHORTER—I don't want Hartford Prolific.

MR. WIER—We use grapes chiefly for culinary purposes, and like the Janesville, Concord and Ives. The foxiness of flavor passes off in cooking. I think there will be an increasing demand for grapes for culinary purposes.

DR. ENNIS—Delaware does quite well on the Mississippi bluffs, but Rogers' Hybrids we find deficient in foliage; our main dependence is the Concord, for which we get about four dollars per hundred pounds. I agree with Mr. Wier, that the chief value of grapes is for culinary uses.

HOW TO CAN GRAPES.

MR. MCWHORTER gave his method of canning grapes, as follows: Clip the grapes from the bunch, when fully ripe, with a scissors, letting them fall into the can, until full; then set the can in a kettle of water, and gradually heat to about the boiling point; then put in a hot, thin syrup, made of the best sugar, until *full*, and seal up immediately. In this way few berries break, and they keep nicely.

On motion of the Secretary, the

CULTIVATION OF RASPBERRIES

Was next taken up, and he was asked for his experience.

MR. GALUSHA—I have cultivated raspberries, more or less, in Grundy county, for about fifteen years, and have always found that good culture, with mulchings of manure, applied after a thorough cultivation, given just after gathering the fruit, always pays well. The mulch should consist of barn-yard or stable manure, and should remain on the ground over winter. If the ground is very rich, this may be applied only once in two or three years. I have practiced pinching back the young canes twice to three and a half or four feet, upon the Philadelphias, about the time of the ripening of the fruit. This makes the young canes grow stout and throw out laterals, which produce bountifully the succeeding year. The black-caps I have usually pruned in the spring. Perhaps the manure and good cultivation does not increase the *number* of the *berries*, but it does increase largely their size and pulpiness, and, of course, the yield in number of quarts.

MR. NELSON—I agree with Mr. Galusha in reference to the value of high cultivation, but my practice in pruning is different. I prune in the spring, cutting back the canes to from three to five feet, and they then produce fruit all the way from near the ground to the tops. I cultivate as soon as the fruit is gathered—not before.

PROF. THOMAS had found that, in growing raspberries in a garden, they succeed best upon the north side of a tight board fence, and the poorest upon the south side.

MR. WIER stated that where mites prevail they feed upon and destroy the lower leaves, while the upper, younger leaves feed the fruit; hence it is not a good practice to prune in summer or autumn. He had the Philadelphia fruiting well with him on almost pure sand without manure.

MR. SLADE—The raspberry is one of our most important fruits, because easily grown and almost universally relished. I have a difficulty in growing the black-caps, which is this: The canes start out from the roots a little higher each year, so that after two or three years they break down under high winds. I now plant rather deeply and hill up to the canes from year to year, and find that they stand up much better; and the same plantation can, in this way, be kept in bearing several years longer than when planted and cultivated in the old way.

DR. ENNIS testified strongly in favor of manure, cultivation and mulching, to produce large crops of large berries. He plants in autumn, and covers the first winter by throwing on a forkful of manure, and thus secures a good growth the first season, no matter how severe the winter.

MR. KEITH (of DuPage county)—I cut back the canes to three feet, after planting, and have raised in this way fifty bushels per acre on prairie soil without manure.

MR. PLUM—In Wisconsin we plant in the spring, in rows eight feet apart by two to two and a half feet apart in the row. We take up the rooted tips of black-caps in autumn and pack them in bins or barrels in the cellar, and cover over the top well with moss; in this way they keep nicely till spring. We prune by cutting the tops once during the summer, but never cut the laterals. *Mulching* and good cultivation must not be neglected if you would secure a large crop. The rows should run north and south, so that the plants will partially shade each other. We cultivate in the spring, by first plowing away from the rows, then after a short time plow back and drag down between the rows thoroughly, aftewards cultivating with the Hexamer hoe.

In the year 1867 I planted three acres in apple trees, one rod apart each way, and filled in at the same time with raspberries. We have had good crops of berries, notwithstanding the ground was "worn out land," and we have given no manure. We have given good cultivation; and the fallen leaves make a mulch, being held by the snow. They also, of course, act as a manure. I regard the raspberry as one of the best of fruits—so easily kept when canned, and so good when dried.

At this time a discussion upon

VARIETIES OF RASPBERRIES.

Was called for and agreed upon.

MR. WIER opened the discussion by calling attention to the raspberry which he designated as "The Raspberry for the West." He said: It is a variety of the black-cap species, grown from a native plant selected by A. L. Burns, of Manhattan, Kansas. It is different from all others, is *very hardy*, and the fruit as good as that of the Doolittle.

THE PRESIDENT announced that the election of officers would be the first business of to-morrow morning.

Adjourned till nine o'clock to-morrow morning.

THURSDAY MORNING.

The Society met at nine o'clock, and prayer was offered by Mr. S. G. MINKLER.

As announced last evening, the

ELECTION OF OFFICERS

Was the first business of the morning. Messrs. WIER and SLADE were appointed tellers.

MR. MINKLER nominated L. K. SCOFIELD, and Mr. L. K. SCOFIELD nominated H. C. GRAVES for the office of President.

The ballot for President resulted as follows: Nineteen votes for L. K. SCOFIELD, three for H. C. GRAVES, two for L. ELLSWORTH, and one each for Mr. WIER and Mr. SLADE.

THE PRESIDENT announced the vote, and Mr. SCOFIELD's election was made unanimous.

The remaining officers were elected without a dissenting vote, namely: First Vice-President, H. C. GRAVES; Second Vice-President, ARTHUR BRYANT, Jr.; Recording Secretary, O. B. GALUSHA; Assistant Recording Secretary, J. S. ROGERS; Treasurer, L. WOODARD.

LOCATION OF NEXT ANNUAL MEETING.

MR. MCWHORTER, in behalf of A. R. WITNEY, invited the Society to hold its next meeting at Franklin Grove.

MR. WILLIAMS invited the Society to Batavia; but, after quite a discussion, was persuaded to withdraw his application for the present. He hoped the Society would remember that he only yielded for one year.

The vote for Franklin Grove was unanimous.

A TALK ABOUT ORCHIDS.

On motion, the regular order of business was suspended, and Mr. J. W. COCHRAN invited to give the promised talk on orchids. He complied, speaking about fifteen minutes in a very interesting and instructive manner upon the cultivation of flowers in general and orchids in particular. Among other things he said that orchids did not all require so much heat and so exact care as many have stated, some varieties being quite hardy. He said that some very pretty varieties would flourish in a bay-window or conservatory where the temperature is not allowed to remain for any considerable time below fifty degrees.*

On motion of Mr. WILLIAMS, a vote of thanks was given to Mr. COCHRAN for his interesting and instructive discourse, and he was invited to prepare an essay on *Floriculture*, to be presented at next annual meeting.

REPORT OF COMMITTEES ON OBITUARIES.

The several committees appointed to draft resolutions on the deaths of Dr. HULL, Mr. DUNLAP and Mr. HILL, reported as follows:

RESOLUTIONS ON THE DEATH OF DR. HULL.

Mr. President:

Your committee appointed to present resolutions expressive of the sentiments of the Society in reference to the death of Dr. Hull, offer the following:

WHEREAS, Since our last annual gathering, Dr. E. S. Hull has been suddenly removed from this field of labor and transplanted to that sphere where the trees are ever green, and the flowers bloom immortal; therefore

Resolved, That in the death of Dr. Hull, we feel that we have lost one of the most efficient laborers in Western horticulture, an able, earnest advocate of whatever he considered for the highest good of the State and the world.

Resolved, That in his sudden removal, and that of his amiable and gifted companion, our sympathies go out to their bereaved children; and we trust that they may emulate his virtues and his activities, that, when their work here shall be finished, their memory may be fondly cherished, as is that of their deceased parents, by all who have known them.

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* By previous understanding between the Secretary and Mr. Cochran, the latter was to furnish a copy of the substance of these remarks for publication; accordingly, no notes were made of this very valuable talk. Ill health has prevented Mr. C. from fulfilling his promise, much to our regret and to the loss of the readers of this volume. —EDITOR.

Resolved, That a copy of these resolutions be transmitted to the afflicted children of our deceased friend.

O. B. GALUSHA,
T. McWHORTER,
W. T. NELSON,
} *Committee.*

RESOLUTIONS ON THE DEATH OF MR. DUNLAP.

MR. MINKLER, from the committee, reported the following:

WHEREAS, It hath pleased our Heavenly Father to take from among us our associate and co-worker, the Hon. M. L. Dunlap; therefore,

Resolved, That we deeply feel and regret our loss, and sympathize with his family in their great affliction.

Resolved, That we recognized in the deceased an able, efficient and earnest co-worker in our noble art, whose works will speak in language more potent than words long years after we who are here to-day shall have passed from earth, in commemoration of his noble efforts in behalf of horticulture and home adornment.

Resolved, That these expressions of our sympathies and regard for the deceased be spread upon the minutes of this Society, a copy sent to the family, and published in our annual reports.

S. G. MINKLER,
D. WILMOT SCOTT,
A. R. WHITNEY,
} *Committee.*

REPORT ON THE DEATH OF WM. HILL.

D. C. SCOFIELD, chairman of Committee on Resolutions in memory of Mr. William Hill, read as follows:

Inasmuch as it has pleased God to remove by death our venerable and esteemed friend and co-worker in horticulture, Mr. Wm. Hill, of Dundee; therefore,

Resolved, That we deeply sympathize with the bereaved family and kindred in their sore affliction, and most heartily commend them to the consolations of Divine Grace.

Resolved, That in his death we realize that this association is bereft of an earnest and valuable friend and Christian gentleman

Resolved, That in the recent removal by death of the three worthies, Messrs. Hill, Dunlap and Hull—men whose animating zeal and wise counsels have so long enkindled a flame of enthusiastic ardor in the halls of our sittings, and with whom we have held sweet converse; we are most solemnly admonished of the truth, that *we* too are mortal, and in our turn will soon be called to "give an account of our stewardship;" that we are impressed with a full sense of the Divine injunction, "Whatsoever thy hand findeth to do, do it with all thy might, for there is no knowledge, nor device, nor wisdom in the grave," whither we go.

Resolved, That the foregoing resolutions be embodied in the transactions of this Society, and a copy thereof be transmitted immediately to the bereaved family.

A letter from Prof. H. H. MCATEE was presented, expressing regrets that he could not attend the meeting.

DELEGATES CHOSEN.

Delegates were chosen as follows; To Wisconsin Horticultural Society — Messrs. Whitney, Emery, L. K. Scofield, Benton, and L. Woodard.

To Iowa State Horticultural Society—Messrs. Whitney, L. K. Scofield and Minkler.

To Eastern Iowa Horticultural Society—Messrs. Ellsworth, D. C. Scofield, McWhorter, Gilkerson, Williams, Keith and L. K. Scofield.

DISCUSSION ON PRESIDENT'S ADDRESS.

The report of the Committee on the President's Address was taken up for discussion.

MR. WIER said that though the Stark apple may not be valuable in the extreme Northwest, it was so with him on trees several years in bearing.

MR. WOODARD said the Stark trees shed their leaves, at Marengo, so that the apples did not mature.

MR. SCOFIELD (of Elgin) commended the words of the President relative to timber planting, and referred to the statistics published last year on pages 215 and 216, of Vol. VIII of Transactions of Illinois State Horticultural Society. He also referred to the condition of some of the countries in Europe and Asia which have been stripped of timber, and expressed the fear that unless the people of the United States soon awake to the importance of planting timber trees, and land owners act as individuals in this matter; and unless the General and State governments also take the matter in hand in earnest, a timber famine will soon be upon us. He commended the action already taken by Congress, to encourage the planting of groves on public lands.

CENTENNIAL TREES AND ARBOR-DAY.

DR. ENNIS stated that the Iowa State Horticultural Society had set apart one day in April of each year, to be known as Arbor-Day, in which all who own lands are expected to plant trees; and had offered premiums to persons planting and caring for the largest numbers.

D. C. SCOFIELD offered the following:

Resolved, That it becomes each nursery-man belonging to this association to give to each customer one tree, in the coming spring, to be planted and known as the *centennial tree*.

This resolution was supported by several members.

L. K. SCOFIELD offered two good trees to each member of this Society, who would receive and plant them.

The resolution was adopted.

Quite an animated discussion ensued, in which one or two motions were made but not supported, relating to adopting an Arbor-Day for this district. This discussion culminated in the passage of the following resolution, offered by Mr. WILLIAMS, of Batavia:

Resolved, That the Corresponding Secretary of this Society be instructed to name a day, not later than the twentieth of April, to be known as Arbor-Day, in which it shall be expected that a tree shall be planted for every member of every family owning lands in this district; and that the Secretary be requested to correspond with the secretaries of other horticultural societies, with a view to the general adoption of this plan.

On motion of L. K. SCOFIELD, the hour of final adjournment was fixed at nine o'clock this evening.

REPORT UPON FRUITS ON EXHIBITION.

The following was received and read:

Your Committee on Fruits would respectfully report, that they find on the tables

Eleven	varieties of apples	by	S. G. Minkler, of Oswego.
Thirteen	"	"	Dr. E. G. Mygatt, of Richmond.
Nine	"	"	R. G. Benton, of Nunda.
Twenty	"	"	Lucius Beckley, "
Nine	"	"	J. Notestine, "
Three	"	"	O. Beardslee, "
Five	"	"	Rogers, Gilkerson & Prescott, of Marengo.
Ten	"	"	V. E. Benton, of Michigan.

Also, a few varieties from Wisconsin, by B. B. Olds, of Clinton, and J. C. Plum, of Milton.

This exhibition is made up mainly of the best and most successful of the old varieties, with few new ones of any special promise. But one thing is apparent: that the practical tendencies of the age, as well as the necessities of the time, demand that our fruit lists, and at last our fruit exhibitions, must be made up largely of the *successful varieties*, that show themselves adapted to a wide and successful culture—by a class that demand the *bushels*, for domestic and commercial purposes.

A. R. WHITNEY,
W. T. NELSON,
J. C. PLUM,
Committee on Fruits.

DISCUSSION OF RASPBERRIES RESUMED.

DR. WILLIAMS, (of Batavia,) being called out, said: I have cultivated raspberries for many years. The Doolittle and McCormick produce fine

crops; I have also Philadelphia, Clark, Ellisdale, and last, but not least, the Turner, which I procured five years since from Prof. Turner, and value very highly. The plant is hardy and productive, and the fruit bears transportation well. The Ellisdale is a cap-berry, like the black-caps, except in color; but I can't recommend it, as it don't hold on well and is uneven in size. The McCormick is larger than Doolittle, but hardly equal to it in flavor. Davison's Thornless has suffered more from drought than other varieties. My soil is rich prairie, with light-colored, rather porous subsoil.

MR. NELSON thinks the McCormick and small "Miami" are not identical, though claimed by many to be so; McCormick is larger, and has a bloom upon it, while the Miami is quite black. He has had Turner several years, but is not as well pleased with it as formerly. His soil is a clayey prairie soil. He has seen a heavy crop of Turner berries at Odell. The owner treated the plants in this way: He cultivates well, keeping down the suckers, leaving four or five canes in a hill: in the spring he ties these canes together with a strong cord, about three and a half or four feet from the ground, and cuts them off just above the band. He never saw so fine a sight in fruit as they presented, or a more beautiful berry, and never tasted any one of as fine quality.

MR. GALUSHA gave his experience with varieties in Grundy county, saying that he could make more money from Philadelphia than any one he had tried.

MR. SLADE (of Elgin)—My raspberries are on "timber land," with a clay-loam soil and a clay subsoil. I am confident that soil has no more to do with success or failure, with any particular varieties, than any thing else. I began with Doolittle, but have abandoned it; and I am glad that I did not invest largely in Turner, as it don't give crops; Philadelphia produces good crops, and also Davison's Thornless, which is worth more on my grounds than any other sort.

L. K. SCOFIELD (of Freeport)—Davison's Thornless is a failure on my ground, which is hazel-barrens. Doolittle is best of all black-caps with me. The Franconia is hardy, but suckers badly; the fruit is fine in quality.

DR. WILLIAMS said the Franconia killed on his oak-barrens everywhere, even on the north side of fences.

PRESIDENT ELLSWORTH—A berry cultivated in Naperville as Franconia, and which I suppose is genuine, is the best variety there.

Some discussion ensued about the identity of Miami ("small") and McCormick, with the usual result—failure to agree, or to convince, on either side, some contending that soil and cultivation made all the apparent difference.

MR. WIER insisted that something else was the matter, besides soil and latitude. He said: The mites feed upon some varieties more than others, and often you may condemn a variety for your soil, simply because it is preyed upon by mites, and you don't know it.

MR. SCOTT mentioned a plantation of Franconia, at Galena, on a high hill, in an exposed situation, on stiff clay soil, which was eight years old and still productive.

Adjourned to half past one o'clock.

THURSDAY AFTERNOON.

The Society met as per adjournment.

FINAL RESOLUTIONS.

The following report was received:

Resolved, That the thanks of this Society be tendered our President, for the efficient and able manner in which he has presided over our deliberations at this meeting.

Resolved, That our thanks are due to Mr. Walkup, President, and Mr. R. G. Benton, Secretary, as well as a number of the members of the Crystal Lake Horticultural Society, for their efforts in our behalf, in providing a place for meeting, entertainment for our members, and for courtesy shown us.

Your committee would also make mention of the favor shown our Society in the reduction of fares by the Chicago and North-Western Railway Company and the Illinois Central Railroad Company.

Your committee would also express their gratification at meeting so many of the older members and men of long experience in horticulture: and although, during the year 1875, we were called to mourn the loss of three of our best and most earnest workers, we still hope to profit by their experience and teachings. We hope that for many years we may have the pleasure of seeing at our annual gatherings the old, familiar faces now present.

D. WILMOT SCOTT,
O. B. GALUSHA, *Committee.*
L. K. SCOFIELD,

THE PRESIDENT stated that he had received a letter from ex-President SAMUEL EDWARDS, expressing sincere regrets that he could not attend the meeting.

On motion, it was voted to spend fifteen minutes in a

DISCUSSION ON GOOSEBERRIES.

THE SECRETARY said that he wished information as to the Mountain Seedling and Charles Downing varieties, for which it is claimed exemption from mildew and general superiority over the well-known sorts, American Seedling (or Cluster) and Houghton's Seedling.

MR. NELSON—It will take us but a little while to learn all we want to know about this sour fruit. I have Houghton's and American Cluster, both bearing well, but the fruit is so extremely sour that we don't care any thing for it.

MR. GALUSHA—I am surprised to hear so intelligent a fruit grower cast away a fruit because of its acidity. Gooseberries, when green, are very sour, but, when canned and kept till spring, are relished by almost every one. When the first warm weather of spring comes, we crave and need acid fruit; and, at the time this fruit is of sufficient size to be used, it is relished by laboring men, when sweetened to taste, better than naturally sweeter and richer fruit. Besides, when the Houghtons are ripe and dried by artificial heat, they are good for puddings and pies. The flavor is peculiar and refreshing, and generally relished. I ask for information about the newer varieties.

DR. ENNIS—I have the Mountain Seedling, and prize it highly; it is from one-third to one-half larger than Houghton, and is the best variety that I know. I have the Charles Downing also, but it is not quite equal to Mountain Seedling. I regard the gooseberry as a valuable fruit—one which I could not be induced to dispense with.

MR. MCWHORTER did not value the gooseberry. He said: You may put a pound of sugar to a pound of fruit, and it is too sour; you may add a half pound or a pound more, and yet it is too sour.

MR. WIER said there was no accounting for tastes and preferences. He liked the fruit, and said that equal parts of sugar and fruit made an excellent dish.

On motion it was voted to spend not exceeding half an hour on the discussion of

BLACKBERRIES.

THE SECRETARY asked if any of the members had tested the Snyder blackberry in Northern Illinois.

MR. NELSON—I have had this variety for several years, but do not find it hardier than the Kittatinny. I suppose my plants were genuine, for

I had them from Mr. Wier, who said he procured his from Mr. Gaston, whose stock is considered genuine. During ten years Kittatinny has killed but twice with me; and if I could get but two crops in five years, I would have it in preference to any other sort.

THE SECRETARY—I think there must have been a mistake about the genuineness of Mr. Nelson's plants of Snyder; for I have never before heard either the hardiness or productiveness of the true Snyder questioned, its only fault being over-productiveness—occasioning a lack in size and flavor of the later pickings.

MR. WIER—I raised one hundred and fifty bushels of Kittatinnies in 1874.

MR. NELSON inquired about the Ancient Briton. It had been on his grounds two years, but bore very few berries and did not spread by suckers.

L. K. SCOFIELD has had Ancient Briton for a number years, and thinks highly of it on account of its hardiness and freedom from suckers. The berry is not large.

MR. WIER said it had proved hardy until it was attacked by mites in the fall of 1874. The following winter the plants died in consequence.

DR. ENNIS—Ancient Briton is not a large berry, but the plants are extremely hardy.

Further discussion elicited nothing of value.

The Society voted to devote half an hour to a

DISCUSSION ON STRAWBERRIES.

THE PRESIDENT was known to have a fine variety of strawberry in cultivation, but concerning which the members knew but little; therefore, to draw him out he was asked what variety he would choose if he was confined to one. He replied that possibly he was not a disinterested judge, and would only say that if he could have but one, that one would *not* be the Wilson.

MR. COCHRAN said he knew something of the variety which Mr. Ellsworth was too modest to name—the Prouty's Seedling—and thought highly of it.

MR. CROW (of Crystal Lake)—I have tried almost every sort in cultivation, and have come down to three sorts for general cultivation:

French's Seedling, Prouty's Seedling and Wilson. Jucunda is good, requiring a stiff soil and cultivation in hills. I value the Col. Wilder, but have not tried the Charles Downing.

THE PRESIDENT asked testimony as to Green Prolific.

L. K. SCOFIELD—It has done well at Freeport—better than Wilson.

MR. WIER—The berry is excellent for home market, but too soft to ship.

This variety was commended by several members, whose testimony agreed with that given at the meeting of the State Society, and recorded on pages 19, 20, 22 and 23, of this volume.

MR. WIER said of the Wilson: It blooms earlier than other sorts, and, if standing on low ground, these first blossoms were liable to be killed by frost.

L. K. SCOFIELD covers his strawberries with corn-stalks late in autumn.

THE PRESIDENT puts on leaves first, and a few corn-stalks above them. He has known Green Prolific bearing heavily on cleared timber land. It is excellent for family use, fresh, and good to can.

DISCUSSION ON CURRANTS.

THE SECRETARY inquired if any members present had fruited the Long-bunch Holland.

L. K. SCOFIELD—I procured this variety from Samuel Edwards, and have cultivated it several years. The plants are free from insect depredations and thus far very productive; the leaves are large, the bunches long, and the berries larger and later in ripening than Red Dutch.

MR. NELSON substantiated Mr. SCOFIELD's statements, adding that the berries will hang long on the plants, owing to the persistent foliage. The Victoria also holds on well, even till frost. Both these varieties are valuable.

MR. WIER—Long-bunch Holland is not preyed upon by insects, and bears well. It is difficult to propagate it by cuttings; the best way is to make stools, or mound up among the plants so they will take root.

MR. MCWHORTER spoke highly of the Versailles.

THE PRESIDENT cultivates the Cherry currant, and values it very much, owing to its fine fruit, of large size, and the habit of the bushes to hold their foliage well. He prefers Red Dutch for the main crop, but

wants the Cherry for later use. A few years since, he picked twenty bushels of Red Dutch currants from a patch three and a half by four rods in extent.

APPLES.

MR. MCWHORTER—I move that we now call up varieties of apples, and hold brief discussions upon them.

This motion was agreed to, and he named the

JONATHAN,

Which he called an excellent friend, giving better satisfaction, for a series of years, than any other winter variety, all over the Northern district.

MR. NELSON—I put it first, or nearly first, on the list, all things considered. The tree is almost as hardy as the hardiest, and the fruit excellent for all purposes for which apples are used. They are *earlier* than the general crop of winter apples, and then they will keep well.

MR. MCWHORTER—As soon as they begin to drop, take the hint and pick them, and they will keep till spring.

MR. MINKLER—It is our best apple for early winter.

ROMAN STEM.

MR WIER—I wish to name the Roman Stem as the best winter apple in my locality; and it is also very reliable on ordinary prairie soil. The tree is very hardy, and will produce twice as many bushels in a term of years as the Jonathan; and we all know it is a delicious, high-flavored apple. Its dull color and want of size prevent its ready sale in the general market—large, red apples always sell best; but those who know the excellence of this variety will buy it, if they can get it.

MR. MCWHORTER—I have praised this apple more than any man in the State; yet, I don't think that, on my grounds, it will produce quite as many bushels, per tree, in a term of years, as Jonathan. Good as is the Roman Stem, yet, all things considered, I place Jonathan before it.

MR. WIER stated that Roman Stem requires a rich soil; and that Jonathan and Winesap will not do well on bluff lands.

MR. WHITNEY (of Franklin Grove)—It won't pay to raise the Roman Stem for market.

BEN DAVIS

Was next called up.

MR. CROW—I have grown the Ben Davis, and place it next to Jonathan in value. The tree grows well, and bears young and heavily,

on any soil. The flavor of the fruit is not as good as that of the Jonathan; but the apples are all fair, of fine size, well colored, and keep well.

Several gentlemen gave their experience with this now popular variety, all agreeing that it is wonderfully productive, and that as long as it will *sell* well it bids fair to stand at the head of the list *as an apple to sell.*

DR. ENNIS said he never eats this apple; yet it will sell as well in market as Jonathan, and that the trees will bear four times as much fruit as Jonathan. He knew it is a nice thing to look for *quality* in an apple: yet, when a man raises fruit *to sell,* he wants the fruit which will bring him the greatest number of dollars.

MR. COCHRAN had found Ben Davis of pretty good quality, where grown on a light soil, underdrained by a gravelly subsoil—much better than when grown on stiff soils.

MR. MINKLER—I set out Ben Davis trees, sixteen feet apart, to grow for fence posts. I nail on laths and attach wires. They are good for this use, and the fruit is good—*to sell.* I don't sell it to my neighbors, but take it to market, and there *its hide* sells it. Handsome, fair, red apples, of good size, are the ones to offer in the market, where purchasers *will go by appearance,* and not by quality.

WILLOW TWIG.

MR WIER—I have in one orchard one hundred Ben Davis, and one thousand each of Willow Twig and Jonathan; and the Willow Twig trees are one-third larger and produce more apples than the Jonathans. If I were to name the two varieties having the most money value for market in Northern Illinois, I would name Willow Twig and Ben Davis.

MR. WHITNEY (of Lee county)—I can make as much money from five hundred Willow Twig trees as from a thousand of Ben Davis. My soil is clayey with no gravel below.

MR. MINKLER—Willow Twig apples should not be sold till April or May, when they will bring a high price; hence there is more money in them than in other sorts that are not as good keepers.

Several other members spoke of the value of this variety as a long-keeper, though no one called its quality excellent. One said that it was only *good* after all others were gone.

MR. NELSON said it scabbed on his grounds, and was much infested by codling-moths.

MR. MCWHORTER also thought it was quite liable to be so infested.

MR. WHITNEY said he was not troubled with scab on his apples, as he gave his orchards good top-dressings of manure, keeping his trees thrifty.

DUCHESS OF OLDENBURG

Was the next apple called up.

MR. WIER—Duchess has all the good qualities we can ask for in tree and fruit, except that the fruit is too sour. The tree is hardy, and bears young and bountifully; the fruit is large, fair and beautiful.

MR. MINKLER—I find no fault in tree or fruit; we want such acid apples for culinary uses.

MESSRS. NELSON, WIER, ELLSWORTH and L. K. SCOFIELD spoke of the fact of the Duchess trees being damaged in the roots last winter; but, as this "root-killing" is of so extremely rare occurrence, it was not regarded as serious objection to the tree.

MR. VAUGHN (of Chicago) said he had found it a more difficult tree to transplant than most other varieties, owing to a want of fibrous roots.

WAGENER

Was the next candidate for discussion.

MR. NELSON—It is one of our very best winter apples. The tree does not form enough roots, and, on this account, does better stock-grafted or grafted on limbs of hardy trees in the orchard. It bears young, and is a most profuse bearer.

MR. KEITH—The Ben Davis is a good stock for Wagener.

MR. MCWHORTER—It bears young and enormously; will kill itself in bearing in a few years, if the fruit is not thinned when quite small. It is not quite hardy. The fruit drops early; hence, should be picked before close of September.

MR. WIER—In my Wagener orchard, of three hundred trees, those branching at the ground are best; those branching below eighteen inches from the ground are healthy and productive; but those with high heads are dead. I say to planters, get two-year-old trees, and head them low. If I were to plant another orchard, I would plant one-third to Wageners, and make them branch at the ground.

MR. BENTON (of Crystal Lake)—I have an orchard that does not bear or grow. The heads of the trees are four feet from the ground.

D. C. SCOFIELD—My friend, Minkler, grows his apples in *climate* instead of soil, probably taking a hint from air-plants. I wish to name a

tree which is very notional, utterly refusing to bear except on soil of its own choosing, no matter what the *climate* is. This tree is the

NORTHERN SPY,

One of the finest apples on certain soils. Root-grafted, on prairie with clay subsoil, it is uniformly barren; on sandy soil it is just the same; but on an intermediate timber-land soil, only a few miles from me, it bears well. Top-grafted, it bears wherever I have seen it tried.

MR. MCWHORTER—It is not safe to trust it. I have known trees to bear no fruit until eleven years in orchard, then bear a few years, then stop and remain unfruitful.

Other witnesses stood up to testify against the Northern Spy, and the result was a pretty general condemnation.

KESWICK CODLIN

Found friends on all sides.

MR. MINKLER said it is a good apple every way—one of his most profitable varieties.

MR. MCWHORTER said it was not as *good looking* as the *Duchess*, and was sour besides.

MR. VAUGHN testified that the tree grows well and bears well on all soils in Cook county; and the apples sell well in Chicago.

MR. COCHRAN—It is a good tree for the early settlers to plant—it bears so young and profusely, though it is not as valuable for general planting as Duchess.

MR. WIER—On light soils the tree bears well and heavily, and the fruit sells well in market.

THE PRESIDENT—We can begin to cook the apples when half grown, even earlier than any others. They are in use a longer season than Duchess.

FAMEUSE (SNOW APPLE).

MR. WIER called it a good apple for family use, but not valuable for market.

MR. MCWHORTER—They are all on the ground in September, and mellow in October, with me.

MR. WATROUS spoke of the tree as highly valuable in Wisconsin—one of the hardiest and most productive. The fruit will keep till March if picked early.

Several members testified to the value of this excellent fruit, some saying, which we know to be true, that if picked early and handled carefully the fruit may be kept into December. Some one testified to the value of manure for Fameuse trees.

MINKLER

Was called up by the PRESIDENT, who gave its history, as already published in our reports, adding his testimony to its value as an orchard tree, though a straggling grower in the nursery. He described the fruit as a fair, red apple, of good size, a good keeper, and of fair quality.

MR. MCWHORTER thinks it is probably identical with Brandywine.

MR. WIER complained of it as not bearing on light-colored, clay soil.

RED ASTRACHAN

Was next called.

D. C. SCOFIELD—It is a remarkably vigorous-growing tree; but in sixteen years it has not begun to bear, on my gravelly subsoil land.

MR. MCWHORTER—In our region it is slow in coming into bearing, but profitable when in bearing. In one orchard near me this variety sells for a higher price per bushel than any other apple. Its splendid appearance and large size will command sale at high figures.

MR. WIER has this variety on different soils, yet does not regard it as profitable. It does the best on high, loess soil. The apple must be picked early.

THE PRESIDENT—Some years ago Mr. Allen, of Warren, told me it was productive with him, but it has not been so with me: the fruit does not ripen evenly and is uneven in size.

MR. MCWHORTER—The apple is better in quality than the Duchess, and a little earlier in ripening.

MR. VAUGHN—The tree is a shy bearer in Cook county.

EARLY PENNOCK.

MR. MCWHORTER—The Early Pennock trees bear young, and the fruit is large, but not quite acid enough to cook.

MR. WIER—The trees are always good and productive when headed low.

TETOFSKY

Was named.

MR. MCWHORTER said it is an indifferent tree to grow, and not valuable.

Several spoke of the Tetofsky, but it had no warm friends.

BENONI.

MR. MCWHORTER placed this variety at the head of the list of summer apples for all purposes. The fruit is of best quality, ripening from the tenth to the fifteenth of August in Mercer county.

MR. COCHRAN—Tree and fruit are both excellent in Cook county.

MR. WIER—Low-headed trees are productive with me, but the fruit, though of best quality, ripens last of September, which is too late to command best prices in market as a summer apple.

HASKELL'S SWEET.

MR. MCWHORTER, in answer to a question, said he regarded Haskell's Sweet as the best sweet apple ripening in autumn; flesh tender, juicy and rich. The tree is hardy. He spoke of *Sweet Vandevere* as another excellent sweet apple, ripening a little later than Haskell.

MR. WIER thinks Sweet Vandevere the best apple for apple butter, and is also excellent for the dessert.

BAILY SWEET

Was commended by Mr. MCWHORTER as excellent to stew, good to bake and good to sell.

The Society then adjourned to seven o'clock this evening.

THURSDAY EVENING.

The Society met at the usual hour, and resumed the .

DISCUSSION ON APPLES.

TALMAN SWEET

Was named, but found no advocates.

CAROLINA RED JUNE.

MR. MCWHORTER described the two varieties of Red June, the striped and blush red. The trees can not be distinguished, yet the fruit is always somewhat dissimilar—the striped variety being a little larger, and, perhaps, preferable. The trees had been variable in productiveness with him. Several others spoke favorably of this tree and its fruit.

EARLY HARVEST

Was discussed by a half dozen members, who agreed as to the high value of the fruit—being the earliest to ripen; and also as to the unprofitableness of the tree until it has attained the age of twelve or fifteen years; after which, if alive and well cared for, it is generally profitable.

THE PRESIDENT complained of the fruit as scabbing.

AMERICAN SUMMER PEARMAIN.

MR. COCHRAN has had considerable experience in raising this fruit, and admires it highly for home use; but, inasmuch as it ripens at a time when apples are abundant and cheap in the markets, it will not sell well. The tree is hardy, and a fair orchard-tree, though a slow nursery-tree.

MR. WIER and MR. MCWHORTER both spoke of the apple as the most delicious one of its season, and of the tree as *very* slow in the nursery.

PRIMATE

Found an advocate in MR. WIER, who has top-grafted one hundred Rawles' Janet trees with it, and they bear well. He picks the fruit before it is ripe, and allows it to ripen in the barrels. Grown and treated in this way, he finds it a profitable variety.

THE PRESIDENT and MR. MCWHORTER do not value it.

LOWELL.

MR. MINKLER—The tree is hardy and productive; fruit of good size and excellent quality.

MR. MCWHORTER—A first-rate fruit for cooking.

THE PRESIDENT added: And a fair eating apple.

MAIDEN'S BLUSH

Had many admirers among the members present. The tree is acknowledged to be tender in the nursery, but is known to be pretty hardy when well established in the orchard.

FALL ORANGE.

This variety was commended, in tree and fruit, by several orchardists present, who had grown it for many years; the only objection made being, that the fruit decays soon after being gathered.

MR. GALUSHA said, however, that, if picked early and kept in a cool, dry place, the apples will keep a month or six weeks, if the family will allow them to. The apple is so large and fair, and withal so tender and good to cook, that it *doesn't keep well*, unless the supply is large.

THE DOMINE

Did not want for advocates. This variety sustains even a better reputation among members than in former years, inasmuch as the fruit is fairer upon old than upon young trees; though the trees are not quite as hardy as is desirable.

NEWTOWN PIPPIN

Was generally condemned, though Mr. MCWHORTER said he had moderate crops from thirty trees top-grafted or budded on seedlings.

D. C. SCOFIELD said that, in an orchard ten miles west of Elgin, planted on hazel-barrens, Newtown Pippin trees had averaged two dollars and a half to three dollars per tree, per year, in value of apples sold.

CAYUGA RED STREAK.

THE PRESIDENT—It drops from the tree on my grounds. I will ask Mr. Minkler of his experience with it.

MR. MINKLER—The tree is one of the best and most profitable in my orchard. The fruit is very large, fair, handsome, and of fair quality; I can always sell it, whether apples are plenty in the market or not. The fruit does not all color at once, and I go over my trees about three times, picking them as soon as colored. They are so large that they fill up fast, and make more bushels than most people would judge by seeing them on the trees. I regard this sort as the best *big* apple for Northern Illinois.

Others who had grown this variety confirmed Mr. MINKLER'S statement.

RED CANADA

Was not generally known.

MR. MCWHORTER—It is a synonym of Steele's Red Winter (of Michigan). The tree is a feeble grower, but profitable; the fruit of good size, fair, good quality, with spicy flavor.

YELLOW BELLFLOWER.

MR. WIER stated, as reasons for the general unproductiveness of this tree, first, that the blossoms were not perfect—on some trees the

stamens and on others the pistils are wanting—and only under certain favorable conditions will the flowers be fertilized. He knows one orchard on the west of Peoria lake, where the lake is generally five miles wide at time the Bellflowers are in bloom, in which the trees bear well. Second, the bloom is usually so profuse that the fertilizing power is weakened.

DISCUSSION ON PLUMS.

MINER.

MR. COCHRAN stated that, eight years ago, he procured Miner and also Wild Goose plum trees from Mr. Miner himself, and had no fruit from either. He wished to know of the success of others with the Miner.

MR. MCWHORTER—I procured trees from D. W. Scott, of Galena, which bore young, and have continued to bear well. When an apple tree dies in my orchard, I do not plant another in the place, as trees so planted are not likely to do well; but I plant a Miner plum tree there, and am successful. The fruit is large and of fair quality, though not first-rate.

MR. WATROUS has seen Miner trees, near Galena, thirty-five years old, with trunks four feet in circumference, two feet from the ground. As a general rule, he says, this tree does not bear young, and is not always successful on low or flat lands; but on high lands it is satisfactory.

MR. CROW—Seven years ago I planted two trees, which have grown finely, but produced no fruit till the last season, when I had two specimens of a good variety of wild plum.

MR. WIER—I procured one hundred and twenty-five so-called Miner plum trees, from Mr. Barlow, of Wisconsin, and they began to bear a little fruit when quite young, and have continued to give a little from year to year since: but three years ago I saw fruit of the "Hinckley," from Mr. Scott, which is claimed to be another name for the Miner, and the fruit was entirely dissimilar. The Hinckley is large, a little oblong: color, a dark crimson, somewhat mottled.

I am confident Mr. Cochran's Wild Goose trees are spurious, as the true Wild Goose bears young.

L. K. SCOFIELD (of Freeport)—The Miner trees have been profitable to me. Trees planted five years ago have borne, but not as well as some older trees near by. These are eight to ten inches in diameter of trunk, and spread twenty feet. The fruit, with the skins taken off, and cooked or canned, is first-rate. The trees are sadly mixed, many persons having spurious ones.

WILD GOOSE.

MR. MCWHORTER—It ripens as early as any of our wild plums—earlier than the Miner. Both sorts are hardy.

MR. WIER—There is a large flock of this "Wild Goose," the seedlings having been largely disseminated as the true variety. The true tree is hardy—a vigorous grower—I have them two years old, seven feet high; the twigs are more slender than those of Miner; leaves like peach leaves, finely serrated; fruit a bright scarlet, and ripe from the fifteenth to the twenty-fifth of July, in Marshall county; is no better than that of Hinckley (or Miner), but sells higher in Chicago. Mr. Downer, of Kentucky, says the seedlings of Wild Goose are fine ornamental trees: the leaves are beautiful, blossoms beautiful, and when in fruit the bright scarlet fruit is beautiful, giving the tree a charming appearance. The seedlings of this tree and Miner, of which so many have been planted, may be utilized by grafting them with the genuine Wild Goose plum.

ADJOURNMENT.

The hour fixed for final adjournment having arrived, the PRESIDENT thanked the members of the Society for their courtesy to him during the sessions, and, hoping that we would meet again at Franklin Grove for another annual re-union, declared the session adjourned.

MEMBERSHIP LIST

OF

HORTICULTURAL SOCIETY OF NORTHERN ILLINOIS, 1876.

NAME.	POST OFFICE.	COUNTY.
Arthur Bryant	Princeton	Bureau.
S. L. Keith	Palatine	Cook.
J. W. Cochran	Blue Island	"
G. H. Clayson	Palatine	"
A. Dunning	Jefferson	"
W. H. Schuyler	Chicago	"
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Geo. E. Morrow	"	"
C. H. Atkins	"	"
J. R. Eby	Lanark	Carroll.
H. C. Graves	Sandwich	DeKalb.
C. A. Snow	"	"
Lewis Ellsworth	Naperville	DuPage.
A. B. Austin	Downer's Grove	"
D. W. Scott	Galena	Jo Daviess.
Mrs. S. C. Harris	"	"
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David Hill	Dundee	Kane.
W. A. Pratt	Elgin	"
D. C. Scofield	"	"
S. M. Slade	"	"
P. Vannostrand	"	"
H. W. Williams	Batavia	"
S. G. Minkler	Oswego	Kendall.
J. S. Seely	"	"
Robert Douglas	Waukegan	Lake.
Samuel Edwards	Mendota	LaSalle.
A. R. Whitney	Franklin Grove	Lee.
J. R. Whitney	"	"
Wm. H. Hansen	"	"
D. B. Wier	Lacon	Marshall.
O. B. Galusha	Normal	McLean.
Tyler McWhorter	Aledo	Mercer.
O. Beardsley	Nunda	McHenry.
J. Nolestine	"	"
C. Frisby	"	"
L. Beckley	"	"
A. Thompson	"	"
J. Walkup	"	"
N. Beardsley	"	"

NAME.	POST OFFICE.	COUNTY.
Robert Wilson	Nunda	McHenry.
A. M. Benson	"	"
J. Goodwin	"	"
W. H. Huffman	"	"
Richard Robinson	"	"
R. G. Benton	"	"
James Crow	Crystal Lake	"
S. S. Gates	"	"
J. J. Wilson	"	"
J. S. Rogers	Marengo	"
Thos. Gilkerson	"	"
C. W. Prescott	"	"
L. Woodard	"	"
D. E. Peck	"	"
Allen Johnson	"	"
Geo. T. Kasson	Woodstock	"
T. McD. Richards	"	"
W. P. Walkup	Ridgefield	"
J. H. Garrison	Greenwood	"
Dr. E. G. Mygatt	Richmond	"
H. M. Weed	Peoria	Peoria.
L. K. Scofield	Freeport	Stephenson.
W. T. Nelson	Wilmington	Will.
C. A. Westgate	"	"
W. E. Lukins	Rock Falls	Whiteside.
Dr. John E. Ennis	Clinton, Clinton Co.,	Iowa
Y. E. Benton	Linden, Genesee Co.,	Mich.
Freeman & Smith	Racine, Racine Co.,	Wis
B. B. Olds	Clinton, Rock Co.,	Wis.
J. V. Cotta	Lanark, Carroll Co.,	Ill.
Jas. W. Scott	19 Washington St.,	Chicago.
D. J. Piper	Foreston, Ogle Co.,	Ill.
Wm. M. Morris	Marengo, McHenry Co.,	Ill.
G. R. Hyatt	Nunda, McHenry Co.,	Ill
W. H. Ragan	Clayton,	Indiana.
Capt. L. H. Beebe	Geneva, Kane Co.,	Ill.
Edmund Seely	Kendall, Kendall Co.,	Ill.
Reuben Dixon	Lanark, Carroll Co.,	Ill.
C. L. Hostetter	Mt. Carroll, Carroll Co.,	Ill.
J. S. Knowlston	Byron, Ogle Co.,	Ill.

HONORARY MEMBERS.

L. Heinl ..... Terre Haute, Ind.
J. C. Plum ..... Milton, Rock County, Wis.
Charles Watrous ..... Elmo, Grant County, Wis.
S. V. Bradstreet ..... Monticello, Jones Co., Iowa.
Prof. Cyrus Thomas ..... Carbondale, Illinois.
E. F. Olds ..... Clinton, Wisconsin.

INDEX.

Pages 219 to 234 contain transactions of the Galesburg Society.
Pages 235 to 263 contain transactions of the Warsaw Society.
Pages 264 to 268 contain transactions of the Jacksonville Society.
Pages 269 to 282 contain transactions of the Champaign County Society.
Pages 283 to 324 contain transactions of the Alton Society.
Pages 329 to 417 contain transactions of the Horticultural Society of Northern Ill.

Illinois State Horticultural Society.

ANNUAL MEETING FOR 1876.

The Annual Meeting for 1876 will be held in the city of Galesburg, December 12, 13, 14 and 15.

Railroads converge to Galesburg from all directions.

Reduced rates will be given by the railroad companies and at the hotels; and the citizens will extend hospitalities to members.

An unusually rich and varied programme of exercises is arranged. Admission to all lectures, essays and discussions is free; and all are invited.

Those who can not attend may become members by sending to the Secretary one dollar for membership, and forty cents for postage on copy of Report, which will be sent by mail.

A. C. HAMMOND, *President.*

O. B. GALUSHA, *Secretary,*
NORMAL, McLEAN COUNTY, ILL.

Horticultural Society of Northern Illinois.

The Horticultural Society of Northern Illinois will hold its tenth Annual Meeting at Franklin Grove, Lee county, on Tuesday, Wednesday and Thursday, January 23, 24 and 25, 1877.

Membership fee, one dollar, entitling to the volume of published Reports.

Reduced fares on railroads to members attending.

All interested in horticulture are cordially invited.

L. K. SCOFIELD, *President.*

D. WILMOT SCOTT, *Corresponding Secretary.*