



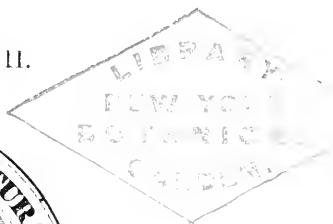
Yours low
Benj. D. Walsh

TRANSACTIONS
OF THE
ILLINOIS STATE
HORTICULTURAL SOCIETY
FOR 1869,

BEING THE
PROCEEDINGS OF THE FOURTEENTH ANNUAL MEETING
HELD AT
OTTAWA, DECEMBER 14TH, 15TH, 16TH, AND 17TH.

WITH PROCEEDINGS OF LOCAL SOCIETIES, ETC.

NEW SERIES—VOLUME III.



ST. LOUIS:

R. P. STUDLEY & CO., PRINTERS AND LITHOGRAPHERS, 221 NORTH MAIN STREET,

1870.

"The breath of orchard, big with bending fruit.
 Obedient to the breeze and beating ray,
 From the deep-loaded bough a mellow shower
 Incessant melts away. The juicy pear
 Lies in a soft profusion scattered round.
 A various sweetness swells the gentle race.
 By Nature's all-refining hand prepared,
 Of temper'd sun, and water, earth and air.
 In ever-changing composition mix'd.
 Such falling frequent through the chiller night,
 The fragrant stores, the wide-projected heaps,
 Of apples, which the lusty-handed year,
 Innumeros o'er the blushing orchard shakes.
 A various spirit, fresh, delicious, keen,
 Dwells in their gelid pores: * * *

Where Autumn basks, with fruit empurpled deep,
 My pleasing theme continual prompts my thought:
 Presents the downy peach; the shining plum;
 The ruddy, fragrant nectarine; and dark,
 Beneath his ample leaf, the luscious fig;
 The vine, too, here her curling tendrils shoots,
 Hangs out her clusters, glowing to the south,

* * * * *

The vineyard swells refulgent on the day,
 Spreads o'er the vale, or up the mountain climbs.
 Profuse; and drinks amid the sunny rocks."

THOMPSON'S SEASONS.



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JAN 18 1902

INTRODUCTORY.

AN apology is needed for the very tardy appearance of this volume, which has no doubt been a source of vexation to the members of the various Societies whose transactions are included in it, and certainly has been much more vexatious to the writer than it can have been to any one not held responsible for the delay. The fact that it was two months after the meeting before the reporter's manuscript was all in the hands of the editor, and unusual slowness on the part of the printers (who have, however, exercised great care in doing their work well), are the main causes of delay.

Arrangements will be made this year to insure the going to press of the Transactions as soon as the Galesburg meeting is closed, and so avoid a repetition of this insufferable delay.

The Executive Committee have taken the responsibility of incurring the expense of the portrait of B. D. Walsh, which they believe will be highly valued by all our members as a memento of the valued and eccentric scientist who first occupied the position of State Entomologist. Illustrations of Dr. Hull's curculio catcher, of his investigations of pear blight and graft selection, and of Mr. Riley's valuable paper on the curculio, have been kindly loaned by the Prairie Farmer Company, and R. P. Studley & Co. of the Journal of Agriculture.

An attempt has been made to classify the fruit and other lists botanically, so as to popularize the natural orders of plants in our tables of reference.

It was found best in this case, and probably will be hereafter, for the out-going Secretary to edit the volume for which he has gathered the material.

In conclusion, it is with some natural feeling of regret that the writer closes his labors in this department and turns over his duties to another. The pleasant although sometimes arduous labors of his office, the friendly associations it has originated, and the pretty general approval that his efforts to advance the art of Horticulture, through perfecting the organization of its friends, have met, will be long and gratefully remembered.

W. C. F.

OFFICERS FOR 1870.

PRESIDENT:

WILLARD C. FLAGG, Alton, and Moro, Madison County.

VICE-PRESIDENTS:

1st District	—	L. WOODWARD,	Marengo, McHenry County.
2d	“	SAMUEL EDWARDS,	Mendota, La Salle County.
3d	“	A. C. HAMMOND,	Warsaw, Hancock County.
4th	“	TYRA MONTGOMERY,	Mattoon, Coles County.
5th	“	J. W. FLETCHER,	Centralia, Marion County.
6th	“	H. J. HYDE,	Godfrey, Madison County.
7th	“	A. M. BROWN,	Villa Ridge, Pulaski County.

SECRETARY:

O. B. GALUSHA, Morris, Grundy County.

ASSISTANT SECRETARY:

H. J. DUNLAP, Champaign, Champaign County.

TREASURER:

JONATHAN HUGGINS, Woodburn, Macoupin County.

EXECUTIVE COMMITTEE:

W. C. FLAGG, TYLER McWHORTER, A. M. BROWN, ELMER BALDWIN, and
O. B. GALUSHA.

E. S. HULL, Alton State Horticulturist.

STANDING COMMITTEES, 1870.

Gentlemen on these Committees are expected to act independently, and each requested to report upon his topic with reference to his particular district—Northern, Southern, or Central, as the case may be. It is believed that important facts and principles may be discovered, relating to the *conditions* to which fruit culture in Illinois must conform, by a careful study of atmospheric phenomena, our soils, insects and birds, in connection with vegetable physiology and the hygiene of plants.

METEOROLOGY:

NORTHERN.	CENTRAL.	SOUTHERN.
James W. Tollman, Winnebago.	Wm M. Baker, Champaign.	John H. Tice, St. Louis, Mo.

GEOLOGY AND SOILS:

J. Shaw, Mt. Carroll	W. F. Bliss, Champaign.	H. C. Freeman, South Pass.
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BOTANY AND VEGETABLE PHYSIOLOGY:

H. H. McAfee, Freeport.	T. J. Burrill, Champaign.	George Vasey, Richview
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ENTOMOLOGY:

Wm. Le Baron, Geneva.	C. V. Riley, St. Louis, Mo.	T. A. E. Holcomb, South Pass.
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ORNITHOLOGY:

Jona. Periam, Chatsworth	G. W. Minier, Minier.	Jas. E. Starr, Alton.
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ORNAMENTAL AND TIMBER TREES:

Samuel Edwards, La Moille.	J. W. Fell, Normal.	A. M. Brown, Villa Ridge.
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FRUIT PACKAGES:

H. D. Emery, Chicago.	E. A. Riehl, Alton.	P. R. Wright, South Pass.
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TESTING NEW VARIETIES:

- | | |
|--------------------------------|-----------------------------|
| 1. J. W. Cochran, Blue Island. | 4. M. L. Dunlap, Champaign. |
| 2. Samuel Edwards, Mendota. | 5. B. Pullen, Centralia. |
| 3. D. B. Wier, Lacon. | 6. H. J. Hyde, Godfrey. |
| 7. P. R. Wright, South Pass. | |

AD INTERIM:

J. W. Cochran, Blue Island.	D. B. Wier, Lacon.	Parker Earle, South Pass
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COMMITTEE OF CORRESPONDENCE.

The following persons are respectfully requested to co-operate in furnishing information to the Secretary, Vice-President and Standing Committees, on all points bearing on the theory and practice of Horticulture in their respective counties:

<i>Names.</i>	<i>P. O. Address and County.</i>	<i>Name.</i>	<i>P. O. Address and County.</i>
D. C. Benton.....	Quincy, Adams.	A. R. Whitney....	Franklin Grove, Lee.
E. J. Ayres.....	Cairo, Alexander.	L. Baueroft.....	Pontiac, Livingston.
J. G. Sprague....	Greenville, Bond.	Charles S. Capps..	Mt. Pulaski, Logan.
George Chaffee...	Belvidere, Boone.	George Wood.....	Decatur, Macon.
A. McPhail.....	Mt. Sterling, Brown.	Jonat'n Huggins..	Woodburn, Macoupin.
A. Bryant, Jr....	Princeton, Bureau.	Wm E. Smith.....	Alton, Madison.
B. F. Childs.....	Hardin, Calhoun.	J. Warren Fletcher	Centralia, Marion.
James Shaw.....	Mt. Carroll, Carroll.	D. B. Wier.....	Lacon, Marshall.
J. Q. Meriam.....	Beardstown, Cass.	J. Cochrane.....	Havana, Mason.
M. L. Dunlap....	Champaign, Champaign.	George Brown....	Metropolis, Massac.
John H. Harper...	Pana, Christian.	G. W. Closson....	Prairie City, McDonough.
Benjamin Sweet..	Melrose, Clark.	James Crow.....	Crystal Lake, McHenry.
W. A. Taulby....	Flora, Clay.	H. Schroder.....	Bloomington, McLean.
O. B. Nichols....	Carlyle, Clinton.	John Hill.....	Petersburg, Menard.
M. C. McLain....	Charleston, Coles.	Tyler McWhorter..	Millersburg, Mercer.
J. W. Cochran....	Blue Island, Cook.	Charles Heuckler..	Waterloo, Monroe.
S. A. Moore.....	Leroy, Crawford.	W. F. Bliss.....	Nokomis, Montgomery.
E. Jennings....	Neoga, Cumberland.	J. B. Turner.....	Jacksonville, Morgan.
H. C. Graves....	Sandwich, DeKalb.	W. A. Ballard....	Sullivan, Moultrie.
C. F. Moore.....	Clinton, DeWitt.	D. B. Stiles.....	Rochelle, Ogle.
E. Daggy.....	Tuscola, Douglas.	B. L. T. Bourland..	Peoria, Peoria.
Lewis Ellsworth..	Naperville, DuPage.	W. T. Winters....	DuQuoin, Perry.
B. O. Curtis.....	Paris, Edgar.	James C. Johnson..	Monticello, Piatt.
J. B. Orange....	Albion, Edwards.	E. V. Rice.....	Pittsfield, Pike.
Wm. Matthews....	Mason, Elingham.	Louis L. Koch....	Golconda, Pope.
H. F. Jerrold....	Vandalia, Fayette.	A. M. Brown.....	Villa Ridge, Pulaski.
R. R. Murdock...	Paxton, Ford.	Smiley Shepherd..	Hennepin, Putnam.
George Hamilton..	Ewing, Franklin.	Wm. M. Jeffrey...	Rockwood, Randolph.
D. F. Emery.....	Canton, Fulton.	George Mason....	Parkersburg, Richland.
J. G. Holt.....	Shawneetown, Gallatin.	D. F. Kinney.....	Rock Island, Rock Island.
B. S. Culver.....	Whitehall, Greene.	Charles Burnett...	Raleigh, Saline.
Henry Clapp.....	Morris, Grundy.	L. C. Francis....	Springfield, Sangamon.
H. Vice.....	McLanesboro, Hamilton.	D. C. Johnson....	Rushville, Schuyler.
A. C. Hammond..	Warsaw, Hancock.	John R. Woods....	Winchester, Scott.
James M. Warren..	Elizabeth, Hardin.	J. B. Reeve.....	Shelbyville, Shelby.
W. L. Stockton...	Oquawka, Henderson.	Wm. H. Butler....	Toulon, Stark.
B. A. Gurney....	Kewanee, Henry.	H'v. Engelmann...	Belleville, St. Clair.
Wm. P. Pierson...	Onarga, Iroquois.	C. H. Rosenstiel..	Freeport, Stephenson.
J. S. Hartman...	Makanda, Jackson.	G. W. Minier.....	Minier, Tazewell.
F. L. Jones.....	Newton, Jasper.	Parker Earle....	South Pass, Union.
J. S. Galbraith...	Mt. Vernon, Jefferson.	Richard Jones...	Canlin, Vermillion.
I. Suedecker....	Jerseyville, Jersey.	J. P. Geisler....	Meier, Wabash.
D. Wilmot Scott..	Galena, Jo Daviess.	J. E. Barnes.....	Young America, Warren.
W. E. Scarsdale..	Cedar Bluff, Johnson.	Geo. Wilgus.....	Richview, Washington.
A. B. Fish.....	Elgin, Kane.	G. W. Wickersham..	Home, Wayne.
Milo Barnard....	Manteno, Kankakee.	R. S. Graham....	Carimi, White.
S. G. Minkler....	Oswego, Kendall.	L. S. Pennington..	Sterling, Whiteside.
A. G. Humphrey...	Galesburg, Knox.	W. T. Nelson....	Wilmington, Will.
E. Douglas.....	Waukegan, Lake.	John H. White....	Marion, Williamson.
E. Baldwin.....	Farm Ridge, LaSalle.	Alonzo Gorham...	Winnebago, Winnebago.
A. Shaw.....	Lawrenceville, Lawrence.	John G. Zeller...	Spring Bay, Woodford.

LIST OF MEMBERS FOR 1870.

- Albert, J. B. Florid, Putnam.
 Alberts, F. B. Ottawa, La Salle.
 Allen, Martin. Mendota, La Salle.
 Baldwin, Elmer. Farm Ridge, La Salle.
 Bancroft, L. Pontiac, Livingston.
 Barber, Joseph. Richview, Washington.
 Barler, O. L. Upper Alton, Madison.
 Barns, J. E. Young America, Warren.
 Barry, P. Rochester, N. Y., Honorary.
 Basset, J. K. Aledo, Mercer.
 Beach, J. A. Woodburn, Macoupin.
 Bliss, H. C. Providence, Bureau.
 Bliss, H. N. Providence, Bureau.
 Bliss, W. F. Nokomis, Montgomery.
 Brown, A. M. Villa Ridge, Pulaski.
 Bryant, A., jun. Princeton, Bureau.
 Bryant, A., sen. Princeton, Bureau.
 Carpenter, D. L. Seneca, La Salle.
 Chaffee, W. H. Carlinville, Macoupin.
 Chapman, H. C. Sublette, Lee.
 Clapp, Henry. Morris, Grundy.
 Crumpacker, J. R. Washington, Ia., Honorary.
 Cummings, J. F. Bunker Hill, Macoupin.
 Curtis, B. O. Paris, Edgar.
 Daggy, E. Tuscola, Douglass.
 Dalton, A. H. Dalton, Cook.
 Davis, B. W. Belleville, St. Clair.
 Dodge, Jacob. Rock Island, Rock Island.
 Douglass, Robert. Waukegan, Lake.
 Downing, Charles. Newberg, N. Y.—honorary.
 Draper, Albert. Upper Alton, Madison.
 Dunlap, H. J. Champaign, Champaign.
 Dunlap, M. L. Champaign, Champaign.
 Durlay, W. Hennepin, Putnam.
 Edwards, Samuel. Mendota, La Salle.
 Ellsworth, Lewis. Napierville, Du Page.
 Ellsworth, M. L. Napierville, Du Page.
 Emery, H. D. Chicago, Cook.
 Fish, A. B. Elgin, Kane.
 Flanagan, John. Bunker Hill, Macoupin.
 Flagg, W. C. Moro, Madison.
 Fletcher, J. W. Centralia, Marion.
 Forbes, C. K. Manti, La Salle.
 Foster, Suel. Muscatine, Iowa.
 Francis, L. C. Springfield, Sangamon.
 Freeman, H. C. South Pass, Union.
 Furnas, Isaac. Bridgeport, Ind.—honorary.
 Galusha, O. B. Morris, Grundy. [ary.
 Gore, David. Carlinville, Macoupin.
 Graves, H. C. Sandwich, DeKalb.
 Gregory, J. M. Champaign, Champaign.
 Gurney, B. A. Kewanee, Henry.
 Hammond, A. C. Warsaw, Hancock.
 Harrington, F. Homestead, Iowa.
 Haussen, W. H. Franklin Grove, Lee.
 Hennessey, John. La Salle, La Salle.
 Hilliard, A. A. Brighton, Macoupin.
 Hogboom, G. L. Forrest, Livingston.
 Holcomb, T. A. E. South Pass, Union.
 Holliday, Geo. H. Carlinville, Macoupin.
 Hollister, E. Alton, Madison.
 Hooper, John H. Pana, Christian.
 Huggins, J. Woodburn, Macoupin.
 Hull, E. S. Alton, Madison.
 Humphrey, A. G. Galesburg, Knox.
 Hunter, George. Carlinville, Macoupin.
 Hyde, H. J. Godfrey, Madison.
 James, Albert. Benton Harbor, Mich.
 Keith, S. L. Palatine, Cook.
 Kimball, J. E. Iowa City, Iowa.
 Kinney, D. F. Rock Island, Rock Island.
 Lapham, I. M. Milwaukee, Wis.
 Love, J. K. Philo, Champaign.
 Lowell, John L. Salem, Mass.
 McComb, G. H. Woodburn, Macoupin.
 McWhorter, Tyler. Aledo, Mercer.
 Mann, W. H. Gilman, Iroquois.
 Mechan, Thomas. Philadelphia, Pa.—honorary.
 Merian, J. Q. Beardstown, Cass. [ary.
 Miller, Mark. Des Moines, Iowa.
 Mills, D. E. Farm Ridge, La Salle.
 Minier, G. W. Minier, Tazewell.
 Minkler, S. G. Oswego, Kendall.
 Montgomery, Tyra. Mattoon, Coles.
 Mulleman, J. K. Woodburn, Macoupin.
 Murdock, R. R. Paxton, Ford.
 Murtfeldt, C. W. St. Louis, Mo.
 Nelson, W. T. Wilmingon, Will.
 Nims, Forrest, Livingston.
 Nutter, James. Bunker Hill, Macoupin.
 Parmelee, Geo. Old Mission, Mich.
 Paul, John. Ottawa, La Salle.
 Pearson, J. M. Godfrey, Madison.
 Periam, J. Chatsworth, Livingston.
 Perrine, Charles. Centralia, Marion.
 Perrine, G. H. Centralia, Marion.
 Pettingill, J. A. Bunker Hill, Macoupin.
 Phinney, Geo. B. Champaign, Champaign.
 Phinney, J. B. Champaign, Champaign.
 Phinney, Mrs. L. Champaign, Champaign.
 Pierson, W. P. Onaga, Iroquois.
 Porter, J. E. Ottawa, La Salle.
 Pullen, B. Centralia, Marion.
 Ragan, Wm. H. Indianapolis, Ind.—honorary.
 Reddick, Wm. Ottawa, La Salle. [ary.
 Riley, C. V. St. Louis, Mo.
 Rugg, Geo. H. Ottawa, La Salle.
 Russell, John L. Salem, Mass.—honorary.
 Schroeder, H. Bloomington, McLean.
 Sedgwick, S. B. Forrest, Livingston.
 Shana, J. R. Ottawa, La Salle.
 Shaw, James. Mt. Carroll, Carroll.
 Shearman, J. S. Rockford, Winnebago.
 Shepherd, A. Hennepin, Putnam.
 Shepherd, Smiley. Hennepin, Putnam.
 Sheriff, A. B. Keithsburg, Mercer.
 Shimer, H. Mt. Carroll, Carroll.
 Smith, W. E. Alton, Madison.

LIST OF MEMBERS FOR 1870—(CONTINUED.)

Snedecker, Isaac. Jerseyville, Jersey.	Vickroy, H. K. Champaign, Champaign.
Springer, Phil. S. Springfield, Sangamon.	White, W. H. South Windsor, Conn.
Steward, J. W. Florid, Putnam.	Whitney, A. R. Franklin Grove, Lee.
Strohm, H. Iowa City, Iowa.	Wier, D. B. Lacon, Marshall.
Taulby, W. A. Flora, Clay.	Wilgus, Geo. Richview, Washington.
Thatcher, N. Napierville, Du Page.	Woodward, L. Marengo, McHenry.
Thompson, W. O. Blairstown, Iowa.	Wright, Paul R. South Pass, Union.
Thompson, G. L. Ottawa, La Salle.	

Total number of members	133
From Illinois	113
" Iowa	7
" New York	2
" Indiana	2
" Michigan	2
" Massachusetts	2
" Missouri	2
" Wisconsin	1
" Connecticut	1
" Pennsylvania	1— 133

The 113 Illinois members represent 43 counties, of which La Salle has 14, Macoupin 13, Madison and Champaign 8 each, Livingston and Putnam 5 each, Bureau and Marion 4 each, Cook, Du Page, Lee, Mercer and Union 3 each, Carroll, Grundy, Troquois, Rock Island, Sangamon and Washington 2 each, and Cass, Christian, Clay, Coles, De Kalb, Douglass, Edgar, Ford, Hancock, Henry, Jersey, Kane, Kendall, Knox, Lake, Marshall, McHenry, McLean, Montgomery, Pulaski, St. Clair, Tazewell, Warren and Will 1 each.

DELEGATES PRESENT.

ALTON HORTICULTURAL SOCIETY:

W. C. FLAGG, E. S. HULL, J. HUGGINS, H. J. HYDE, A. A. HILLIARD,
O. L. BARLER, W. E. SMITH, ISAAC SNEDECKER.

BUNKER HILL HORTICULTURAL SOCIETY:

JONATHAN HUGGINS.

CENTRAL ILLINOIS HORTICULTURAL SOCIETY:

E. DAGGY, President. H. J. DUNLAP, Secretary. T. MONTGOMERY.

GALESBURG HORTICULTURAL SOCIETY:

A. G. HUMPHREY.

JO DAVIESS HORTICULTURAL SOCIETY:

D. WILMOT SCOTT.

MATTOON HORTICULTURAL SOCIETY:

TYRA MONTGOMERY.

CONSTITUTION AND BY-LAWS,
AS AMENDED 1869.

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 two dollars; 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 from each Fruit District in the State, a Secretary, an Assistant Secretary, a Treasurer and an Executive Board, which shall consist of the President, the last three Ex-Presidents, and the Secretary; all of whom shall be elected at the annual meeting, and serve from the first of January until the thirty-first of December, and until their successors are elected.

V. It shall hold an annual meeting, and other meetings, and an annual fair, as the Society or the Executive Board may direct.

VI. 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 committees, unless otherwise ordered.

II. The Vice-Presidents, in the order of their Districts, shall act in case of absence or disability of the President; and shall, by correspondence and personal intercourse with the horticulturists of the various counties of their respective districts, endeavor to organize local societies, obtain accurate information of the condition and progress of Horticulture therein, and report annually, in writing, to the Society.

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 Assistant Secretary, in the case of the absence or disability of the Secretary, shall perform his duties; and shall aid him, at the annual meeting, in making his report.

V. 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.

VI. The Executive Board shall, subject to the direction of the Society, manage all its affairs.

VII. There shall be chosen annually, by the Executive Board, a Standing Committee, to consist of one or more members from each of the three divisions—Northern, Central, and Southern—of the State, on the following subjects:

1. Meteorology in its relation to Horticulture.
2. Geology and Soils.
3. Botany and Vegetable Physiology.
4. Entomology.
5. Ornithology.
6. Ornamental and Useful Trees.
7. Fruit Packages.
8. Testing New Varieties.
9. Ad Interim.

VIII. These By-Laws may be altered at any meeting by a majority vote.

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 the Illinois State Horticultural Society, of which Dr. G. [sic] S. Hull is president and James E. Starr, recording secretary, shall by that name and style be hereafter known as a body politic.

SEC. 2. The object of the Society being to develop and promote the horticultural interests of the State, they shall be allowed, for that purpose only, to hold real and personal estate, the former to the amount of twenty thousand dollars.

SEC. 3. The 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 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. The Society shall have power to alter and amend their present constitution, to make, alter, and repeal such by-laws as may be deemed necessary for carrying out the objects of the Society.

SEC. 5. This act to be in force from and after its passage.

APPROVED FEBRUARY 11, 1857.

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. Ayres, 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.

An Act to Punish Fruit Thieves.

Be it enacted by the people of the State of Illinois, represented in the General Assembly, That if any person or persons shall hereafter enter the enclosure of any person, without the leave or license of such owner, and pick, destroy, or carry away the fruit of any apple, plum, peach, pear, or other fruit tree or bush, such person or persons shall be guilty of a misdemeanor, and upon conviction thereof, may be fined any sum not less than ten dollars, nor more than fifty dollars, and may be imprisoned in the county jail, for any period not exceeding twenty days. The penalties incurred by a violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offense is committed, or the fine may be recovered in an action for debt before any justice of the peace of such county.

APPROVED FEBRUARY 26, 1861.

An Act for the Protection of Fruit and Ornamental Trees, Shrubbery and Vegetable Products.

SECTION 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly,* That if any person or persons, in this State, shall willfully, maliciously and without lawful authority, cut down, root up, sever, injure, peel or destroy any fruit or ornamental tree, cultivated root or plant, fruit or other vegetable production, grape, strawberry or cranberry vines, currant, gooseberry, raspberry, or cultivated blackberry bushes, standing or growing on or being attached to the land of another, or shall, willfully and without lawful authority, cut down, root up, destroy or injure any fruit or ornamental tree or shrubbery, planted or growing on any street, lane or alley, or public grounds in any city, borough or incorporated town in said State, every such person so offending, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the jail of the county not exceeding three months, or both, at the discretion of the court, and shall, moreover, be liable in double the amount of damages to the party injured.

This law to take effect from and after its passage.

APPROVED FEBRUARY 15, 1865.

An Act for the Protection of Growing Fruit.

SECTION 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly,* That if any person or persons shall, hereafter, enter the enclosure of any person, without leave or license of such owner, and destroy, or carry away any part or portion of the fruit of any apple, pear, peach, plum, or other fruit tree or bush, such person or persons shall be deemed guilty of a misdemeanor, and, upon conviction thereof, may be fined in any sum not less than ten nor more than fifty dollars, and may be imprisoned in the county jail for any period of time not exceeding twenty days. The penalties incurred by a violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offense is committed, or the fine may be recovered in an action of debt before any justice of the peace of such county.

APPROVED FEBRUARY 16, 1865.

An Act for the Protection of Orchards, and to prevent the destruction of Small Birds.

SECTION 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly,* 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 herein before designated, shall be punished by a fine of not more than five dollars for each offense.

This Act to take effect and be in force from and after its passage.

APPROVED FEBRUARY 24, 1859.

An Act making an appropriation in aid of the State Horticultural Society of Illinois.

SECTION 1. *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 State Horticultural Society, to be expended in the payment of premiums, in publishing the Transactions of said Society, procuring scientific investigations relating to Horticulture, and paying expenses of Ad Interim Committees, the sum of two thousand dollars per annum.

SEC. 2. The said sum of two thousand dollars shall be paid to the Treasurer of said State Horticultural Society, on the order of the President and Secretary of the same.

APPROVED FEBRUARY 28, 1867.

An Act for the Protection of Consignors of Fruit, Grain, Flour, etc., to be sold on Commission.

SECTION 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly,* That if any warehouseman, storage, forwarding or commission merchant, or his or their agents, clerks or employees shall convert to their own use the proceeds or profits arising from the sale of any fruits, grain, flour, beef, pork, or any other goods, wares, or merchandise, otherwise than as instructed by the consignors of said goods, and shall on the demand of the consignor fail to deliver over the proceeds or profits of said goods, after deducting the usual per cent. on the sales as commission, shall be found guilty of a misdemeanor. And any person or persons who shall be found guilty of retaining or embezzling any money prohibited in this section, not exceeding one hundred dollars, shall be punished by a fine of not more than five hundred dollars, or imprisoned in the jail of the county not exceeding three months, or both, at the discretion of the court, and shall, moreover, be liable in double the amount of damages to the party injured; and any person or persons who shall be found guilty of retaining or embezzling a greater sum than one hundred dollars, shall be punished by fine, not more than five hundred dollars, or imprisoned in the jail of the county not exceeding one year, or both, at the discretion of the court; and shall, moreover, be liable in double the amount of damages to the party injured.

SEC. 2. This act to take effect from and after its passage.

APPROVED MARCH 4, 1869.

An Act to permit the planting of Shade and Ornamental Trees along the Public Roads.

SECTION 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly,* 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.

SEC. 2. This act shall be deemed a public act and be in force from and after its passage.

APPROVED MARCH 25, 1869.

POMOLOGICAL RULES.

As adopted, with additions from American Pomological Society.

1. No new seedling fruit shall be entitled to the recommendation of this Society until its qualities shall be ascertained by at least five years' experience in more than one locality, and which is not at least equal to any similar variety of the first rank already known; or which, if only of second rate flavor, is superior in vigor, hardness, productiveness, or other important quality or characteristics.

2. No new fruit shall be considered, as named, until it has been accurately described by some person or committee, known to be conversant with existing varieties; and such description shall have been published in at least one horticultural or agricultural journal, or some pomological work of acknowledged standard character.

3. The originator, or he who first makes known a new variety, shall be entitled to name it, and such name, if suitable, shall be adopted by the writer describing the fruit for the first time.

But if the name proposed is inappropriate, or does not come within the rules of nomenclature, the describer shall be at liberty to give a name.

When two persons have named or described a fruit, the name and description first published, if according to the rules, shall have the priority.

4. In giving names to new varieties, all harsh, vulgar, or inelegant names, such as "Sheepnose," "Hogpen," etc., should be avoided, and no name should consist of more than two words, excepting only when the originator's name is added. Characteristic names, or those in some way descriptive of the qualities, origin or habit of fruit or tree, shall be preferred. They may either be of intrinsic properties, as Golden Sweeting, Downer's Late, etc.; or of local origin, as Newtown Pippin, Hudson Gage; or the season of ripening, as Early Searlet, First Gage; or the form and color, as Golden Drop, Blue Pearmain; or which commemorates a particular place or person, as Tippecanoe, La Grange, Baldwin, or any other titles which may be significantly applied.

5. The description of new varieties of fruits shall embrace the following particulars:

First. An account of their origin.

Second. The fruit—its size, form and exterior color, texture and color of the flesh, flavor, and time of ripening, with the addition on stone fruits of the size of the stone, adherence or non-adherence of the flesh, form of the suture, and the hollow at the stem, and in kernel fruits, of the size of the core and seeds, the length, position and insertion of the stalk, and form of the eye.

Third. The tree—its marked characters of growth, young and bearing wood, foliage and blossoms. In peaches, the form of leaf, glands and size of blossoms. In strawberries, the character of the blossoms, whether staminate or pistillate. In grapes, the form of the bunch or berry.

6. No variety of fruit, vegetable, tree, flower, or other horticultural product, shall be placed upon, or taken from the lists of the Society, unless it receive a majority of six votes, of persons residing in the district for which it is recommended; and it is recommended that no person vote upon the question unless he have personal experience or observation of the qualities of the variety in question.

FRUIT, OR HORTICULTURAL DISTRICTS.

I. NORTHERN ILLINOIS.

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

MEETING OF THE EXECUTIVE COMMITTEE.

BLOOMINGTON, June 1st, 1869.

At a called meeting of the Executive Committee of the Illinois State Horticultural Society, held at the Ashley House, in the city of Bloomington, on this day, there were present Tyler McWhorter, President; A. M. Brown and Elmer Baldwin, ex-Presidents, and W. C. Flagg, Secretary. Absent—Parker Earle, ex-President.

The place and time of the next winter meeting were first discussed, and it was then voted to meet at Ottawa, December 14th, 15th, 16th and 17th, 1869.

The matter of offering premiums for fruits, etc., exhibited at the winter meeting, which had been referred to the Executive Committee for their action, was next taken up, and it was voted that no premiums be offered, but that a full exhibition be solicited, and that a committee be appointed to make a special report on all fruits, etc., exhibited.

Appropriations being next acted upon, the following were voted :

To Dr. E. S. Hull, State Horticulturist, the sum of seven hundred and fifty dollars (\$750), with the understanding that he perform what service he can during the year for that compensation.

To the Ad Interim Committee, to pay traveling expenses, an amount not exceeding two hundred and fifty dollars (\$250).

To W. C. Flagg, Corresponding Secretary, for office rent an amount not exceeding one hundred dollars (\$100).

To the Executive Committee the actual expenses of each member in attending this meeting.

Several essayists and topics for discussion at the next meeting were named, and the Secretary instructed to correspond with the persons suggested, and to invite their attendance.

Adjourned *sine die*.

TYLER McWHORTER, *President*.

W. C. FLAGG, *Secretary*.

PROCEEDINGS OF THE ANNUAL MEETING,

AT OTTAWA, DECEMBER 14-17, 1869.

[George Bulkley, Phonographic Reporter.]

CIRCULAR.

OFFICE CORRESPONDING SECRETARY,
ILLINOIS STATE HORTICULTURAL SOCIETY. *Alton, November 13th, 1869.* }

The Fourteenth Annual Meeting of the ILLINOIS STATE HORTICULTURAL SOCIETY will be held at the Court House in OTTAWA, on Tuesday, Wednesday, Thursday and Friday, December 14th, 15th, 16th and 17th, 1869, commencing at 9 o'clock, A. M., on Tuesday.

Delegates are cordially invited from other State and Local Horticultural and Agricultural Organizations, and a general attendance of the Farmers, Fruit Growers, Nurserymen, Gardeners and Florists of Illinois, is earnestly solicited.

Contributions of Fruits, Flowers, Vegetables, Scions, Seeds, Wines, Ciders, Horticultural Implements, &c., &c., are solicited for the purpose of making a Winter Exhibition. No premiums will be awarded; but all articles will be examined by competent committees, and their merits carefully reported upon.

The Chicago, Rock Island and Pacific Railroad Company will furnish return tickets at one-fifth fare on presentation of the Secretary's certificate to the agent at Ottawa. The Chicago & Alton Railroad Company will furnish return tickets at one-fifth fare to members presenting the Secretary's certificate to their agents at Joliet, Bloomington and Normal. The Illinois Central will return members paying one-fifth fare on presentation of the Secretary's certificate to conductors. The Chicago, Burlington and Quincy Railroad will return free members who go over their road via Mendota, Wyanet, or Galesburg, on presentation of Secretary's certificate to conductors, but no reduction will be made in favor of parties going or returning via Chicago.

Persons unable to attend can become members for 1870, and receive the transactions for 1869, by remitting two dollars to the Treasurer, Jonathan Huggins, Woodburn, Macoupin county, or to the Secretary.

Secretaries of Local Horticultural Societies are requested to report to the Secretary of this Society, a list of their officers, and an abstract of their proceedings for 1869.

Contributions to the volume of transactions for 1869 are solicited, especially from the old settlers in reference to the early orchards, nurseries, &c., of Illinois, and from those who have had valuable experience with old or new methods of horticulture.

TYLER MCWHORTER, *President.*

W. C. FLAGG, *Secretary.*

FIRST DAY—MORNING SESSION.

In accordance with the call contained in the above circular, the Society met in the Supreme Court, at Ottawa, Tuesday morning, December 14th, and were called to order by President Tyler

McWhorter. Prayer was offered by Rev. Mr. Lewis, of the Plymouth Church.

Hon. Elmer Baldwin delivered the following address of welcome:

On behalf of the citizens of Ottawa, I welcome you to our annual reunion. We meet you as representatives and exponents of the refining and ennobling art of Horticulture, and we expect to derive much pleasure and profit from this meeting. Your Society has done much to awaken an interest on the part of the people in those pursuits which it was designed to foster; and in carrying out the objects of the Society to a useful result you have done more than was ever accomplished before in this State, and have paid back a hundred fold what you have received from the State. Combining, as it has done, the experience of the leading fruit culturists of this and adjoining States, it has accomplished more for this State than anything else ever done for the benefit of Horticulture and the rural arts. We expect much pleasure from intercourse with you, and we anticipate that Horticulture will receive an impulse here, as it has elsewhere, wherever you have been. The part you have taken in the selection of fruits has done much to point out the peculiar conditions of soil and climate necessary for the successful cultivation of each kind, and has been of great benefit to the State, and placed it years in advance of what it would have been but for the existence of your Society.

The regular succession of fruits from early June until the golden time of Autumn, increases the wealth, the health, and the happiness of our people. Thousands of bushels of small fruits, unnoticed before, have of late years been shipped, and this fact can not, in its influence, be over-estimated. We have a soil which for ease of cultivation has no equal, yet it is a naked plain in its natural condition, without a tree or shrub to adorn it, and the condition of the landscape is but an unpleasant and forbidding sight. It requires the hand of intelligent culture to embellish and adorn; to plant the Spruce and the Fir, the Evergreen hedge, the Maple and the Holly, and to embellish it with rural art; to dress the land and deck it with exotic and native shrubs, where the birds can sing, and children laugh and play, amid scenes of sylvan beauty. Such influences educate the taste of those who dwell among them. This rural art is ennobling and refining in its character—it elevates the individual and tends to the formation of social happiness, public morality, virtue and patriotism. Mankind naturally love their country, but to develop the full force of this love, that country should be made loveable. The Swiss, living in their happy homes, become passionately attached to their country, and removed from it, they pine away and die of home-sickness.

I trust your society will never cease in their efforts in this direction until every dwelling and every farm house and every shanty on the broad expanse of our Prairie State shall be thus adorned.

I welcome you to our city, I welcome you to the hospitality of our citizens, to the social converse of our families, to our homes and our firesides. We thus expect to form pleasant acquaintances and learn more of the noble art which you practice, and we expect you will do us good.

President McWhorter replied as follows:

In behalf of the Illinois Horticultural Society, over which I have the honor to preside, I will say this very kind and genial welcome, so nobly expressed, by one whom we have long known as a horticultural brother, is most cordially appreciated.

We have come together as a Horticultural Fraternity. We feel gratified with the interest you express in the object of our association—we love to meet with genial minds; and we trust the courtesy and generosity of your citizens will be gratefully remembered. We have come together from every portion of our extended State to meet with you here, to form the pleasant acquaintance of your citizens, to enjoy the social hospitalities of your firesides, and to discuss subjects relating to the health, comfort and embellishment of our homes and the refinement of our lives.

Again thanking you for this generous reception, we will proceed to the business for which we are convened.

A SIDE SHOW.

Mr. Wier suggested the propriety of inviting Professor Powell to deliver a lecture before the society. He said in support of the suggestion: "It is the most interesting lecture I have ever had the good fortune to hear; and I think it would be of interest to all of us. We can get him here by Thursday night if desired. We shall have to appoint a committee to arrange the matter and select a suitable room. To-night he lectures at Cincinnati, but could be here by Thursday.

Mr. Flagg—On Thursday night we have an address from a man, who perhaps more than all others, would interest this society, Mr. Thomas Meehan, of Philadelphia; and though I should be glad to hear Professor Powell, providing it could be done without interfering with the business of the society, yet it appears to me it would not be possible to give up Thursday evening for that purpose. On Wednesday evening there is a vacancy caused by the death of our late State Entomologist.

Mr. Wier—It would be impossible for the Major to be here on Wednesday night. Would it not be possible to arrange so that Mr. Meehan could take Thursday afternoon, and leave the evening for Major Powell?

Mr. Earle—Perhaps that change could be effected. I should be glad to hear a lecture so full of interest as that of the Major; but it is not horticulture, and I do not think we have ever yet seen the time when we could spare a full evening for a matter that was entirely foreign to the subject under discussion, and I do not think we shall have time now.

Mr. Daggy—It seems to me this would be a little in advance of our position—to invite a lecturer here without first conferring with the citizens of Ottawa.

Mr. Flagg—I move that the matter be referred to the Executive Committee, with instructions to report after dinner.

The motion was unanimously adopted.

TREASURER'S REPORT.

Mr. Huggins, the Treasurer, then presented and read his annual report.

STATEMENT OF TREASURER OF THE ILLINOIS STATE HORTICULTURAL SOCIETY.

RECEIPTS.

Balance in hand per statement of account, Dec. 15th, 1868	\$1,512.52
Membership, fees for 1868-1869 (J. Huggins received \$135, W. C. F. \$80.25)....	215.25
Donations from the State for 1869.....	2,000.00
Whole total.....	\$3,727.77

EXPENDITURES.

Cash paid as follows:

Dec. 16th, 1868—M. L. Dunlap, on order of the President	\$ 6.50
Dec. 17th, 1868—O. B. Galusha, on order of the President.....	24.50
“ “ “ —E. S. Hull, on order of the President.....	147.70
Dec. 19th, 1868—W. C. Flagg, on order of the President.....	174.35
Jan. 24th, 1869—W. C. Flagg, on order of the President	15.00
April 5th, 1869—E. S. Hull, on order of the President.....	250.00
May 15th, 1869—On vote of the Society, B. L. Kingsbury.....	41.75
“ “ “ —On vote of the Society, J. A. Warder.....	25.00
Aug. 10th, 1869—Prairie Farmer Co., Chicago, on order of President	1,369.39
Oct. 19th, 1869—E. S. Hull, on order of President.....	500.00
Whole amount paid.....	\$2,553.19—\$2553.19
Leaving in the Treasury the sum of....	\$1,174.58

JOXA. HUGGINS, *Treasurer*.

OTTAWA, December 14, 1869.

Mr. A. Bryant moved that the report be accepted. Carried.

PRESIDENT'S ADDRESS.

Mr. McWhorter, the President, then addressed the meeting as follows:

Friends of the Illinois State Horticultural Society:

Most cordially I greet you all, and congratulate you that we are again convened to enjoy that reciprocal good feeling by which horticultural gatherings are so much characterized. And I trust there will be no abatement in our zeal in investigating those interesting subjects, so intimately related to the higher advancement of our civilization, the improvement of our landscapes, the charms of rural life—in short, to our whole domestic prosperity.

It is with much diffidence that I assume the position to which you have elected me—a position which was to me quite unexpected, and I will add, unsought. If I fail to

meet your expectations, I will trust that the same spirit of kindness and personal respect that have ever been manifested towards me, will induce you to bear with my incompetency.

We are assembled together to hold our fourteenth annual meeting, here in this interesting town of Ottawa, surrounded by the picturesque scenery of timbered bluffs and rocky promontories, that call to mind the memories of Indian legendary.

With the older members of this association it is but natural to recall the fact, that the original foundation of our present Society was the Northwestern Fruit Grower's Association, organized in the autumn of 1851.

Sitting before me are some familiar faces of those who were among the founders of that primitive organization; and inadvertently the mind recalls the memory of those who then participated in our gatherings, but have since passed away.

In looking back over the field of our past labors, we have abundant reason to congratulate ourselves on the practical progress we have made. A spirit has been awakened in the public mind until tree planting and fruit growing have been carried to an extent that at that time no one could have anticipated—even in some instances the spirit of planting has out run people's judgment. Over the broad prairies where the wild winds and prairie fires had free sweep, we have lived to see it dotted with valuable homesteads, surrounded with groves and orchards and lines of hedges. We see an increasing tendency to improvement in homestead arrangements, in which the rich and enlivening effect of evergreens begin to appear. Lands formerly deemed worthless, have been brought into valuable requisition, and extensively applied to fruit culture.

During the fruit season, loaded fruit trains are moving over our railroad lines, until well filled boxes and baskets are heaped and piled in the markets of our larger towns, and the markets of nearly every railroad town in our State are perfumed with the aroma of our fruits! Grape culture, from a state of nonentity, has been sprung into being, and by a spirit of enthusiasm is being extended over our whole country!

But it is not to regale ourselves over what we have accomplished, that we are come together; but to consider earnestly the work that is before us. Too well I understand the character of the men whom I address, to suppose I can satisfy you with flourishes of rhetoric. You will expect from me practical suggestions on the subjects of our investigations.

As a horticultural society we have a field of investigation scarcely equaled by any other State. True, we have not the diversity of mountain ranges or inland lakes. The hilly range extending across the southern portion of our State, the lowness of our river bluffs, the changes in our underlying geological formations, the diversity of our black prairie soils and thinner soils of our rolling lands, constitute the principal topographical features, having any local influence on horticultural pursuits. But the fact that our State has an extent of nearly four hundred miles of latitude, gives to our Horticultural Society an extensive field of labor.

Again, the climatic character of our inland region, the extreme vicissitudes of our changing seasons, constitute for us a special subject of inquiry. Some seasons we have continued rains and cloudy skies, favorable to the spread of the fungus family, greatly affecting the products of our orchards, vineyards and gardens. Such has been the preceding season. Other seasons we have extreme drouths extending into autumn; so that trees close their growth in mid-summer, circulation ceasing before the essential elements are elaborated to sustain and perfect the next year's crop. Such was the

summer of 1867, followed by the deficient crops of 1868. Our soft southern winds that prevail in the summer months, extending into autumn, give us a free growth, but not always well ripened wood to endure the severity of winter.

These peculiarities of our climate, and the very distinct character of our sub-soil—more favorable for deeper planting—renders it unsafe for us, in the valley of the Great West, to rely for instruction on the horticultural savans of the Atlantic States. It devolves on us to solve our own horticultural difficulties. And it can not be disguised that, to some extent, these difficulties increase with the increased extent of planting. This is perhaps only what we should expect. That the prevalence of insects and parasitic fungi will multiply and extend in proportion as we provide the means by which they can exist, is but a natural result. This has been the case in other countries. More diseases extend and more scientific skill is required to raise fruit, as the country becomes older. This is so much the case in the Eastern States that an opinion has gained considerable extent, that the apple crop is there on the decline. In the minds of some this is an occasion of some alarm. I have placed in the hands of the secretary an extract from a private letter from J. J. Thomas, on this subject, and I think the Secretary has communications from other horticulturalists of the older States, on the same subject. The letter from which I have made extracts is in the brief condensed style for which the writings of that veteran horticulturist are characterized. Mr. Thomas takes a common sense view of the subject, free from hypothetical vagaries.

Thus it seems to be a fact that, with the increase of orchards, we have an increase of fungoid infections and insects that infest orchards. It is from this circumstance that several varieties of apples, that were most profitable in our first orchards, are now so frequently scabby and worthless, that they are falling into disrepute. Hence it is, that our fruit lists need occasional revision. Varieties, that a few years ago we held in the highest regard, we are inclined to reject.

As yet we can boast of no signal triumphs over the hordes of insects that infest our orchards and gardens, and scarcely any control over the various fungoid infections.

The subject of pruning is one on which western horticulturists are quite unsettled in theory. We have not yet given this subject the close observation that its importance deserves.

I would also invite attention to the subject of cultivation of orchards and fruit grounds generally. We often have excessive rains, our soils are easily washed. We are yearly applying to fruit culture more grounds with broken or undulating surface. We are startled by the revelations of geology, of the wonderful denudation of continental regions in past durations of time! Fortunate for us, that by some means (we know not how), a goodly thickness of *drift* was spread over the old denuded surface, constituting for us the best sub-soil of which any land can boast. But if several hundred feet in thickness, of the original surface, was carried away by the action of the elements in past time, well may we concern ourselves with the the ten-fold greater rapidity with which the surface of our cultivated grounds are now being washed away and carried off by our streams. While we are reveling in a soil enriched by decaying grasses and the ashes of prairie fires of past centuries, it becomes us to consider how we are to secure continued fertility after the vegetable humus and alkalies of our present surface shall be washed away. To counteract or diminish the washing process, to what extent we may profitably resort to underdraining, surface mulching, seeding to grasses, or to other means, are important considerations.

As horticulturists, it is not only proper for us to learn in the various departments of our pursuits, how a given amount of labor can be turned to the most dollars and cents; but if we are that dignified, scientific, self-sacrificing body of men we claim to be, this should not be the sole object of our deliberations — not solely to conduct our avocations so as most efficiently to line our own pockets, but we should study and work for the love and pleasure of bringing forth fruits or facts that may be a blessing to those that come after us.

Thus far, all the progress that has been made in the improvement of varieties of fruits, beyond the labors of a few isolated experimenters, has occurred from accidental seedlings. As yet, very little has been done in the production of new varieties by artificial means of fertilization.

For untold ages this work of hybridizing has been going on through the agency of the winds and the little bee. Let us take hints from nature, and learn from the bee. If the bee can transmit the pollen of the flower from tree to tree and plant to plant, may not the hand of intelligence do as much? A wide and interesting field here lies before us almost unexplored! What blessings to posterity is yet to be the reward of scientific diligence in this direction!

If all our melting pears have originated from the wild choke pear of Europe, and the peach and the almond from the wild peach of Persia, by the means of natural variations and accidental crossing, who shall say where is the limit to the improvement of fruits, or what may not be effected by intelligence in artificial means of hybridizing?

With the accidental seedling we experiment with not to exceed one chance in a thousand for improvement. With hybridizing, we proceed with intelligence and a reasonable expectation of what may be the result. It is but making a practical application of the principles of nature for the amelioration of our fruits. I will venture the opinion that through this means a class of fruits will be brought forth in future entirely surpassing our present selections. We yet know nothing of any bounds that nature has set in the improvement of fruits.

Between the Siberian apple and the common apple, it is believed that several accidental hybrids have already originated. I am aware this is doubted by some, merely on theoretical grounds. But it is now well known that hybridization is not in all cases bounded by the barriers of botanical classification. We have already crossed that boundary line in different instances where the specific difference is more strongly marked than between the *Pyrus malus* and *Pyrus malus prunifolia*. What a pity, that Nature pays so little regard to some of the *by-laws*, and *botanical rules* we have prescribed for her in *our books*! And who shall say through means of artificial hybridizing what is to be the mission of the Siberian apple? May not new hybrids be originated having mainly the hardy characteristics of the tree of the one parent, and the fruit of the other? And thus, may not the cultivation of our apple be carried up our mountain slopes, and beyond the line of British America. On this subject of hybridizing, there is an interesting field of inquiry of which we are yet almost entirely ignorant. It rests with us to make an advance in this direction, or leave it wholly for those who shall come after us.

While tree and fruit culture have extended greatly in the last decade of years, and we have learned much of practical cultivation, yet it must be confessed we have not made equal progress in the improvement of varieties, except, perhaps, with the grape.

It is true that some varieties of berries have made their advent under fanciful names, and the use of much paper and ink. But in most cases, after the sale of the first plants, under the puff of advertisements, they are scarcely heard of.

With that most desirable fruit the cherry, we have made no advance since the labors of Prof. Kirtland. The lonely Early Richmond (or to please some of our friends, we should perhaps call it *Early May*) holds entire monopoly in our Western markets. We would not discourage those who are experimenting with seedlings from this variety; it is an enterprise from which we may hope for good results. But I would solicit attention to the more certain means of hybridizing with the Dukes.

The subject of the influence of dissimilar stock on fruitfulness is one that demands more close attention. We already understand that circulation may be retarded by a dissimilarity of stock, and, that whatever retards circulation, increases the formation of fruit buds. It seems nearly conceded that the Early Richmond is more productive on the Morello stock; and, that several varieties of apple have shown more tendency to productiveness when budded or stock grafted. Some recent experiments seem to indicate that several varieties of the sweet cherries will succeed with us when worked on the Early Richmond as a stock. This subject should receive more attention; also that of working some of our most desirable apples, that are shy bearers, on some of the Russian varieties, or on Siberian stocks. With a laudable ambition we have proved ourselves able to supply our markets with fruit; let us next devise the means to supply a *better quality*.

Another subject to which it is thought proper to invite your attention, is that of some action to guard against the introduction and spread of the Canada thistle, and other noxious weeds from the older States. This subject legitimately claims the attention of this society; for the means by which we are in the greatest danger of the Canada thistle being introduced into western soil, is in the packing of nursery stock, shipped from the East. This has already occurred in some instances. I submit to you to take such action as in your judgment may be thought most efficient to check, or prevent this dreadful pest. It may be advisable to appoint a special committee to communicate with the Secretaries of County Agricultural Societies and other persons in different counties of our State, to ascertain to what extent this thistle is already introduced, and to solicit the action of Agricultural Societies, to take steps to eradicate or check the evil.

Our society has not been delinquent in its duties in making repeated efforts to admonish the public against imposition. In these efforts it is to be regretted, that we have so little reason to be gratified with our success. The evils and imposture, that are but natural consequences of the prevailing system by which trees and plants are disseminated over the country, are apparent to all. But the existence of these evils is in a measure due to the fact that a considerable portion of our western people have a morbid craving for imposture. With that class of individuals, horticultural societies can adopt no means to fortify their credulity. But, for the sake of those who seek information, let us continue to disseminate such caution as may place the public on their guard against all manner of imposition. Let us continue to be guarded against any action by which we will become accessory to any speculation scheme.

Your attention is invited to the subject of dividing the State into Fruit Districts, as proposed by our Secretary in the printed circular calling this meeting. In the proposed division into seven Fruit Districts, it is the object to take into consideration

difference of latitude, temperature, rain falls, geology, and topographical configuration.

It is submitted to your judgment whether this or a similar division will not be better adapted to a successful management of our society, with the view of electing vice presidents and other officers with regard to the Fruit Districts.

But before closing this address it becomes my duty to drop a tribute to the memory of a departed brother. One, whose loss we shall deeply feel! One, who by earnest application, had advanced to high scientific attainments in a department of knowledge of the highest importance to horticulture! One, who from the genial worth of his soul, held a place in all our hearts! By a sad casualty, our State Entomologist, B. D. Walsh, has been taken from us! He died on the 18th of November.

Such was the personal regard I had for Mr. Walsh, it is with difficulty I can approach the subject; I can bring to my use no language to express my feelings. We have lost a genial friend and an earnest worker! To us, as horticulturists, the loss of Mr. Walsh is inestimable. I can only recommend the usual course of a committee to present resolutions on the loss of our valued friend.

It may be proper for me to mention in this connection the death of A. S. Coe, of Port Byron. Though not for the past few years a member of this Society, Judge Coe was a member of the Northern Illinois Horticultural Society, and was formerly connected with the Northwestern Fruit Growers' Association.

He was an intelligent horticulturist, one of our prompt correspondents, and a valuable citizen, esteemed at home and abroad. He died the 17th of October. Whatever may be the pressing interest of business before us, let us ever be ready to pause and drop a tribute to the memory of our departed friends.

Gentlemen, I will no longer detain you with remarks of my own. Your labors will not be limited to the subjects to which I have invited your attention. You need no stirring words from me to arouse you to a sense of the importance of the objects in which you are engaged. I need not tell you how greatly our national prosperity depends on the advancement of horticulture; that no nation can continue prosperous when culture and refinement all tends to concentrate in city life; that wherever such is the case, that is a tendency to national decay; that culture and refinement can not extend into country life without a widely diffused knowledge of horticulture. Your minds are fully imbued with a high sense of such facts, and the importance of the work that is before you.

The address was received with great applause.

SECRETARY'S REPORT.

Mr. Flagg, the Secretary, then read his report, as follows :

The Transactions for 1868, being the largest volume yet issued by the Society—and I believe also the best—was also the most costly, and owing to unforeseen causes was greatly delayed in publication. The following is the printer's bill in detail :

1,137,426 ems composition, at 70c	\$796 20
115 tokens press work, at 75c.....	86 25
90,300 ems composition, tables, at \$1 40.....	126 42
Press work on tables	10 00
Extra time on tables, 2d, 3d and 4th pages.....	12 00
Half cost re-printing 3d and 4th pages book.....	4 75
Composition and press work on Index	21 27
Paper for and printing 700 covers.....	7 85
200 tables on flat cap paper.....	14 00
31 7-20 reams book paper, at \$9 00.....	282 15
Binding, 300 cloth, 700 paper (binder's bill).....	137 50
Packing, cases, drayage, postage, &c.....	10 00
	<hr/>
	\$1,508 39

Of this amount \$150 was paid by the Northern Illinois Horticultural Society, in consideration of our including their report in our volume, leaving the amount actually paid by our Society, \$1,358 39.

Hence it will be seen that the average cost of paper and cloth copies has been a trifle over \$1 50 per volume. The volume is well worth this; yet under the vote of last year we have been furnishing it for a membership fee of only \$1. As we need all the funds we can command, and as I believe all, or nearly all our members are quite as willing to pay one dollar as two for the benefit of the Society, and as the advantage claimed that we would receive as much money for one dollar memberships as for two dollar memberships, has never yet been gained, I respectfully submit that we had better make the annual fee two dollars, and let it remain unchanged.

Having been appointed a committee on behalf of the Executive Committee to prepare a seal for the Society, I finally settled, after consulting many friends and members of the Society, on the design which is carried out in the engraving found on our circular calling this meeting. The outer circle contains the name of the Society and the date of its organization. The three figures are designed to represent Ceres, Flora and Pomona, being the same rural deities that appear on the Horticultural Hall at Boston. The motto—"this is an art which does mend nature," is from Shakspeare's Winter's Tale. One attempt to get this design carried out was a failure, costing the Society \$25, without any equivalent. A second attempt was more successful, though not entirely satisfactory.

My printer's bill for stationery, circulars, etc., for the performance of official duties, is as follows:

Dec. 22d, 1868, to one-half ream letter heads.....	\$ 4 00
June 19th, 1869, to 1,000 envelopes, printed.....	10 00
Aug. 2d, 1869, to 200 circulars on tables.....	3 75
Nov. 10th, to 1,000 circulars annual meeting.....	13 50
Nov. 10th, 1869, to 400 railroad certificates.....	3 75
	<hr/>
Total.....	\$35 00

My postage, express and stationery account is the following:

March 26th, 1869, Expressage on manuscript.....	35
“ “ “ Stamps.....	3 00
June 18th, “ Expressage on index and tables.....	85
July 14th, “ 2 quires wrapping paper.....	2 00
“ “ “ 1 ball twine.....	40
“ “ “ Stamps	5 00
“ “ “ Freight on reports.....	6 55
“ “ “ Unpacking	75

Aug. 20th,	"	Stamps.....	3 00
" 31st,	"	".....	5 00
" "	"	Express.....	75
Sept. 20th,	"	Stamps.....	10 00
Oct. 29th,	"	Wrapping paper.....	80
Nov. 10th,	"	1 ball twine.....	40
" 13th,	"	500 envelopes.....	1 15
" "	"	Stamps.....	4 00
" "	"	".....	6 00
Total.....			\$50 00

WARRANTS DRAWN.

The warrants drawn for the last year are the following :

E. S. Hull, <i>ad interim</i> , etc.....	\$147 70
M. L. Dunlap, <i>ad interim</i> committee.....	6 50
Postage, printing, etc., of Secretary, 1868.....	133 15
W. C. Flagg, <i>ad interim</i> committee.....	41 20
O. B. Galusha, <i>ad interim</i> committee.....	24 50
Drawing seal (Hugh Smith).....	15 00
Salary in part of Dr. E. S. Hull.....	250 00
Printer's bill, less \$150, of P. F. Co.....	1,358 39
Engraving seal (a bad job).....	10 00
Balance salary Dr. E. S. Hull.....	500 00
Expenses attending Ex. Com., W. C. Flagg.....	6 00
Expenses E. Baldwin at Ex. Com.....	5 00
Expenses A. M. Brown ".....	5 00
Expenses T. McWhorter ".....	5 00
Engraving of seal, etc., R. P. Studley & Co.....	40 00
Printing bill L. A. Parks & Co.....	35 00
Office rent W. C. Flagg.....	75 00

HORTICULTURAL DISTRICTS.

The present division of the State into three districts—Northern, Central and Southern—being too general to be satisfactory, I have heretofore, in the Transactions for 1867, attempted to invent something more suitable and based not only on differences of latitude and temperature, but on those of rain fall, geological formation, configuration, plant growth, etc. I respectfully call attention to it again, in the hope that it, or something better, may be adopted. Perhaps by combining it with our present divisions we may attain the advantages of both. Let districts one and two be called Northern, three and four Central, and five, six and seven Southern Illinois, and we shall have three large districts, not varying much from those we now have, and each of these subdivided into two or three sub-districts, between which some very important differences exist. The subdivisions may be used or neglected according as necessity requires, or as judgments may dictate; but I believe all will admit that our present three districts are too large and contain too various soils and climates to have their wants and preferences expressed in the same list of fruits.

Mr. Nelson moved that the report of the Secretary be accepted, and the motion was adopted.

REPORTS OF VICE PRESIDENTS.

The next matter in order being the reports of Vice Presidents, the President called—

1st District—Mr. Cochran of Cook, who was announced to be sick.

2d District—Mr. Crow, who was announced not present.

3d District—Mr. Haussen, who was announced not present.

4th District—Mr. Walsh, who was announced not present.

5th District—Mr. J. W. Stewart.

Mr. Stewart—I am present, but I have not my report ready.

The President—Perhaps you could make a verbal report of the condition of horticulture in your district.

Mr. Brown—I move that Mr. Stewart be allowed time to prepare a report. Carried.

6th District.—Mr. O. B. Galusha made the following verbal report:

I had personally prepared a report, but unfortunately left it at home. I can, in a few words, embody what was said in that report, and ask the privilege of perfecting the report and handing it to the Secretary.

VICE PRESIDENT'S REPORT FROM THE SIXTH DISTRICT.

(As written out.)

Mr. President and Brother Members: There is so little to report, encouragingly, from my District, that it seems almost idle for me to occupy your time at all.

The increase of insect enemies is everywhere a topic of conversation among fruit-growers, while few can give an intelligent or probable cause therefor, and almost none can offer an effectual antidote for more than one or two species. There is no disguising the fact that a general feeling of discouragement in the cultivation of apples pervades almost the entire agricultural population.

We need more of that spirit which does not stop with observing and brooding over *effects*, but which searches assiduously and perseveringly for their *causes*, with a determined will to surmount obstacles and conquer enemies, however formidable or insidious they may be. Orchard fruits have been a partial or total failure throughout this district the past year. This is doubtless owing mainly to climatic causes, one of which undoubtedly was the great deluge of the spring and summer, a greater, perhaps, than has occurred from the days of Noah to the present time.

The Codling Moth, and the Apple-tree Louse (*Aphis Mali*) have been unusually prevalent this year, the latter rendering nearly all the varieties more or less scabby, and entirely ruining some sorts. Some of those escaping are Jonathan, Seek-no-Further, Maiden's Blush, Duchess of Oldenburg, Fameuse, Swaar, Talman's Sweet, Fall Orange, all the Russets and probably some other varieties.

Among those rendered almost or entirely worthless I noticed the Carolina June, Winesap, and White Winter Pearmain.

Dr. Hull, our State Horticulturist, thinks he has discovered to a certainty that the scabs on the apples are caused by this insect, and will doubtless suggest, in his report, some valuable preventive.

The easiest way that I know of to keep the Codling Moths in check is to place bits of woolen rags, or old bits of carpets in the forks of the trees. These may be easily scalded and replaced as often as the pupæ of the moths are found in their folds.

The benefits of *protection* have been as clearly seen this year as in any former one. Apple orchards which are partially or entirely sheltered by timber have borne better crops than those on similar soils and elevations without such protection. In orchards exposed to the winds, the trees in the middle or toward the eastern side of the orchard were found bearing better than those on the Western side. I have also this year noticed a fact which has been stated, by myself and others, at a former meeting of this Society, viz: That fruit trees in exposed situations usually bear much more fruit upon their eastern and northeastern sides than on other portions; owing, of course, to the partial protection which the trees themselves afford from the prevailing west and south-west winds.

The want of timber belts and groves is—and I fear will for several generations remain—the most serious obstacle to successful orchard culture on the prairies of Central and Northern Illinois. This protection to orchards and growing crops is so easy and comparatively inexpensive an improvement that it seems the most consummate folly to neglect it. Any person who can hold a plow and use a jack-knife can shelter his orchard by preparing a border on its west and north sides and planting cuttings of such varieties of rapid growing deciduous trees as readily grow in this way. These screens are, of course, inferior to those composed of evergreens, which afford winter as well as summer protection.

I am aware that this subject of timber protection is an old story to us; for we have harped upon it and demonstrated its value by facts and figures again and again for many years; yet let us keep on preaching and *practicing* "on this line" of duty while we live, then *the trees themselves* will remain to take up the text and preach it with the demonstration of truth to those who will come after us.

The general neglect to take proper care of apple orchards, in this region, and generally throughout the state, is doubtless an important cause of the failure to realize crops of fruit. Farmers are too ready to declaim against the prairies as not adapted to fruit growing because, forsooth, the trees will not take care of themselves and flourish amid the weeds, grass, or what is perhaps worse than either, crops of small grain. I find some exceptions to this class, however; and even in this, the most unfavorable of years for apples, have seen some orchards well cared for and yielding fair crops of fruit.

When farmers will give as good cultivation to their orchards as they do to their corn-fields, taking pains to destroy the borers, the moths, and the aphides from the orchards, as they do the crows, gophers, mice and worms which infest their corn-fields, they may look for remunerating crops.

PEARS are growing in favor, from year to year, succeeding pretty well wherever cultivated in moderately rich soil, underdrained or thoroughly surface drained.

But few PLUM trees are planted in this district, on account of the depredations of the Curculio. The Lombard and the Miner are about the only ones which intelligent cultivators care to plant.

The list of CHERRIES has been gradually reduced here until only two varieties—the Early May (“Richmond”) and English Morello—are planted to any extent. These varieties are hardy and very productive on all soils. A few persons, however, are found in every neighborhood who still adhere to the old Black Morello, despite its suckers, on account of the fruit being so good for pies, and when canned or dried in sugar.

A few years since the Early May was grafted almost exclusively on Morello suckers; but these are everywhere such inveterate sprouters that planters are now discarding them and planting trees on the Mahaleb stock. Trees thus worked prove hardy, do not sprout, and bear plentifully in a few years from the planting. The Cherry crop was quite good here the past season.

More attention is being paid, in each succeeding year, to growing SMALL FRUITS for family use, and to some extent for market. The varieties which give the most uniform satisfaction are: Red Dutch, Cherry and White Grape Currants; Houghton’s and American Seedling Gooseberries; Kittatinny Blackberry; Miami and Philadelphia Raspberries; (Clark Raspberry, is highly prized by those who grow it): and Wilson’s Albany Strawberry.

This district has been somewhat infected with the epidemic *Grape fever*, which, however, has not proved *fatal* except in low grounds, or those below the “high water mark” of the flood of 1869. In all such situations the CONCORD, IVES, HARTFORD and CLINTON succeed well.

It is with pleasure that I am able to report an increasing desire among farmers and others to render their homes more pleasant by planting near them EVERGREENS and other trees and shrubs. A *few* also are found in almost every township who have begun the work of planting evergreens for screens, and deciduous trees for timber.

Let us hope that *many* will soon imitate their examples.

Respectfully submitted,

O. B. GALUSHA.

7th District.—Mr. Pierson, who was announced not present.

8th District.—Mr. Francis, who submitted a written report.

Through the blessing of a kind Providence I have a far more favorable report to make of the fruit crop in the Eighth District, than last year. In Sangamon county the Strawberry crop was very good; Currants and Gooseberries were also abundant; Lawton Blackberries bore well, but a portion of the canes being slightly injured by the winter, some of the berries were deficient in flavor. Pears were a good crop, but little blight among the trees. The Peach crop was a failure. The Apple crop was very good, though some varieties were quite scabby; among these were the Wine-sap, Bell-flower, and Striped Pearmain. About one-third of the winter apples were frozen on the trees in October; quite a proportion of these apples were made into cider. Insects, injurious to the apple, were uncommonly scarce this year. The Canker-worm seemed to have entirely disappeared; the Codling Moth was not troublesome; the Curculios were all alive this year. I have noticed but one class of Apples (the Siberian Crab,) affected by them. A large proportion of the Morello

Cherries were stung. Plum trees set well with fruit; but, with the exception of the wild, stung by the Curculio.

—Mr. C. S. Capps reports from Mount Pulaski, Logan county, that we have had a good average Apple crop. Much of the fruit is scabby (an unusual thing with us). The old popular varieties seem most affected in this way. Carolina Red June, Early Harvest, Fameuse, Rawles Janet, Wine Sap, and Milam are very badly affected. New York Pippin, Jonathan, and King of Tompkins county, are fine this year; probably half the Apple crop in this section was frozen on the trees in October.

The Pear crop was very good, and the fruit generally perfect. We have had rather more blight this year than usual; the Cherry crop was very good. We had no Peaches or Plums, and very few Grapes; of the latter, the Isabella was the best. Small fruits were very plenty; quality, about as usual. I do not think the Codling Moth was quite as destructive as usual. The Curculio did not leave us any Plums or Nectarines. Peach Borers are about as numerous and active as usual. I do not think we have any Bark Lice yet.

Of the Grape crop about half the Catawba and some others rotted. Delaware dropped about all their leaves before the fruit was ripe. Several of the new varieties of Grapes, and many varieties of Pears, and nearly all varieties of Plums, shed their leaves prematurely. In fact, I am inclined to think that leaf-blight is one of the worst diseases that our fruit-trees are heir to.

Of Pears I find that the Beurre D'Anjou has the healthiest foliage, and does not seem quite as subject to blight as other varieties. It is a fine, healthy, thrifty growing variety; a little tardy about bearing, but will probably prove a good bearer at the age say of fifteen years. The fruit is large, rich, and excellent with us.

I will close my report with a letter from our much esteemed friend, G. W. Minier:

MINIER, December 8th, 1869.

Hon. L. C. Francis, Springfield, Illinois:

DEAR SIR:—Your favor of 30th ultimo was duly received. I fear very much I shall aid you but little. The time of meeting is so near, and my business will not let me help much.

A few facts in regard to fruit crops in our district may be beneficial; and, first: insects have done but little damage comparatively. The drenching rains at the right time *did* the Codling Moth. Entomologists to the contrary notwithstanding, I am confident that rains, at the right time, will kill insects. Our Apples are large, fine, and smooth—a good crop. But, alas! Capt. Jack Frost played smash with my neighbors'. Through sheer good luck I got mine well taken care of. I should think one-fourth the entire crop of Winter Apples were frozen. Should not our Society more earnestly insist on early picking for late keeping? The best thing we can do for our bearing Apple orchards is to seed them down to *pigs*.

Everyone who has a grape vine and brains, has found out the past season that draining is *indispensable*. A brown mould overspread the vines; new shoots, old canes not affected, and very little injury on well drained lands. The vines cast their fruit in the following order:—Clintons worst; then, Isabella, Hartford Prolific, Ives Seedling, Delaware, and Concord, best of all.

As is always the case, best cultivated pays best, and no pruning during the summer. I believe we prune too much anyhow. Vines left up last winter did well,

but it is a dangerous practice and not to be recommended. Our Plums, save the Red Chickasaw, all killed by *Cureulio*. What about strewing the ground with salt? What says Dr. Hull on the salt question?

I was about to say something about the birds. But as I shall not be present to defend these useful creatures, had better be silent. Indeed, I have an article on ornithology, in which occurs this sentence: "The Alton Horticultural Society is the only company of sensible men, that ever charged birds with high crimes and misdemeanors." Now, to present such a thought and not present to defend it, would bring down most likely the Starr, the Flagg, and perhaps the Hull (whole) of Alton upon me. Surely, in such a case, "prudence is the better part of valor."

I am truly sorry I can't participate in this meeting; shall think of you every day and every session. Shall sit by myself and think how well you are enjoying yourselves, while—

"Like sad Philomel—
But let similes drop,
And now, that I think on't, my story may stop."

Success attend you; may your sessions be harmonious, useful and happy; may the public be benefited by your deliberations, and may we *not* have to wait long for your reports in *Book* form. Very truly and most respectfully yours, for Horticulture,

G. W. MINIER.

Respectfully submitted,

L. C. FRANCIS.

9th District.—Mr. Overman, who was announced to be not present.

10th District.—Mr. A. A. Hilliard, who submitted the following written report:

Notwithstanding the very promising prospect for a larger crop of fruit than usual of all kinds in the early spring, owing to late frosts, extremely wet summer, innumerable insects, and the cold snap on the 24th and 25th of October, fruit growing for market in the 10th District has not been profitable. Whatever profits there may have been, the Railroad and Express companies have got it in their pockets.

There have been a great many new vineyards planted in the 10th District within the last two or three years. Whether there will be a market for large quantities of native wines I am not so sure. My experience in selling native wines is something like trying to water a horse when he ain't dry; if he won't drink you can't make him drink. I can sell ten barrels of good refined cider at 50 cents per gallon where I can sell one barrel of native wine, and nine-tenths of the Americans prefer the cider to the wine at the same price, 50 cents per gallon.

Notwithstanding, I am for raising grapes to any extent. I believe we shall get new varieties and learn new ways by which we shall be able to keep them fresh through winter, spring and early summer. I believe we can raise grapes cheaper than any other fruit, and when they can be bought in market for three or four cents per pound in summer, and at eight and ten cents at Christmas and New Years, they will take the place of other fruits that are failing, and we will have a market for all the grapes we can raise, and at as remunerative profits as any fruits we can raise.

There has been an increased interest in and encouragement given to planting out Osage Hedges. This is particularly the case in Macoupin, Green and Jersey counties, and more or less in all the counties in the 10th District. It is now a settled fact that the Osage Hedge is to be *the* fence of our Western prairies. I have never known but one instance of failure when properly taken care of.

The Central Railroad, I understand, contracted with parties to fence their road with Osage Hedge. They set out their plants, and owing perhaps to the extreme dry summer and neglect, the larger part of the plants failed to grow. The parties became discouraged and did no more to them. The result, an entire failure.

In my neighborhood nearly all the farms are planted out, wherever there is a fence or a fence needed, with Osage. Oldest hedges, that have been turned out six or seven years, are a complete success, and when kept in proper trim are beautiful; and whoever lives to see one of our large western prairies completely fenced and properly trimmed, will behold a landscape view not to be excelled in any other part of the world.

A. A. HULLIARD.

Mr. Huggins—I have prepared a few remarks touching the early horticulture of our county, and something also concerning the present year's operations, and portions of it I propose to read at this point if you desire it.

The President—I think it is proper.

Mr. Huggins then read his paper on Macoupin county :

The first apple trees planted in this county were seedlings set along the timber on Bunker Hill Prairie by James Breden, at the head of a branch of Wood river, and further down by David Wright, Elijah Lincoln and others, as early as 1830. In 1836 and 1837 small orchards of budded apples and seedlings were set by Luke Knowlton, Rodney Town, Larkins and Stark, near the timber. Captain Moses True set the first fruit trees in the place then called Lincoln (now the town of Bunker Hill) in the year 1835. In 1840 and 1841 orchards of 100 and 200 trees were planted far out on the Bunker Hill prairie by N. H. Flannagin, Joseph Burton, Edward Burton, John A. Pettingill, D. E. Pettingill, Rufus Kelf and others, of improved varieties, which orchards for many years (if we except the present) have given satisfactory returns.

"I find there are on Bunker Hill Prairie at the present time eleven thousand (11,000) apple trees in bearing; pears in bearing, 2,000; peach trees in orchard, 3,000; cherries in bearing, 2,000, 1200 of them being in one orchard of J. V. Hopper; about 9,000 grape-vines in bearing, mostly Concord and Hartford Prolific. Some 25 varieties of grape are in bearing and all have failed to a greater or less degree the present season, except the *Ives*, which has gone through our wet season unscathed, either in fruit or leaf. J. A. Pettingill's vineyard is the oldest, set out in 1863 and in 1868. His ConCORDS produced at the rate of six (6) tons to the acre. About 15 acres are set in blackberries, mostly Lawton's, although Kittatinny and Wilson are planted out, and promise well. Of Doolittle, Miami and Philadelphia Raspberry, about 10 acres will be in full bearing in 1870. Philadelphia bears enormous crops of a good (not best) berry.

"*Clark* (although not much planted) nearly equals *P.* in all things with a much finer berry—15 acres of Strawberries, mostly Wilson. *Jucundas* will not stand our hot sun. Downer nearly equals Wilson and much more hardy. Five acres would cover Currants and Gooseberries. An abundant crop of all the small fruits were grown to perfection the passing year, although much of it was not picked on account of the extremely low price.

"GRAPES, in some vineyards, almost a total failure; others one half crop, and others with first crop a good yield. A splendid show of bloom on all APPLE trees in the spring, but not half a crop of Apples, and generally very poor. What the codling moth, Apple cureulio and scab left to mature, were a greater part ruined by the October 19th and 23rd freezes.

"The first Nursery was established by John A. Pettingill, in 1841; and, with the exception of 1848 and 1849, has been continued to the present time. J. V. Hopper engaged in the business in , and continued in it till , when he sold out to Mr. John Flanagan, who still is engaged in it. Mr. E. A. Bechtel is largely engaged in the propagation of Grapes. Some twenty thousand fine plants on hand for sale. Mr. Pettingill says, Apples profitable for market (early) have narrowed down to *one*—Sops-of-wine; for family, Williams' Favorite and Foundling; early Fall, Porter and Lowell; Fall, Rambo and Hubbardston None-such; Winter, Rawle's Janet, Red Canada, Gilpin, and Smith's Cider.

Bunker Hill stands second to no other town in Illinois, in its beautiful flower gardens, in its masses of flowering shrubs and vines, in its broad streets and avenues lined with stately Elms and Maples, with its conservatories, bay windows, and even nine-by-twelves, are conspicuous with Geranium, Pelargonium, Fuschias, Monthly Roses, &c.: all of which, by example and precedence, has been greatly enhanced by none other so much as by J. A. Pettingill.

The first trees set set in the neighborhood of Carlinville were seedling apple trees set by — Dugger, in 1835. Col. J. C. Anderson set an orchard of grafted trees in 1836; also John and Isaac Greathouse, in 1837. Trees were also set out by A. Kent and R. W. Purviance, about 1831, of the large and small Romanite varieties. The Eldreds, near Chesterfield, have a well selected orchard of small as well as large fruits, just in youthful vigor and promise. Col. J. R. Miles, of Miles' Station, on the Chicago and Alton Railroad, has a fine orchard of 1,500 Apple trees; Dr. John Ash, 1,000 Apple and 1,000 Peach trees. Near Brighton, Mr. Elliot, 2,000 Apple and Peach trees, just in bearing order. A. A. Hilliard is one of the oldest fruit growers about Brighton. His first orchard of improved or grafted Apple trees was planted in 1835, forty feet apart, with Peach trees between, one way of the rows. His main orchard was planted from 1835 to 1845, and comprises about sixty acres. Mr. H. has been eminently successful as a fruit grower, he being fortunate in his location, and selections of varieties, and having got under full headway at an early day, before competition was so brisk as now, and when insects, we may say, were not known in this county—or if sometimes seen, were not troublesome. Of him it has been said, that he awoke every morning a richer man. Asking a neighbor of his how he made his money, the finger was immediately pointed to his well grown orchard. Mr. H. has this year made about two hundred barrels Cider, and says he can sell ten barrels refined Cider, for fifty cents a gallon, where he can sell one barrel Concord wine for the same price. Mr. Hilliard believes in raising

Grapes for market, has over five acres, mostly Concord and Hartford, and may now take his ease, sitting under his own vine and *Cider* tree.

The first fruit trees planted on Woodburn Prairie were set by Rev. Elijah Dodson, about the year 1835, composed mostly of seedlings, some of which were grafted to large and small Romanites, his then favorite varieties.

In 1842 J. Huggins set out the first fruit trees in Woodburn, on a village lot, and the first shade trees in the streets of that town. In 1848 he set out 240 Apple trees on the place where he now resides, which orchard has grown to some 8,000 fruit trees, covering sixty-five acres at the present time, with several acres small fruits. The proprietor of this orchard, believing in wind-breaks, has several growing ones through his grounds, composed of evergreens as well as deciduous trees.

The first Hedge (*Osage*) set in this county twenty years since, is found here, and which has proved a perfect protection against all kinds of stocks for many years. The Woodburn Nursery was commenced by J. Huggins in 1845, on a small village lot, and grew in breadth until it covered some twenty-five acres, composed of some one hundred varieties, including Apples, Peaches, Pears and Cherries, and a general assortment of shrubs and flowers. On account of the increasing labors and cares of the fruit department, the Nursery is now reduced; and here may now be found only those few varieties of fruit trees and bushes, which experience has taught is desirable.

A. A. Hilliard, at one time, had a small nursery at Brighton. Also H. Clark and B. Johnson. Chas. Brown is still in the business at Carlinville.

There is a vineyard of some 2,000 vines, mostly Concord, at Woodburn, now in its fifth year, by Major Mulheman, which bore well this year. There are many fine young orchards far out on the prairie, which cannot even be named in this report. But I cannot omit mentioning that of Mr. David Gore, the present President of our County Agricultural and Mechanical Society. Mr. Gore is a self-made man, whose example may be safely followed. Some years since he located far out on the prairies north of Carlinville, our County seat. His first move was to set out an orchard *north of his house*; and at the same time an *Osage* hedge was set out around the orchard, and still, outside of the hedge, a wind-break, composed of Silver Maples and Black Walnuts. The orchard is just in bearing—a gem of an orchard, which no fruit-grower, passing that way, will fail to notice and admire, in connection with the ornamental trees, not forgetting those beautiful Evergreens, scattered through his grounds.

The Pennock and Gilpin seem to have been introduced into our county at an early day, and while the one is classed as poor and the other as hardly good, yet, up to this year, they have both proved profitable; Gilpin for cider and late spring use, and the Pennock for a Southern market. This year both were imperfect, but especially Gilpin. Janets, this year, were fair, if we except an unusual cloudy appearance. The Russets were all fair; the Spitzenberg family also—no dry rot and very few wormy. Ben Davis fair; also Rambo. Maiden's Blush somewhat affected by a fungus growth, yet there were many perfect specimens.

Of early Apples Keswick Codling was fair and free from scab; and so of the Sops of Wine. These two are at present our only reliable early apples for market and family. The Red Astrachan we have hopes of as a profitable market apple. But of the Early Harvest and Red June, as apples for profit, if we judge them by the

returns they give in dollars and cents, we cannot say much. And, especially, if we judge them by "their fruits" of this year, they certainly will be found wanting. From several hundred bearing trees of these varieties, we did not, this year, pick a perfect fruit; all were so scabby as to be unfit for use. We will, however, hope for better things of them, and give them yet further trial. Insects, injurious to our fruit, are on the increase; and we are anxiously looking and inquiring for the best way to protect our fruit from their ravages. With outstretched arms we stand, imploring aid from some quarter. O, ye Entomologists, can you not help us? Is there no sure and speedy way, whereby we may rid our fruit grounds from these pests? Are we yearly to be everrun by the Codling Moth? And that precious little beauty, the Curculio, (of which our entomologists have of late years invented several new varieties,) must the fruit-grower submit and allow the little Turk to rule over him? And how about the Plant Louse? Is he to invade our grounds next year in force, and before our fruit trees fairly get their eyes open in the spring? Do you tell us we must fight our insect enemies; vigilance is the price of fruit, etc.? But we have fought them and intend still to be vigilant against them. But in view of the past, and with fears for the future, we are led to cry aloud for aid. Come, Vigilance! Come, Intelligent Culture! Come, Cannibal Insects, and eat our Insect enemies only! Come, Insect eating Birds, all of you, and eat those millions of insect enemies! Come to our aid, O ye, who have made entomology a life study! Tell us, O, tell us, and that speedily, how shall we subdue effectually those noxious insects which so annoy the fruit grower?

J. HUGGINS.

On section 18 and 19, the section that Brighton is located on, there is 150 acres in orchard. In 1832 I bought of Mr. Collet 125 apple trees, and set them out that spring on section 18. Jonathan Brown set out fifty apple trees the spring following. Braughton and Ferguson, in 1842, made a large addition to the orchard that I set out, say 200 (the Apple, Pear and Peaches). David Nelson, and Rev. Mr. Zombs, and J. W. Gibson have set out the balance.

Our people have been very negligent in regard to hedges; there is not more than one mile that is sufficient to turn stock in this corner of the county.

Respectfully yours,

H. GRIGGS.

11th District.—Mr. J. W. Fletcher, who was announced to be not present, but subsequently reported.

12th District.—Mr. Geo. Wilgus, who was announced to be not present, but also subsequently reported.

13th District.—Mr. T. A. E. Holcomb, who submitted a written report, as follows:

REPORT OF THE VICE PRESIDENT OF THE 13TH DISTRICT.

Your Vice President of the 13th District can hardly claim to have performed the duties required of him by the Constitution, for he has neither assisted in organizing

new societies, nor corresponded with well known horticulturists throughout the district; but, knowing that a failure to perform those two duties would not absolve him from the third, that of making a written report to the Society, he respectfully submits the following:

The past year has not been a remarkable one in any particular. A moderate crop of everything, selling at moderate prices, has rewarded but not enriched the horticulturists of this district. They have received an answer to the prayer, "give me neither poverty nor riches," and, consequently, they have not become proud and forgotten that God helps those only who try to help themselves, nor have they, so far as I know, been convicted of stealing anything.

But while they have probably only averaged to keep their worldly estates good, they have undoubtedly gained something in experience. One valuable lesson, which has indeed been mentally admitted for years to be true, seems in the last year to have gained in that true faith which testifies its reality by works, and that is the lesson of thorough cultivation and honest preparation for market. Experience clearly shows that the cultivation of peach orchards by repeated plowings works a great injury to maturing insects, while it greatly assists maturing fruit. And it now seems to be universally acknowledged that no peaches can be raised in the 13th District, without systematic and persistent energy in warring against the *Cureculio*. And all the plans that have been generally recommended, are considered as fit and proper modes of Christian warfare against this most unchristian Turk. And I am happy to say that I believe that all the modes alluded to are now more generally practiced than they have heretofore been. Peach orchards are plowed and harrowed, fallen fruit is gathered by hand and by hogs, and the *cureculio* catcher makes its regular rounds. And in many instances where peach trees have been so planted or pruned that this treatment is impracticable, the trees themselves are being removed to be replaced by those of better form, or by fruits of other kinds.

In the cultivation of apples and pears there is not quite so much unity of sentiment, but the Meehan practice prevails largely in theory and is constantly increasing in practice. The practice would be more readily adopted if men were not so avaricious, or if retaining their eagerness to acquire richness they could become possessed of more faith. As it is, they will not await the long process of making the sweet short grass of the orchard a muleh, which in three years will enable the tree to produce a buttery pear, but they will cut the grass off, feed it to the cow, and in less than a week have *butter* itself. So, many refuse to sow grass, because they are unwilling to subject themselves to a temptation, which, if not resisted, they know will lead to injurious results.

An attempt was made in our district during the last season to ship strawberries through to Eastern cities. The experiment met with several unfortunate disasters, in the shape of disabled cars and belated trains, and did not as a whole prove remunerative as compared with other shipments; yet if account should be made of the influence which sending this fruit to other places had upon Western markets, it would show it was a success. At any rate, it proved that by judicious loading, and a friendly and generous co-operation between railroad companies, the smaller fruits may be shipped to Detroit and Buffalo, to the advantage of producers,—this advantage to be gained in the price obtained and by the sustaining of fair prices in Western towns. The credit

of originating and executing this experiment belongs to Parker Earle, Esq., aided by the South Pass Horticultural Society.

But while most subjects directly and collaterally connected with Horticulture are receiving more intelligent attention and more prompt and vigorous action, I think there is an unwarranted apathy concerning the present and prospective ravages of the Codling moth. Indeed so little attention is paid to this insect that I think I may safely say that not one fruit grower in fifty knows the animal by sight, nor can a much larger number even tell whether the thousands of bushels of apples that yearly fall to the ground immatured, are brought low by means of this insect, or whether the apples that remain are seriously injured by it. And yet it is a certain fact that the Codling moth is in our debt for apples enough to pay all our railroad freights, and at least a share of our commissions. The Curculio gained on us by steady advances, but we at last believe him a foeman worthy of our steel. We ought to learn by that experience to be beforehand with the Codling moth.

But without any remarkable exertion, a very large crop of apples has been gathered and sent to the various markets, from St. Paul, Minnesota, to New Orleans, La., and Mobile, Alabama. Indeed the 13th District may well lay claim to being the apple orchard of the State.

There was not the usual amount of rain during the last summer, no heavy rains occurring from June till late in November. Yet a sufficient amount fell to prevent a serious drouth, and all the trees and plants, having made all the growth necessary are well ripened up, and give promise of abundant crops the coming season.

THOS. A. E. HOLCOMB.

SO. PASS, Ills., Dec. 13th, 1869.

APPOINTMENT OF SPECIAL COMMITTEES.

None of the Standing Committees being ready to report,

Mr. Flagg moved that Special Committees be appointed on the President's address, on auditing Treasurer's report, on examining fruits, wines, etc., and on final resolutions. Carried.

Mr. Earle nominated as the Committee on President's Address, Messrs. Wier, Dunlap and Holcomb.

Mr. Dunlap declined, and nominated Mr. Miller.

Mr. Miller declined.

Mr. Dunlap—I would move as an amendment that the committee be composed of Messrs. Wier, Earle and Holcomb.

The amendment was adopted.

MISCELLANEOUS MATTERS.

Mr. M. L. Dunlap—I suppose it would be well to make a regular motion as to the hour of adjournment. I therefore move that when we adjourn it be until 2 o'clock P. M.

Mr. Baldwin—Before that motion is put I would suggest that gentlemen who would like to accept of the hospitalities of the city would please come here (to the table) after adjournment. I think it would be well to meet at 8½ A. M. and adjourn at 12 o'clock at noon. Meet again at 2 o'clock and adjourn at half past 4, and then an evening session from 7 to 9 o'clock. I will make a motion that those be the hours of meeting.

Mr. Dunlap withdrew his motion, and the question then being on the motion of Mr. Baldwin, it was carried.

Mr. Flagg—Before the meeting adjourns I would like to bring up another matter for the convenience of the Treasurer. There is a little question as to what the fee of membership is. I move that the Society re-affirm its constitutional provision, and that the membership be retained at two dollars.

Mr. Galusha—I second it.

The President—I hope that all see the importance of this motion, so that there will not be any lengthy remarks upon it; and I hope it will carry.

Mr. M. L. Dunlap—As I was perhaps the occasion of the change to one dollar, I deem it proper to say that I deem it a cheap rate, and for the present I am willing to waive it, but with the firm protest that as soon as we can we shall return back to the cheap rate of one dollar.

Mr. Flagg—The point in my mind is this: We can expend, profitably, all the money we can get. Then the question is, "in what way will we get the most money—by putting the subscription at \$1 or at \$2?" At Mr. Dunlap's suggestion we tried it at Bunker Hill last

year, and I think at Champaign in 1866, and at neither time did we get as much money as we did at \$2. Although the membership has been larger this year than ever before, it has not produced as much money. I feel that all of us are as willing to pay \$2 as \$1 for the purposes of the Society. Mr. Dunlap himself is, I know.

Mr. Wier—If it is the object of this Society to get all the money they can, or if it is the object to do all they can, then that is the point. If you can do more good with \$2 than with \$1, why well enough; but I cannot see it in that light. There are hundreds over the State who would be willing to send a dollar to get our transactions, who would not be willing to pay two dollars. I think we can do more good by disseminating our transactions than in any other way. The burden of two dollars is not much, but in some cases it comes hard. There are hundreds of men who would come here if they could afford it.

The President—I think the motion to adjourn received a second, and was therefore in order.

Mr. Galusha—I move as an amendment that the subscription be \$1 50 for the current year. We, of course, are willing to pay, whether it is one or two or five dollars. If we can distribute our books at one dollar, let us have it a dollar, and if the volumes cost a dollar and a half, they are richly worth that, and it appears to me that should be the price of membership.

Mr. Earle—It should be said that while the actual cost of the books is a dollar and a half, the cost to the members is two dollars.

Mr. Nelson—I would favor the one dollar proposition. I have no objection to paying two dollars myself, but I know that in my locality the circulation of these volumes would be much greater. I will agree to take ten copies myself, and I am in favor of this cheap rate.

Mr. Galusha—As it will take some time to arrange places for members, I think it would be well to adjourn.

Mr. Dunlap—I move to adjourn until 2 o'clock. The motion prevailed and the meeting stood adjourned.

FIRST DAY—AFTERNOON SESSION.

The Society met at 2 o'clock pursuant to adjournment.

Mr. Dunlap moved that the ladies of the city of Ottawa be invited to attend the meetings of the Society. Carried.

APPOINTMENT OF SPECIAL COMMITTEES.

The President announced the following committees:

On Treasurer's Report.—Messrs. Hilliard, Nelson and Fletcher.

On Fruits and Wines.—Messrs. Brown, Kinney and Kimball.

On Resolutions.—Messrs. Holcomb, A. Bryant, Jr., and Miller.

On Resolutions as to Deceased Members.—A. Bryant, Sr., O. B. Galusha, Parker Earle.

MEMBERSHIP.

Mr. Wier—I move that the resolution passed at the last meeting making membership one dollar be re-affirmed.

Mr. Dunlap seconded the motion.

Mr. Flagg—I made the motion that the \$2 membership be retained; but the matter in order, as I understand it, is the order of business this afternoon. That question would not now come up properly until the business of the afternoon has been disposed of.

Mr. Dunlap—Let us go on with the order of business on the programme. If we get behind now, we will be behind all the time.

The President—The Executive Committee having duly considered the question of inviting Major Powell to lecture before this body, have concluded that it would scarcely be practicable, as it would break in upon the business to so great an extent.

Mr. Flagg—If the discussion of the apple list would be next in order, I have about fifty copies of the tables of fruits that would be useful to members.

Mr. Nelson—In the programme for to-night something is said about districting. I would suggest that it would be better to do it

before this apple list is revised. It would seem to me that that would be better.

Mr. Wier—I move that the Secretary call the apple list. Carried.

REVISION OF APPLE LIST.

AUTUMNAL STRAWBERRY.—Mr. Earle—I do not want to say anything about the Autumnal Strawberry, but it seems to me that if this was to continue, we might run through the session. My idea is that the proper selection of apples grown throughout the State will be an advantage to ourselves and to the community. I do not estimate very highly the policy of putting on or taking off, but I do like discussion. We have just passed the Red Astrachan, and I am very sorry to say that apple passed without discussion.

The President—I like the suggestion of Mr. Earle. I think, if brief, a few remarks would be of great use. The great difficulty is that we would be too lengthy.

ASTRACHAN, RED.—Mr. Earle—I move to strike out the Red Astrachan. It is very unproductive until it has attained a great age, especially from root graft.

Mr. Wier—I have had very good crops of apples at five years from root graft.

Mr. Nelson—It is one of our best apples. There is no difficulty about getting it early in top grafting.

Mr. Baldwin—I supposed it to be the best apple we had.

Mr. Huggins—It is, in St. Louis, one of our most saleable apples—very desirable—always sought after.

Motion lost.

AUTUMNAL STRAWBERRY.—Mr. M. L. Dunlap moved to strike out the Autumnal Strawberry in the Center. It is unprofitable for market, that is the reason I move to have it stricken out.

Mr. Wier—It is one of the most valuable market fruits, in my opinion: of very fine flavor. They have only failed one year since they came into our district. It is a beautiful grower, and a fine shaped tree.

The President—I will take the liberty to enter my own experience. I have it in several orchards—some old and some young. It is with me, found to be a most uniform bearer. I can scarcely tell of any equal to it. It is however a poor apple to handle—it will almost leave the marks of your finger upon it.

Motion lost.

AUTUMNAL SWEET SWAAR—Mr. Nelson moved to strike out the Autumnal Sweet Swaar for market in the North.

Mr. Bryant—I think it is not a good market apple, and not a profitable apple. It is not as good as represented by Thomas and others, as it has grown in the State of Illinois. It is neither excellent nor profitable.

The President—my experience concurs with that of Mr. Bryant—I regard it as not worth cultivating.

The question being on striking out, it was carried.

BACCOLINUS—Mr. Earle—I would like to hear something from Judge Brown, about Baccolinus. I move that it be added to the list for market in the South.

Judge Brown—The tree is very thrifty and productive. The only objection to it is its small size. It cooks remarkably well, and is of fine flavor. Whether it be very valuable as a market fruit I dont know, I believe it is liked best by those who have most of it. The tree is productive and hardy. It is a handsome apple but small; that is the only objection. It is a Southern apple. I would remark, that it had better remain another year where it is.

Mr. Earle withdrew his motion.

BELLEFLOWER, YELLOW—Mr. Wier—I move to strike out Bellefleur from the list, for family use in the North.

Mr. Earle—You may strike it from the list, but the people will raise it anyhow.

Mr. Wier—I have no doubt the people will plant trees, but I dont think they will raise much fruit. I have had it for 25 years, and this season is the only one we have had fruit to any extent. They have now

and then borne two apples—this year they bore half a crop. Not only is this so with young trees, but with old ones also.

Mr. Lewis, of La Salle—I have been trying to raise it for 25 years. I dont think I ever raised five bushels all told. If the gentleman can tell me how to raise it, I would be happy to raise it. I have them old and young, but we dont get fruit, and I fail to find out how to get it.

Mr. Bancroft—I have had some since 1862, and they are doing very well.

The President—It has caused us more discussion than any half dozen apples put together.

Mr. Nelson—I go against Bellefleur in any locality—that is prairie. I have a tree 20 years old, that has never had two bushels on it. I know places where they have a sandy loam, where they raise them well enough, but with me it is not so. I do not think it is worth setting on the black prairie.

Mr. Wier—I think the Bellefleur produces more blossom than any other fruit. The flower is not perfect; I have found them with stamens and without pistils. The blossom is extremely full, and takes away so much of the vigor of the tree, that it cannot do anything.

Mr. Bryant—I move to lay the Bellefleur on the table.

Mr. Earle—It is the best apple in Southern Illinois. I have known a man to pick 40 bushels of apples from 4 trees.

The President—I simply say that the Bellefleur produces reasonable crops in our location, and frequently large crops: and no one comes to buy apples but they ask for Bellefleur.

Mr. Baldwin—In certain localities it bears well. I think with this discussion upon its merits on the different soils, the thing will be well understood if it is retained on the list.

Motion lost.

BEN DAVIS—Mr. Flagg—I move that the Ben Davis be added to the list for market in the South; because it will sell better than some other apples, and is easily grown: not because it is very good.

Mr. Earle—Let us hear from Dr. Hull.

Dr. Hull—I dont want it, because it is possible to get better fruit.
Motion lost.

CAROLINA RED JUNE—Mr. Wier—I move that Carolina Red June be stricken from the list, for market and family use in the North.

Mr. Earle—I move as an amendment, that it be also stricken from the list for market in the South.

Mr. Wier accepted the amendment. On the trees he had there has been no fruit fit for any use for years. The first year they bore fairly, and then they seemed to lose their vigor, and the next and subsequent years bore none at all.

Mr. Nelson—I saw some trees in my neighborhood, where a man had budded Red June into Yellow Bellefleur and produced fine samples. He told me it had borne three years, and he thought it had shown as good as the best.

Mr. Foster—I do not fully understand one of the remarks of Mr. Wier—that the trees lost their vigor.

The President—I wish to know whether he meant that the variety had deteriorated constitutionally—whether it was in old trees or young—or whether he meant that particular trees had lost their vigor.

Mr. Wier—I mean that the variety has lost its constitutional vigor.

Mr. Foster—I speak directly to this point. Mr. Richard told me that he had raised good Red Junes by cultivating the ground, and that he admired the Red June.

Mr. Shephard—It is in my neighborhood, and it is very popular. I have never ascertained that there was any advantage in cultivating it. It is very fine in appearance, but unless you have it in very good ground, and give it good cultivation, it will soon over-bear itself. But, there is a prime objection in another aspect—it will take three of the Early June to be as big as one of the Red Astrachan. It is small and it is scabby, and in many cases you could not see the red unless you had a microscope.

Mr. Daggy—While it is true that it scabs very much, that is when it over-bears itself. When it bears sparse crops the apples are generally good.

Mr. Wier—I would say that you are mistaken about the sparse crop. My trees have had a medium crop for three years, but they have scabbed.

Mr. Baldwin—In reference to the scab it should be recollected that most of our varieties have scabbed within the last five years, and yet, we have some very excellent winter apples we do not want stricken out on that account. It is all nonsense about its having lost its vitality.

Mr. Galusha—I should be very sorry to see it stricken from the list for the North. As I remarked this morning, these cases of failure are either local or temporary. It seems to me unwise to strike it from the list simply because for a few successive years it has scabbed.

Mr. Earle—The remarks of Mr. Shephard were exactly applicable to Southern Illinois. They are very scabby, and very unworthy. I am not speaking for all Illinois, but only for my own neighborhood.

Mr. Brown—It does very well for my purposes.

The question then being on striking out, it was lost.

CRAIN'S SPICE.—Mr. Brown—Crain's Spice is a small apple, but a very excellent one, and a very fine grower. A. M. Lawver, of Cobden, has propagated it with success, and it ought to stand where it does.

CULLASAGA.—Mr. Brown—Cullasaga has been cultivated in my neighborhood. It is a very fine winter apple, but I do not know much about it.

The President—When does it appear to ripen?

Mr. Brown—I cannot tell. There will be a few specimens on the table to-morrow.

DAVIDGE.—Mr. Brown—The name is spelt wrong—it should be Davidge. It is a seedling, and the most promising winter apple I know of, but as very few have been propagated, it will not be for sale, probably, for a year or two, and it had better remain where it is. It is exceedingly productive, of very fine quality. It keeps with a less

amount of loss than anything I know of. It is good to eat in February and March.

DOMINE.—Mr. Wier—We consider the Domine one of the best apples we have to pack—always right and always good.

DUCHESS OF OLDENBURG.—Mr. Shephard—The Duchess is of no use with me any how. One of the difficulties is that we hardly ever get it; so, in our neighborhood it is useless. In my orchard it begins to ripen about the last of September. The tree corresponds with the description of the Oldenburg. I have, as yet, never got but one crop that was fit to offer to any one. It is a thifty grower, makes a very handsome head, and has a stout, vigorous shoot. The wood of the new growth is soft.

The President—That cannot be the Duchess of Oldenburg. The tree is not a vigorous grower—rather a moderate grower, and extremely hardy—the buds are rather long jointed, not very close together, the branches not very numerous. They do not produce very numerous shoots. The apple, in our part of the State, commences to ripen about the last of August. It was a fall apple in the East, and Charles Downing sent me the genuine one, which was exactly the same as mine. It is purely a question of climate. It is the most productive of anything I know, and I never saw a blotch or scab upon it.

Mr. Durley—I have them in bearing, answering to the description given by the President, and the tree has been almost worthless for 12 years. I never got a full crop from them.

Retained.

EARLY PENNOCK.—Mr. Earle—I move to strike out the Early Pennock for market and family use in the South.

Mr. Downing—It is one of the most profitable apples we have, and therefore I object to the motion to strike out for market and family use in the South.

The motion was lost.

EARLY STRAWBERRY.—Moved that it be stricken out for family use in the Center.

Mr. Bancroft—It is one of the best apples we have. I hope it will not be stricken out.

The motion was lost.

ENGLISH GOLDEN RUSSET.—Mr. Galusha—The English Golden Russet is that which has a dark brown appearance in its first year of growth, and a speckled appearance the second year. It is, by the best of testimony, our most regular and abundant bearer for the last few years. The only fault is blighting in the limbs, but the blight stops and does not injure the tree subsequently. It is entirely free from scab. The shoots are quite slender.

Mr. A. Bryant—I am rather surprised to see it recommended for a market fruit. I thought it would be good for anything except that. The fruit drops from the tree before it is ripe. After it is gathered, if it is not kept right in barrels, it wilts and shrivels up.

Mr. Huggins—I suppose I am correct, because I got the fact from my friend Galusha. Amidst scabbing and all other diseases this year, we found it perfect. I do not see why it should not sell.

Mr. Hilliard—I had a Golden Russet forty years ago. It was quite a small, yellowish russet, very high flavored, kept well. There were vast numbers of these trees propagated, but it never could be marketed, because of its size. It was good for family use. I have several new varieties of English Russet since, but nothing like that.

Mr. Baldwin—I am not certain about which apple I am speaking. There is a good deal of confusion. I have had a great many of them. There is a russet cultivated in our vicinity that cooks so well that it does not require peeling. I have with me a sample of the fruit which I will show to-morrow. If that is the English Russet, it ought to be cultivated, for there is no scab upon it, and it is a valuable fruit. It is a very good market apple, and a very good cooking apple.

Mr. Wier—I wish to say that I have planted pretty largely of this tree. Last fall I happened to make some cider from it, and I found it to be the most delicious cider I ever had. This fall I did not make

any cider, but I found the pies were the best I ever tasted. I do not think it is worth anything for an eating apple.

Mr. Carpenter—The English Golden Russet has always done well with us. This year they are very fine and of uniform size.

Mr. Galusha—In an orchard, the best cultivated of any I know, the English Golden Russet this year was twice the size I ever saw it before. At first I thought they were not the Russet, but I found they were. They had been manured and the land dug up for several feet around them. This shows that this variety will bear higher cultivation without injuriously affecting the fruit.

Retained.

GILPIN.—Mr. Earle moved to strike out for market use in the South, but the motion was not seconded.

HIGH-TOP SWEETING.—The President—I desire to ask if this is not meant to be the same as the Sweet June. They are generally considered synonyms, but they are not so.

Mr. Bryant, Sr.—I think Downing makes the two names synonymous.

Mr. Wier—I have both of them. They are very different trees; one ripens sooner than the other. Are either of them of any value?

Mr. Nelson—Does not Warder describe them as being identical?

The President—I do not think he does.

HORSE APPLE.—Mr. M. L. Dunlap—There is another apple called Horse Apple, whereas the Horse Apple properly so called is yellow.

KENTUCKY.—The President—I think Kentucky should be recommended for general cultivation. It has become very well known in our portion of the State. I think it is fully equal in value to the Maiden's Blush as an apple, and is a hardier tree. It is remarkably like the Ben Davis. It is rather a rich apple, about as acid as the Maiden's Blush—a little more acid than persons like to eat; it is a superior cooking apple, a great bearer, and ripens early.

KESWICK CODLIN.—Mr. Dudley—I move that it be stricken from the list; it is not good for anything.

Mr. Wier—I would like to know something about its not being good for anything.

Mr. Earle—It is too sour. You cannot get sugar enough to make it good.

Mr. Wier—I think I can make more money of it than of any apple that grows.

Retained.

Mr. Brown—I move to strike out the Keswick Codlin for market and family use North. We can do all with the Red Astrachan that we can do with the Keswick Codlin.

Mr. Bryant, Sr.—The Red Astrachan ripens earlier, and I have never found the Codlin good either for market or family use.

Mr. Woodward—In McHenry we could not do without it. We cultivate it as much as any kind. It ranks nearly with the Duchess, About Chicago and the northern part of Cook county it is raised more than any other.

Mr. Bliss—Some say we have not sugar enough to cook the abundance of it. I am very anxious to look at it, because it is good. If you put one-fourth into your dried apples it will give life to all of them. If you have been about half sick by eating these tasteless apples, and you eat one of them, you will stand up straight; and I could say more things in its favor.

Retained.

LADY APPLE.—Mr. Francis moved that the Lady Apple be struck out of the list for market in the Center, and the motion prevailed.

LARGE STRIPED PEARMAIN.—Mr. Brown—I think this apple is now well enough known to induce me to move that it be entered for market and family use in the South. It is a good sized apple—not very large—very fruitful—bearing very young.

Carried.

LARGE YELLOW BOUGH.—Mr. Bancroft—I have five trees of it; very fine fruit, but the tree is not a full bearer. They were plenty in 1862.

Mr. Wier—We have had trees bearing for about twenty years, but we consider them utterly worthless.

Mr. Durley—We have some sixteen or twenty years old that we find very valuable for family use, but not worth much for anything else.

Mr. Hammond—I move that it be stricken out from the Center. The motion was not entertained from want of a second.

MAY OF MYERS.—Mr. Wier—May of Myers bears on heavy clay land very fine fruit, and on light soils it is worthless. On thin soils it overbears and kills itself. On young trees on rich land it is a large apple, light green in color, and keeps until about the first of May, and has an insipid sweet flavor. The tree is very crooked and branchy and has a large spreading head. I should call it a tender tree. It comes into bearing young and bears very full.

Mr. Bryant, Sr. —I do not think we have any better keeping apples than the May of Myers. It is an apple inferior to the Gilpin. I have very little respect for the man's taste who would say it was a good apple. My experience is that it is not fit to put into a man's stomach.

Mr. Bliss—To say it is worthless is a mild term. Pour a bushel of them into a two-horse wagon, and I will warrant that you can drive two miles over a rough road without breaking the skin. It is entirely worthless whether for making cider or for any other purpose.

Mr. Galusha—I have had the apple for several years, and I would never plant it again if it was given to me. I regard the tree as being entirely worthless.

Mr. Wier—I do not wish to be understood as recommending the apple at all. I never have recommended it to any one. It is a good market apple, a good baking apple, and some people think a good deal of it to eat. I would as soon eat a potato.

Mr. Bliss—I move that it be struck out of the list for trial in the North.

Mr. Earle—What consistency is there in this action? We have retained several other apples. It would almost seem that the worthlessness of an apple, entitled it to a place on the list, and I think the May of Myers ought to go on.

Mr. Wier—If you are going to retain Ben Davis on the list, let the May of Myers be retained for trial.

Retained.

MELON—The President—Is there any person present who has fruited the Melon and the Newark, and has observed whether they are synonymous? I have done so, and found them to be the same. The character of the Newark King is the same as the Melon with me. This Newark King is an apple of a good, fair size, rather broad at the base, marbled and striped with red, and tapers considerably at the blossom. It is well defined at the basin, and there is a delicate network of russet. It is tender and juicy, rather a brisk pleasant acid. It is a late autumn and a early winter apple. Some will ripen and fall quite early.

Mr. Francis—I have one specimen. It is a very green specimen, and perhaps some of you could tell whether it was the same as the Newark Pippin. [Sample shown.]

The President—That is Norton's Melon. It is perhaps a little overgrown; the same variety I received for Newark King. Do you recognize this as the Newark King, Mr. Freeman?

Mr. Freeman—I do not recognize it as such.

MINKLER—Mr. Nelson—There must be some mistake about the Minkler, I see it is only recommended by one individual in the North. I move that it be entered for market and family use in the North.

Mr. Galusha—I would like to say one or two words about it. It is a red apple, round, and of medium size. The tree is remarkably ugly in its growth, but its habit of bearing is very good: it bears excellent crops. They may be kept safely until March. To show how the fruit is regarded in my own county: I was solicited, as a nurseryman, to get a certain apple, giving a local name, and graft it. For several years I was importuned to get that variety. When I did get the apple, I found it was the Minkler, which they had been cultivating as Logan's Northern Pippin. I have never heard of its failing anywhere. It is rich in its juice, but tough in its flesh, and I do not regard it as being a first class fruit. I would like to ask any one present if they have recognized the Minkler as a synonym of any other fruit?

Mr. M. L. Dunlap—I got some from Mr. Jones, which were called Brandywine. It is the same apple identically. I see that Warder, in his Pomology, describes them as two different apples.

Carried.

MOTHER—Mr. Bryant—Mother is a very fair bearer; not any richer apple to be found: it is rather an early fall apple; ripe in September and October; not always in September, but generally in October.

NORTHERN SPY—Mr. Huggins—I move that it be entered for market and family use in the Centre.

Mr. M. L. Dunlap—I move to amend by saying “special localities.”

Mr. Daggy—I move, as a further amendment, that we recommend it for our children.

Mr. Galusha—Northern Spy requires peculiar treatment.

Mr. Huggins—For our county it is just the right apple, and its value is just beginning to be appreciated. It is a slow apple in coming to bearing.

Mr. Bryant, Sr.—I think it is not always a very small tree that does the best bearing.

Mr. Huggins—It is one of these late bloomers, which is another thing in its flavor.

Mr. Wier—The Northern Spy commences to bloom about the eighth year after planting, but it proves to be a fall apple in our soil; and at the usual time of gathering it will all be on the ground. I do not consider it an apple to be recommended for a winter apple at all.

Mr. Bryant, Sr.—It appears to me that it gets better as the tree gets older.

Mr. Douglas—Mr. Wier seems to think the Northern Spy will not keep long enough to be a winter apple. I have sold them in the month of March. I remember very well one instance where I sold twenty barrels of them. I was busy at the time, and I sent the man into my cellar. I told him to examine them for himself. He went, and in a little while came back and said he had examined four barrels, and there were no bad ones amongst them. It did not matter about examining any further.

The President—In a warm autumn it begins to drop rather soon. In putting them up for winter there is no apple that grows that requires such great care. Every specimen should be examined to see that the skin is not broken at all. If the skin is not broken you may head them up in barrels. Handle your barrels carefully, and open them the first of March, and you will find a very small percentage of loss.

Mr. Wier—If we did not gather them before the last of September we should have none on the trees to gather. I say they won't keep in our neighborhood. They may on the prairies, but with us they won't.

Mr. Earle—It is an apple that is gaining in favor about South Pass.

Mr. Brown—In my locality it is too early, and therefore not to be recommended.

Mr. Earle—It is of large size and exceeding beauty. Its general magnificence of appearance will make it more saleable than almost any other apple. I would therefore recommend it for market and family use for special localities in the South.

The question being on so recommending it, it was carried.

NORTHERN SWEET.—Mr. Woodard—We have the Northern Sweet in Northern Illinois. It is of a medium size and very profitable. The trees that we have in bearing are young trees, but are very healthy, stand winter well, and are hardy.

Mr. Bryant—It is a hardy tree and bears very well. It is handsome, and of very fair size.

PRIMATE.—Mr. Wier—I consider it our best summer apple.

Mr. Daggy—I move that it be added for family use in the Center. I have cultivated it this year on a small scale, and it is very satisfactory. It bears young, and the fruit is of very good quality.

Mr. Bryant—My experience is that it is an amateur fruit.

Mr. Kinney—I have grown it for several years. It is a large, fine apple. The only fault I find with it is that it is rather inclined to be watery. It is a very refreshing apple, and a fair bearer.

Mr. Wier—I planted some in 1862. They commenced bearing in three years. Very fine fruit, larger than the Red June, and the flavor equally as good.

The President—Does not the Primate generally ripen very early, while a portion of the crop will be very late?

Mr. Wier—I do not find it so. I put mine in barrels four or five days before they were ripe, and in that time they were very fine, and I sold them at a high price. It commences bearing very early.

Motion lost.

PRYOR'S RED.—Mr. Francis—I move that Pryor's Red be stricken from the list for market in the Center.

Mr. Hammond—It is one of the most popular apples. It does not bear until it is twelve or fifteen years of age. It does not bear very large apples, but they are very uniform in size, and very handsome.

Mr. Shephard—I never saw any apple that varied so much in shape and size as this. It would be difficult to persuade a man that did not know it that they were the same apple. I admit that the quality is good.

The motion to strike out, not being seconded, was not entertained.

PERRY RUSSET.—Mr. Miller, of Iowa—I would like to say a few words about this apple. There is an apple in our State, grown very extensively, which I think is this apple. I have a few specimens of it with me.

Mr. M. L. Dunlap—It is large. I have grown it for several years. It is large at the base, and gradually tapers. It is a golden yellow—a beautiful apple, and valuable, but it fails to meet my expectations in the centre of the State.

Mr. Miller—That answers my idea, except as to the shape. It was called Perry Russet in the State of New York, and it originated within twenty-five miles of where I lived—in the town of Perry.

Dr. Hull—Warder says it is "Golden Apple," "Golden Russet."

Mr. Wier—I think that any one having once seen the tree would know it. It is a very hardy tree. As for its bearing qualities I do not know anything about them.

Mr. M. L. Dunlap—I had a splendid crop this year.

RAWLES' JANET.—Mr. Shephard—By inquiry I find that others have observed two varieties of this apple. I have seen it as large as a Domine, and I have seen it much smaller. I would ask whether that is the common apple. I have frequently been asked whether that was Rawles' Janet.

The President—In reply to the inquiry, I think that any one who has had any experience with the Janet, knows that it will sometimes produce very fine fruit, when not too old. It might do so on a well grown tree, when it had rested for a few years. At other times they would be inferior apples.

Mr. Francis—I am very glad this has been brought up. We have Janets grown from young trees, which are called uncommonly large, and I suppose that is all the difference. I took some to the house that was selling apples for us, and the proprietor told me that the Janets he was selling were still larger, and different from them; he was certain there was another variety.

Mr. Freeman—I think in the Southern part of the State it grows larger than it does in the Northern part.

Mr. Baldwin—I have observed two distinct varieties of the Janet. One is larger than the other, and a little redder—I think in consequence of being a little longer. The smaller one I do not think is quite as crisp and good an apple, but it keeps longer. There is no difference in the trees.

Mr. Brown—The Janet is a very common apple in Kentucky. This variation in size was so common there that it was commonly remarked that there were two varieties. The difference of the fruit, I think, arises from the condition of the trees. Now, of Pryor's Red in my county, a man whom I know says he has three distinct varieties, and they are so much unlike that a man unacquainted with them would say they were not the same fruit.

Mr. Francis—May it not be the case that one of these is a seedling from the original Janet?

Mr. Shephard—Those I saw were all taken from the same orchard and planted at the same time, and the trees looked very healthy. I could see a difference between them, and it may be owing to some local quality in the soil. The trees which I noticed particularly were precisely the same; there were no signs of age or decay; one was used as well as the other. I never saw apples look better than these did, and yet, there was this manifest difference.

Mr. Wier—I have been aware that the apple they have in Missouri was not the same as we have here. Their red is not the same—it is darker. Their apple is yellow, and ours is a whitish green. Theirs is the better apple of the two, I think.

The President—I am sorry that our notes will show a confusion in regard to this apple. I think it is necessary to say that I was for several years on the search for the big Janet. I procured it from different places, and twice from Missouri. It is all the same thing—it is all Janet.

RHODE ISLAND GREENING.—Mr. M. L. Dunlap—I move that Rhode Island Greening be recommended for market and family use in the Center. When it will break free from the stem it is time to harvest it.

Mr. Huggins—I have noticed that when everything else was spoiled, this apple was very little affected. It is an apple that is good for cooking in the family—that is my experience. It would not do to grow in a nursery, as it is an ill-shaped, crooked tree.

Mr. Miller—I will inquire whether in root-grafting, you got good fruit from it.

Mr. Huggins—Any way you can take it.

Mr. Wier—We have it top-grafted, and it bears young and very abundantly. Root-grafted, it is very vigorous, although it does not commence bearing early.

Mr. Baneroft—I have a good lot of these trees—they are healthy and good trees. I have had very fine fruit, but not a crop. I like them so well that I have commenced grafting them into other trees.

The motion to add it to the list for market and family use in the Center was carried.

A motion by Mr. Galusha to add it for family use in the North was lost.

SOPS OF WINE.—Mr. Huggins moved to add to the list for family use in the Center, but not being seconded, it was not entertained.

SPARKS' LATE.—Mr. Brown—If this apple were as well known in other districts as it is in mine, I should move that it be added for market and family use. It is remarkably fine in its growth, fruit handsome, and of the best quality. I am not making any motion about it, because it has not been sufficiently cultivated, but I recommend my friends to plant it in the North.

SOPS OF WINE again.—Mr. Huggins—Just one word as to the Sops of Wine. We have grown it for several years, and as a family apple we find it good. Speaking with one of my friends about early apples that were good, he remarked that they had simmered down to Sops of Wine—we had no early apples that were good except Keswick Codlin and Sops of Wine, and in uniting them we find they make most excellent sauce. The two being regular bearers, you will be sure to get apples when you want them.

Mr. M. L. Dunlap—I unfortunately have but ten trees that have been set ten or a dozen years, but I find them to be the best Summer varieties I have—the Keswick Codlin and Sops of Wine. They are first-rate apples, and profitable. Sops of Wine is a good apple—stained with red.

The President—I am not certain that the Sops of Wine we have reference to is what Charles Downing calls Sops of Wine.

Mr. Francis—In the East it is small, and stained more than it is here.

Mr. Hilliard—It is the only Summer apple of any consequence to me on my place.

The question then being on adding Sops of Wine for family use in the Center, it was carried.

Mr. Galusha—I move to add it for trial in the North.

Carried.

Mr. Earle—I move that we do now adjourn. Adjourned.

FIRST DAY — EVENING SESSION.

The President re-announced the special committees, so that persons now present, who had not before been present, might know who were the members.

At the request of the President, Judge Brown took the chair.

Mr. Flagg—Before entering on the business of the evening, I would announce that under the arrangements made, the fruit will be put on exhibition in one of the rooms below, and will be locked up until the examinations have been made by the committees. All the fruit should be received and in place by 8 o'clock to-morrow morning, thus giving until 9 o'clock for the examination of it.

The President—Under the rule as I understand it, we will now take up the order of business for the evening, which is the revision of the pear and quince lists.

Mr. Wier—The question of membership has not been settled yet.

Mr. Dunlap—I think that point is settled—that we leave it just as it is.

Mr. Earle—If we leave the point I suppose it stands constitutionally fixed at \$2. We remitted \$1 last year.

Mr. Galusha—At the time the subject was dropped the question was on my amendment to make the subscription a dollar and a half.

Mr. Wier moved to suspend the rules for the purpose of taking up this question.

Carried.

The question then being on the amendment of Mr. Galusha to make the subscription \$1 50,

Mr. Flagg read a statement showing the receipts from subscriptions for the years 1865, 1866, 1867, 1868, as follows :

1865.....	80 members.....	at \$2.....	\$160
1866.....	128 “.....	at \$1.....	\$128
1867.....	125 “.....	at \$2.....	\$250
1868.....	161 “.....	at \$1.....	\$161

Mr. M. L. Dunlap—I think we had better adhere to the one dollar system; that we had perhaps better manage our business with the intention of making cheap rates. These have not been fairly tested. In this last volume there has been a good deal published that does not belong to us. If we excluded all that, we should bring the cost to less than a dollar bound. Then another thing is the tardy manner of getting these transactions out. If they were put out promptly they would be anxiously sought after; as it is, they fall like a dead weight on the public. If we could make the volume complete and get it out, say by the first of March, then I have no doubt that the one dollar would get more money out of it than we get now. I wish it to be done fairly, squarely and promptly. This last one was pretty near the last of summer. The days of its usefulness were past.

Mr. Emery—The fee of two dollars could only be altered by a vote of two-thirds of those present.

Mr. Wier—I think that at the last meeting we had a vote of two-thirds of those present, and thereby the constitution was changed.

Mr. Baldwin—I think there was nothing said about changing the constitution; but to settle that I propose to test the vote again. I do not believe you will receive more than half the amount.

Mr. President—If it be true that the constitution was not changed on the last meeting, I shall consider the whole thing out of order.

Mr. Flagg—I will state that the record, as I have it, shows that there was a vote to reduce the membership fee to one dollar at the last meeting. I looked back at my minutes to see if there was any mistake made, and find they are consistent.

The President—The decision then is that the discussion is out of order.

Mr. Wier—I move that the constitution be so amended as to read one dollar instead of two dollars.

Mr. H. J. Dunlap—Who are members?

The President—I consider that all who were members last year are members now.

Mr. Earle—Let us not forget that volumes to members cost \$2

each, while to others they cost something over one dollar. Now, if we think we can give away volumes at half their cost, let us do so.

Mr. Galusha—I shall oppose this motion. From the records of the Secretary it appears that we should not be gaining our end. If we vote to reduce the subscription to one dollar it will be as an act of benevolence, and not as profit to the society. If by advertising the book, and stating what it contains, we can not induce people to purchase it at something like its value, so that we won't have to lose a great deal in the operation, we had better let it stand as it is, and let those who appreciate our enterprise get the book.

Mr. Daggy—The question to me appears to be this: shall the State donate to us for the purpose of covering the deficiency, or shall we pay it ourselves? If the treasury is in a healthy condition, and the State makes this annual appropriation for our use, then we ought to distribute these books.

Mr. Hilliard—I would ask what would be the probable deficiency of last year?

The President—There is no deficiency.

Mr. Woodard—I was in favor of the proceedings of last year. I was Treasurer of the Northern Illinois Horticultural Society, and I collected, at \$2 per member, between \$300 and \$400. We received the benefit of it in the books, and my experience is that money is the wheel on which we move, and if we cut ourselves short of the money we lose the life and light of our meeting and of our reading matter. It strikes me we had better pay the printer, and publish to the world all that we do, and be liberal enough to pay the costs.

The question being on Mr. Wier's motion, it was declared lost.

Mr. Wier demanded a division, when there appeared for the motion, 9; against it, 11.

The motion was therefore lost.

REVISION OF THE APPLE LIST AGAIN.

The President—The next thing in regular order is the revision of the Pear and Quince lists.

Mr. Woodard—I move that the rules be suspended, and that the revision of the Apple list be first completed. The motion was agreed to.

SOPS OF WINE again.—Mr. Woodard—I move that Sops of Wine be added for market and family use in the North. If not out of order, I would state that in McHenry county Sops of Wine is among our early apples. It bears transportation well, is an abundant bearer. Almost everything you can say in its favor is deserved, so much so that it stands now, in our county, among the first. It is a good bearer, a tough, hardy tree, and is better than almost anything we have there.

Mr. Douglas—In Southern Wisconsin it is prized as Williams' Favorite. It is not the Williams' Favorite, but it is grown as such in that district.

Carried.

WHITE WINTER PEARMAIN.—Mr. Earle—It is about as near worthless as an apple can well be. It is uniformly scabbed and one-sided. I would like to have it taken off the list for market in the South.

Mr. Hammond—I would like to amend by including the centre.

The apple was perfectly worthless in that district.

The question being on the amendment, it was lost.

Mr. Wright—I only say that I am not ready to take it off. I have seen some very fair specimens this year. I do not know how much the defects spoken of were owing to cultivation. Mr. Earle speaks of its being uniformly scabby. I have seen some very good specimens, and until I am better satisfied that it is worthless, I am not prepared to go against it. And even now, as we sometimes get it with full crops, it is one of our best apples, and I should be sorry to see it taken off.

Mr. Freeman—In our section we have only had an experience of about ten years. Our early experience was very good, and it is only lately that it has been scabby. I think it would be hasty to take it off the list now.

Dr. Hull—It always appeared to me that we were doing wrong in

striking out apples simply because they are scabby. I am pretty positive that the scab is the work of a little louse. The remedy is so easy and so effectual, that it appears to me we ought not to act hastily in the matter. I made very careful observation of this difficulty in the Spring, and found that these little marks called "scab" originated from the puncture of a louse. This wound is made quite early, after the apple is in bloom. Tobacco-water and soap will kill the lice without any difficulty. You, perhaps, recollect Dr. Walsh's visit to our neighborhood. He spoke about the lady-bird eating the eggs of these lice. The lady-birds were destroyed by the soldier-beetle, and the result was our trees were literally swarming with lice. I would, therefore, act with caution in discarding any of these apples. I never saw finer specimens than I saw growing in my locality.

Mr. Huggins—We regard it as one of our best Winter apples.

Mr. Earle—I have accomplished the object of my motion, and, therefore, withdraw it.

Dr. Hull—The Winesap is one of those varieties that are uniformly scabby this year. It is a little singular that these lice appear to feed upon the leaves of some varieties, upon the twigs of others, and upon the fruit of others; but upon this Winesap they prey on all three. I cannot tell you the reason. The smooth varieties, generally, are more or less affected; some of them escape; the Keswick Codlin escapes. I cannot tell you how it is, anymore than I can tell you why the grasshopper prefers my Newtown Pippin to the Janet, but so it is.

The President [McWhorter]—There are some little spurs that live, and some that die, giving the tree a half dead appearance through the Summer. I would like to hear from some gentleman on that.

Mr. Brown—It was so in my orchard last year to such an extent that I supposed they would hold no crop this year.

Mr. Hilliard—I noticed that myself.

The President—In the orchards in my neighborhood there has been no scab this year, but our orchards are literally swarming with lady-birds.

Mr. Earle—The Winesap with us is perfectly free, and our whole country is covered with lady-birds.

Mr. Holcomb—I have the White Pearmain, the Carolina Red June and the Winesap. The Winesap is perfectly free and the others are scabby. I have seen Pearmainns that were fair, but not in my orchard. That particular part of the orchard is rather low, and has not been cultivated like the others.

Mr. Riley—I can only say what I have said before, that I incline to believe that Dr. Hull has given us the true theory of scab; yet I can give no corroborative testimony, and prefer to withhold a definite opinion till the proper experiments are instituted another year. I have long since believed that the lice were instrumental in causing the gnarled appearance often observable in apples; because their punctures have the direct effect of causing a depression or sinking of the fruit surface, or a shrinkage of the leaf or stem. The only way in which I can conceive that the lice produce scab, is by their punctures furnishing a nidus for some cryptogam. As another fact which might militate against the Doctor's theory, I will mention that the scab has extensively prevailed around St. Louis the past season, notwithstanding the lady-birds were unusually numerous early in the spring, and, aided by the feathered birds, effectually cleared the trees of lice.

I can hardly conceive how the Spined soldier-bug—the Potato-beetle enemy which Dr. Hull alludes to—could be instrumental in annihilating the lady-birds, which are so active and fly so readily. I only know of one instance where the soldier-bug has been observed to attack a lady-bird, and this species was the Nine-marked lady-bird, and not the spotted species which is most common on our apple trees. Another objection to Dr. Hull's theory is, that the lice are mostly killed off by their natural enemies, before the fruit is formed.

As to the deadening of the spurs which Mr. McWhorter refers to, I can only say that there is a kind of spur blight very common, which is not caused by insects, while twigs are often killed by insects, especially by small boring beetles, belonging to the genera *Tomicus* and *Scolytus*. The former kind, or that not caused by insects, was very

common the last season in Mr. O. L. Barler's orchard at Alton, and I observed that the wood below the dead portion was invariably swollen.

Mr. McWhorter—There is one little remark I wish to make, with reference to the scabbing of the apples. I have observed, from year to year, that the scab prevails most extensively, on trees that have overborne the previous year. I scarcely have known an instance of scabbing to any extent, on young vigorous trees, not exhausted by previous crops.

Mr. Wier—I have not examined as closely as I could wish, but by the aid of a common magnifying glass, in every instance I found the spur incircled with a very narrow film of fur. I would ask if any one else has noticed this fur. (Referring to the dead spurs.)

Mr. Riley—I have observed that very frequently the bark would crack on the green portion, and I have noticed that the wood immediately below the dead portion was swollen, and it would appear to me that it was strangled there. I have found no insect work about the peculiar spur blight you are now discussing.

Mr. Holcomb—In our locality where we have the lady-birds, we have also a great many of these soldier beetles.

Mr. M. L. Dunlap—When was their first appearance?

Mr. Holcomb—I do not know, but I have noticed them for two or three years.

Dr. Hull—You understand the difference between the soldier beetle and the cannibal beetle?

Mr. Holcomb—I think I know the beetle you speak of. It is a bug about half an inch long, a narrow back, and spots on his wing.

Mr. Riley—Mr. Holcomb refers to a yellow, narrow beetle—the Pennsylvania soldier beetle—which, in the larva state, attacks with its jaws the common euculio; and Dr. Hull refers to the soldier bug—a true bug (order, *Hemiptera*)—which, in the perfect state, stabs and kills with its beak the Colorado potato beetle, and, occasionally, also lady-birds. The misunderstanding arises from misuse of the popular terms beetle and bug, unaccompanied by the scientific name.

Mr. Holcomb—I feel there is nothing in my mind contrary to his

theory. I do not think what I have said about soldier beetles is anything against his theory, because these bugs may have something else to do than to attack the lady-birds.

ADDITIONAL APPLES.

Mr. Foster—I would recommend the Montreal Beauty Crab for market and family use North; my wife likes it.

Mr. Galusha—I have grown it for four or five years. It is rich and fine, and my wife concurs with Mrs. Foster in her good opinion of it.

Mr. Foster—The apple is much like the Transcendent. I compared them at the State Fair, and we rather thought it was superior in quality. It is a little larger than the Transcendent. It is a beautiful tree, and Mr. Verry Aldrich says: "I do think, when it is in fruit, it is the handsomest tree I ever saw."

Mr. Woodward—I would move that the Hyslop be added for market and family use North. I might add that it is becoming a favorite with us, and also in the State of Wisconsin—I might say in the Northwest. The more we have of it the better it seems to take, and I certainly see no reason why it could not rank with any in beauty, and it keeps well in winter.

Mr. Galusha—I shall go against adding any fruit that does not give us an advance in some direction. I vote for the Montreal. The best claim for the Hyslop is that it is equal to the Transcendent.

Mr. Woodward—In answer to that I would say that with us it is cultivated extensively. There is as much call for it as any crab, and those who have it in bearing are the most desirous of having it and keeping it. It matters very little to me whether it is placed on the list or not, so far as I am individually concerned. We shall certainly have to take off the yellow if we are to advance. These are certainly in advance of the yellow, and I cannot see any reason why it should not be placed on the list.

Motion lost.

Mr. Keith—I move that the Stannard apple be added for market and family, North.

Mr. M. L. Dunlap—I move to amend by including the Center.

Mr. Keith accepted the amendment.

Mr. Dunlap—It seems to me that by this course you will be changing every year. I have no axe to grind. If there is any apple in the whole list that is better than another it is the “Stannard,” in the north part of the State. I have had over 4,000 bushels this year, of which 700 were Stannard. It has never missed a fair crop in the last twenty years. There is no apple brings the same price at its season, and its season is the longest of any. It comes in for eating in the early part of October, and it will last two months yet. I have sold a great many barrels in Chicago. They have been picked up by the Italians who keep the fruit stands, and in less than three days after it became known that we had them we sold upwards of 100 barrels out of our own cellar. Within the last few years I have advertised that I would send scions to any individual who would send postage. I have done so for the purpose of disseminating this very useful and valuable variety. I am somewhat astonished that it is so very little known after all these years; but it only shows one thing, that the most useful are the slowest to come into general use while a humbug takes our attention like a whirlwind.

The motion as amended was then agreed to.

REVISION OF THE PEAR AND QUINCE LISTS.

BARTLETT.—Mr. Galusha—I move that the Bartlett be stricken out for family use in the North. We have better pears, and not so much subject to blight as the Bartlett. It sells well, therefore let it go to the market. We raise it and sell it because it will bring money.

Mr. Foster—For a market pear, it is with me number one.

Mr. McWhorter—It can hardly be serious, it appears to me, this motion to strike the Bartlett out.

Motion lost.

BELLE LUCRATIVE.—Mr. Earle—I was going to say that it is the best pear in the world, to eat, but it is a very poor market pear. It never colors up after it is gathered. If it has not done this before it

is taken from the tree, it never gains any more; it will be green and never change that color. I know of no other fault than this and the tendency to rot at the core.

Mr. Galusha—I would like to raise Belle Lucrative to eat and Bartlett to sell.

Dr. Hull—I would combine both of them; I would take Belle Lucrative to eat and also for market. It is a much better pear to eat than the Bartlett, and if you are accustomed to send good fruit and none other to market, they will pay you for them; but if you are not, then they discard your good brands.

Mr. Hilliard—I think if we discard the Bartlett from the list, we may as well hang up our fiddle and go home.

Mr. Pierson—The Belle Lucrative with us colors up and becomes quite yellow. It is a most wonderful pear, and bears as well as any apple tree in our orchard.

BEURRE BOSC.—Dr. Hull—If I were called upon to mention the best pears, I would say that Beurre Bosc was one of them, and Beurre D'Anjou another. In my locality it is without fault.

Mr. Douglas—One of the best in our locality.

Mr. Woodward—It is one of the best in our locality.

Mr. Brown—My idea has been that it was not quite so fruitful as some others, but it is nearly as perfect as I can get them up. My trees are nearly ten years old, and dwarfs at that.

BEURRE DIEZ.—Dr. Hull—Shall we not be in favor of letting that go? I am in favor of it.

Mr. Earle—The tree does not hold its leaves well, it does not ripen well, and so far as I have seen, the fruit is very astringent, very poor, and cracks as badly as anything we have.

Mr. Hull—That matter of shedding leaves is one that is very easy to control. I will explain, to-morrow, a certain process that entirely obviates the shedding of the leaves.

Mr. Brown—With me, two years ago, it was remarkably fine. The trees were loaded with fruit. I think they would average half

a pound, and I think some of them were a pound; of fine appearance and quality.

BEURRE, EASTER.—Dr. Hull—If I were to be confined to one variety, that is the one I would confine myself to for market, for family use, and for profit.

Mr. Brown—It does well in my part of the country, ripening about midwinter; very valuable on that account.

Mr. Earle—It is a very fine grower; I know nothing that grows better; the wood is hardy; it seems to hold its leaves excellently well, and so far as I have had an opportunity of testing the fruit, it is very good indeed. If the tree is allowed to overbear, I think it will be small, and not excellent. With us, in the South, they have been kept until April or May I think.

BEURRE GIFFARD.—Mr. Brown—I consider it one of the finest of our early pears for size and quality. It ripens about two weeks before the Bartlett with me.

Mr. Wright—I have raised it, and it is a very fine pear, but does it produce well anywhere? So far as I know, it has a very few pears on a tree. The tree is also a very bad grower; it grows in very bad shape.

Dr. Hull—It is a very good market pear; not the very best, but a good pear.

CLAPP'S FAVORITE.—Mr. Flagg—I have fruited this pear, top grafted, this year. The leaves did not stay; and I suspect it was not true. It seemed to me more like Beurre Clairgeau.

Mr. Earle—I do not think it has been fruited in our district. The tree has the appearance of Flemish Beauty. Its reputation at the East is getting bad, on account of its rotting at the core. I think it is not going to answer.

DEARBORN'S SEEDLING.—Dr. Hull—It is too small for market.

Mr. Hyde—I corroborate that.

Mr. Galusha—Is there anything larger that comes in at the same time?

Mr. Hyde—Bloodgood, Doyenne d'Ete, Tyson.

DOYENNE D'ETE.—Mr. Wright—It is so small and you get so few. It is a fine flavored pear, and being early it brings a large price, but I cannot consider it profitable for market. The tree is a poor grower. I have never seen any large tree, or a tree that bears any considerable amount.

Mr. Flagg—I only have a test of one tree, but that has been quite a fair bearer and a good grower.

Mr. Edwards—I have had it some years, and with me it is the very best of its size. They are on their own roots.

Mr. Douglas—I would not advise growing it on quince, as they seem to break off.

Mr. Earle—I have not it on quince at all. It grows as a standard with me.

Mr. Edwards—It ripens with me in the month of July, and is far superior to Bloodgood, or Dearborn Seedling.

Mr. Wier—I have one that has grown very heavily and borne very abundantly; it has borne itself to death.

Mr. Daggy—I have one on a quince root; I think it has borne so that it will kill itself.

DOYENNE WHITE.—Mr. Douglas—I move to strike it off the list for North, Center and South.

Mr. Edwards—Has any gentleman known it fruiting for any length of time worked on the thorn? I have had two trees grafted in the spring of 1866; one died two or three years ago, the other one is still bearing crops of perfect fruit; no crack whatever. On the pear root or quince they crack.

Mr. McWhorter—I have one tree standing in a neglected corner of my garden which was grafted on a Washington thorn, and it has borne well and not cracked any to speak of. I do remember picking up one or two pears this year that have had some cracks in them. It has been sodded around with blue grass and been entirely neglected.

Dr. Hull—I think we had better leave it off. I have seen it sometimes cracked and sometimes not. I have seen it bear very fine

pears, but when it is so it is not like Eastern grown pears. I would be in favor of discarding it.

Mr. Douglas—Why I move to strike it from the list is this: It cracked at Boston twenty-five years ago. After that it was the best pear in Western New York, and it was the only pear that came to the Chicago market; but it has cracked there and is worthless there. It finally began to crack near Waukegan. About three or four years after it began to crack on sandy or gravelly soil it began to crack on clay land. At Freeport a gentleman from Iowa said it was the best pear there. Why I move to strike it out is that if we do not it will be planted in new places and people will be sorry for it afterwards.

Mr. Bryant, Sr.—It has cracked with me this season the first time; previously it has always been fair.

Mr. Freeman—At South Pass it was up for discussion and was retained on the list through the influence of the gentleman who occupies the chair. That leads me to make a remark which may influence its cultivation and suggest a remedy for the faults complained of. The circumstance struck me very forcibly as indicating that there was something in the soil that had to do with it. But since this meeting referred to I have been investigating these soils, and it is a soil very different to what we have at South Pass; it is what is known in geology as the loess, and is a magnificent species of soil for producing fine growths. Mr. Douglas states that it fails on sandy soil first and on clay soil later. The soil where he lives is well calculated to retain moisture to that extent which moisture loving trees like, and I suppose this is a clue to the cracking. Another thing, I could say, that the climate at Judge Brown's is also somewhat favorable.

Mr. Pierson—I have studied the pear in a great many localities in our State, and my impression now is that in 19 out of 20 localities this pear is a failure, and it strikes me that to keep it on our list when it fails in nineteen-twentieths of cases is very bad policy. If it were a new pear there would be some room for investigation, but I see no motive for cultivating where it was so certain it would fail. In my

locality it is a total failure; and on land which had these characteristics of moisture.

Mr. Freeman—I do not want a wet soil.

Mr. Pierson—Well they were on a soil that withstands drought well without being wet. I have seen a great many trees as black as if they had cracked all to pieces. I saw one large orchard of about a hundred trees, and I looked to find one pear that was fit to eat but could not do so, though the trees were loaded heavily. My recollection was that this pear was discarded last year by this Society. It was retained by some oversight perhaps.

Mr. Flagg—We did not discuss it last year at all.

Mr. Freeman—My object was to say that it is a pear that is widely disseminated, and to suggest a remedy so as to save it.

Mr. Earle—I would suggest that it be made to stand for special localities. It has cracked very little in our locality. At Judge Brown's it is really a first-class pear in all respects. I should be unwilling to have it taken off the list. I will make a motion that it be so modified.

Mr. Douglas—I withdraw my motion.

Mr. Wier—In our neighborhood we have it on a great variety of soils. I think I have as good soil as there is in Illinois. The last three years it has been a failure everywhere. Every pear that I have seen has been worthless. I am changing my trees into anything else that I can get. They do not appear to graft well. I suppose I had 15 bushels of White Doyenne this year, but I wish to ask Dr. Hull if the crack is caused by the *Aphis* same as on the apple; the fungus appears to be the same.

Dr. Hull—It is impossible for the fungus to be the same. The skin of the pear is nothing but modified leaf, and when the growth of the skin is arrested and the growth of the interior continues, it bursts itself open. This fungus seems to curtail the expansion, and hence the cracking of the sides.

Mr. Humphrey—It is spoken of as being successful when grafted on the thorn.

Mr. Edwards—I have not tried it extensively in that line. I think some one might have had experience same as my own.

Mr. Pierson—I find this matter was up at the last meeting but one, and I find that every one who spoke on the subject at that time was against its continuance on the list, except Mr. Bryant and Mr. Earle. I find that several say it has been good, but that it was then a failure. Mr. Bryant now comes forward and says it is a failure with him this year. Now I hold that a pear which is so universally a failure, on which so many thousands of dollars have been spent, and when there is only one locality that can speak in favor of it, I say that it ought to be recommended solely for that one locality. It grows very vigorously, and it is a very pretty tree, but I do not like to see it covered with these miserable black crooked pears. I thought I would put out a hundred because it was on the list, and I went visiting localities and found out, until at last I came down to two. I say let it be recommended for South Pass only.

The question being on recommending it for special localities, it was—Carried.

Mr. Brown—Is any one experienced with the Grey Doyenne?

Dr. Hull—It cracks, but it is really a first class pear. I have found points where they all cracked, but I do not think we ought to discard pears because they crack, yet there are other varieties that are so liable to crack that they ought to be discarded. I never had one crack and I never expect to have.

Mr. Pierson—That pear bears very finely in my neighborhood. It is very healthy, and I have no notion of its cracking.

Mr. Brown—With me it ripens with the White Doyenne. It is fully equal in quality, I think better, but not quite so productive. Those who discard the White might attempt the Grey.

DUCHESSE D'ANGOULEME.—Dr. Hull—I would not grow it because they are too large, and not first rate in quality, and do not sell for any more than others. I go in for the first quality of fruit.

Mr. Galusha—How does it compare with the Bartlett in quality?

Dr. Hull—The Bartlett is a much better pear. We find our good names are worth more to us than even a large amount of fruit.

FLEMISH BEAUTY.—Mr. Woodard—It stands foremost in McHenry. It is considered the best we have.

Mr. Wier—We consider it the best pear we have in our neighborhood.

Mr. Keith—In Cook county we consider it the best pear we have.

GLOUT MORCEAU.—Mr. Foster—I recommend it for market and family use in the North. As far as my own experience goes, the tree is subject to blight and the fruit is astringent.

HOWELL.—Mr. Wier—I would move to recommend it for market and family use in the North.

Dr. Hull—I told you which were my first two varieties—this is the third—Howell, Beurre Bosc, Beurre D'Anjou.

Mr. Galusha moved to amend by saying “for trial in the North.” It was not sufficiently known to recommend it.

Mr. Douglas—I thought it had been sufficiently tried North. I recollect very distinctly its being spoken of well in the North. I have had it in bearing from ten to twelve years, and the only fault I find with it is that the fruit spurs seem to be tender. The Bartlett is somewhat so, and the Duchesse a good deal so, and I think there must be gentlemen here who have fruited the Howell and found it so.

Mr. Earle—I think our friends in the North will find it all right if they can get it to bear. Its fruit buds are more tender because they swell with heat. With that single exception it is about the best pear we have any knowledge of.

Mr. Douglas—I think it is quite as hardy as the Bartlett or the Duchesse—quite as good a pear—but it does not bear quite so young.

Mr. Earle—I think it would be found to bear as early as the Bartlett but for that tenderness of the buds.

Mr. Hilliard—I think there are more trees of that kind planted out than any other variety.

Mr. Douglas—There are a good many Howells that parties do not know to be Howells.

Mr. Edwards—Mr. Hausen, of Lee county, has fruited it, and considers it one of the best.

Mr. Galusha withdrew his amendment.

Motion carried.

LAWRENCE.—Mr. Hyde—One of the best pears of the season.

Mr. Douglas—Quite hardy with us—late coming into bearing, but a very healthy tree, and holds the leaf well.

Mr. Bryant—My experience is that it has been planted fourteen years without any fruit.

Mr. Douglas—I think it is a very good sign in a pear tree not to come into bearing too early. I have had the pear about seventeen years, and it must have been about three years from the bud before I planted it, and it is only about two years that it has borne; it looks very promising, however.

Mr. Earle—As regards its earliness in bearing it is without any peer with us in Egypt. We have some of these trees that are pretty well set with fruit buds—about four years planted. I do not think it has any fault whatever. I do not think I could say that with so much emphasis with regard to any other variety. It is perfectly hardy as a tree; it holds its leaves well; it bears well; it never rots at the core, and there is no better pear grown than the Lawrence.

MADELEINE.—Mr. Brown—It is very liable to blight at all times, and I do not think it is valuable on that account.

NAPOLEON.—Mr. Hyde—I move that Napoleon be stricken from the list. Carried.

MADELEINE, again.—Mr. Galusha—I move the same as to Madeleine. Carried.

LOUISE BONNE DE JERSEY.—Mr. Earle—I would like to hear something about this. I have a good many of them, and I want to know what to do. It leaf-blight very badly—no tree worse. It is an excellent pear where the tree holds its leaf. I have seen that variety the past year in a number of localities, standing in grass, and under these circumstances it has held its leaves very well, and ripened its fruit perfectly; but whenever it does lose its leaves it is very astringent, and

is not worth anything. Now, what I want to know is this, does seeding down the ground help any tree in holding its leaves?

Mr. Douglas—I have nearly 200 of Bartlett's in bearing. I have one that stands on the lawn, and that tree has done more than any one of the others. I believe if it stood up in tall blue grass it would be run out entirely. Mr. Meehan and Dr. Warder saw it last season, and I think I called Dr. Hull's attention to it. I have a good deal of faith in that. Mr. Meehan has advocated that for several years. He claims that where you give grass surface good manuring the roots will not penetrate deeply; keep your land in good tilth, keep it rich, and mow your grass often, and your trees will do better there than any where else. Now, I wish that some of our horticulturists would try these things—there is a great deal in them. If each one of us would just try a tree or two it would be a benefit to all of us.

Mr. Earle—I am delighted to hear the remarks of Mr. Douglas. I would not have this subject begun to-night, as we have to hear Mr. Meehan.

Mr. Freeman—I should think, that without regarding differences in climate, with our elevated position in Egypt, we have an excessively dry condition to work against, and we want mulching pretty heavily to keep the soil moist below.

Mr. Pierson—I will state the experience in my neighborhood. Those which bear most uniformly and most abundantly are all in grass. I know Louise Bonne, standing in a blue grass spot right on the top of our sand hills, in the yellow sand, and it bears abundantly every year. I call to mind eight or ten pear trees in another blue grass place, and they produce an abundance of pears for a large family, and they bear uniformly: there are the Grey Doyenne, Beurre D'Anjou, and some other varieties. I think the gentleman told me that the only culture he gave them was to pour chamber-lye on them.

Mr. Earle—Does the Louise Bonne lose its leaves with you under any circumstances?

Mr. Pierson—I have never known it yet. They are in a high state

of cultivation, and I do not know of its dropping its leaves in that neighborhood.

ONONDAGA.—Dr. Hull—I move to strike it from the list.

Mr. M. L. Dunlap—I find it one of the most profitable pears I have.

Mr. Earle—Would it be well to recommend it in the South for special localities? It is, in a few cases, a very superior fruit.

Dr. Hull withdrew his motion.

OSBAND'S SUMMER.—Mr. Douglas—This is one of the very hardiest trees. The pear is not as good as some, but the tree is a very fair bearer, and it is a very handsome pear.

ROSTIEZER.—Mr. Hyde—It has borne fair crops with me for the last four years.

SECKEL.—Mr. Galusha—I move to strike out for market and family use North.

Mr. Foster—I like the pear very much to cultivate.

Mr. Douglas—I think it will bear higher culture than others. The Seckel is a good hardy tree, a good bearer, and still it is a little fickle sometimes. I have known within the last eighteen years that they would be killed in winter; but as a general thing it is pretty hardy.

Mr. Galusha—How does it compare with Flemish Beauty in quality?

Mr. Douglas—Is there any gentleman here acquainted with Kirtland?

Mr. Earle—I know very little about it. It is a very pretty growing tree.

Mr. Flagg—I fruited it this year. The tree is very nice; the fruit is not very large, handsome, and I thought not very good—rather insipid.

SHELDON.—Mr. Hyde—I call it number one in every respect, and have never seen any crack on it. It ripens just after the Bartlett, probably about two weeks later; it holds its leaves well.

Mr. Earle—It is not one of the best with me in that respect. It is with the Duchesse in season so far as I can recollect. It seems to reach a position where it is a very good pear, and then in a day or two it is far gone and mellow. I am not satisfied that it is going to be a very good pear for us.

Mr. Hyde—I had them in Chicago for sale on Thanksgiving day, and sold them for \$2.50. a box.

Mr. Hilliard—It is the best early pear we have.

Mr. Earle—It is a very good pear and the tree is very healthy. It dont hold its leaves very late in the summer; but it holds them until after the fruit is gathered. It is not liable to blight. It is only a moderate grower. It is a fine Beurre to be sure. There is not anything as good at the time. It is equal to the Seckel in quality though not so large. It stands side by side with the Seckel with regard to its freedom from blight.

Mr. Douglas—That is my experience.

URBANISTE.—Mr. Douglas—A good hardy tree with us.

VICAR OF WINKFIELD.—Dr. Hull—I move to strike it from the list for the whole length of the State.

Mr. Earle—It is a very good cooking pear. I think it should be retained. It sells well in Chicago, and therefore we should not strike it from the list.

Mr. Hilliard—I do not think they will ever get mellow if you boil them all day.

Mr. Pierson—I have learned from some source that the vigor degenerates as you go south: that it is no better in Egypt than a peanut. If that is so perhaps we had better strike it out.

Motion lost.

WINTER NELIS.—Dr. Hull—It is a good pear.

Mr. Hyde—It is not so good as Lawrence.

Mr. Douglas—It is not a good pear on our gravelly and sandy soil.

QUINCES.

The following paper, received too late to be read at the meeting, is here inserted:

TROY, MADISON CO., Dec. 11th, 1869.

W. C. FLAGG, *Alton, Ills.*:

In answer to the letter you wrote me Oct. 7th, in regard to the growing of Quinces, I would be glad to meet you in your Society at Ottawa, but my education forbids my making speeches, or writing essays to be read in public. I am sorry it is so. But I give you a short sketch of my experience in the management of the Quince.

1st. It must have a very rich soil. This is of great importance.

2d. Get as many branches near the ground as you can. Let them run up thick, (I have from 3 to 14) and when they begin to bear the fruit will spread the tops. I have them as above when at the fourth year, from small sprouts, they bore one-quarter of a bushel to the bush. I think they should be pruned with care, and not as is the rule with other trees. I only cut the thorns, dead branches, and dwarf limbs, leaving the water sprouts to go up and form, as it were, a new tree, thus keeping the tree healthy, cutting off the old limbs when they begin to fail.

I have been treating trees in this way for 25 years, and they are now among my finest bearers. I speak of the Orange kind; other kinds may be treated differently. If I should meet your Society I would make the earnest inquiry as to what the Orange Quince is, for in this doctors differ. I think none other worth propagating. I have about 650 trees in bearing, or two acres planted, 12 feet apart, one acre young the other old; the old does best. I sold last year about 100 barrels for about \$900; this year 70 barrels for about \$400; bad this year on account of blight. I had a conversation with Dr. Hull last spring in regard to blight. I think he is mistaken in saying that root pruning will stop the blight. I think they blight when the roots are not diseased. I have a small nursery of young trees started last year and they blighted fully as much as my old trees. I think the blight this year was caused by the cold wet and late spring, causing the trees to grow rapidly until the sudden dry and warm weather set in, that somehow affected the sap that caused the blight. If this can be of any benefit to you in any way I will be glad of it.

Yours truly,

LYMAN BARBER.

Mr. Bliss—The Orange Quince I find to be a good one, and it bears with me regularly every year. For 20 or 30 years, and I think 30 years, I have not failed of a crop. I think it can be raised generally without any trouble. The soil suitable for pears is suitable for it. My soil is perhaps a little sandy, prairie soil, with a very tenacious sub-soil within 3 or 3½ feet of the surface. The way I have succeeded is to plow rather deep and then to plow up in the center, and throw on some sod in the Spring, and continue to throw up the sod.

Mr. Woodard—I move that we do now adjourn until half-past eight to-morrow morning.

The motion prevailed and the meeting stood adjourned.

SECOND DAY—MORNING SESSION.

The Society met at half past 8 o'clock pursuant to adjournment. President McWhorter in the chair: Mr. Foster opened the proceedings with prayer.

SECRETARY PRO TEM.

At the request of the President, and in the absence of Mr. Flagg who was engaged in arranging the fruit tables,

Mr. Earle consented to act as Secretary pro tem.

ORDER OF BUSINESS.

Mr. Murtfeldt, of Missouri—Moved that the peach list be passed over, and that the cherry list be taken up.

Mr. Freeman—I would like to have a new peach put in it before it is absolutely passed over.

The President—The intention was to wait until Mr Flagg came in; not to pass it over entirely.

The motion of Mr. Murtfeldt was then agreed to.

NECTARINE LIST.

ELRUGE—Dr. Hull—I have had considerable experience with Nectarines, and I think Elruge and Downton ought to be the only ones on our list.

PITMASTON'S ORANGE—Dr. Hull—That is a very beautiful thing, but it does not bear sufficiently.

CHERRY LIST.

BELLE DE CHOISEY.—Dr. Hull—This is a beautiful thing. We at one time considered it as hardy as the Dukes; latterly we do not. It is more liable to splitting of the bark. It sheds its leaf at the second growth. It sheds its bark from the juices not being elaborated.

BIGARREAU, OR YELLOW SPANISH.—Dr. Hull—It is the best of the class of the white or yellow: exceedingly productive, and as hardy as the majority of that class; but it won't bear comparison with the Dukes.

BLACK EAGLE.—Dr. Hull—Black Eagle is a hardy fellow. It is fully up to the description given by the books. We could hardly dispense with it, provided you are willing to wait for its fruit 8 or 9 years. I should think wherever the cold would not get below 30°, and where it is cold enough to reach 10° below freezing point, it may be treated so as to make it perfectly hardy. It is a moderate bearer.

Mr. Freeman—Have you observed any change in its fruit as regards productiveness by cultivation or manuring? I know a large tree in our neighborhood that bears magnificently; it stands in front of Mr. Clark's residence at South pass.

Mr. Wier—We find it with us, one of the hardiest and most productive of sweet cherries. It is early with me, but it is on poor sandy ground.

Mr. Shephard—They say the soil requires to be peculiar in order to make it successful. These sweet cherries are the sweet cherries of the east, and have proved tender and not recommended. I suppose we are all aware that we must keep hands off until we see what latitude we are in.

Mr. Wier—I am well satisfied that where I live I can raise just as many as I can of the Early Richmond. I can do it on prairie soil. The fault is not in tree killing or bud killing. I should top graft it from the north side. I have been planting them in rows and very close together in the last eight years. I had them on Mazzard Stocks, but I would not recommend the Mazzard in open ground. I had it also on Early Richmond. I have found great advantage in grafting other varieties on the Early Richmond. We have cherries put on the north side of the building that have no other protection.

BLACK TARTARIAN.—Dr. Hull—It is a beautiful cherry, but it is not as hardy as some of the other hearts, and I think we can dispense with it in view of the fact that we have other cherries that fill the place.

CLEVELAND.—Dr. Hull—It is extremely productive and very beautiful, and the tree is also a fair grower—rather more than a medium grower, in point of strength—and of good form.

ELKHORN (Tradescant's Black Heart, or Downing).—Dr. Hull—I think it is the finest black cherry on the list. I have found several people who have had very sad experience of it in other parts of the country. With me the tree is perfect in form—it spreads its branches just about right. At about ten years of age it will be about twice the size of the Tartarian. The fruit may be a trifle inferior to the Black Tartarian.

The President—Do you think it will be practicable to bring these Hearts into general cultivation?

Dr. Hull—I see no reason why they should not, but at the proper time I will explain myself as far as I can.

EARLY PURPLE GUIGNE.—Dr. Hull—I think it can be grown further north than any other kind: it is a very good cherry in its season.

ELTON.—Mr. M. L. Dunlap—I fruited a large number of the heart cherries, and it is the only one that ever produces enormous crops of sweet cherries, and I think I have had a quart in my lifetime. It was set out about thirteen years ago, and about three years ago I lost the last of them.

Mr. Shephard—I saw one tree this last summer that had perhaps two quarts of cherries on; but I do not think it will ever have any more.

The President—What has been your observation, generally, with this class of cherries? My observation was, at first planting, that they all died soon. I believe there are some people, like Mr. Wier, who may grow them successfully.

Mr. Galusha—I can say a word for this cherry. I had a few trees grafted on the old stock, near the ground, and I have never procured any fruit at all from the Elton, Black Tartarian, or Black Eagle, and the final result was—I made a good bonfire of them.

Mr. Bryant—I do not believe that the cherry can be raised with any success on rich prairie. I planted a good many of them in 1855 and 1856, and I have never planted any since. Those planted in my neighborhood failed, and the trees died off. The heart bursts and

becomes totally useless. Sometimes the blossom-buds were destroyed in the winter and dropped off like peach-buds.

Mr. Durley—I can only say that I planted the Elton, with all the best cherries I find on this list, about sixteen years ago. They were dwarfs and standards both. I can now say that the Early Richmond and May Duke do well, but from the others I never obtained three bushels of cherries, all told.

Mr. Weir—Did not all the stems of the trees die on the south side?

Mr. Durley—No, sir; I think not.

Mr. Wier—I find a few of these cherries as hardy or hardier than the May Duke, top-grafted on the Early Richmond, and putting the graft in the branches of it on the north side. I know we have trees which have borne fruit every year for eighteen years. All the protection they have is another tree on the south. It does not appear to matter what the protection is, if there be a little protection on the southwest side of the tree. I have a Governor Wood planted in that way, and every portion of it for six years has been as good as the Early Richmond alongside of it. I am speaking of what we call second bottom—rich heavy soil.

Mr. Murtfeldt—I would suggest the propriety of confining the discussion to one variety at a time.

Mr. M. L. Dunlap—The Secretary of the Indiana State Horticultural Society, Mr. Ragan, is here, and he can give us some information.

Mr. Ragan—I came here for another purpose than to educate this body. While I regret the feeling against heart cherries, yet we, as a body, should be very careful in recommending something so little adapted to our climate, and encourage men to buy varieties that will not do them good. The May Duke belongs to the sweet cherry class: we have had partial success with that, but with that exception there is not one worthy to be placed in any class.

Mr. Huggins—From experience and observation, I find that they do well on the north side of a river. The trees I planted myself have lived and flourished well for more than twenty years. Therefore I would recommended that position for family use.

Mr. Forrest—I am almost afraid of saying anything for sweet cherries after hearing our veterans. I know of some in Woodford county, near Minonk, top-grafted on a Morello stock: the union is poor, but the trees are growing well. Trees planted alongside of them, on other stocks have uniformly been failures. This is in the open prairie.

Mr. Hilliard—I would like to inquire as to old Morello. I consider it superior to any other we have had. It is true they are not profitable for market—they are so juicy.

EARLY WHITE HEART.—The President—In this class of cherry there are only a few individuals that seem to have been successful—it will be observed by their location, they are either as far south as Alton, or they have a peculiar situation among bluffs or along rivers, or under the lee of a bluff. I have noticed another thing—that people are not willing to tell of their failures. It is only justice to the public that we should be just as willing to tell of our failures as of our successes.

Mr. Shephard—I have a white cherry with a slight blush on its cheek. It is not on the list unless this is it. I got it from New York, and they told me it was a recent importation from Germany. I have had it in bearing five or six years, and it has borne abundantly. It ripens before any of the old fashioned cherries. I attribute this to its being in a sandy place, and its healthfulness. It is exposed to the western blasts. That cherry I would recommend. I do not know whether it is the Early White Heart or not.

Mr. Hilliard—I think it is a little hardier than any other of the Hearts. It is a delicious, sweet cherry. It generally overbears. The wood is about as hardy as the Bigarreau. It does not come into market as early as some other sorts.

Mr. Edwards—I have a single tree of this kind, planted in 1850, on a Mazzard stock. It is now standing where it is sheltered, and every third or fourth year I have a full crop of fruit. It bears good cultivation, and yields pretty well.

The President—Was it not grafted pretty deeply?

Mr. Edwards—Yes, sir.

GRIDLEY.—Dr. Hull—It is a gem in our latitude. It is equal to any

other in point of quality, we think, and when right, it is firm enough. It is enormously productive; so much so, that I have taken three bushels at three years old.

KENTISH OR EARLY RICHMOND.—Mr. Forster—In Iowa it is a good Cherry. They were brought into our market and sold at 75 cents a bushel, and they lay until they were thrown into the river. Mr. Nichols, of Davenport, had some made into wine, and it was very good.

Mr. Pierson—In our neighborhood there is a grub works into the wood of this tree. It is particularly so in the grass orchards. I do not know that I am sufficiently familiar with him to describe him. He works into the bark and leaves his hole full as he goes, and winds about in a very crooked route up and down the tree. I think he has rather a flat head and is about half an inch long; his color is white. There was a good many heavy rains during the time I speak of. From the time they bloomed to the time they ripened, it rained all the time. I think it possible it was the curculio. As to this grub, most of my own trees are in well cultivated ground. Where the tree is thrifty and vigorous I see none of them.

The President—Have you ever known an Early Richmond do well standing in the grass for several years?

Mr. Pierson—I am not sufficiently acquainted with it to say. I know that my own trees, in well cultivated ground, are doing well.

Mr. Bryant—On which side of the tree was it?

Mr. Pierson—I think it is on the southwest side of the tree. I got the trees from Mr. Dunlap. My neighbors' trees I do not know anything about. I am inclined to think that there are three or four of my trees that have some grubs on them, that are on Morello stock. I have my doubts as to whether the stock has anything to do with that.

Mr. Bryant, Jr.—Did you have a Curculio catcher? It appears to me that this is nothing more nor less than the same thing that gets into any tree where the south side is much exposed to the sun. You find it in the apple, in the hard maple, and in the soft maple, this same

flat-headed borer. It uniformly gets in where the bark has been scorched by the sun. Any one will see that that side will not merely become heated by the rays of the sun, but it becomes diseased and unhealthy.

The President—Do you understand it to be distinct from the apple tree borer?

Mr. Bryant, Jr.—Entirely distinct. The head is always flat, and the body quite slender. I have seen them of very different sizes, but they all resemble each other in that respect, and they work immediately under the bark. A large piece of the bark becomes dead. With regard to the *Curculio* of the cherry, I do not know but we may be in as much danger as Dr. Hull says, of losing our cherries by them. But years ago the wild cherry was attacked by the *Curculio*. I am not learned in *Curculio*; but it was one of these varieties, and not a cherry could be found without a worm in it. I have never met with a single instance in any cultivated cherry.

Mr. Riley—I did not know that it was in order to discuss this matter. The cherry borer has long been known as peculiar to the cherry, and I do not think it is confined to any particular kind of cherry. It is a species very similar to the flat-headed apple tree borer. The difference, practically, is nothing, and the same means can be taken to get rid of it: that is the use of soap on the tree. The peculiarity of the moth is that the tips of the wing-cover are bifurcated—that is the cherry borer. The *Curculio* infests the cherry, but I wish to disabuse you of the idea that this *Curculio* is the cause of the rotting of the cherry.

Mr. Wier—This year, on the 20th of June, or thereabouts, we had three days of severe windy weather—very severe. All the cherries that were anywhere near ripe at that time ripened up without any rot whatever, but those that were just beginning to turn, or were at their full growth, were bruised all over. The rot commenced on the west side of the tree, and the wind came from the west. Some varieties were largely stung by the *Curculio*, and some not at all; but they all rotted.

This three-days' wind formed the nidus on the fruit. I attribute it to the bruising of the fruit by the wind.

Dr. Hull—This rotting of the cherry I am quite familiar with. It is sometimes caused by the *Curculio*, and sometimes it is not. I lost some this last year by the water standing on them say twenty-four or forty-eight hours. I had an idea of pasturing my ground, with a view to feeding pigs, but if the gentleman can talk this up, why it will enable me to keep the cherries. [Laughter.] Some one remarked that their wild cherries were stung by *Curculios*. The *Curculio* they brought is entirely different from the Plum *Curculio*.

Mr. Riley—I really do not know much about the *Curculio* in the wild cherry. The one in the cultivated cherry is the common Plum *Curculio*.

Mr. Keith—I think there is no doubt it was caused this season by wet weather. That was the fact in Cook county.

Mr. Woodward—About this cherry. I have them in bearing, both upon the Mahaleb stock and on the Morello. Those on the Mahaleb are perhaps a little sweeter than the other.

Mr. M. L. Dunlap—Dr. Furness, of Indiana, where we get our cherries from, is here, and I would like to hear from him.

Mr. Galusha—It looks to me as though we were wasting time. We all know all about the cherry by experience and observation for a great many years. Enough have been planted to supply all the markets, and it seems to me that unless something new about its character and diseases is mentioned, we are spending our time to no purpose.

Mr. Bliss—I wish to say something about this cherry. A man from the east will first fill his mouth full, and the sharpness of the flavor he does not like, but a great many think if they can get the Early Richmond to can, it is all right. Let us have this criticism go with the recommendation of the cherry. In canning, it has not the life of the Morello.

NAPOLÉON.—Dr. Hull—That variety seems to be remarkably hardy. There are two trees standing which I planted ten years ago, from which the parties who own them tell me they pluck eight bushels annually.

Mr. Shephard—I have planted it different times, and on the same soil, and it always seems to me to be hardy.

MORELLO, ENGLISH.—Dr. Hull—It is very hardy wherever I find it. It has one defect, that of breeding insects, and leaving its fruit on the tree until they come out.

Mr. Galusha—I will say that it is every way reliable and hardy, and yields very large crops. That and the Early May are the only ones I can tie to in the North.

Mr. Wier—It has a large red fruit which will always sell and bring a good price. It has a very dark and rich red in canning. The stone is quite large and plump shaped. The tree is perfectly hardy I believe. It feeds well on Mahaleb or Morello stock, and will grow anywhere in any part of the State.

Mr. Nelson—Do you know anything of the Late Richmond?

Mr. Wier—I have it, and we think almost as much of it as we do of the Early Richmond. It is about two weeks later. We also have a seedling from it. It has not quite so much juice as the Early Richmond.

Mr. Nelson—I can state that with us it is just as productive as the Early Richmond. We think it as good in quality. All the difference I see in the cherry is this, it is later by about ten days. With me they bear just as soon as the Early Richmond. I found it on my ground when I went there. I have shown it to a great many men. The tree now is old, and it favors Early May so much that it is very hard to distinguish them from each other.

The President—I would not regard it as being so good in quality as the Early Richmond. There is less juice. I think you can distinguish it whether canned or not.

Mr. Wier—I am well aware that there are several of this kind. The old original one that we had was a much larger cherry and very watery.

Mr. Galusha—Is not this Late Richmond the Late Kentish?

Mr. Shephard—I would inquire if any persons here have any knowledge of a cherry which I received from Col. Hardman, of Buffalo. It is a most productive cherry. I have invited a great many people to see

and taste it, and I have found no one who knows anything about it. It is a heart shaped cherry, but of the Bigarreau class. It is a fine shaped cherry, large and juicy, and the birds will never allow it to rot on the tree. It is one-third larger than the Yellow Spanish or the Napoleon Bigarreau. It never needs any pruning. It has never lost a leaf or bud by cold weather. I got it about sixteen years ago, I think. I have also another cherry which I call the French Morello, which I have never heard of before.

Mr. Brown—There are two subjects on the programme to-day, for which I would like to have plenty of time. First, Dr. Hull's report, and second, the essay of Mr. Riley on the Curculio. I would like to have this matter left for afternoon and evening. I move now that we finish the plum and apricot lists.

Mr. Brown afterwards withdrew his motion.

Dr. Hull—I wish to have this peach list laid over for a time.

Mr. Murtfeldt—I move that Dr. Hull now read his paper on the Codling Moth. Carried.

CODLING MOTH.

Dr. Hull read a paper thereon as follows: [Not furnished.]

After the paper had been read, the following discussion was had:

Dr. Hull—In alluding to the fact that Mr. Burrill, and not Mr. Trimble, was the discoverer of the remedy, I did not design to impute any wrong motives. It is often the case that discoveries are attributed to others than the real inventors. Mr. Burrill gave this remedy some thirty years ago in the *New England Farmer*.

Mr. Galusha—As far as my observation extends, the rags are very much to be preferred, for the reason that the larvæ can be so easily destroyed. All you have to do is to dip them in boiling water and hang them up to dry. Hay bands are more cumbersome. I think the cellar is one of the most prolific breeding houses we have, and I would inquire whether the moth would not be destroyed by having bright lights in the cellar—large lamps, with the flame exposed.

Dr. Hull—I have no doubt it would, provided it were standing in a dish of water or oil.

The President—It would be inconvenient to have boiling water for the rags off a thousand trees.

Mr. Bryant—With regard to fires in orchards and lights in the cellar, I think I once heard Mr. Riley say that the Codling Moth was not attracted by light.

Mr. Galusha—In reply to the President I would say that the application of rags is the cheapest way.

Mr. Baldwin—When would be the time?

Dr. Hull—The time to begin would be when the Red June is ripe. My impression is that it would be about every twenty days, depending upon the warmth of the weather.

Mr. Wier—It always appeared to me that the time to attack that moth was when it deposited its eggs. There certainly must be something to attract it.

Mr. Riley—I can give Mr. Wier some little hope. We have a means, but as long as we pay no attention to it and continue to look for something else, we shall never succeed. I am convinced the moth is not attracted by light. I have written night after night in summer, with the windows open, and have never yet caught a codling moth though I have been in the neighborhood of orchards that I knew were covered. There are very few insects that are attracted by light. Those that you find in your rooms are all moths with long trunks. I think it is sufficiently proved that the codling moth is not attracted by light.

So far as regards this hay-band theory, admitting that Mr. Burrill recommends the use of rags and that Dr. Trumble recommends hay-bands, I do not think that one detracts from the credit due the other. It is not necessary to give my opinion, because I have always thought that rags were preferable to hay-bands. It is a difficult matter to go over an orchard and twist hay-bands. You have to take your finger and crush each worm individually. By using carpets or rags you can take them down and destroy the worms by wholesale—

I think most farmers use some kind of cauldron every week or so, and on these days you might just do this as well as not. I think if we paid a little more attention to scalding our barrels and destroying the Chrysalis we should reduce the number very materially, but I can give no hopes of reducing them by fires or lights, and I have no faith in the syringe which Dr. Hull recommends. Rely then, on entrapping the moth and killing it.

Mr. Brown—I would like to ask whether the worm, after it has got into the tree is taken by birds, and whether the greatest supply we have is from the cellars?

Mr. Riley—Yes, it is so; the apples containing the worms would drop to the ground and rot, and the worms would leave them, and in such a position they would be sought out by birds in the winter time, and few of them would escape, there being so many birds pinched with hunger in the winter time. Woodpeckers and many other birds live almost entirely upon such food. It is in our storehouses that the brood is propagated.

Mr. Ragan—Some of us are cultivating small fruits among our apples. I would raise the query whether these small fruits will, to any considerable extent, harbor these worms?

Mr. Riley—I do not think they would. They prefer the old bark of a tree, or some nook of a rag, or anything else, to the living tree.

Dr. Hull—I alluded to the syringing of the tree not as preventing the worm from depositing its eggs, but I know that when I throw tobacco water and soap upon any of the trees, it invariably kills the worms. If my friend Riley will take, the coming spring, and make a strong decoction of tobacco water and soap, I will guarantee it will kill them, but it will not prevent them laying their eggs.

Mr. Riley—I would suggest to Dr. Hull how continuously you would have to syringe your trees to affect the moth. Now suppose you come to your orchard once in a morning, you would only kill what few you had not touched before. They can stand rain, and I doubt whether drenching by tobacco would kill a moth. It is one of the last of all insects to deposit its eggs.

The President—Would you not recommend every man to scald out his apple barrels in the spring?

Mr. Riley—Yes sir, that is what I was going to do. It is needless, of course, to scald your barrels unless there is something to scald them for. Examine your barrels first for these little white cocoons. They disguise them as well as they can, so that generally they are the same color as the object to which they are attached; but with carefulness you will find them.

Dr. Hull—You need not scald them unless you wish, but turn your barrels down, and the chickens will go for them. I have a garden engine which will throw a stream horizontally 60 feet. When it is directed on the branches of a tree it will throw a spray, in consequence of the soap, to all parts of the tree. Now if Mr. Riley will call to mind the fact, that if he were immersed in tobacco water it would kill him, he must admit that it would kill this moth. It would kill a cow.

Mr. Bryant—I have taken 25 or 30 barrels and let them stand out a week or two, and then found abundance of worms under the hoops. I do not think the chickens will answer for that, as they can not get at them. The worms may be destroyed by striking on the hoop. I have always found it pay to destroy them in some way.

Mr. Riley—The worm is generally gone before the apple falls. It goes through a hole, and you will find a little brown excrement around the hole. It is useless to destroy that apple. You can not tell when there is a worm in an apple, because there is no hole in it, but you can tell when the worm is gone, because there is a hole.

Dr. Hull—One of the best things is to use simple soap on the bark. It smooths the bark; it prevents deposit of all the borers, and it prevents the accumulation of root borers at the base of the tree.

Mr. Ragan—I know of one orchard comparatively exempt from the ravages of this insect. This orchard was located almost in the center of a large farm, and the fruit there is almost entirely exempt from the ravages of the moth, but it is at least half a mile from any other orchard.

Mr. Freeman—I was passing an orchard once that seemed to me perfectly clear from these pests. The owner said he had not done anything except to whitewash them for 16 years. He had done that in the spring, and they were as clear as they could be, if they were only two or three years old.

Dr. Furnas—Is there any danger whatever of this soft soap injuring the tree?

Dr. Hull—No danger whatever. I apply it with a paint brush.

Mr. Galusha—I move that further discussion of the varieties of fruits be dispensed with until the other business has been finished. There are subjects of most vital importance to fruit growers to which we have given very little attention. These subjects underlie the whole process of growing with regard to soils and their properties, atmospheric effects and changes, dryness and humidity. These subjects are practical and are of more importance to us than discussing varieties of fruits.

Carried.

REPORT OF SPECIAL COMMITTEE.

Mr. Foster, from the Special Committee on President's Address, made the following report:

Your Committee to whom was referred the President's Address, beg leave to report, that to remedy the evil effects of *drought*, deep subsoil plowing, mulching, and timber planting throughout the country, especially of evergreens, are the best preventives. For *soil washing off* by rains, underdraining, and mulching, and in some cases grass sod and mulching are preferable.

As to grafting on different kinds of stocks, hybridizing and new seedlings, we would recommend a special committee to confer with the Professor of Horticulture at the Industrial University.

Canada Thistle and noxious weeds, we recommend to refer to the committee of the whole Society. Let every member feel it his duty to enforce the good and stringent law for the suppression of the thistle, by making individuals liable to good wholesome penalties for allowing it to grow upon their land.

We also recommend a special committee to confer with secretaries of county agricultural societies, or other county officers, to ascertain the extent of the spread of the Canada Thistle in their county, and advise them of the importance of having the law enforced.

We also recommend the continuance of the committee appointed for the purpose of testing and reporting officially on new fruits. The continual flooding of the country with such unmitigated humbugs as the Mexican Ever-bearing Strawberry and the "Mammoth Cluster Raspberry (probably humbug only in name), and many others, should have some estopper put upon it. Although we are well aware that this society has done well nigh its full duty in the premises, we would further recommend that it be the duty of the State Horticulturist to visit parties offering new varieties in their fruiting season, as far as practicable, and report officially thereon.

We would also recommend that this Society devote more time to the discussion of vegetable physiology or structural botany, and the cultivation proper of our orchards, and adaptation of different soils to profitable fruit growing, and the proper drainage of the same, and less to the revision of the fruit lists.

Fruit Districts—We recommend a Special Committee, of which the Secretary be Chairman.
D. B. WIER, *Chairman*.

Mr. Furnas—I would like to know whether the Mammoth Raspberry is one of those fruits that you call humbugs?

Mr. Wier—We have another of the same kind that is pretty well known in the West. I am speaking of the Minnesota. It has been known for years.

Mr. Daggy—I move that the report be accepted and the committee discharged.

Mr. Foster—About that Mexican Ever-bearing Strawberry? I do not know but that much of the humbugging has been done by editors.

Motion carried.

Mr. Galusha—I move that half an hour be devoted to the discussion of topics contained in the report. Carried.

Mr. Wier—I think the discussion on the Mexican Ever-bearing Strawberry would more properly come up with the report of the Special Committee on New Fruits.

Mr. Flagg—The first subject in the report is the matter of "drought as being remedied by mulching, deep sub-soil plowing, and timber planting."

"Underdraining and mulching recommended, and in some cases grass and mulching, to prevent washing."

The President—I will mention one little matter in regard to washing. I think it is an excellent plan, with any horticulturist who is

cultivating land with a desire to keep it in the best condition, in the summer, when he wishes to suspend cultivation, to seed that ground thickly with oats, so as to prevent severe washing in autumn, winter and spring.

Mr. Flagg—"Grafting" is the next subject.

Mr. Foster—I was informed by some one that there was a standing committee to confer with the Horticultural Department of the Experimental Farm, and if there be no such committee, I recommend the appointment of one.

Mr. Wier—I would state that the Horticultural officers of the State University have generally conferred with us.

Mr. Galusha—That is an important matter, and we have long been looking to the establishment of this institution as a nucleus round which should gather all the horticulturists of this State, and as the center from which should radiate horticultural effort. It would seem that at this time this suggestion is very important. I think it is very important that they should know and recognize this State Horticultural Society, and hold it as the center from which emanates light on this subject, and that to be successful there, they must get light from this body. I move that a committee of three be appointed, as recommended by Mr. Foster.

The question being on Mr. Galusha's motion, it was carried.

CANADA THISTLE.

Dr. Hull—I wish some gentleman would inform us whether it is possible to grow that thistle in the southern part of the State of Illinois.

Mr. Galusha—My experience of this thistle has not been painful, but I have been obliged to watch constantly. Since my first importations from the East there has not been a year, for the last fifteen years, that I have not imported Canada thistles, and very many times the seed, and we need to use the utmost diligence in every box from the East, to examine the roots and to see that no fibre can adhere, and then burn everything in the way of packing, that the box con-

tains. There are many things propagated East that are not propagated here, and it is absolutely necessary to receive importations. I have once or twice had a Canada thistle get the start, and on one occasion it had rambed a couple of rods under my best evergreens, and I had the ground dug up and every fibre taken away, though in doing so I had to destroy some of my evergreens. I do not think we have as much to fear in Illinois as they have in the East.

Mr. Bryant—The report recommends the enforcement of laws against individuals. The laws against corporations must be enforced also. Let any one pass through Michigan, where they have a stringent law against them, and he will find the railroads are lined with Canada thistle. You will see the seeds floating in the air, and coming into the carriage you are about to occupy—perhaps traveling 20 or 30 miles. The waste lands along the railroads are the nurseries for the Canada thistle, and in that way it is creeping along towards our State. I have found it in these importations from Rochester, and it has taken some time to destroy it.

The President—Is the greatest danger from small pieces of roots or from the seeds?

Mr. Bryant—It is from the small pieces of roots. I suppose a piece of root one inch long would be sufficient. Any one may dig down and ascertain how they grow. I have sometimes had difficulty in taking out the roots. One difficulty is that a great portion of the people do not know it when they see it. The flowers are rather small, and the thistles are slender, but more prickly than any other kind. It is easy to recognize when it has once been pointed out.

Mr. Wier—I have been wanting to say a few words for Dr. Hull's information. I have had the Canada thistle introduced into my place at two different times. The first time it started from the seeds in packing fruit trees. I had the big trees pretty well unpacked before I knew there were thistles in the packing. I packed it up again and covered it with a sheet. The next summer I watched for the thistles, and I suppose there was a hundred of them came. The next time they were planted with a pear tree, and I suppose they had a space

of four square rods completely covered. Our plan of getting rid of them was this: To commence in the spring of the year with a good sharp hoe, and every time we passed that way, clean up every thing we saw on the surface. I killed a very large patch in this way. The Canada thistle, unlike other thistles that trouble us, is a perennial—our other thistles, I think, are biennials. In very thin soils the roots do not seem to get through the soil, but in loose, rich loam we find them from one to two feet under the surface.

Mr. Foster—Salt brine is sure death to them. It will kill the whole plant if it is well applied.

Mr. Wier—That is impracticable, because we very often get them mixed with other plants we do not wish to kill. This summer I syringed with fluid carbolic acid, and found it only killed as far as it went.

Mr. Douglas—I hope Mr. Bryant is mistaken about these thistles extending miles and miles along the railroads in Michigan. Furber and Mehan had a long spat about the rapidity of their extension some years ago. Now I know five lots of Canada thistles in our neighborhood, and have known them for twelve years. One is on the top of the bluff at Waukegan; they get cut every year: some one gives a man a quarter or fifty cents to go and lop them off. They are very thick where they grow. I had quite a lot in a pasture about ten or twelve years ago. I gave a man the wood and brush for destroying them. They soon disappeared after the cattle run on them. I think the cattle destroyed them.

Mr. Hyde—I move that we now adjourn.

The motion prevailed and the meeting stood adjourned.

SECOND DAY—AFTERNOON SESSION.

The Society reassembled at 2 o'clock, pursuant to adjournment, President McWhorter in the chair.

Mr. Brown—There is a large quantity of fruit to examine, and I therefore propose to have another committee on pears and other fruits.

Mr. Flagg—I would also suggest a committee on wines.

The motion of Mr. Brown was adopted.

The President then announced the following as the committees:

On Pears, etc.—Messrs. Brown, Earle and Douglas.

On Apples—Messrs. Kimball, Kinney, and A. Bryant, Jr.

On Wines—Dr. Hull and Messrs. Shephard and Hammond.

THE CURCULIO.

Mr. C. V. Riley then read a paper on Curculio, as follows:

LADIES AND GENTLEMEN: You have invited me to read an essay on the Plum Curculio. I accepted the invitation with the intention of preparing an exhaustive paper on the subject. But the sudden death of my esteemed associate and your State Entomologist, the late Benj. D. Walsh, so completely upset my arrangements, and so increased my labors, that I have found time only to substitute instead the following hasty notes.

So much has been written on the habits of this one little insect, and on the best means of protecting our fruits from its injurious work, that one almost tires of repeating those established facts in its history which, at first thought, it strikes one that all interested should know. But this is a bustling, shifting, progressive world, and there are yet some mooted points to be settled in the natural history of our Curculio.

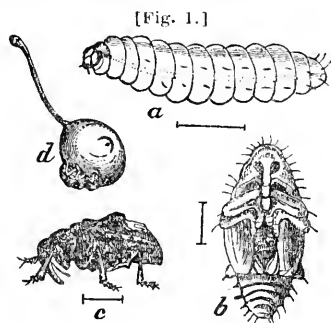
When an experienced man is taken from our midst, the fund of wisdom and the store of knowledge which he had accumulated during a long and busy life-time, are in a great measure buried with him. His younger followers profit as much as they can by his recorded experience, but they must necessarily go over the same ground which he had been over before. Facts in Nature will consequently have to be repeated for all time to come; but it should be our object to reach beyond the facts already known, to obtain a knowledge of all things as far as the mind is capable of, and to delve still more deeply into hidden truths, so that by observation and perseverance, we may be enabled to read aright the yet unread parts of that great recorded book, which was printed, paged, collated and bound by the fingers of Omnipotence! Besides, there are actually many fruit-growers who do not know a Curculio when they see one. Thus three different correspondents have, during the past summer, requested a description of the little pest, because, as they contended, they were not acquainted with its appearance. And yet one of these gentlemen, as I afterwards ascertained from personal observation, was, at the very time when he penned his question, suffering from injuries caused by the "Little Turk."

In this brief paper on the Curculio I shall, therefore, necessarily have to repeat many of the facts which were published in your own Transactions for 1867, and of those which may be found in the First Annual Report on the Entomology of Missouri.

ESTABLISHED FACTS IN THE HISTORY OF THE CURCULIO.

In order to lay this question before you in the very clearest light, it will be best to divide this paper into two different parts. In the first part we will give only those

facts which are established beyond all peradventure; and in the second part, we will consider only those points upon which opinions differ.



Colors—(a and b) whitish; (c) brown, black and clay-yellow

The Plum Curculio, commonly known all over the country as **THE CURCULIO**, is a small, roughened, warty, brownish beetle, belonging to a very extensive family known as Snout-beetles (**CURCULIONIDÆ**). It measures about one-fifth of an inch in length, exclusive of the snout, and may be distinguished from all other North American Snout-beetles by having an elongate, knife-edged hump, resembling a piece of black sealing-wax, on the middle of each wing-case, behind which humps there is a broad clay-yellow band, with more or less white in its middle. For the benefit of those who are either fortunate or unfortunate enough not to be acquainted with the gentleman, I have prepared the above sketch, which will give at a glance its true form, and obviate the necessity of further description and waste of time. (Fig. 1, c.)

This is the perfect or imago form of the Curculio; and it is in this hard, shelly, beetle state, that the female passes the winter, sheltering under the shingles of houses, under the old bark of both forest and fruit trees, under logs and in rubbish of all kinds. As spring approaches, it awakens from its lethargy, and, if it has slept in the forest, instinctively searches for the nearest orchard. In Central Illinois and in Central Missouri the beetles may be found in the trees during the last half of April, but in the extreme southern part of Illinois they appear about two weeks earlier, while in the extreme northern part of the same State they are fully two weeks later. Thus, in the single State of Illinois, there is a difference of about one month in the time of the Curculio's first appearance on your fruit trees; and I hardly need remind you that the time will vary with the forwardness or lateness of the season.

As we shall see from the sequel, it is very important that we know just when first to expect Mrs. Turk, and I therefore lay it down as a rule, applicable to any latitude, that she first commences to puncture peaches when they are of the size of small marbles, or of hazel nuts, though she may be found on your trees as soon as they are in blossom. To prevent confusion, I will use the word "peach," not that her work is confined to this fruit, for, as we shall presently see, she is not so particular in her tastes, but because the peach is more extensively grown in your State than are any of the other large kinds of stone fruit.

Alighting, then, on a small peach, she takes a strong hold of it (Fig. 1, d), and with the minute jaws at the end of her snout, makes a small cut just through the skin of

the fruit. She then runs the snout slantingly under the skin, to the depth of one-sixteenth of an inch, and moves it back and forth until the cavity is large enough to receive the egg it is to retain. Then she turns around and drops an egg into the mouth of the cavity, and after this is accomplished, she resumes her first position, and by means of her snout pushes the egg to the end of the passage, and afterwards deliberately cuts the crescent in front of the hole, so as to undermine the egg and leave it in a sort of flap. The whole operation requires about five minutes, and her object in cutting the crescent is evidently to deaden the flap, so as to prevent the growing fruit from crushing the egg.

Now that she has completed this task, and has gone off to perform a similar operation on some other fruit, let us from day to day watch the egg which we have just seen deposited, and learn in what manner it develops into a Curculio like the parent which produced it—remembering that the life and habits of this one individual are illustrative of those of every Plum Curculio that ever had, or that ever will have, an existence. We shall find that the egg is oval, and of a pearly-white color. Should the weather be warm and genial, this egg will hatch in from four to five days, but if cold and unpleasant, the hatching will not take place for a week or even longer. Eventually, however, there hatches from the egg a soft, tiny, footless grub with a horny head, and this grub immediately commences to feed upon the green flesh of the fruit, boring a tortuous path as it proceeds. It riots in the fruit—working by preference around the stone—for from three to five weeks, the period varying, as I have amply proved, according to various controlling influences.

The fruit containing this grub does not, in the majority of instances, mature, but falls prematurely to the ground, generally before the grub is quite full grown. I have known fruit to lie on the ground for upwards of two weeks before the grub left, and have found as many as five grubs in a single peach which had been on the ground for several days. When the grub has once become full grown, however, it forsakes the fruit which it has ruined, and burrows from four to six inches in the ground. At this time it is of a glassy yellowish-white color, though it usually partakes of the color of the fruit-flesh on which it was feeding. It is about two-fifths of an inch long, with the head light brown; there is a lighter line running along each side of its body, with a row of minute black bristles below, and a less distinct one above it, while the stomach is rust-red, or blackish. The full grown larva presents, in fact, the appearance of Figure 1, *a*.

In the ground, by turning round and round, it compresses the earth on all sides until it has formed a smooth oval cavity. Within this cavity, in the course of a few days, it assumes the pupa form, of which Figure 1, *b*, will afford a good idea.

After remaining in the ground in this state for just about three weeks, it becomes a beetle, which, though soft and uniformly reddish at first, soon assumes its natural colors; and, when its several parts are sufficiently hardened, works through the soil to the light of day.

So much for the natural history of the "Little Turk." Now let us mention a few other facts which it becomes us as fruit-growers to know.

The Curculio when alarmed, like very many other insects, and especially such as belong to the same great Order of Beetles (*Coleoptera*), folds up its legs close to the body, turns under its snout into a groove which receives it, and drops to the ground. In doing this it feigns death, so as to escape from threatened danger, and does in

reality greatly resemble a dried fruit bud. It attacks, either for purposes of propagation or for food, the Nectarine, Plum, Apricot, Peach, Cherry, Apple, Pear and Quince, preferring them in the order of their naming.

It is always most numerous in the early part of the season on the outside of those orchards that are surrounded with timber. It is also more numerous in timbered regions than on the prairie.

It *can* fly and *does* fly, especially during the heat of the day; so cotton bandages around the trunk, and all like contrivances, are worse than useless.

It prefers smooth-skinned to rough-skinned stone fruit.

The Miner Plum, otherwise known as the Hinckley Plum, Isabel Plum, Gilett Plum, Townsend Plum, Robinson Plum; and other varieties of that wild species known as the Chickasaw Plum (*Prunus chicensis*), are less liable to its attacks than other kinds.

Both the male and female puncture the fruit for food by gouging hemispherical holes; but the female alone makes the crescent-mark above described.

Scarcely any eggs are deposited after the pit of the fruit has become hard.

The cherry when infested remains on the tree, and the preventive measures that may be applied to other fruits will consequently not hold good with this.

The larva cannot well undergo its transformations in earth which is dry or baked, and severe drouths are consequently prejudicial to its increase.

It often matures in apples and pears, especially in early varieties, but in the great majority of instances the egg either fails to hatch or the young larva perishes in a few days after hatching.

Many other facts might be cited, but in the foregoing remarks I have confined myself to that which I know, from ample personal experience, to be the truth and nothing but the truth.

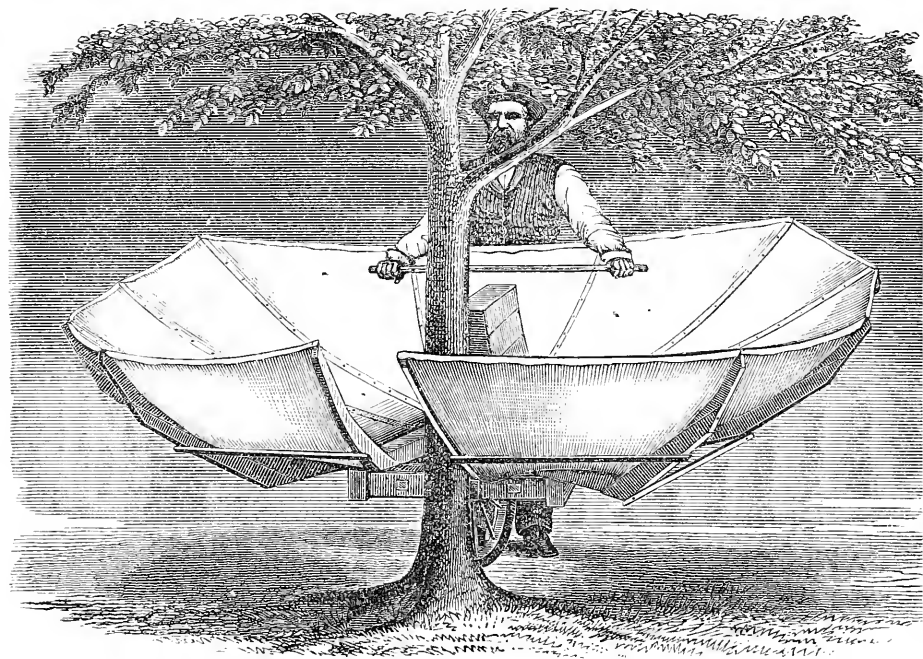
ARTIFICIAL REMEDIES.

Now, gentlemen, it must be clear to you that, as practical men, this is all you need to know to enable you to fight and conquer this evil. Those mooted points which we shall presently consider are of great interest to the naturalist and to the scientific man, and although I do not quite agree with Dr. Trimble, that the hibernation of the Curculio, for-instance, is practically of no consequence, yet the settlement of these questions is not necessary to the carrying on of a successful warfare. We need not necessarily understand the morphology of a plant in order to make it grow; neither is it always necessary to penetrate into all the details of an insect's history in order to circumvent its injuries. You can fight Curculio without being a thorough Entomologist. The remedies are few. They consist of prevention, by destroying the fallen fruit which contains the grub, and by jarring down and catching and killing the beetles. There are a variety of means which can be employed for destroying the grubs which fall with the fruit before they enter the ground. It can be done either by hand or by stock. Hogs and poultry are of undoubted use for this purpose. In the article entitled "Hogs vs. Bugs," in the first number of the *American Entomologist*, abundant proof in support of this fact may be found, and I have, since that was published, obtained much additional proof of a similar nature, and am convinced that our friend Dr. Hull underestimates the value of these auxiliaries. Of course, the first year they are used they do not in the least decrease the number of beetles, but wherever they CAN be used, a most beneficial effect will be noticed the second year, and every year

afterwards. As stated in the article referred to, the practical difficulties in the way of carrying out the system of subduing fruit-boring insects by hog-power are: 1st, The necessity of having all the orchard land under a separate fence, which of course in many cases involves a considerable extra outlay for fencing materials. 2d, The necessity of giving up a practice, which is conceded by the most intelligent fruit-growers to be otherwise objectionable, namely, growing other crops, such as small grain, corn, or small fruits, between the rows of trees in bearing fruit orchards. 3d, The necessity of giving up the fashionable theory of low-headed trees; for otherwise, if apple and peach trees are allowed to branch out like a currant bush from the very root, any hogs which range among them will manifestly be able to help themselves, not only to the wormy windfalls that lie on the ground, but also to the sound growing fruit upon all the lowermost boughs.

The jarring process may be carried on in various ways, accordant with the extent of the orchard or the character of the trees to be jarred—always bearing in mind that a sudden jar, rather than a severe shake or knock, is necessary. There is no more thorough and expeditious way, however, than by means of Dr. Hull's *Cuculio-catcher*. Every member of this Society is probably familiar with the appearance of this machine; but, believing that a description of it has never been published in your Transactions, I will give one in the Doctor's own words:

[Fig. 2.]



“To make a *Curculio*-catcher we first obtain a light wheel, not to exceed three feet in diameter, the axletree of which should be about ten inches long. We next construct a pair of handles, similar to those of a wheelbarrow, but much more depressed at the point designed to receive the bearings of the axletree, and extending forward of the wheel just far enough to admit a cross-beam to connect the handles at this point; one-and-a-half inches in the rear of the wheel a second cross-beam is framed into the handles, and eighteen to twenty-four inches further back, a third. The two last named cross-beams have framed to their under sides a fourth piece, centrally, between the handles, and pointing in the direction of the wheel. To the handles and to the three last named pieces, the arms or ribs to support the canvas are to be fastened. To the front part of the beam connecting the handles in front of the wheel, the ram is attached; this should be covered with leather stuffed with furniture moss, a dozen or more thicknesses of old hat, leather or other substance, being careful to use no more than necessary to protect the tree from bruising. Ascertain the elevation the handles should have in driving, and support them in that position. We now put in place the stretchers or arms, six for each side, which are to receive and support the canvas. We put the front arms in position. These extend back to near the center of the wheel on each side, and in front of the wheel (for large machines) say six feet, are far enough apart to receive the largest tree between them on which it is intended to operate. The remaining arms are supported on the handles, and fastened to them and to the two cross and parallel pieces in the rear of the wheel. These are so placed as to divide the space at their outer ends equally between them and the first mentioned stretchers and fastened to the ends of the handles. Next we have ready a strip of half-inch board two and a half inches wide. One end of this is secured to the forward end of one of the front arms, and in like manner to all the others on one side of the machine, and fastened to the handles. Both sides are made alike. The office of these strips is to hold the outside ends of the arms in position; they also hold the front arms from closing. These outside strips also receive the outside edge of the canvas, which is fastened to them as well as the several arm supports.

“It will be seen that the wheel is nearly in the center of the machine. To cover the opening at this point, a frame is raised over it, which is also covered with canvas. The arms, or stretchers, are so curved that the motion of the machine, in moving from one tree to another, should bring everything falling on the canvas to depressed points, one on each side of the wheel, where openings are made into funnels emptying into pockets or bags, for the reception of insects and fallen fruit. The whole machine should not exceed ten or eleven feet in breadth, by twelve or thirteen in length. These are for large orchard trees; smaller ones could be protected with a much smaller machine. If the frame work has been properly balanced, the machine will require but little lifting, and will be nearly propelled by its own weight.

“The *Curculio*-catcher, or machine, is run against the tree three or four times, with sufficient force to impart a jarring motion to all its parts. The operator then backs far enough to bring the machine to the center of the space between the rows, turns round and in like manner butts the tree in the opposite row. In this way a man may operate on three hundred trees per hour.”

I have noticed that where this *Curculio*-catcher has been constantly used the trees have suffered serious injury from bruising, and would suggest that, by driving a spike (one with a shoulder to it might be manufactured for this express purpose) into

each tree at the proper height, this trouble may be easily overcome. This is more necessary with old and large trees, which do not vibrate so easily as do younger ones. Let us hope that the day is not far distant, when this machine, or some improvement on it, will be in such general demand as to insure its manufacture by some of our implement dealers. It should be considered by all who wish to grow stone-fruit, as a horticultural implement, second only in usefulness to the plow.

Before leaving this subject of remedies I will say that much can be done in a small way by crushing the egg with the finger-nail, or by cleanly cutting out the newly hatched larva. It will also suggest itself that, in planting an orchard with timber surrounding, the less valuable varieties should be planted on the outside, and as the little rascals congregate on them from the neighboring woods in the early part of the season, they should be fought persistently. It will also pay to thin out all fruit that is known to contain grubs, and that is within easy reach; while, wherever it is practicable, all rubbish and under-brush should be burnt during the winter.

AN APPEAL.

The burden of this essay is to impress upon you the utter futility of all other pretended remedies. One of our most eminent Eastern horticulturists has honored you, gentlemen, by calling you the most philosophical set of fruit-growers in the land. I want you to deserve this honor by showing your good sense in this *Curculio* matter. Tolerate no other methods of fighting this foe than the two above named. I am thoroughly satisfied that there is no other remedy, and the sooner we are all convinced of it the better. For over half a century the agricultural and horticultural press has been flooded with wondrous remedies, and yet, aside from the two methods already indicated, there are but three out of the whole catalogue which have even the appearance of common sense, and these are altogether impracticable in an orchard of average extent.

Lazy men may croak: they may declare that the days of profitable fruit-growing are gone by, that fruit-growers are going to perdition, and that the *Curculio* can not be conquered! But sensible men know better. Witness the commotion which one of the thousand proposed *Curculio* remedies recently produced among the members of the lately organized St. Louis Farmer's Club. A gentleman claims to have a remedy, which is, however, a secret, as he wishes to make money with it. Forthwith an exciting discussion takes place, and Col. Colman offers a million dollars for a remedy—a million dollars for a remedy for the *Curculio*! Now, what did these gentlemen mean by a remedy? If they had ever read their State Entomological Report they would have found one there given. But no: they look for some panacea, some placebo, some Aaron's rod wherewith to smite the hosts of the *Curculio* throughout the land with a single wave of the hand! They might as well try to produce fruit without first planting and cultivating the tree which is to bear it, as to try to conquer the *Curculio* by any other but the rational means we have set forth. We do not now live in the age of miracles; and if a man undertakes to feed five thousand persons on five loaves and two small fishes, he will fail most ignominiously in the undertaking. Just so long as we look for remedies of a miraculous nature, just so long will the *Curculio* retain the upper hand; but as soon as we abjure all washes, fumes and patent applications to the tree, of whatever sort, and confine ourselves to killing this little foe, either in the

grub or perfect state, then shall we be able to raise fruit free from its injuries. Our experiments should all tend in the direction of improving the methods of destroying the grub, and of jarring down and killing the beetle. In fact, the jarring of the trees and killing of the little rascals must henceforth be considered as part and parcel of stone-fruit culture. You may argue, and with reason, that, with the utmost diligence, you can never succeed in entirely subduing this enemy, for it will breed in the forest, will in some few cases perfect in the fruit that hangs on the tree, and will come in upon you from your neighbors:—granted. In like manner, you may cultivate your land year after year, so that not a single weed shall ever go to seed upon it, and yet you can never entirely subdue the weeds. But would you therefore cease to cultivate, and let the weeds overrun you? It is useless to seek for good without evil, and the man who wishes to raise stone-fruit without fighting the Curculio ought to read Henry Ward Beecher's advice to him who wanted an easy place.

The more united the effort to fight the Curculio, the less work will there be for each; but even where one determined man is surrounded by negligent and slovenly neighbors, he will be rewarded for his efforts. If this Society could only devise some means to insure concerted action in this respect among its own members, a great point would be gained. The negligent fruit-grower can not be brought to duty by legislative means, but might not this Society, by resolution, make it obligatory on its members to fight Curculio, if they grow stone-fruit, by voting itself plenary power to fine such members as prove recusant? At all events, as we were advised last winter by Mr. L. C. Francis, in his excellent essay on the Plum, let us fight it out on the jarring line, if it takes all summer, and it WILL take all summer, for the trees should be jarred regularly, from the time the fruit is set until it is ripe.

I have little patience with those persons who claim that fruit cannot be protected from the Curculio by the jarring process; or that it will not pay to carry on the business when this work is necessary. As a general rule, such persons were never guilty of jarring a tree, or, if they were, they did not pursue the process systematically. All who properly pursue it for a number of years are successful. Judge Brown, Dr. Hull, and many other members of this Society, can attest the truth of this assertion. Dr. Trimble, of New Jersey, never once failed to obtain a good crop of plums, apricots and nectarines for ten successive years, though his more neglectful neighbors could not succeed. Ellwanger & Barry, of Rochester, N. Y., J. J. Thomas, of Union Springs, N. Y., and a host of prominent Eastern fruit-growers whom I might mention, all testify to its efficacy and success, when followed up year by year, and as to the cost, Mr. Parker Earle, of South Pass, in an able article in a recent number of the *Rural New Yorker*, demonstrated by the actual figures of those who had kept an exact account of the labor used, that it costs a trifle less than *eight cents per tree* to run one of Dr. Hull's machines during the Curculio season! No one will claim that the crop is not worth saving at ten times such a cost!

NATURAL REMEDIES.

Dr. Trimble has lately communicated to me the fact that he has discovered a true parasite upon the larva of the Curculio. The sooner it makes its appearance in the West the better, for no such parasite has ever been detected here yet. It was well known that ants destroyed the grubs as they left the fruit to enter the ground, but up

to 1868 no other cannibals were known to attack it. In the summer of that year, my late lamented associate, Mr. Walsh, discovered several which habitually prey upon it, namely, the larva of the Pennsylvania Soldier-beetle (*Chauliognathus Pennsylvanicus*, DeGeer), that of an undetermined species of Lace-wing Fly (*Chrysopa*), that of an unknown Ground-beetle (probably *Harpalus Pennsylvanicus*, DeGeer), and the Subangular Ground-beetle (*Aspidiglossa subangulata*, Chaud). Those who wish full descriptions, with figures, of these Curculio enemies, will find them in the October (1868) number of the *American Entomologist*. The Pennsylvania Soldier-beetle is evidently the most effectual of the four, for its larva is frequently met with; while the beetle itself, with its yellow jacket and two broad black spots near the tail, is very abundant during the months of September and October, on many of our composite flowers, and especially on the golden-rods, spireas, bigonias, privets, and on carrot blossoms. It does no harm to the flowers, being content with the pollen which they afford, and it should never be ruthlessly destroyed.

But I have this year discovered an insect friend, which, though far more insignificant in appearance, is yet more useful to us in checking the increase of the Curculio than are all the others put together. It is in the shape of a yellow species of *Thrips*, of microscopic dimensions, the business of whose life seems to be to hunt up and devour the Curculio egg as soon as deposited. I had often wondered why so many Curculio eggs failed to hatch, and was gratified last May to find the cause. A description of this *Thrips* would not edify you, and it suffices to state that the word *Thrips* is used in the Entomological sense, and not in the sense which many horticulturists use it, as in speaking, for instance, of the Leaf-hopper of the vine. The illustration which I have prepared will give you an idea of the contour of these little animals. The species in question is yellow, and scarcely measures one-twentieth of an inch. Thus far I have only noticed it in two orchards near Sulphur Springs, Mo., and cannot yet tell to what extent it occurs elsewhere; yet who knows but this liliputian little friend may, in the course of a few years, rout the ubiquitous "Turk," by attacking him in his most vulnerable point, just in the same manner that the lady-birds routed the Colorado potato bug in many sections, by devouring its eggs; or that the minute Acarus or Mite, described by Dr. Shimer as *Acarus mali*, and first noticed two years ago, has routed the Oyster-shell bark-louse in many orchards? Verily, Nature's ways are so varied—so complicated, and the phases of animal life are so intricate—so protean, that this much desired result may yet be consummated. Only this year, a worm which I have called the pickle-worm, and which was never before known to cut up such capers, has everywhere penetrated our melons and our cucumbers, and presents its ghastly self even in our choicest pickles. The "Struggle for Life" causes many a vacillation in the proportion of an insect and its parasite—the cannibal and its prey—and the Little Turk may yet find his match in this apparently insignificant *Thrips*.

MOOTED POINTS.

We will now briefly touch upon a few points on which there is difference of opinion, and which will, it is to be hoped, elicit discussion, and draw out the opinions and experience of those present.

There is conflicting evidence from different authors, as to whether the Curculio is single or double brooded each year, and as to whether it hibernates principally in the

perfect beetle state, above ground, or in the preparatory state, below ground; the very earliest accounts we have of the Plum Curculio, in this country, differing on these points. Thus, it was believed by Dr. James Tilton, of Wilmington, Delaware, who wrote at the very beginning of the present century, and by Dr. Joel Burnett, of Southborough, and M. H. Simpson, of Saxonville, Massachusetts, who both wrote interesting articles on the subject, about fifty years afterwards; that it passed the winter in the larval or grub state, under ground, and Harris seems to have held the same opinion. But Dr. E. Sanborn, of Andover, Massachusetts, in some interesting articles published in 1849 and 1850, gave as his conviction that it hibernates in the beetle state above ground. Dr. Fitch, of New York, came to the conclusion that it is two-brooded, the second brood wintering in the larva state in the twigs of pear trees; while Dr. Trimble, of New Jersey, who devoted the greater part of a large and expensive work to its consideration, decided that it is single-brooded, and that it hibernates in the beetle form above ground, and he recently informed me that he still holds to the same opinion. Since the writings of Harris and Fitch, and since the publication of Dr. Trimble's work there have been other papers published on the subject. The first of these was a tolerably exhaustive article, by Mr. Walsh, which appeared in No. 7 of the 2d Volume of the *Practical Entomologist*, in which he takes the grounds that the Curculio is single-brooded; though subsequently, on page 67 of his First Annual Report, he came to the very different conclusion that it was double-brooded. In the summer of 1867 I spent between two and three weeks in Southern Illinois, during the height of the Curculio season, and closely watched its manœuvres. From the fact that there was a short period about the middle of July, when scarcely any could be caught from the trees, and that after a warm shower they were quite numerous, having evidently just come out of the ground, I concluded that the insect was double-brooded, and communicated to the *Prairie Farmer* of July 27th, 1867, the passage to that effect, over the signature of "V.," which is quoted by Mr. Walsh (*Rep.*, p. 67), as corroborative of its two-brooded character. Subsequent calculation induced me to change my mind, and I afterwards gave it as my opinion, on page 113 of the Transactions of this Society for 1867, that there was but one main brood during the year, and that where a second generation was produced it was the exception. My reasons for this opinion may be found detailed in the Missouri Entomological Report. Finally, our friend, Dr. Hull, of Alton, Illinois, who has had vast personal experience with this insect, read a most valuable essay on the subject, before the meeting of the Alton (Ill.) Horticultural Society of March, 1868, in which he evidently concludes it is single-brooded, and that it passes the winter, for the most part, in the preparatory state, under ground; and judging from an article recently published by him in the *Prairie Farmer*, he yet inclines to the same belief.

Now, why is it that persons who, it must be admitted, were all capable of correct observation, have differed so much on these most interesting points in the economy of our Plum Curculio? Is there any explanation of these contradictory statements? I think there is, and that the great difficulty in the study of this, as well as of many other insects, lies in the fact that we are all too apt to generalize. We are too apt to draw distinct lines, and to create rules which never existed in Nature—to suppose that if a few insects which we chance to watch are not single-brooded, therefore the species must of necessity be double-brooded. We forget that Curculios are not all hatched in one day, and, from analogy, are very apt to underrate the duration

of the life of the Curculio in the perfect state. Besides, what was the exception one year may become the rule the year following. In breeding butterflies and moths, individuals hatched from one and the same batch of eggs on the same day, will frequently, some of them, perfect themselves and issue in the fall, while others will pass the winter in the imperfect state, and not issue till spring; and in the case of a prancing green worm that is found on raspberry leaves, and that passes the winter under ground, and develops into a four-winged fly (*Selandria rubi*, Harris) in the spring, I have known a difference of three months to occur between the issuing of the first and last individuals of the same brood, all the larvæ of which had entered the ground within three days. Far be it from me to pronounce that there is no such thing as rule in Nature, and that we cannot, therefore, generalize; I simply assert that we frequently draw our lines too rigidly, and endeavor to make the facts come within them, instead of loosening and allowing them to encompass the facts.

It was my intention to have thoroughly and forever settled these disputed questions the past summer, but owing to a lengthy sickness of Mr. Walsh, I was overwhelmed with other matters, at the very season in which the proper experiments could alone be made. Such observations as were made, however, only confirm me in my previous opinion, that it is single-brooded as a rule; but, in justice to Mr. Walsh I will say, that to the day of his death he held the contrary opinion of its being double-brooded. It was on account of this difference of opinion between us, that we could never editorially touch upon the point in the columns of the *American Entomologist*; though we had each of us decided to come to an agreement, in accordance with the facts to be elicited in discussion at this meeting. Alas! how inscrutable are the ways of Providence! He has been taken from our midst, and we shall nevermore listen to his bold, outspoken voice.

Dr. Trimble writes: "I have a friend, an accomplished ornithologist (companion of Audubon), with whom I frequently converse. Once, speaking about quails, I spoke of their having more than one brood a year. He said, 'did you ever see a brood of quails, whether full grown or half grown, without the old birds with them?' In thinking it over, I can not remember that I ever did. The inference follows: the early broods of quails this year, have the early broods next year—the late broods this year, the late broods next year. Why not so with Curculios?" On broad principles it may be stated that insects differ from other animals in so far that they do not breed an indefinite number of times in the course of their lives, but that the females perish soon after depositing their first and only batch of eggs. But although a great many insects occupy but a few hours or a few days in laying this batch of eggs, yet many of them require a much longer time. This is eminently the case with our Plum Curculio, and indeed with most of the insects in the same great Order of Beetles to which it belongs; and I know that Curculios which hibernated may be found upon our trees even a few days after the first bred Curculios of the season appear. Again, few persons—even among those skilled in Entomology—are aware of the wonderful influence produced upon insects by climate or by the character of the seasons. To illustrate: The Oblong-winged Katydid (*Phylloptera oblongifolia*, De Geer) in a state of Nature finishes depositing its eggs, and ceases its chirrup by the first of October in the latitude of St. Louis, and yet this very year, by keeping them within doors and feeding them on green apples, I succeeded in keeping several which I had hatched from the egg, alive until the first days of December; and though everything was

bleak and bare outside, and the Katydid had been swept off by the early frosts nearly two months before, *yet these continued to deposit up to within three days of their death.* No one with the knowledge of such facts, would for a moment doubt that in certain southerly latitudes, it is possible for the Curculio to be double-brooded, and yet be single-brooded in more northerly regions; for several instances of a similar nature in insect life, might be cited. But that it is single-brooded as far south as the southern part of the State of Illinois, I feel quite satisfied. The Curculios generated from those which wintered over, never lay eggs the same season they are hatched; at least, no one has ever succeeded in making them do so, though the experiment has been tried by Dr. Trimble, Dr. Hull, Judge Brown, and myself. Indeed, all analogy confirms the belief in its one-brooded character, for it is admitted that the Plum Gouger (*Anthonomus prunicida*, Walsh), the Apple Curculio (*Anth. quadrigibbus*, Say), the Pea-weevil (*Bruchus pisi*, Linn.), and many other closely allied species produce but one brood each year, and it is with good reason argued, that if there were two generations of Curculios, late fruit would be covered with their crescents, whereas we know that such is not the case.

As to the hibernation of the Curculio, it is only necessary to state, that I am positive that the beetles survive the winter, for I have frequently found them myself during this season of the year, under the rough bark of both fruit and forest trees, and they have been found in like situations and under the shingles of houses, etc., by several other persons. Dr. Hull, on the contrary, believes that they pass the winter in the preparatory state, and records in so many words, that he has found the larvæ in January at a depth of from fifteen to thirty-six inches, and that in April he has found both larvæ, pupæ and beetles below ground. Now, I have a good deal of faith in the accuracy of the Doctor's observations, and accept these statements as truth, the more willingly because the Four-humped, or Apple Curculio, which attacks our apples, quinces and haws, does pass the winter in the larva state under ground. But had he not found the beetle in company with the larvæ and pupæ, I should not so readily have accepted such proof; but, like Oliver Twist, should ask for more; for the larvæ of several species of snout-beetles very much resemble each other, and we are all liable to make mistakes. Individually, I never found Plum Curculio larvæ at a greater depth below ground than six inches, and my efforts to find them in the winter under trees from which infested fruit had fallen during the previous summer, have so far been fruitless.

As to whether the Curculio is the cause of the Peach-rot, there can be no question whatever that it is greatly instrumental in spreading this dreaded disease. So much is this the case, that by protecting fruit in such a manner that no insects can get at it, you may in a great measure save it from rotting; and this is an additional reason why trees should be thoroughly jarred and protected from the Curculio. But I yet hold that the puncture cannot possibly be the first cause of Peach-rot. This is sufficiently proved by the facts, that much of the fruit is punctured long before the rotting season commences; that the fruit often arrives at perfect maturity, still containing the grub; that in certain localities, and in favorable seasons, the rot is scarcely known, though the fruit is badly punctured; and, finally, that the crescent of the Curculio often (indeed, in the great majority of instances) heals up entirely, thus precluding the idea of any poisonous effect attending the puncture. It might, with equal reason, be argued that the Grape-rots, the Potato-rot, and all the innumerable other rots are also

caused by insects; but as I have already devoted all the time I can spare to this paper, although many interesting facts have not even been alluded to, and as this matter does not properly come within my province, I leave it for the discussion of the more wise and experienced.

Mr. Freeman—It seems to me quite likely, in the present state of investigation, that the class of observations for and against the theory of a double brood may be right in the fact, and I was intending to make a remark, which Mr. Riley himself alluded to in his essay. Southern Illinois is so distinct a climate that it appears to me that there may be a double brood there and not a double brood North.

Dr. Hull—I have listened to the paper read with a great deal of interest, containing as it does perhaps more information than it has ever been my fortune to read or hear. I would, however, like to make a qualification, because I see the gentleman does not properly understand me on one question, that is, in reference to the eggs. Were all our fruit to fall on the ground when it contained larvæ, then the hogs would be the best protection. But that is not so. A great deal comes out while it is on the tree. Another difficulty is this: Suppose you and I have an orchard, and our neighbor has an orchard; you may keep your hogs in your orchard, and yet I will breed enough to destroy all that is in the adjoining orchard, because they fly out, and hence we cannot rely upon the hog. There is another fact: If one has to run a Curculio-catcher, the hog is not the slightest use in the world, because from the time they come upon the trees to the time they lay their eggs, will be some ten or fifteen days, and I have demonstrated that the running of the catcher takes ninety-nine out of one hundred, and I so loosen them, and so completely catch them up, that I may as well catch that excess as catch a few. If we adopt the Curculio-catcher, we may do away with the hogs. If we succeed, we shall catch them all in fifteen days. There are about twenty-two days from the first commencement of laying eggs until they cease.

Dr. Schroeder—Always my heart was with you when you had your meetings, and my good wishes, and very often I sat down and made a speech on these things, particularly this Curculio question. Now let me tell you that the devil is to be fought in one way or the other,

and if we take him, he won't be there. I have now no Curculios on my plums, but since my plums begin to bear, my apples begin to get sick. I began to shake the trees, and I could not do it always, and so I got the old woman to shake. But that would not do any good, because my neighbors would not shake, and they were blest with a good crop of Curculios. Well, you know I had a barrel of wine that would not come right any how, and it was leaking at the staves, and so I put an old carpet round it, and the carpet all got full of the bad wine. Well, I one day knocked the end of the barrel in, and threw the carpet over a tree that was full of Curculios, and it killed them all. Now, that is one cure for Curculio. Then there is another cure for Curculio: American whisky. We can kill a rebellion in a short time; we can kill any thing; and shall we say that we cannot kill Curculio? Give him plenty of American whisky and it will kill him. It will kill the devil if he take it. [Laughter.]

RASPBERRIES.

Mr. Flagg read a letter from Mr. Combs, of Collinsville:

Considering the easy production and good quality of the Raspberry, as compared with other fruits of the farm and garden, it is certainly greatly neglected. While nearly every farmer that cultivates his own land has his apple orchard and his peach trees in the fence corners, if no more, there is not one farmer in ten, and I believe not one in twenty, in the State, that grows Raspberries enough for his own table, when one-fourth of an acre, properly cared for, would supply him with an abundance of this most delicious fruit, not only for the bearing season, but for the whole year.

The grower of large fruits has many enemies to contend with. Some attack his tree while growing, others attack the fruit, and sometimes render it almost worthless; but in cultivating the Raspberry, there are no destroyers to contend with; and, after waiting for years for his trees to grow, his hopes may be blasted by a cold snap in the winter killing the buds, or a late frost may catch them in blossom; but there is no uncertainty in the cultivation of the Raspberry. I have been growing them for the last ten years, and have been familiar with them for twenty years, and I have never known a failure in the crop. I don't wish to be understood to discourage tree planting, but I would say to all, plant trees, and plant berries too, and not only Raspberries, but other small fruits, enough at least to have a succession during the fruit season: and after you have planted, don't forget to cultivate. That is the great essential to success.

Raspberries require about as much cultivation as is necessary to grow a good crop of corn; perhaps a little more the first season, as they should be tended later, and the

first season the canes should be topped back to one foot of the ground, and they may be kept at about that height for the season if you don't wish to grow plants, but if you wish to grow plants it will not do to top later than the twentieth of June, as the laterals must have time to grow and mature by about the first of September, the time the plants commence taking root. The second season the canes should be topped back to about two feet and a half feet just before the berries begin to ripen. If done too soon, the laterals will grow out and be in the way of the pickers before the close of the season; and if you don't wish to grow plants, you can increase the yield of berries largely by cutting out the old wood and topping in again and giving the new canes one or two plowings after the picking season is over. It will not be necessary to stake them if you top them while growing. My experience has been principally with the Miami or McCormick berry, and I know of none so well adapted to general cultivation. While there is no variety more hardy and vigorous, I don't think they are equalled by any in the large size and uniformity of the berry, the last berries of the season being as large as the first, and I know of no variety that will yield larger crops. I have grown sixty bushels to the acre on old land that would not have produced thirty bushels of corn with the same amount of cultivation. I recommend them for general cultivation.

Yours, truly,

W. S. COMBS.

Mr. Pierson—In the east part of the State there are certain appearances that are very alarming. I am not satisfied whether they are the results of insect life or of the wet season. In canes that were only in the third year of their growth the fruit matured very imperfectly—the Miami and also the Doolittle. The Purple Canes have been better; but the Miami which before had been remarkably vigorous and healthy, has this year been, to a large extent, a failure as to the quantity of fruit and hardly fit to eat, and the wood is very inferior. In my Congressional district a correspondent gave me notice of some insect that was at work.

Dr. Schroeder—Did you make many layers of them?

Mr. Pierson—I made some, sir.

Dr. Schroeder—I found that to be the case with mine, but I made a great many layers.

Dr. Hull—I would like to add a word as to this, especially as there is a statement that there is no disease. We have a disease—the orange rust—not only on the raspberry, but on the blackberry.

Dr. Schroeder—What kind of ground were these raspberries grown on?

Mr. Pierson—We have a kind of sandy ridge—not poor soil—it is

a mixture of sand and prairie soil. My impression is that the wet weather was the cause.

Mr. Riley—I beg to differ with the essayist. There is an insect which bores into the root, and there is the orange rust or fungus on the root, which kills the entire vine, so that the raspberry grower must not go off with the idea that he has no difficulties to contend with.

Mr. Humphrey—I found my vines affected at the roots, and I lost a great many in that way. In many cases I could not find any insects, but in a dozen at least, I found a little grub about one-eighth of an inch long. It was a light colored one, and he went round on the bark and then he seemed to go out.

Mr. Wier—I wrote to Dr. Walsh about it and he sent me a cane, as the gentlemen speaks of it, but it was not the same as mine.

Dr. Schroeder—I just want to know if there is any fruit that is free from insects, or even, man, if he does not keep clean? [Laughter.]

Mr. Riley—I made the statement I did, because I think it would be hard to find any fruit that did not have an insect enemy.

REPORT OF STATE HORTICULTURIST.

In presenting my first annual report, I shall confine my remarks to such considerations as are disconnected with statistical information. I have two reasons for pursuing this course: 1st, the Society annually appoints one Vice President from each Congressional District, whose duty it is to collect and report all facts relating to horticulture in their respective districts; 2d, in addition to this, there is annually constituted three *Ad Interim* committees, one for the north, one for the center, and one for the south parts of the State. These several committees are expected to possess themselves of such horticultural information, especially of a statistical nature, as may be of general interest, and report the same. In view of these facts, as well as to make the most of the space allotted to me, I shall confine my remarks to the consideration of such topics as, it is hoped, may prove to be of general interest to the horticulturist; leaving the duties assigned to the several officers and committees of the Society to be performed by them.

In anticipation of this report, I accordingly in the winters of 1868-9, and the following spring and summer, made many observations and experiments to test the theories which had long guided me in the production of superior specimens of fruit and in inducing hardihood in trees. Of these experiments, together with the observations

made of certain vegetable diseases, and of some of the habits of several of our insect foes, not before understood, will mainly constitute the base of my present remarks.

PEAR, APPLE AND QUINCE TREE BLIGHT.

Before we can hope to vitalize by artificial means structures so delicate as are those which we have determined are the cause of blight, it will be necessary to possess a thorough knowledge of the laws of vegetable growth.

So small are the structures which I propose to figure and describe, especially in the germ state, that millions of them might be dispersed among the wood cells contained within a cubic inch, with a scarcely perceptible increase of its bulk. The process of vegetating them is such as to require the greatest nicety in manipulation.

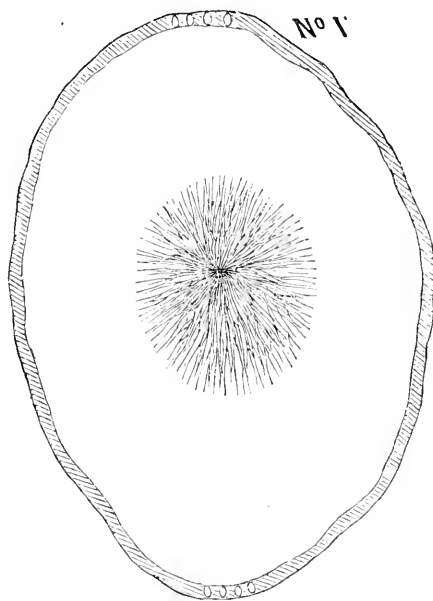
Whoever can, from day to day, so control the conditions affecting plant growth as to cause leaves of fruit trees to root and branch, may hope artificially to vitalize the spores of blight. The nicety of manipulation, however, will not end with vitalization.

To figure and describe these mucilaginous globules, for such plants causing blight in trees appear to be, taxes to the utmost our sight, our skill and endurance. The slightest breath will detach those plants that are fully grown from the parent or point of attachment and disperse them; and when by chance we have them under observation, the powerfully reflected light to which we have to subject them, quickly burns or dries them up. These and many other difficulties, a full enumeration of which I shall not now attempt, constantly interpose, requiring on the part of the operator leisure to observe, skill in handling, and a determination to overcome obstacles in the way of success.

If we examine closely the bark of pear trees sometime in the month of May, or at any time until near the time the tree completes its growth for the season, we may find in the outside layers of the living bark, on those trees subject to blight, little raised patches presenting to the eye something of a spongy appearance. This raised spongy bark is not confined to any particular varieties, nor will particular branches, or any certain parts of trunks of trees, be found more likely to be free than other parts; slow growing sorts, or those that mature their growth early in the season, are most exempt from the killing effects of blight, as will appear in the course of my remarks. If we cut the spongy bark, of which I have spoken, into very small pieces, and for convenience in handling put a pin through each piece, then place a number of these small pieces of bark in a bottle containing enough moisture to afford the humidity needed to excite vegetable growth; then cork and put the bottles containing these specimens in a box and cover the whole with damp saw dust or other material to exclude light. Next, the box with its contents, for a period of from two, four or six days, must be kept at a temperature from 80° to 100°. At the end of this time, if we take from the bottle some of these small pieces of bark and place them under a microscope, manifesting five or six hundred diameters, there will be seen on the outer edges of some of them little cellular like forms, attached to the sides, or partly, protruding from little crevices or abrasions in the bark. If we observe closely, it will become apparent that these little forms which come under observation, and which at first sight appear to be identical, are quite different, and may properly be divided into two classes.

The one I shall first briefly describe and figure, which I do for comparison, is a wood cell, and was made out of the materials which the tree is constantly elaborating

during a greater part of the season of the tree's growth. I make the qualifications, viz: "The greater part of the season, because there is a part of each year in which the cellular growth of trees is, except under peculiar conditions, wholly confined to the roots, to the leaves and to the fruits."



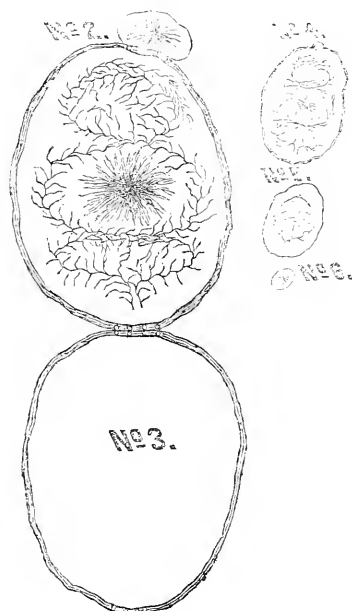
To return then. The cell which I commenced to describe is a wood cell. See figure No. 1. In our sketch it appears as do all newly forming wood cells before they have been surrounded and pressed upon by other cells. In the central part of this new cell appears an oval, composed apparently of the same mucilaginous substance as is the cell itself, but so much thicker than other parts as to be distinctly seen, its thicker filaments radiating as spray, and around the central part, the whole of the interior substance of the cell being enclosed in a delicate membrane or covering.

I will now come to the second class: those that cause blight in pear, apple and quince trees. The figures No. 2 to 6 illustrate these. No. 2 and 3 mature blight cells or plants. No. 4, cell in process of growth, with germ just visible at the end; 5 and 6, germs of the same of smaller growth.

These cells are found interspersed among the new wood cells. Many of them have one of their ends attached to other similar little cells which are but just discernible in the pores and seams of the bark.

These last mentioned cells are perfect *fac similes* of the wood cells but varying greatly in size, and differing in their internal structure, in so far that their rayed nucleus is surrounded with small rayed or sprayed lines. These lines seem to emanate from the base, or end of the cell that is or was attached to another cell. These

thickened spiral lines, or tracings, which seem to start near the base, as they ascend, diverge to near the sides of the cell, then return and cross each other below the center and then pass around and above the central point or nucleus, then returning a part of the way by a course similar to that in their ascent, when they are lost to view. These minute microscopic lines or tracings, in the interior of this second class of cells, are believed to be the channel through which the circulation is maintained.



Each of these last described cells is, in fact, really a distinct plant of the unicellular type, that is a plant consisting of a single cell, each little cell containing within its membranous covering the laboratory necessary to the production of other similar plants. That this is so, may be known by an examination of them. At the end opposite the one by which the plant is attached may be seen several small, thin dots, and on some of these cells will be seen a small globe of jelly-like substance. (See fig. No. 4.)

This small globe as it first appears is just discernible under a high power. Strange as it may appear, this small nearly transparent globe of mucilage is really the germ of a new plant, as may be determined by examining other cells or plants, on some of which several of these little globular forms will be found to be much enlarged. Some of the new cells will show the small rayed nucleus or center, on others half grown cell plants, and on others those of larger growth, to full grown plants. All these young cells, as soon as they are fully grown, or soon after, separate from the mother cell, when they in turn produce other cells in the way we have described. When these one-celled plants, or small pieces of them, or the spores find a lodgment in the

living bark of trees, under favorable conditions they quickly grow, and each becomes the center of a new cluster of cells; these, as they grow, force their way into the living tissues which they reduce to an unhealthy condition, gradually penetrating into it until they reach the alburnum or newly forming sapwood. When these unicellular plants are once in contact with the alburnum or newly forming sapwood, and the conditions for their growth are most favorable, they increase with astonishing rapidity. So rapidly may they increase, that in a single night, or two at most, they will disperse themselves through a square inch or more of space. As this growth goes on the little cells push into the newly forming cellular parts of the tree, and as far as they penetrate they separate the little wood cells of recent formation, thus breaking up the organized channel of circulation, and feed on the juices which are liberated, and flow into these wounded parts.

If the circulation in the trees is very active, so much sap is diverted into these wounded places and thence out through the spongy or wounded bark, as to run down many feet on the branches or trunks of the trees. Could these little fungoid plants or cells which we have described always remain as we at first find them, then the harm they could inflict on trees would be so trifling, as compared with the injury they really do, as scarcely to deserve a passing remark.

All individual living organisms, however, be they animal or vegetable, after performing their functions, die, giving place to others of their kind. So it is with the little one-celled plants of which we are treating. These run their course in a few hours or days, when the substance of which they are composed breaks down, and their sappy or watery parts mix with the sap or juices of the tree. This mixing the juices of the one-celled plants with the sap of the tree, probably, dissolves the little particles of which the sap in the trees is made, much in the same way that certain substances, when introduced into the veins of men or animals, are known to break down and dissolve the little flattened globules of which the blood is composed.

When the blood of man or animals becomes deranged by mixing with it substances that will dissolve it, as by the introduction of milk into the veins, or injection of poison by the bite of reptiles, then ulceration of the parts, or death of the animal is the invariable result. Nor do we find the mixing of the juices of the one-celled plants, of which we have spoken, with those of trees, less fatal to trees, than is the vitiated blood to animals.

In my report to the Illinois Horticultural Society for 1868, I detailed my experiments in inoculating healthy pear and apple trees with blight. To that report I will now add that pear, apple and quince tree blight appear to be identical, since the little cellular growth when taken from one of these trees and introduced into the circulation of either of the others, it will induce the disease, to all appearance, the same as when it occurs in the usual way. It is by the process of inoculation that I was able to determine that the little cell growth of which I have spoken, was the cause of blight.

By collecting on a camel's hair pencil a number of the little cells found on the bark which was enclosed in the bottles, as I have before described, and put them in contact with the newly forming sap-wood of healthy trees, then the disease will appear in the inoculated part in from two, four or six days, varying in the time, according to the state of the weather.

In the early part of the season of the tree's growth, it generally requires about four weeks for the little parasitic plants, which are the cause of blight, to pass through the

layers of live bark to the alburnum or sap-wood. This will explain why it is not uncommon for trees of slow growth to make their terminal buds on the current year's shoots while blight is yet in the bark. When this happens, the flow of sap in the bark is arrested, and the wounds made by the blight dry up, leaving the dead patches in the bark which are so often found in the pear. After the poison has passed through the bark to the sap-wood of slow-growing trees, they mostly escape extensive injury from blight, for the same reason, that is, the want of active circulation in the tree to disseminate the vitiated sap.

The effects of this fungoid growth, inducing pear-tree blight, may be rendered comparatively harmless by a judicious system of root pruning; a rule for which may be found in the society's transactions for 1868, page 36.

[NOTE.—Since these instructions in root-pruning were written, we have perfected an implement for cutting the roots of trees by horse-power. Patterns of these cutters are now in the hands of a competent mechanic, who will shortly advertise them for sale.]

In addition to the instructions as printed in the last year's proceedings, I add the following hints on

ROOT PRUNING PEAR TREES ON PEAR ROOTS.

If root pruning the Pear is to be done to induce tardy bearing trees to become fruitful, then the pruning should be done in time, and with sufficient severity, to cause the trees to produce their leaves fully grown at least six weeks before frost in autumn. But when the pruning is to be done to ward off the attacks of blight, then the roots must be so much shortened that the trees will show terminal buds on leading shoots, at the earliest period that trees are known to show the effects of blight in the sap wood. No rule based on time can be given, since each mile, North or South, would make some variation necessary. Or, to be more explicit: the degree of maturity I describe, of course, would be reached earlier South than North. For instance, take Seckel trees making moderate growth. These in the latitude of Alton would show terminal buds, at the ends of the latest growing shoots, about June 1st. At Villa Ridge and South Pass, the 15th to the 20th of May; while a similar condition of growth, as far north as the north part of Iowa and Galena, could not occur earlier than July 1st.

For these and similar reasons any rule made as a guide for root pruning must have reference to conditions rather than time. Above I aimed to show that in the early part of the season, the little cell growth, generating pear disease could not in the latitude of Alton, unaided pass through the bark to the sap-wood before about the first of June. These conclusions are based on microscopic examinations, also on observations made on root pruning, extending through a period of more than twenty years. To my mind they establish the fact that in no instance can pear tree blight materially injure a tree on which all the leaf growth is well developed by the time the first branch growth of slow growing Seckel trees is ended; provided a second growth is not made. Excellent examples in support of this view may be found in the Seckel growing on poor soils. Under such conditions the trees form terminal buds on the strongest of the current year's shoots at the time we have named.

It is probable that these slow growing Seckel trees could not blight, in fact do not, until a second flow of sap occurs. On this account, Seckel, and other trees of similar

habit of growth, could be kept in health by a moderate shortening of the roots; while trees which continue branch and leaf growth to a later period, must be more severely root pruned. Theoretically considered, especially for the South, pruning to secure early maturity of wood growth is wrong; since trees which naturally go to rest early, after they have been a short time inactive, generally cast their leaves and then make a partial second growth, which is injurious or fatal to them. Observation, however, has taught the important lesson that root pruned trees make but one growth the same season.

When severe top pruning is done, then the roots grow slowly until the balance in the top and roots is again restored. In like manner, trees which are deprived of a part of their roots push only a part of their germ branches, these are soon grown. After this branch growth has ceased the leaves continue a long while active and change leaf to fruit buds; a large number of buds are so changed. After which, all further growth of the season, if there be any, goes to restore the loss of the roots.

Trees pruned as I direct, do not again restore the balance between the top and roots before the end of the second season. Hence root pruned pear trees, growing under any conditions in which I have yet observed them, cannot blight until the third summer. For this reason, shortening the roots once in two years, in accordance with the rule established by me, will protect the trees from injury by blight.

Among other advantages gained by root pruning, besides preventing blight, may be named the following, viz.:

- 1st. So far, root pruned pear trees have invariably resisted leaf blight.
- 2nd. Tardy bearing trees, perfect fruit buds the first summer, after their roots have been cut, and produce full crops of fruit the next.
- 3d. The size of the fruit is much increased.
- 4th. The pears on root pruned trees are smooth-skinned and free from russet patches and bands, and on ripening, color finely; in this respect rivaling the California pears; which they also greatly excel in quality.
- 5th. Root pruned pear trees, on pear roots, may be dwarfed to almost any extent desired.
- 6th. Trees of any age after they have been several times root pruned, may be safely transplanted.

HOW DWARF PEAR TREES ARE CHANGED TO STANDARDS; AND HEADS OF A PRACTICAL HEIGHT ARE SECURED.

Dwarf trees on being transplanted into the orchard, ought to be put so deep that the junction of the stock and graft shall not be less than three or four inches below the surface of the ground.

Either before or after putting the tree in the ground, raise wholly out of the pear wood, two lips, one on each side of the tree. These lips should be cut so deep that each lip will contain about one-fourth of the wood in the stem or trunk. These lips may be two and a half or three inches long, and to prevent them from again uniting with the stem or trunk, a bit of glass should be crowded into the slit. This done, fill in the earth around the tree. In June, or later, with the formation of the new wood growth, granulations will occur at the lower ends of the slits or lips, and later from these cellular deposits, rootlets will appear.

These new pear rootlets, in soils repeatedly stirred, will grow with great rapidity.

Trees from the nursery should be well supplied with branches from near the ground to the top. Cut these all off the stem to the height of twelve or fifteen inches, from this point to where the heads of the tree branch; at it leave branches once in about three inches and on different sides of the stem; cut each of these back to one or two buds. As growth begins, each of these buds will develop shoots or branches; as soon as these are grown to the length of eight or ten inches, the ends should be pinched off, to prevent them from running off with too much of the forces of the tree.

Should some one of the branches selected to form the head of the tree, be likely to run off with too much of the growth, then it must be checked by pinching; otherwise allow all to grow to the end of the season.

Second year. In pruning, the second year, cut back the branches on the stem to one and two buds each, and as soon as the shoots from these are eight or ten inches long, pinch, as directed in the first year. If any of the branches intended to form the future head of the tree, become too long and straggling, or are likely to become naked, cut them back to some bud, a branch from which will point in the right direction.

During the summer, if any of the young growth becomes too vigorous, cut it out, if not wanted, or check the growth by pinching.

Third year. This year, treat the branches on the stems as directed in the second year. By the end of the third season the trees will have straight, tapering stems or trunks, which will be strong enough to support the tops without bending. It will, therefore, be necessary to cut away all the side branches on the trunks below it. In the fourth year, all the branch and leaf growth will be confined to the head of the tree. This may cause an excess of young shoots; these must be rubbed out as they appear, and any excess of growth controlled by pinching, as before mentioned. Trees after growing four years in the orchard, ought to be large enough to begin to bear fruit. At this age they will most likely require to be put in a condition to resist blight. This will be effected by shortening the roots in the way before described.

Pruning the roots will have the effect to cause the tree in the following year to change a vast number of leaf into fruit buds; these buds will be so perfectly formed that nearly all of them may be depended on for fruit, therefore it will be well to prune away so many of them as are not wanted for fruit—also so much of the top growth as will give a perfectly formed head, and cause full exposure of the growth which is left to the light and air. The amount of pruning to be done will vary greatly; some varieties will need to have half or more of the young growth cut away, while some sorts, as Howell, Beurre d' Anjou, Beurre d' Amalis, and some others, may have their branches spread or tied apart without pruning. Heads of trees, kept spread apart a few days during the growing season, will ever after maintain that position.

Pear trees, which are kept systematically root pruned, will make but little annual growth, and hence, after the heads of the trees are once properly formed, they will require but little annual pruning. This after pruning will consist mainly in removing such superfluous branches as may appear, and from time to time thinning out any excess of short branches, or fruit spurs, as they are sometimes called, as will leave no more than are needed to produce fruit.

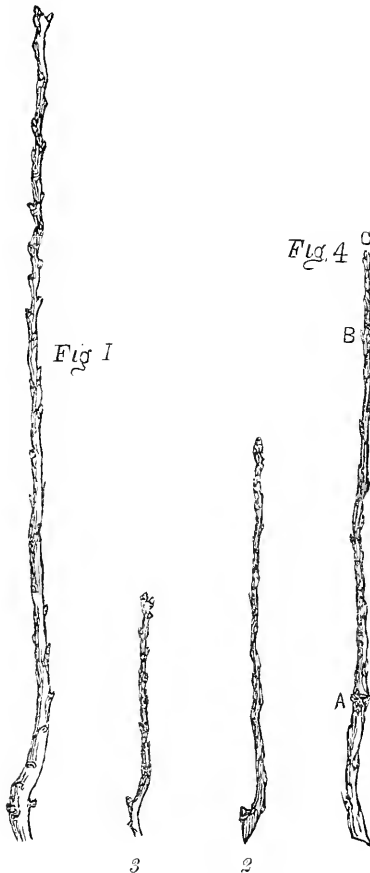
Old trees on quince stocks may be tipped on several sides of their trunks, much in

the way I have described for smaller trees. This should be done early in the season, and the earth banked up around the tree, where it ought to remain until the following spring, when the earth may be leveled.

SELECTING GRAFTS FOR THE NURSERY.

Each mature leaf bud of any of our fruit trees contains an embryo branch with a number of leaves. These microscopic branches with their germ leaves, are formed during the growing season and winter in the buds. If we carefully observe these germ branches taken from different parts of the trees, we shall find that they will vary greatly in several quite essential particulars, viz.: germ branches are largest, and are supplied with the greatest number of embryo leaves in those buds which occur on shoots, the leaves of which in the season of the tree's growth were most exposed to sunlight and air. Except in very young trees, it may be stated as a rule, that trees which are not severely pruned, nor more highly stimulated than they were in the preceding year, unfold only their germ branches and leaves that were formed the previous season, and wintered in the bud. But when trees are more highly stimulated one year than they were in the preceding year, or are severely pruned, then the vegetable forces, from being greatly increased, or by being concentrated, unfold the terminal or other strong buds of the current year, thereby virtually making the branch and leaf growth of two seasons in one. This will be better understood when it is explained that, not only is the number of branches and leaves that a tree puts forth one year, established and provided for in the previous year; but in addition to this, each individual cell of which leaves are composed, exists in the bud. No process of stimulating or concentration of forces can add a leaf or an individual cell to a leaf that did not exist in the bud, as formed in the previous year. But when these previously formed parts of a tree are fully expanded, and an excess of vigor remains, then the buds of the current year's growth are unfolded, producing the growth which under normal conditions would have remained dormant in the bud until the following year. A knowledge of the facts, as herein stated, will aid the horticulturist in many ways. I will cite one or two examples, viz.: It may be necessary to cut scions for grafting in the nursery. In this case, the best grafts will be taken from those branches, the leaves of which grew under full exposure of sunlight and air; because on these branches the buds are the strongest, that is, they contain the greatest number of germ leaves. Hence, when these are all unfolded, the length and strength of the branch will be in proportion to the number of leaves the branch shall develop into full grown ones. Therefore, grafts selected by this rule, other conditions being equal, will universally produce trees that will be quite uniform in height and strength. See No. 1. If it be desirable to use all the grafts on a tree, then it will be well to select those that are next best; these will produce trees of medium height. No. 2. We now have left those smaller branches grown in the interior of the heads of the trees. These for reasons before stated, will have buds, the germ branches in which will be slender and short; that is, they have but few leaves to unfold. When these are used for grafts, the shoots from them will be much weaker than either of the two preceding selections. See No. 3. Each selection of grafts must be planted by themselves. In this way, other conditions being equal, the trees grown from these three selections will vary in size, just in proportion as the germs in the buds, from which they emanate, were

supplied with a greater or less number of leaves. Or in other words, the height of the first growth of trees from grafts will always be controlled by the germ branch as formed in the previous year. Again, let us suppose that the three selections of grafts of which I have spoken, had been taken promiscuously as is commonly done and put on roots carefully selected. In this case we should at the end of summer have just what may be found in any nursery in this country. That is, the trees will vary in height, say from three feet down to one foot and less, as shown in Nos. 1, 2 and 3. Whenever weak grafts are put on vigorous stocks, then the germ branch is soon



developed into a full grown one. The buds at the axil of the leaves as well as the vertical or terminal ones are all early perfected. It is the normal condition of these buds to remain dormant until another year, but they cannot when placed on stocks capable of supplying more food than is required. Therefore, the terminal or other strong bud is unfolded and the germ branch that was within, is added to the one

already grown, giving us a full illustration of two year's growth in one, as seen in No. 4 from A to B. These facts are of value to the nurseryman, since knowing why it is a certain growth occurs, he will be able to produce or avoid it.

No. 1 has 37 active buds, besides five dormant ones near the base, which were partially consumed by the leaves and buds of later growth. The graft producing this tree was taken from a shoot, the leaves of which in the previous year, grew under full exposure of sunlight and air.

No. 2 has two dormant buds and nineteen active or perfect ones. The branch from which this graft was cut, received but partial exposure; while the graft producing No. 3, which has one dormant and ten active buds, was much shaded, as I have elsewhere described.

No. 4, like preceding, is from a graft taken from the interior of the tree; but unlike either of the others, the stock on which this one was grown, was one of great strength. The first growth from this graft consisted of twelve buds, extending to A. When these were formed, the terminal bud unfolded, producing a second or additional top growth of twenty-five buds. This growth was ended at B. When these were perfected, the top or terminal bud on this second growth, opened, making a third addition of four inches to the height of the tree; when, as seen between B and C, the growth was arrested by cold. Under normal conditions, in this last tree, we have the bud formation of two, and a part of the third year's growth in one.

SCAB OR ARRESTED GROWTH OF APPLES VS. APPLE TREE LOUSE.

Perhaps it is a little singular that we should, year after year, have gone on discarding one variety of apple after another, because they yielded to what was believed to be a disease of a fungoid origin, popularly known as scab. Singular, not because the apples, when once scabbed, were not worthless enough to entitle them to a place on the rejected list, but singular because of our ignorance in not understanding years ago, as we might have done, the true origin of the disease. During the past winter, in my own orchard my attention was repeatedly arrested by the vast number of clusters of little eggs which were glued to the branches near the base of the leaf and fruit buds. These egg clusters were those of the apple tree louse, and were placed where they were found by the winged lice in the previous fall. These eggs are hatched by the warmth of spring; the temperature which develops the blossoms and leaves, being sufficient to hatch the eggs. All the eggs, however, do not hatch at the same time. It often happens that a part only of the little cluster of eggs are hatched when the remainder is prevented by cold. From this cause, sometimes one or more weeks intervene between the first and last hatching.

Our knowledge of the extent of the mischief sometimes done our trees by the root louse, made me curious as to the possible damage that might result from such vast numbers of these tree lice. On consulting authorities, I learned that it is the normal habit of these insects to feed on the newly forming leaves, and on the young shoots of the current year's growth.

To this view I may add, as the result of my investigations made the past spring and summer in my own grounds, and in different parts of the West, that in respect to their food, these lice seem to be extremely fastidious. On some varieties of the apple they feed almost exclusively on the leaves, and on the young shoots. As an

example of this, I may state that the leaves and shoots of all russet varieties are selected in preference to the fruit. Also, I could mention, as being mainly exempt from their attacks, the fruit of Keswick Codlin, Duchess of Oldenburg, and other sorts. On the other hand, the fruit of Early Harvest, Carolina, Red June, Newtown Pippin, Winesap, and many other fine sorts, in localities where the louse abounds, were this year totally ruined.

The injury done to our apples by this insignificant little louse, results from its puncturing and sucking the juices of the young fruit just before and after it is in bloom. At these punctured points growth is arrested. After the louse has disappeared, fungoid growths attach to the wounds and quickly spread from one wound to another, and so far as they extend, arrest the external growth. If an examination is delayed until after the disappearance of the louse, or until these fungoid growths or their effects are visible to the unaided eye, then the punctures made by the louse can not well be detected, and the injury, viewed at this time, would appear as of fungoid origin.

The injury done to the apple crop, by the apple tree louse, can not well be estimated. Its mischievous operations are not confined to certain orchards or States. All parts of the West, and probably the East, also, suffer great loss annually, by reason of its depredations.

What is remarkable of the past respecting our knowledge of this insect, is, that we should not have found out that it was its normal habit to puncture the germs of fruit, as well as the tender leaves and branches. But for the chance desire, on my part, to study the structure, the habits, and the possible mischief done by this louse, orchardists might have gone on in blissful ignorance for years to come, as in years past, discarding one variety of apple after another, until our last variety subject to the attacks of lice had been rejected.

In the latter part of June, 1868, Mr. B. D. Walsh, State Entomologist, spent a week in the Alton district, prospecting the bugs. While here, Mr. W. was greatly pleased to find a cannibal beetle feeding on the Colorado potato bugs. So greedy and energetic were these cannibal insects found to be, that only four to eight days were required by them in which to destroy all the potato bugs in the worst infested fields. Pursuing his investigations further, Mr. W. found the cannibal on the Colorado bug also feeding on lady-birds. To these discoveries I will add, that at the end of the summer, in the Alton region, so general had been the destruction of the lady-birds, that not one could be found. All, or nearly all, had fallen a prey to the rapacity of the same cannibal insect that destroyed the Colorado potato bug. This circumstance in itself is insignificant enough, and perhaps the reader is ready to inquire what possible connection there can be between the appearance of a cannibal on potato bugs and lady-birds with that of the scab on apples.

Perhaps this will better be understood when we explain: In the fall, after the apple tree lice become winged, they lay clusters of eggs on the young shoots, as before mentioned. These lice eggs are greedily sought after by the lady-birds. In the fall and early spring, the lady-birds consume a vast number of these eggs. From the eggs that are not eaten, little colonies of lice are hatched. In the midst of these young lice, the lady-birds drop a few of their own eggs, which soon hatch, producing small larvæ. These larvæ of the lady-bird immediately commence preying upon the apple tree lice, catching and devouring them with the greatest avidity, one after another, in

quick succession, without apparently diminishing their appetites. From what has been stated of the habits of the lady-bird, it will readily be inferred that to their destruction chiefly, may be attributed the great increase, the past spring, of the apple tree louse, and that to the little lady-birds, and closely allied insects, in the aid they afford us in the destruction of noxious insects, may justly be attributed much of our success in the cultivation of the apple. Also, it will be seen, that when our cannibal insect friends are greatly diminished or destroyed, then those insects, injurious to vegetation, must be kept within control by artificial aids.

REMEDIES DESTRUCTIVE TO APPLE TREE LICE.

Make a strong decoction of tobacco, by boiling tobacco, or tobacco stems, in water. To four gallons of the tobacco water, add, say one quart of strong soft soap, and with a garden engine apply this mixture to the infested trees.

Another remedy, equally efficacious, consists in slacking quick lime with boiling hot water, using only so much water as will reduce the lime to powder. Lime so slacked will possess more caustic properties than air slacked. After a shower, or while the trees are wet with dew, throw the powdered lime over them. One application, well applied, especially if they are wet enough to cause the lime to adhere, will kill the lice and prevent scab on apples.

OBSERVATIONS CONCERNING THE PLUM CURCULIO.

It is the belief of many persons that curculios hibernate above ground during winter in the beetle form. Among the advocates of this theory are several of our learned Entomologists. On consulting them with reference to my own grounds, which were so cultivated as to afford no hiding place for the hibernation of curculios, they at once pointed to the adjoining forest, which separates my orchard from those of my neighbors, as affording them ample shelter in winter.

This forest ground had not been burned over in the past fifteen years. Much of it had been under fence eleven years, but had not in that time been pastured. Hence the accumulated rubbish was so great as to lend a strong probability to the theory of its being the favorite winter resort of the "Little Turk," and from which the orchard was constantly supplied. It was in vain that I endeavored to explain to my friends, learned in the science of bugs, that the annual influx of insects into my grounds from the direction of the forest could come from the orchards beyond. To fully test the possibility of their presence in the woods, and encouraged by the hope of destroying our little foe by wholesale, I raked the leaves away from the fences and applied fire to all sides of the forest at the same time.

Thus, in less than two hours, I probably destroyed a vastly greater number of forest trees than of curculios. This will appear when it is stated that in May last, from the fifth to the twenty-seventh, there was a gradual increase of curculios in my orchard. But from that time until the sixth of June, their decrease was such as to justify the hope that the end of the curculio season was near at hand. With respect to the insects bred in my own grounds, this was probably the case. Two or three days later, however, there occurred a very warm afternoon, with the wind blowing from my orchard directly over the burnt district, and towards the orchards beyond. It will, doubtless, be a matter of surprise to the reader when I state that on the fol-

lowing morning my catch of insects greatly exceeded in numbers all that had been previously taken in the twenty or more days' run with our curculio catcher.

From the time of this great increase until past the middle of the month, after each warm day, great numbers of curculios were captured, the numbers taken always being greatest after the wind had been blowing from my grounds to orchards distant one, two and more miles, and from which the fruit had but recently fallen.

From this circumstance was deduced the following fact, if fact it be: that curculios, as well as some other insects, discover their food by scent, and by flying against the wind they reach the spot where it is to be found.

It would be a difficult task to determine the exact ratio of increase of the curculio. The casualties to which they are liable are various. And yet from observation it may be stated, as a general rule, that just in proportion as we provide a regular and increased supply of food for them, as by the multiplication of fruit, just in that ratio will be the ratio of their increase. In many neighborhoods in the West, where the growing of fruit is the chief occupation of the inhabitants, there the curculio has already become master of the orchards, a few days only in the early season being required by them in which to render worthless the fairest prospect of the largest orchards, or those of whole districts. It has been my fortune during the past few years to visit many orchards producing their first and second crops. As a rule, in nearly all of these that were fruiting the first time, a few only of the fruits were stung; especially was this true of orchards that were a considerable distance from trees that had matured several crops. But when old fruit districts which are badly overrun by curculios become fruitless, either by cold or by the early destruction of the fruit by insect enemies, then the curculios migrate in such numbers and to such distances as to sweep whole orchards miles away. If not, how else are we to account for the widespread destruction of fruit in the new fruit districts nearest the old, in which there was a failure of fruit?

It may be stated as a general thing that when curculios once enter an orchard, they will in the second or third year at farthest so increase as not only to sting all the fruits, but, on the majority of them they will make from ten, to forty, or more cuts. One egg in each fruit would have made it sufficiently worthless, either for market or for food. Indeed so certain is the *ratio* of increase of curculios in orchards once invaded by them in which there is a yearly supply of fruit, that it is only necessary to understand the conditions of orchards, with reference to stung fruit one year, to enable one to predict, with much correctness, with reference to the following year, of the comparative scarcity or plentifulness of the curculio. In neighborhoods infested by curculios, where contiguous orchards in considerable numbers occur, *there no general success need again be looked for, until a scarcity of fruit shall reduce the curculio, or until the proprietors of orchards shall all unite to destroy them.*

In districts where fruit orchards are near to each other it will often prove of no avail for one orchardist to daily catch and destroy the curculios in his own grounds while those of his neighbors are neglected. The reason of this will be best understood when we state, that at a temperature of 70° and under, curculios are unable to fly, and are comparatively inactive at a temperature of 80°. Hence at 80° and under they may be easily jarred down upon sheets, but so soon as the temperature reaches, say 85° and upwards, then the curculio flies with so much freedom especially if the sun is shining, as to make it impracticable longer to attempt the jarring of them down. From

such time until near evening, provided the weather continues warm, curculios from all the surrounding orchards are flying in, and have the time until the orchard is again jarred, in which to deposit their eggs. If we allow an influx of five insects to each tree daily, to come in from the surrounding orchards, and ten eggs to each insect as their average deposit, then in twenty days we have two thousand stung fruits to the tree, as the egg product of the migratory insects alone. Extravagant as this estimate may appear to the uninitiated, nevertheless it is not one-twentieth the number caught by me in my own orchard the past summer, and other years when the surrounding orchards were destitute of fruit.

Indeed, so great were the numbers of curculios captured on our trees, that all the fruit grown by us the previous year, admitting them all to have been wormy, could have bred only a small part of them.

Notwithstanding curculios breed rapidly, and fly freely from one part of the orchard to another, or to distant points, in search of fruit in which to deposit: yet so long as fruit is plenty, in which they can put their eggs, they usually remain near the place where they were bred. In such instances the trouble of protecting the fruit is not great, since the sexes seek each other on the trees some ten or fifteen days before depositing their eggs. Therefore, if the fact be borne in mind that they are wholly unable to fly at a temperature below 70°, and rarely ever fly freely when the temperature is below 85°, it will greatly lessen the labor of catching. Or, to present the case in a different way: if curculios were to assemble on the trees, say ten days before laying their eggs, and the curculio catcher were run every other day, then each individual insect would stand at least five chances of getting caught before it was in readiness to lay its eggs. Thus it will be seen that it matters not how many insects are bred in one's own grounds, since we are certain to catch all before they are ready to lay. But when curculios come in from other points, it is because of the scarcity of fruit at the place from which they migrate, and as their flight is in the middle and after part of the day, their arrival usually occurs after the run of the orchard has been made.

On this account it is difficult in the latter case to protect fruit, while in the former, the labor will be comparatively easy and certain.

In this connection another fact is worthy of note, namely, that in grounds infested only by its own insects the curculio season may be terminated, by judicious use of the catchers, fifteen or twenty days earlier than could be done when the migratory insects have to be caught. The remarks I have made respecting isolated orchards apply equally well to contiguous orchards, since an arrangement entered into by all the proprietors, to run their curculio catchers after each warm day, or part of a day, would end the season in the whole neighborhood, the same as though the whole were but one orchard.

For several years I have been quite satisfied that the rot in peaches and plums was mainly induced by the punctures made by curculios; and to fully test this view, I carefully protected the fruit on some Hale's Early peach trees, by jarring them daily, and later, when the rot began to appear, by picking off all the stung fruit. The Hale's so treated matured fruit as free from rot as any other variety, while on neglected trees, every fruit rotted.

Observation also has taught that one great cause of rot in early peaches is due to

curculios puncturing them for food. This they do some days before and up to the time of full maturity of the fruit.

These little wounds afford points to which the fungus of rotten peaches become attached, when the fruit quickly decays. If the decayed peaches are allowed to remain on the trees, there the rot soon spreads, not only to all the wounded peaches, but is liable under conditions favoring its spread to attack and destroy the sound fruit, also. The preference curculios show for mature fruit for food, is a probable, and only cause why early peaches rot most.

Hogs are but a partial protection. The good they do is in consuming the fallen fruit with the larvæ. It is, however, unfortunate that larvæ perfect themselves and crawl out of the fruit while it is yet on the tree. In this way, enough escape being eaten by the hogs to stock the orchard with curculios in the following year.

As curculio larvæ always leave the fruit and enter the ground by night, chickens are not the least protection. One year I kept one hundred hogs under plum trees in which the chickens and turkeys roosted, and yet every plum on these trees was stung. Other persons in the neighborhood where I reside, have made chicken yards around plum trees and kept them well stocked with fowls, old and young, without ever gathering a sound plum. In short, all the sure remedies which annually appear in print, not omitting the bad odors, have had a fair trial and are found wanting. So far the only effectual plan is found in the jarring process, which is already too well understood to need repeating here.

So far as we know, no cannibal insect has yet been discovered to prey upon the curculio beetles, or to materially diminish the larvæ.

A knowledge of the facts here stated, and a strict practicable adherence to them, by all our orchardists, would again restore to plenty and profit certain fruit districts in the West, which at the present time, in a pecuniary point of view for fruit only, are worth less than the parchment on which the title to them is written.

DISCUSSION ON SELECTING GRAFTS FOR NURSERY.

Dr. Hull—If a branch were put to rest by the frost there would be no fruit on it. Why? Because the fruit bud is nothing but a modified leaf bud. Hence we must have early maturity to mature the fruit buds. If we can not get any fruit until we get perfect wood, then of course we should devote ourselves to the early perfection of the growth, and when the growth is perfected, then we consider it hardy. You never knew a tree that went to rest at the proper time—that is, by the end of July—where there was the result of sun scald by immature growth.

Mr. Galusha—Do we understand you that these growths were all from terminal buds?

Mr. Barry—I think you stated that these were all from terminal buds.

Dr. Hull—Yes sir, from the interior of the tree, as well as this strong growth, which was from one of the weakest shoots I could suggest.

Mr. Barry—I think the fact is owing more to the inequalities of the stocks than anything else, for the reason that nurserymen cut their buds from the outside of the tree. It is very rarely that they are cut from the lower part or inside of a tree. I know it is very important to call our attention to the results you describe, which I have no doubt would come from cutting the shoots you mention.

Dr. Hull—Nurserymen often cut from the inside as well as the outside. Now if you take that terminal bud it would make a growth of 15 or 20 or 30 buds in length. There is where the value comes in—first, as to the exposure of the branches, and secondly, as to grafting. The relative strength of the bud depends upon its position as well as upon its exposure. And that is where you get your mixture in your nurseries. If you go back to your nurseries you will find you have a second growth, the stock affording more nutriment than was required to develop the plant. The point I make is this: that the strength of the bud depends on its exposure. If you go down, you will get weak ones.

Mr. Humphrey—If the stock is strong, must it just double it, or may it treble it?

Dr. Hull—It doubles it if there is strength enough to do it. This branch which I hold has trebled it, as it appears. We should have looked for it in this tree, a much larger bud at the upper part, and a much larger growth. I should say this: we ought to select a stock strong enough to develop that great number of buds perfectly, and to form a perfectly well developed terminal bud.

Mr. Emery—Is it possible to discover the number of leaves that a bud will develop?

Dr. Hull—It is not possible to discover that, but it is possible to discover that there are a great number of leaves in the bud.

Mr. Emery—You can not decide that.

Dr. Hull—No; the leaves are so folded one into another that we are not able to manipulate fully.

Mr. Nelson—Is that a second growth? (showing scion.)

Dr. Hull—That is all one growth. That was the top of the scion.

Mr. Daggy—Do you attribute more of that growth to the scion than to the root?

Dr. Hull—Yes sir, I do; because after the leaf germs have developed they have no support from the root. I ought to state that when that bud was formed there was also stored the power of nutrition in the tree. The tree can not create anything; it can absorb moisture; and it feeds that bud and brings it forward to perhaps half its size. There must be enough of that to produce a certain amount of cellular growth about the roots to make new roots or spongioles, and about that time the leaves come in and assist and carry on the motion, but without that store of nutriment it could not be carried on.

Mr. Barler—Will the weakest root develop the strongest bud?

Dr. Hull—No, sir.

Mr. Barler—Then you would not put the strongest bud on the weakest root.

Dr. Hull—No, sir, I would not.

Mr. Wier—How long does this influence act on the tree?

Dr. Hull—I presume Mr. Barry could answer that better than I could. How long would it be, Mr. Barry?

Mr. Barry—It would very likely enough catch up. It is, however, a very bad place to catch up.

Mr. Bliss—Suppose it should be separated—placed by itself—with equal chances with a larger growth—do they not generally make the best trees? How long would it take, with equal chances, for it to be overtaken?

Dr. Hull—I think if taken out it might become the larger tree of the two, but never in the nursery; it would always be behind.

Mr. Humphrey—If the Doctor's theory is correct, it comes nearer to a mathematical theory than anything I have heard of. If it falls

off, it will fall off in a mathematical ratio. If I understand that in a tree there is a power to develop so many buds, then it is a mathematical rule, so that if the stock is strong enough you will have one, two, or three growths in a year. Then you have double the number of branches that are in the bud; so that as I understand it that small bud can not overtake the other until the age has been sufficient to reduce mathematically the number of buds.

Dr. Hull—Mr. Barry has stated also that this terminal bud should not be selected for this region north, but at Alton, in the south, I would give you twice as much for it as for any other. The further you go south the longer the season, and the less the liability to preventing them perfecting their growth. Now, at Mr. Earle's orchard, which I have seen all through, when these buds have developed into branches there can be no further growth. Having performed their office they shed, and then these germ-branches are burst, and we get the two seasons in one. That is the trouble with the Sweet Cherry. I told you that I would explain why it was that Sweet Cherries might be grown in all parts of the State. More especially I have paid attention to this matter within the last year. There should be no second growth allowed. It should be kept growing at so late a period that the frost should overtake it. In that condition the tree is capable of resisting the greatest exposure of which it is possible. In September last the growth was still active. What is the result of this? That these crude juices will not elaborate. The frost expands them and separates the bark from the tree. That is what we have been troubled with at Alton. My first plantation, with the exception of one or two trees, have gone to Davy Jones' locker. Why was it? Because I planted them as trees are ordinarily planted. I planted them as I did at the East, and in the course of two or three years they began to rupture, and I had the mortification to see them either badly crooked or spoiled. When I made preparations for another lot, I prepared my ground three or four feet deep. I wanted it so that there should be no second growth, and mine is the only orchard

in the West that has stood. There is no injury to it. When I have detected anything wrong I have resorted to root pruning.

Mr. Galusha—I have some in my land. The terminal buds are hard and firm, and yet the second growth is not equal either in number of buds or length, to the first growth. It seems to me that it is not true that the second growth, when it forms its terminal bud, is equal to the first growth.

Mr. Barry—I want to ask as to these anticipated branches on the Cherry? Do you not know that there are a great number of varieties of the Cherry that produce these anticipated shoots, and it is not because the growth of the tree has been arrested by the weather or anything else, but simply from the non-development of the buds below.

Dr. Hull—Is that common with you?

Mr. Barry—Yes, sir, quite common. There are some varieties that run out on a single straight shoot during the year. The Early Richmond and most of the Dukes and Morellos do produce these side branches in great profusion.

Dr. Hull—If you will examine your trees you will find that that growth has been interrupted.

Mr. Wier—I do not think the terminal bud stops growing at all on these trees. Do you know that the Early Richmond will begin to branch when it is a foot high?

Mr. Barler—I have got the impression on my mind that we are to do everything we can to keep them growing.

Dr. Hull—In the South you ought—in the North you must not. At Alton you must, but not in the North.

Mr. Earle—On orchard trees as well?

Dr. Hull—I say, yes. We do not wish to have our fruit buds excited after they have gone to rest. But we are under the necessity, North, of keeping nursery stock to rest, because these conditions of frost, etc., will attend them. When a tree has been affected and you cut through the bark, the young wood is as black as ink. That is from the albuminous matter not being perfectly matured, and hence our northern

men must recognize that fact. The first growth, in being arrested, is the cause of many miseries. When you go to South Pass, our trees, from their second growth not being matured, lose their crop.

Mr. Nelson—You said we should arrest this growth in the North in July. Can you tell us how to do it?

Dr. Hull—I will do so. Root prune by means of a coulter plow.

Mr. Nelson—The same thing with small trees could be done by a tree digger, but they incline borers to take hold of the same trees. For three or four years old trees it will do, I have no doubt.

Mr. Bliss—What time of year will you apply this?

Dr. Hull—If you put this in early the first growth would not be developed.

Mr. Bliss—I think if you take our common ground and put this in early you will effect an enlargement of the growth instead of dwarfing it.

Dr. Hull—I think you are in error there. If you put this in you will arrest the growth.

Mr. Bliss—I generally put this in a few inches down—touching the roots.

Mr. Wier—There is one thing I would like to call attention to. For the last three years I have been examining all kinds of trees late in the fall. My idea is that the last thing the leaf does in the fall is to develop or elaborate the watery sap that flows down between the new bark and the new wood of that year. I read the Doctor's explanations about the apple trees being killed, and I cannot agree with him at all.

Dr. Hull—You are speaking of this diseased sap?

Mr. Wier—No. I think the frost caught that sap before it reached the root, and being between the new bark and the wood, it separated them from each other. Next spring you will find every particle of the tree is dead.

Dr. Hull—I think if Mr. Wier were to examine further, or a little more closely, he would find he was wrong. Three or four years ago Mr. Huggins brought from St. Louis, and exhibited to this Society, a branch of an apple tree from which a ring of bark had been taken two

years, and yet the growth had continued during that time. I found several of the branches of my own apple trees in a similar condition. The change then produced is this, that one or more of these leaves are folded into the form of a vase, and in the center of that is deposited a little cell, and when it has converted it in that way, then it is a fruit bud; and I don't believe your trees were in the condition you have stated until after the change was made. The perfection of these leaves would cause them to drop off, and then it would enlarge them and render the crop more unsafe the coming winter.

Mr. Wier--If Dr. Hull, next year, will take a tree as soon as the terminal bud is formed, and take out a ring of bark near the surface of the ground, one inch away, he will find every branch will die. Let him take all the leaves off an apple tree, and in that case they will all die. Now, if the leaves do not have to elaborate the sap to go down to the roots, what becomes of it?

Dr. Hull--I have 400 trees from which the leaves were all stripped by the grasshoppers. When the leaves are lost early in the summer the roots die just as Mr. Wier has stated. But he has carried it too far. The least of these little roots, under certain conditions of nature, can repair themselves. Why is it that a large root can not make a new root? Will Mr. Barry answer that question?

Mr. Barry--No, sir. I could not say.

Dr. Hull--Will Mr. Meehan answer the question?

Mr. Meehan was not in the room.

Mr. Barry--The root breaks through in many cases, just the same as a branch breaks through and makes a new branch, but it is only in certain cases.

Dr. Hull--The apple tree, I believe, has more power of pushing than many others. It produces both new roots and new branches.

Mr. Barry--I think I have seen peach trees producing new shoots in that manner when as big as my arm.

Dr. Hull--I think it is more likely to occur with the branch than with the root; that is one of the points I was going to make. Suppose the juices to be acting on the root, it forms a callus at once.

Mr. Barry—Sometimes it does not form—sometimes they break through the roots.

Dr. Hull—As long as you have feeders at a distance you will not have a growth near the trunk. I was going to show the advantage of root pruning.

Mr. Barry—I would like to inquire whether any one here has tested fully the plan of uncovering the roots to retard growth? I have seen it done frequently, and with very good effect.

Mr. Bliss. In my neighborhood it was done with one orchard. The tree roots were uncovered for a foot or ten inches deep and left until it was cold, and then filled in with corn cobs, etc., and it produced wonderfully afterwards. I am going to try that practice.

Dr. Hull—Would not the exposure produce partial conversion to branch growth?

Mr. Barry—Yes sir, but it is only a temporary exposure. It is practiced a good deal in England among garden trees, where they are troubled with spring and early autumn frosts. I know it is practiced regularly there.

Mr. Humphreys—Dr. Hull's theory may be correct, and yet when there are circumstances that evade our skill at any point, let us pay particular attention to that point. There must be some cause why these long shoots are produced.

Dr. Hull—There is a good deal of force in a suggestion of Mr. Wier's. In pear growing if you will cut your tree up and it produces a half crop of fruit, and the forces are taken up and used by the fruit, very little is left in store. I have found in such cases that the appearance was that from want of union, the connection was severed as between the top and the roots, and it was for a long time a puzzle to know what that was. I am quite satisfied that that was the cause of the loss of many of our pear trees, and not the destruction of the roots.

Mr. Wier—I am well convinced that the last action of the leaf is to produce root material. The last operation is to produce the

starchy material that goes back into the roots to assist next spring in forcing the sap up into the tree.

Mr. Humphreys—If his idea is true that the sap must go to the root, it makes the root a reservoir. That is contrary to the physiology of the root. Its office is to take materials from the earth at the time they are needed. I think no one acquainted with vegetable physiology would say it was a reservoir.

Dr. Hull—I think it is quite so. I would separate Mr. Wier's theory from the true one. It is the food for the plants—and not merely the watery fluid—which is stored in all parts of the tree. The first growth in spring consists principally in inhibition of water by absorption.

Mr. Baldwin—You stated that in this latitude it was best to stop growth in July. Is not that too early?

Dr. Hull—I spoke in general terms. We find that the leaves are not blighted, the fruit is not rusted, and a second growth is not induced, and there is a reason for that—because we have created a disproportion between the top and the roots.

Dr. Hull—Some of you say you would not grow a certain kind of apple, because it is twenty years in coming to bearing. Why is it so? Because a very large proportion of the buds push forth nearly as many branches as they do buds. What is the result? It is precisely the same as if I was to commence after the first development of the leaves and strip these away. Nature is constantly endeavoring to fill up the loss she has sustained. The tree does not early go to rest, and the result is we have no fruit formation. You cannot find a fruit bud on the tree. You can never find a fruit bud so long as the branch is growing. Understanding the matter as we do, we cannot admit that if a tree is twenty years in coming to bearing it is storing up nutriment all that time. No such thing. It stores up this year what it requires next year and no more—not one particle for the year after.

The following named gentlemen were elected honorary members: Thomas Meehan, P. Barry, Mark Miller, Dr. Isaac Furnas, Wm. H. Ragan.

Adjourned.

SECOND DAY—EVENING SESSION.

THE SOILS OF NORTHERN ILLINOIS.

[By James Shaw, of Mount Carroll.]

Gentlemen of the Illinois State Horticultural Society:

I find myself a member of your Committee on the Geology of Soils; and by request of your worthy President I propose to occupy your attention a short time in discussing the soils of Northern Illinois, and the dynamical forces which have originated, transported, and mingled these soils, clays, and superincumbent masses covering the bed rocks.

Your Secretary, in classifying the fruit districts of the State, maps out one as the Rock River District. My remarks on this occasion will apply principally to that district. You will hear from my co-laborer to-morrow as to the soils of Southern Illinois. I shall not confine myself strictly to the Rock River Valley, but shall speak of that part of our State lying north of the old Silurian Beach, which crosses the State from a point near Hampton on the Mississippi river, and passes eastward a few miles south of this place, bending up a little north of Morris, and thence passing on to the eastern line of the State, south of Chicago. The land north of this Silurian Beach was comparatively elevated table land at the time the coal deposits of the great coal basin lying south of this old beach were in process of formation. And there is evidence that over this comparatively elevated table land a great denudation has taken place. Some great force has worn off and swept away, from Southern Wisconsin and Northern Illinois, a large amount of material, which has been deposited over the face of the country south and west of that elevated region. It is estimated by Prof. Whitney, and other good geological authorities, that at least three hundred feet has been denuded and carried away in the region of the Illinois and Wisconsin mounds. These mounds—Scales Mound, the Blue Mounds, Terrapin Ridge, and the various elevated and island-like elevations left over the general level surface of that part of the State north of this old Silurian Beach—are monuments left standing when the rest of the formation was swept away. Any one with thoughtful mind, who stands upon their tops and looks over the surrounding country, or who examines the regular succession of outcrops up their sloping sides, cannot resist the conclusion that the general level of the whole country surrounding once corresponded with these highest points. As in reading a book we at once miss the pages which are torn out, so in examining these mounds, we at once miss whole leaves and parts of leaves in the Great Stone Book, which have been removed by the forces of which I shall presently speak. The Galena Limestone, the Cincinnati Group, and the Niagara Limestone, are the leaves, whose fragments yet remain to attest a time when each one of them in regular succession spread over the region now under discussion.

Against this Silurian Beach of which I have spoken, the coal measures are shingled, as it were, or deposited. At the place where we are now assembled, the old St. Peter's sandstone shines like sugary masses along the river banks, and is elevated in

fantastic shapes at Deer Park and Starved Rock, a little to the northeast; but at LaSalle, a few miles southwest, coal pits are sunk for hundreds of feet, and the black treasures of the earth found in the greatest abundance. At Sublette the Galena limestone is the bed rock nearest the surface; but at Princeton, towards the south and west, an artesian well, five hundred feet deep, still exhibits coal measure deposits. This shows that this old Silurian Beach, in the carboniferous ages of the world, presented the appearance of a somewhat abrupt range of hills across that part of the State.

Over that part of the country north of this Beach, the bed rocks are covered with superficial deposits from ten to fifty or one hundred feet in thickness, composed of clays, sands, loams, gravels, drift materials, and prairie soils of later growths. If this superincumbent mass should all be removed, leaving the naked bed rocks, the general face of the country as to levelness of appearance, would not vary much from the present state of things.

In classifying the soils in this Rock river district, we find several well marked varieties. The alluvial deposits of the river bottoms are latest in formation, and deserve a brief notice. In examining river deposits, the first thing worthy of consideration is the *flood bed*. Here the action of the river is that of currents, or flowing water. Where the current runs strong, sand will be thrown up in tow heads and sand banks and sand islands; in the still places a fine black mud will be deposited; and this force will exert a sifting and assorting influence, and form mud flats and banks, and deposits of pure sand. The next action of the river will be over its *flood plain*, or that part of its bed covered only by the high water of the spring inundations. This is usually a low bottom, covered at the flood of the river with water, and producing a heavy crop of sour prairie grass later in the season. Over this the water usually rises and falls without much current action, and a yearly Nile-like detritus, or fine mud, is precipitated. The soil thus formed is fat, deep, and sour, and is unfit for agricultural and Horticultural purposes, until it has been built up beyond the influence of the river floods, and sweetened by the sun and atmospheric influences. Then it becomes a soil of inexhaustible richness and productiveness.

Stepping backwards in geological time, we next come to the old river terraces, which are simply the ancient flood-beds and flood-plains of these same rivers, at a time when they rolled an infinitely larger volume of water to the sea. Over these are the sandy soils and the rich, flat bottom lands, Nile-like in their inexhaustible productiveness. The Mississippi River, Rock River towards its mouth, and many of the smaller interior streams present these well known river phenomena; and make a notice of these alluvial deposits and this fluvial action necessary in speaking of the soils of the State.

Receding backward in geological time, we come to the bluff formations, the oldest deposits of the Quaternary system. This is called the Loess, or Bluff formation. It is not extensively developed in Northern Illinois, but is present in most of the bluffs which skirt our streams. Deep rooting trees and vines find in it a congenial soil, and the best soil conditions of growth. Some of these Loess or partly Loess formations in our part of the State would be the best fruit and wine producing districts in the world if kindly Italian skies and genial atmospheric conditions smiled on the tops of the trees and vines. When the Mississippi and the Illinois rivers were lake-like in their expanses, and the waves beat up against their bluff shores, throwing up silt,

oozy detritus, and frothy marls and sand, this bluff formation was deposited and accumulated. It is composed of light cream colored clays, greenish marls, muddy sands, and various combinations and mixtures of these; and, as already intimated, it affords the best soil conditions in the State, or in the world, for the growth of the vine and all kinds of fruit trees. Even in our chilling and unfavorable climate, fruit and grapes of fine appearance and good quality are beginning to be produced in considerable abundance. At Galena, Morrison, Mount Carroll, and Sterling, I have seen small vineyards purple with their great crops of generous fruit, and orchards laden with the finest of our hardier apples; while the strawberry, raspberry, gooseberry, cherry, and other kindred fruits are raised in the greatest abundance, and of good quality.

Next to the Loess in succession are the regular soils and clayey deposits which cover the uplands or general prairie level of the country. And inasmuch as these are originally derived from the decomposition of the rocks, it will be well to call attention to the character of the bed rocks in this part of the State. If the dirt mantle covering these rocks, in that part of the State now under consideration, was all stripped off, the rocks then exposed would be found to belong to the Galena Limestone, Cincinnati Shales, and Niagara Limestone, coming to the surface in irregularly shaped patches. Now, the soil or earth mantle covering these rocks, notwithstanding the tremendous mixing to which they were subjected by the drift forces, to be spoken of hereafter, partake somewhat of the nature of the deposits lying immediately beneath it, and were in part derived from their decomposition. The evidences of this are strikingly manifest. The Galena Limestone and Niagara Limestone, although separated by an intervening formation, are strikingly alike in lithological character. Both are a coarse grained, cream colored and reddish magnesian limestone. When they decompose a rather coarse grained soil is the resultant. In many places, if we dig from the surface to these rocks, we find a coarse, reddish, hard pan, or crumbly clay, resembling closely these rocks. As we sink into this clay we find pieces of "float" mineral and bits of the rock itself, the latter lying evidently *in situ*, unworn by water, and appearing like pieces of the original rocky mass, which was harder and had resisted the surrounding decay and rotting away of the rocky ledges. On the other hand, portions of the country underlain by the Cincinnati Shales are covered by a close grained, finely comminuted, greenish, creamy colored subsoil, closely resembling in texture and lithological character the Shales from which it has evidently been derived. But these resemblances of the earthly mantle to the rocks lying under them are only found in certain localities in and around the "lead basin;" and only to that extent is the "lead basin" a "driftless region."

But the "Lead Basin" is not a "driftless region." In many places around it and through it evidences of true northern drift are found. Boulders are not rare in these places; float or drift copper is frequently found; drift clay exists, regularly stratified, and old river terraces may be traced, and modified drift and gravel is not rare. The lead region seems to have been only partially invaded by the drift forces, and these forces seem to have acted in a modified form. The heavy denuding forces spoken of already acted before the drift period. Then came on the drift conditions and the glaciation of the continent, during which the transportation of clays and soils and a universal mingling and mixing of the surface materials of the earth took place, modified in the lead region in the manner just noticed.

Soils and clays and sands in the first place are derived from the decomposition of the rocky formations at and near the earth's surface. The silent processes of nature to-day, as in past geological ages—if I may be allowed to use the language used in my address some time ago before the Northern Illinois Horticultural Society—are grinding rocks into soils and re-cementing and hardening soils into rocks. There was a time when the surface of the earth was covered with rocks, and rocks only, but atmospheric and chemical agencies, the solvent power of water, dews, and dampness, and aqueous forces kept in constant action processes of slow decay, and soils were gradually formed and carried as sediments into ancient seas. We all know the old adages about the constant dropping which wears holes in the stones; and the files of time, which wear and make no noise; but few realize how important a part these peaceful agencies have played in the creation of the present order of things. The frost and the rain, the dissolving power of water and the mighty power of freezing and cold, and other like agencies and energies of nature are all powerful to bring about the mightiest results. The "tooth of time," gnawing away age after age, will nibble into clay and sand, the solidest rocky ledges. If undisturbed by mechanical forces, the superficial clays, loams, sands, subsoils, and soils covering the underlying rocky masses, would be nothing but the residuum left after the removal by percolation of water of the more soluble portions of the decomposed rocks. The soil would then be *in situ*. Regions of country underlaid by sandstone would be covered with a sandy soil; limestone districts would be covered with a soil with a limestone base, and the geologists could tell at a glance from the appearance of the soil what rocks lay beneath it, and *vice versa*.

But certain forces of nature transposed, mixed and mingled into one mass the materials derived from widely separated sources. The first of these forces are the same silent, peaceful agencies which we see operating round us in our daily walks over the earth's surface. There is a struggle going on all the time in our fields, in our streets, and everywhere, building up and tearing down, construction and destruction, an ever balanced antagonism. Gentle rains and earth-born torrents, little trickling rills and strong streams are tearing down the soil from the hill sides and bearing it away to the lower levels. The small water-plowed trench of to-day next year becomes a chasm, and ages hence a hollow, and the transported materials have been built up in alluvial deposits, or are the fillings in in the bottom of some stream. Alternate freezing and thawing helps along the varying struggle, and God's great plowshare, the frost, runs annually through the surface, mellowing the whole.

These familiar, always acting, somewhat silent agencies, in time produce great results. They mix the soil, they transport it to some extent, but they never carry it long distances from its place of origin, nor do they carry the heavy masses of the drift materials for hundreds of miles away from their parent ledges. Other and mightier forces did this, and while doing it, they ground the stones into clays, and the clays into impalpable powder, as the wheat kernels are ground into superfine flour between the upper and nether mill stone. They were the mills of the gods, which ground exceedingly slow, but ground exceedingly small.

There was some tremendous force, which tore the boulders from their parent outcrops in the distant Lake Superior regions, and drifted them on their journey to the South; which grooved and planed the surface of the solid rocks, and strewed for hundreds of miles in its track beds of clay and sand and gravel, and mingled, mixed,

transported and reformed the soils to such an extent as to well nigh destroy their separate characteristics and origins over large portions of Northern Illinois, and greatly increase the difficulty of their proper classification. This force, whether flocs and bergs of ice, loaded with stones, gravel and detrital matter, and borne along by winds and currents, or strong, earth-born water torrents, moving along and wearing the abraded materials, or the slow procession of the all-powerful, crawling glacier—whatever it was, it moved like a vast army of shovelers, multiplied millions of tons of the loose materials denuded and worn down from the rocks of the North, and piled them like a thick earth mantle over the coal basins to the South and West.

Of that great force I propose now to speak. In order to understand what I shall say, it will be necessary to refer to the well-known action of ice and snow in the glaciers of the Polar world. I have already shown that the struggle of the rain drop to get back to its mother the sea, produces the silent, peaceful agencies and energies of nature, of which I have briefly spoken. I propose now to show that the struggle of the snow-flake to get back to its mother, the same sea, produced those mighty drift forces whose results are so evident around us.

Agassiz, Tyndall, Forbes, and other trustworthy scientific travelers, have made us familiar with the action of the ice forces as they now exist in the Alpine glaciers. Away up in the mountain basins of the Alps snows accumulate in vast fields and in great thickness. When the mass becomes heavy and thick, pressure changes the bottom of the mass into a plastic, porous sort of ice. This basin is the *Mer de Glace*, or sea of ice. Inasmuch as snow is constantly being added to it, the volume and thickness of this sea of ice would soon become so great as to produce serious consequences if some safety valve was not found to afford vent to the pent up mass. The lower part takes upon itself a slow, almost imperceptible, motion, and soon fills the descending valleys with a stream or river of ice. As snow is added at the top, it sinks down to the bottom, and when it becomes ice, is drawn off, as rivers run out of lakes. This ice river flows slow, but is subject to all the laws of flowing water. It widens, it contracts, it deepens where the flow is slowest, and its motion increases where the mass passes over rapids. As it crawls down in its slow, irresistible motion, dirt bands are formed along its margins, stones and great masses of rock roll down upon it, the bottom and sides of the channel are grooved, planed and striated by the mighty power of the grinding, rubbing ice, and all the material accumulated is carried eventually to the lower end of the glacier, and there dumped off in terminal moraines and huge piles of gravel, boulders, and other drift materials. In the case of the Alps, the glaciers melt when they reach the plain and before they find the sea, and glacier-born torrents begin where the ice ends, and the materials borne thither by the ice are further moved and assorted by the muddy, rushing waters which take their place. The struggle of the snow-flake has ended, and the struggle of the rain-drop now begins. Both are trying to get back to their mother, the sea. It is true the ice river flows infinitely slow, but in comparison with the river of water it moves infinitely strong. The Mississippi, if it were a glacier instead of a water river, could bear upon its back boulders and whole ledges of stone as readily as it now floats a feather or a saw log. What it lacked in motion, it would make up in the slow, irresistible and mighty force of its all grinding, all consuming procession. Such is a glacier in the Alps, and these glaciers are kneading certain parts of Italy over now as in past time they kneaded North America.

Over the new Wrangells Land and in Greenland the same forces of the ice are in

active operation, only to a much greater extent. All upland Greenland is one vast *mer de glace*. But the Greenland glaciers, instead of melting in intermediate sunny valleys, push down into the sea itself, and after crawling along its bottom in the indenting bays and fiords, keep breaking off great masses, which float away in the deep blue waters until they are caught by wind currents and gulf streams, to be borne by them as icebergs and ice floes, whither the drift of the ocean carries them. And thus they float, until warmer seas cause them to melt in sunnier climes, and the floor of the ocean is strewn with their adhering dirt and stones. Certain iceberg paths in the sea already are accumulating at the bottom of the waters fields of boulders and huge windrows and beds of gravel and dirt. Baffin's Bay, Hudson's Bay, and other northern seas and bays thus become nests of icebergs, and these icebergs, before reaching the water, were glaciers, and these glaciers, at their origin, were the Arctic snows of Greenland. Thus Greenland, like all other polar and circumpolar lands, is shipping her boulders and her gravel to the bottom of distant oceans, and these, at some time in the future eternities of God, will become the face of continents.

And now you will indulge me a moment to paint a fancy sketch of that scene in that world of savage desolation, home of the glacier, and realm of enduring frost! We will take our stand on some headland of Spitzbergen, or on some flame colored granite ledge amidst the wild desolations of some Arctic waste of snow and ice. Before us is the deep indenting fiord of some pulsating bay, throbbing responsive to the tides of the ocean. Around us are the crawling glaciers creeping down from the ice seas above. As the ends become submerged and break off, the deep fiord, nest of the icebergs, becomes filled with the slow moving bergs. Some are wallowing in the blue waters like huge Leviathans; some impinge upon each other with the resounding crash of parks of artillery, but the most of them shoot up their tall pinnacles into the thin, cold air, presenting the similitudes of ice forests, or the more beautiful and artistic forms of domes and minarets, and beetling pinnacles of a now departed mediæval architecture. The midnight arctic sun hangs in the heavens like a ball of fire, and his golden rays, playing upon these icy masses, lights them up with flame, and emerald and blue, until the whole watery realm glows with amethystine tints and opalescent hues, and the refracted and reflected glory of a thousand rainbows plays around and among and over the scene. Imagination may well revel in a glory like this, and the Beautiful Land, with its flaming city, seen in glimpses by the pilgrim Bunyan over among the Delectable Mountains, comes softly to the mind like the shadow of a dream. Oh! we may dream of our castles in the air, and build beautiful as we will, but Nature furnishes grander scenes than any the imagination can picture, and there is no beauty or sublimity like that in the great Land of Silence round the Poles.

But we will come down from the "misty mountain tops" to the prairies of Illinois. Starting with the boulders in the neighborhood of Lake Superior, we trace them south and west to the Missouri river. These crystalline sandstones, flame colored granites and black-trap rocks, can be traced back to their parent ledges about the starting point. As we advance away from the parent ledges, the boulders become smaller, and the drift materials towards the Missouri river are only gravels and drift clays. On seeing these curious water-worn stones strewn over the face of the country, the most ordinary mind at once concludes that they did not grow there, but were brought there from some other place. They are "nigger heads," "lost rocks," wanderers away from where they originally existed. They are entirely unlike any rocks outcropping round

them, and it is no great task to trace back the track over which they came. The world was lately excited over the Cardiff Giant, but men went to work and soon traced it back thousands of miles to its original bed in the gypsum quarries of Fort Dodge. In the same way they trace the boulders back towards Lake Superior and Greenland, and could find the origin of each one if a few thousand dollars or a large humbug was involved.

In some parts of Iowa these loose stones, from the size of a man's fist to that of a shock of wheat, lie so thickly strown over the ground and accumulate round the margin of the lakes to such an extent, that in the one case parties might walk over them, stepping on the boulders alone; and in the other, they have given rise to the superstition or belief in walled lakes. In looking over a field of these boulders once upon a time, my companion, who was somewhat irreverent, exclaimed, that it seemed to him as if the devil, when he sifted the soils down out of his great sifter, had emptied with a jerk the accumulated stones over this particular field. If he had named the Creator, instead of his satanic majesty, I would have thought the comparison a good one.

Now, I believe the ice cap which covers Greenland at the present time once extended down into the middle regions of North America. Agassiz, some years ago, demonstrated to the satisfaction of the scientific world, that a great ice cap did cover the drift regions of the American continent. The carboniferous summer slowly ended, and the glacial winter as slowly came on. An entire change of the flora and fauna of these parts of the earth took place. Glaciers covered our land in every favorable locality. Seas of ice accumulated in the basins. Stones were torn away from the outcropping ledges; ledges were ground into sand and clay; motion took place in various directions; but the general movement was towards the south and west. As the climate again grew warmer, the ice cap slowly melted, commencing at the south and melting the ice towards the north. Basins became filled with water, and lakes and seas existed, into which glacial born currents of muddy water poured, and in which ice bergs and ice floes floated, as wind or currents drove them. And we thus have the compound forces of the glacier, the ice berg, and the water torrent in vigorous operation. These causes, added to and coming after the peaceful agencies and influences, spoken of in the early part of these remarks, explain all that we see, while examining the drift formations, with which our Illinois rocks are covered. The peaceful causes which worked before the drift have also worked since the drift period, and produced some of the later phenomena observable.

In this way our soils are formed; in this way they are mingled and mixed; and in this way they are carried on long journeys over the earth's surface. In this way they are pulverized, ground up, kneaded. In this way their volume is greatly increased; and they are sweetened up and changed from their sour conditions during the carboniferous ages, and made fit for grains, grasses, hard wood, trees, and man—the crowning and noblest work of all. These are the forces which shoveled and carried such a grand deposit, and spread it over our noble State. And here where we stand, almost in the very garden of the State, I cannot refrain from a local allusion or two. Look around you, you people of Ottawa, and see how you are blessed in all things heart could desire. Rich in agricultural and horticultural resources; the St. Peter's sandstone crumbling from your hills like unworked mines of melting, crystalline sugar; the black treasures of the earth almost under your feet; a stream ready to toil and

make your city alive with the hum of wheels and the bustle of manufactures—all these, and more, have blessed your lot over that of ordinary men. Only in our own unrivalled valley of Rock river has nature been alike kindly in her manifold gifts. *Our* prairies there are so beautiful, and *our* soil is so rich, that we believe some lucky farmer, in sight of the glancing waters of our unrivalled stream, will some day find the remains of the old stump of the old tree of knowledge, as he delves in his rich fields.

Man acts on nature, and nature in turn acts on man; and it is no wonder our State has robbed the Old Dominion of her standing boast, and now arrogates to herself the proud title of “the mother of Presidents,” as she has already so preëminently become the mother of noble men!

But pardon this digression, and I will add a closing remark about our soils. Their various kinds of qualities I do not intend now to describe, except to say that while there is a general similarity in the whole mass, the details differ infinitely, and make a minute classification difficult. We have soils that are light, heavy, warm or cold, wet or dry, compact or porous, fine or coarse, hungry, leachy, loamy, sour, sweet, clayey, sandy, limey, marly, and various combinations of these, which the agricultural chemist alone can determine. Silica, or the earth of flints; allumina, lime, magnesia, potash, and various salts and metaloid compounds unite in various combinations to make up these soils. The humus, which gives the richness and blackness of color, is chiefly derived from the successive growths and decays of grasses and other vegetation.

The question as to what soils will produce and mature good and constant crops of fruit, depends not only upon the nature of the soils themselves, but also upon climatic and atmospheric influences, and the nature and property of the subsoils. There is much more in these influences than any one might at first imagine. Vegetable chemists and the best vegetable physiology demonstrate that the most of the tree and plant, directly or indirectly, is derived from the atmosphere, and not from the soil at all. Soils, of course, are important, but they are not all-important.

In speaking of the drift and drift forces, I have constantly used the word “soils.” Strictly speaking, this use of the word is inaccurate. The great glacial and drift forces apply to the subsoils, and underlying masses of clays, sands, and gravels. Soils, accurately speaking, are the surface deposits, covering these masses. These surface soils are formed somewhat differently from those underlying drift materials above referred to. And this brings us to speak of the origin of the prairies. I will not discuss these at length, but simply give a few of the theories concerning their formation.

Lesquereaux believes they are a slow growth from ancient peaty marshes. Winchell believes them to be of lacustrine origin, that is, that they are the bottoms of lake-like bodies of water, not yet having time to be covered with forest growths. Foster believes them chiefly owing to atmospheric and meteorological influences. Some believe them owing to ancient Indian annual burnings. Judge Caton has still another theory. All of these gentlemen argue their respective theories with ability; and in this conflict it is hard to tell who is right. The probability is, that each of them apply to certain localities, and explain all the phenomena of those localities.

STATE ENTOMOLOGIST.

Dr. Hull offered the following resolution, which was adopted unanimously :

WHEREAS, The office of State Entomologist has become vacant by the death of B. D. Walsh, and it is important that the vacancy should be supplied by the appointment of some suitable and competent person.

Resolved, That the Executive Committee be instructed to take this matter under advisement and confer with the Governor thereon.

Mr. P. Barry, of Rochester, was called upon for an essay on pears :

Mr. President and Gentlemen :—I beg to thank you for the honor you have done me in electing me a member of this society. As the speaker who preceded me said, you have certainly a glorious State, and your organization, I am sure, will exercise a great influence in developing its fruit growing resources. I wish you great success in your work. Your Secretary, when he asked me to come here, suggested that I should prepare a paper on pears, etc.,—a short paper. It would necessarily be very general, but I prepared such a paper, and if it were not so late in the evening I would read it now. It is so late that it will, perhaps, be best to give the main points of it and leave the Society to follow it up by discussion. I was so hurried by other matters that I had no time to make a clear copy, and I do not know whether I shall be able to read it.

I was requested to prepare a paper, to be read here, on the following topics, viz. :

PEARS—GROWING, KEEPING, RIPENING, MARKETING, HABITS AND WANTS OF LEADING VARIETIES.

It must be very evident that a paper, kept within the bounds usually allotted to such, treating of all these points in the culture and management of the pear, must be quite general, and, hence, perhaps, of less value than a more detailed discussion of one or more of these points. However, at the risk of consuming a few minutes of your time, without much profit, I will proceed to lay before you a few observations which may serve as a basis for some profitable discussion.

The Pear, aside from its importance in a pecuniary point of view, is one of the most interesting of all the fruits we cultivate or that can be cultivated in our climate. The tree itself is beautiful in growth, in leaf, flower and fruit, and in all these particulars presenting a *wonderful variety*. The fruit, the most delicious and refreshing of all fruits, presents the same variety in size, form, color, texture and flavor, and season of maturity, so that among the 2,000 or more varieties in cultivation, no two are exactly alike, as if to satisfy the varied tastes and predilections of man. No wonder that the culture of this fruit has awakened so much enthusiasm both in Europe and our own country. It would be surprising if it should not have found favor, even to enthusiasm, amongst men wherever it can be grown. Is such a fruit not worthy of our patient study and care?

What if we are sometimes disappointed? if our trees are occasionally blighted by disease, infested by insects, damaged by storms of hail or wind? We should expect all these things. All our crops are subject to like accidents and frequently fail us. Life is a constant struggle with failures. We dig down deep into the bowels of the earth for the precious metal, but often we dig in vain. Our ships go down at sea and our hopes with them. Our ventures in trade and speculation often come to naught. In the midst of such uncertainties why should we expect Pear culture to be exempt from occasional failures? Some writers in their gloomy moments write as though it were a complete failure. That the few cases of success are only partial successes, and exceptions at that. This is the dark side of the picture, and as a matter of fact is not true. Pear culture has been eminently successful in a multitude of instances in many parts of our country. One thousand barrels of Pears are sent into our markets to-day where there were not ten even as late as ten years ago. Prices do not decline, because our population increases rapidly, and people consume more than formerly. See how many are sold in the shops and about our streets, even at enormous prices.

In many districts of our country, for instance in Delaware, Maryland, Virginia, Ohio, Illinois, etc., large orchards are being planted. I saw it stated the other day that in Delaware one man had an orchard of 16,000 trees, mostly in bearing. We are making great progress, and that we have not made more is owing chiefly to the fact that our people are impatient to grow rich. They are not willing to wait, bestow care and culture, encounter and subdue difficulties and disappointments. They rush into Pear culture as into many other enterprises, without due reflection or preparation, but with "great expectations." Before the trees arrive at bearing age a new enterprise comes up, and the Pear orchard is abandoned, or a few trees die, it may be some other temporary difficulty occurs, patience fails, and the enterprise is given up.

I could name a large number of what were at one time promising beginnings of Pear culture thus abandoned without a reason worthy of the name. Grape culture has had the same experience, and so of many other branches of agricultural and horticultural industry. The truth is, they are too often not entered upon in the spirit which should animate the cultivator of the soil, but rather as *speculations*, expected to realize immense profits, and that quickly. We know that Pear culture can be made highly remunerative in many districts of our country, and for home use can be produced successfully in almost every farm and garden in the Union. During the past season the Pears of New England and California have stood side by side in exhibitions and shop windows—extremes literally meeting.

Now, as to the requisites for successful Pear culture. The first is—

The Soil.—We know that the Pear will grow and grow well, and bear fine fruit, on a great variety of soils, even those of the most opposite character. I have seen splendid crops on sandy soils light enough to blow away, and on clay soils stiff enough for the manufacture of bricks, and on all intermediate grades of texture. One of the best Pear gardens I have seen was in a *reclaimed marsh*. But while it is true that the Pear adapts itself to a great variety of soils, it can not be denied that some are better for it than others. In garden culture it is easy to supply any defects that may exist, or make any alterations that may be necessary, but for large commercial orchards the general character of the soil can not be changed materially, hence it is important that it be as nearly right as possible.

The soil which experience has shown to be best adapted to the Pear on the whole, is

a deep sandy or gravelly loam, with a soft clay subsoil. Very fine trees are found growing where the subsoil is sandy and gravelly, but the clay bottom is preferable when it can be had. The trees on it will, perhaps, not bear so soon, but they will be less liable to exhaustion from overcropping, and will endure longer. Whatever may be the quality of the soil, it must be *dry*; that is, free from stagnant moisture. Many soils are apparently dry, and are sufficiently dry to produce good farm crops, but not suitable for fruit trees. In Western New York, where I reside, I think that there is not five per cent. of the land fit for fruit trees without underdraining, and the land that needs draining is by far the best. Very few soils, indeed, anywhere are suitable for fruit culture without this preparation. I recommend, therefore, *thorough drainage* for all soils intended for Pear orchards, except when the surface is rolling and the subsoil absolutely porous of sand or gravel. The effects of drainage upon soil is now well understood, as well as the manner and cost of doing it; I shall therefore pass that over.

The next requisite to which I wish to call attention is—

Shelter.—This I regard as of the highest importance to all plantations of fruit trees, but especially to the Pear, and this will apply to all parts of our country. Exposure to the winds has a very damaging effect upon both tree and fruit from the time that the leaves and blossoms expand until the fruit is gathered. It is on this account that we see trees in sheltered gardens yielding abundant crops and fine fruits, whilst those in exposed places failed entirely, or produced only knotty and worthless fruits. We often see the leaves and fruit on the exposed sides of trees destroyed, while on the other side they escape injury. At a recent meeting of the Scientific Committee of the Royal Horticultural Society of England, Prof. Ansted called attention to this fact, and the chairman stated that there had been an illustration of this recently in Somersetshire, where the trees for a distance of thirty miles or more had the foliage blackened and destroyed on the windward side. We all know the effect of shelter on many ornamental trees and plants, equal, indeed, to several degrees of latitude. In our State (New York) we have a striking instance of the influence of a sheltered situation, at "Pleasant Valley," in Steuben county, famous now for its wines. This county lies very high, considerably above our best fruit district, and in the country in the immediate vicinity neither the peach nor the vine can be grown. The shelter which the valley receives from hills around it several hundreds of feet in height, combined with the influence of a small lake near by, make it a wonder in the country around. I would, therefore, recommend that, in the absence of ample natural shelter, that belts and lines of rapid growing trees, like the spruce and larch, be planted on the exposed sides, and at intervals through the orchard, if of considerable extent.

Pruning.—The importance of pruning cannot be over estimated. The chief object is to *maintain an uniform degree of vigor and fruitfulness between the various parts of the tree.* Among trees badly pruned, or not pruned at all, it is quite common to see all the vigorous shoots, as well as fine fruit, on a very small portion of the top. On any tree, or part of a tree, where there is not a new, healthy growth of wood, we cannot expect fair or fine fruit. Certain varieties, but all more or less, tend to produce the most vigorous shoots and best fruit at the top. This we must correct by the application of the knife. I recently observed in the grounds of a noted pear grower many trees almost worthless from this cause. Full three-fourths of their surface was so enfeebled as to have reached barrenness.

Summer pruning, which is employed to regulate the growth during the growing season, is an important part of the work. A timely check to superfluous shoots or those of ill proportioned vigor, obviates the necessity for severe pruning afterwards, and arrests at the start the development of a faulty form. It is, in fact, *nipping an evil in the bud*. I do not propose to enter into any details in regard to pruning, as it alone would be subject enough for a paper. My object is merely to call attention to it as a requisite to success in pear culture. The grower who fully realizes its importance will soon acquire the knowledge necessary to perform it well.

Thinning the fruit, is an operation which should never be neglected by those who desire to secure fine fruits and maintain their trees in vigorous health. Certain varieties—all those known to be disposed to great fruitfulness—will, unless severely pruned, set twice or three times as many fruits as they can mature fully, and without being greatly enfeebled. Among our best and most popular pears, I scarcely know one except the Beurre d' Anjou that does not require this care. The Bartlett, Louise Bonne, Seckel, Beurre Clairgeau, Belle Lucrative, Doyenne white, Howell, Oswego Beurre, Easter Beurre, Vicar of Winkfield, Lawrence, Winter Nelis, Josephine de Malines—in fact, I may say all the later autumn and winter varieties in particular. The summer varieties will bear heavy cropping better, as the fruits remain on the trees a shorter period, and are, therefore, less exhausting. The time to commence thinning is when the fruits have ceased to drop off naturally, and when they are about the size of hickory nuts. The amount of thinning will depend wholly on circumstances—the vigor of the tree, the character of the variety, etc. The knowledge necessary to do it well can only be acquired by practice and experience. The Easter Beurre is one of those which requires most severe thinning to secure large fruit of fine quality—all those remarkable for having a large proportion of inferior or unmarketable fruit. This comes from over cropping, and can always be remedied by pruning and thinning. Those who have put this operation in practice know its value. All cultivators of flowering plants (among pot plants we may instance the Camellia) know how that by a judicious thinning of the buds a much finer flowering is secured, as well as a much more vigorous growth of the plant afterwards. The grape is another familiar example. How often do we see the quality of the fruit totally ruined, and the vines permanently injured by over cropping. Our apple and peach orchards, and indeed all our fruit trees, suffer severely from this cause, and the importance of thinning, in connection with pruning, cannot be urged too strongly upon cultivators.

Gathering the Fruit.—If pears are gathered too soon they shrivel, and are insipid. They must attain that condition on the tree when sugar begins to form—if we knew it. It is now pretty well understood by those who have given pear culture any attention, that the pear must not ripen on the tree. I think there is no exception to this. Some varieties require to be taken from the tree earlier than others—those which are known to rot quickly at the core after they are ripe—the Flemish Beauty, Beurre d' Amanlis, Doyenne Boussock, Stevens' Genesee, Bartlett, Clapp's Favorite, and many other fine sorts. Bartlett is greatly improved by very early picking; it is much more melting and juicy, and has less of that disagreeable musky aroma. Both Bartlett and Flemish Beauty may be gathered before fully grown. I have seen Flemish Beauty, from California, which I should think were not two-thirds grown, sold in New York as sound as possible.

When to gather the summer and fall varieties must be learned by observation.

The rule usually given is, when the stem in the fruit will part from the spur without breaking. This is not always a safe guide. The time for gathering varies in the same locality in different seasons and according to the soil, season and condition of the tree, etc., it may vary a week or even two weeks, just like other crops.

Downing regards the dropping of wormy specimens, in a sort of ripe state, as an indication that the time for gathering has arrived. On old trees the same variety will ripen sooner by a week or more than on young trees, and on the same principle that fruit on the lower and less vigorous branches will ripen sooner than that at the top. The proper way is to commence with those which show the greatest degree of maturity, and make two, three or more pickings. The observing and careful pear grower will soon learn by signs that can not be described, when to pick his pears. The dates of the various pickings of each sort and the result should be carefully recorded, especially by the less experienced. Great care should be taken in handling, so as not to break the stems nor bruise the fruit. A pear seems to me almost ruined if the stem is broken.

To ripen in perfection, place the fruit, immediately after it is picked, in small boxes or drawers, not exceeding two or three layers in thickness, where they can be excluded from the air and light. This brings out both color and flavor. They should be examined daily and the ripe ones removed for use. Some recommend placing a woolen cloth over them to aid the ripening process, and also some dry moss, or some soft substance on the bottom of the box or drawer, to set the fruits on. With careful handling, I find this generally unnecessary.

Pears known as winter varieties require special treatment. They should be left on the tree as long as the leaves remain green and healthy, or until frost is expected. When our winter pears are picked, we put them in barrels, or half barrels, which are better, small boxes or crates containing half a bushel or a bushel, and place them in the driest and coldest place we can find, usually on the north side of a wall. When hard frosts arrive we put them on a barn floor and cover with straw or leaves, where they remain until very cold weather. Here they can be kept so that 15° of frost will not hurt them; and indeed if well covered with leaves, they may be kept all winter, as we have done. Yet as we frequently have the thermometer as low as 12° or 15° below zero, we do not feel safe in trusting to that method, and generally put them in a cool dry cellar as soon as we expect a very cold time.

A dealer in our city noted for the beauty of his pears, no less than the high prices for which he sells them, has had magnificent Duchesse d'Angouleme on his stand since the 1st of November. They have been as yellow as gold, and he has sold largely of them at fifteen to twenty cents apiece. I asked him recently how he kept up his supply so well over so long a period, and he told me that he first placed them on a barn floor and kept them there spread out till cold weather set in and there was danger of freezing. Then he put them in a cellar and from there he takes them as he needs them to his kitchen, to fit them for the market. They certainly could not be more perfectly ripened if he had the most costly appliances at his command. Winter pears, that are *well grown*, ripen in the cellar perfectly as a general thing, the temperature being about 40°, or ranging from 38° to 40°—Beurre d'Arenberg, Lawrence and Winter Nelis especially.

If wanted for use before they ripen in this way, they may be placed in a warm room (a temperature of 50° or 60°) to finish them off. We seldom find this necessary.

There are now various contrivances in the way of fruit preserving houses, where ice is employed to keep the temperature cool, which will be found of great value in more southern climates, where there is a long period of warm weather after the winter pears are picked, and in retarding the ripening of summer pears so as to keep a uniform supply in the market. Among these houses that of Rees & Houghton, of Philadelphia, is highly spoken of. Dr. Houghton, one of the patentees, a skillful and experienced pear grower himself, as many of you know, wrote me lately that his experiments with it were highly satisfactory. They claim to keep the air of the house as low as 34°, if desired, and perfectly *dry* and *pure* without the aid of chemical agents, simply, I believe, through the means of cold air from an ice chamber and a peculiar system of ventilation. I intend to have one constructed for my own use, though in our climate such houses are of comparatively small importance. A room above ground, with double walls to exclude frost, or a deep, dry cellar, is sufficient for us, our winters coming early and being very cold.

Marketing.—In sending our pears to market, our plan is to pack them as soon as gathered in *clean, new* half-barrels. The barrel is placed on its head, the bottom taken out, and the pears laid in carefully by hand. Every pear is put in its place singly, layer by layer, till the barrel is full. While packing, the barrel should be shaken three or four times to settle all in their places, so that no movement will take place after it is headed. The dealers in New York, who have had great experience in handling pears, inform me that both for home use and for shipping, the best form of package which comes to them is the *half-barrel*. The transportation will cost less than in small crates. It is quite likely, however, that pears nearly ripe will carry better in small boxes or crates containing half a bushel to a bushel. But even summer pears, bought in our place for the New York market, are shipped while hard, of course, in barrels and half-barrels. Dealers begin to understand the ripening of pears, and prefer to get them before ripe. It is believed by some that pears cannot be shipped any considerable distance. I saw this statement made recently in a journal of high standing, but we know that it is an error. Pears are now sent safely from California to New York and Boston. If care be taken in packing, they carry as well as apples.

Those who are within a short drive of market may find it advantageous to ripen their pears before marketing. To do this, place in small boxes or drawers where the temperature will be as uniform as possible, and the air and light, in a great measure, excluded. Many varieties, indeed most varieties, if ripened in a full exposure to the air and light, either shrivel or are insipid and deficient in color.

Assorting.—In packing pears for market, it is important to have them carefully assorted. A respectable dealer will avoid fruit, especially pears, that are not well selected. All the immature, deformed, unsound and imperfect fruit must be disposed of separately; a barrel of mixed fruits will sell for no more than a barrel of culls.

The grower should aim at making a reputation so that his brand will be a guarantee of excellence and command the confidence of the trade.

Varieties.—The most popular pear to-day is the Bartlett. I think there are nearly as many trees of this variety planted as of all others. There certainly would be if the trees could be obtained. Other varieties stand about in this order:

Flemish Beauty, Beurre d'Anjou, Beurre Clairgeau, Sheldon, Lawrence, Seckel, Howell, Doyenne Boussock, Belle Lucrative, Duchesse d'Angouleme, Vicar of Winkfield.

Clapp's Favorite is rapidly growing in favor to precede the Bartlett. Osband's Summer and Tyson are also being planted largely.

For the Quince Stock.—Duchesse d'Angouleme, Howell, Beurre d'Anjou, Louise Bonne de Jersey, Belle Lucrative, Bartlett, Osband's Summer, Tyson, Brandywine, Beurre Giffard, Vicar of Winkfield.

This represents about the order in which these varieties are called for at present. The Bartlett is the most popular of all, *on pear stock*, and the Duchesse d'Angouleme on the quince.

A great difference, however, exists among planters as to the number or proportion of these to be planted, and this difference arises not so much from their own actual experience as from what they learn from others. The Bartlett is known to succeed everywhere; no other so well known succeeds so generally, and hence it is always considered safe to plant that. The others are taken at more or less hazard. The Bartlett always sells well in the market; it is known to thousands who know no other variety, and will sell readily when a better fruit would not sell.

In the market color is an important quality. No pear, however good, will sell well if its color be not attractive. All the pears I have named are of good color when ripe except the Belle Lucrative, and in some seasons and localities it also colors well. The Vicar of Winkfield, when well grown, colors finely in ripening and commands high prices. When poorly grown, it remains green, and is of no value whatever. Late pears are growing in favor among market growers. Beurre d'Anjou is now the most popular; it is large, fair, excellent in quality, and may easily be kept with us until the 12th of January. The Lawrence stands next; it becomes a beautiful lemon yellow, and keeps rather longer, or later, than d'Anjou. The Winter Nelis is not an attractive looking fruit, but sells at high prices on account of its fine quality; keeps till January. All these ripen in a good dry cellar as easily as an apple.

Beurre Clairgeau promises to be very popular, and is already extensively planted. The tree is a vigorous and handsome grower, and very productive. The fruit is large, of good form and color, and though inferior to d'Anjou, is a pear of first quality; keeps well through December. I have seen specimens from California much finer in quality, as well as superior in size, to any I have seen grown at the East.

The Easter Beurre, the finest of all winter melting or dessert pears, is difficult to grow to perfection, and is almost abandoned except by amateurs. It needs a rich, warm soil and close pruning to maintain a fair growth of wood, and the fruit must be carefully thinned. The tree, at best, does not seem capable of maturing in perfection a large crop, although it is very prolific.

The Beurre Gris d'Hiver is a noble fruit. It requires high culture, with pruning and thinning, to bring it to perfection, as the tree has a tendency to overbearing, like the Easter Beurre.

Josephine de Malines gives great promise; it is of fine size, large enough, of a delicate pale straw color when ripe. The flesh, which has a pale, rose-tint, is melting and delicious. The tree, when young, is but a moderate grower, with small leaves, and never has a luxuriant look, but on good, deep, strong soils it possesses sufficient vigor and bears abundant crops of very uniform fruit. We have kept it sound till April, and regard it as the best long keeper we have among melting pears.

Doyenne d'Alencon similar in character to the Easter Beurre, though less disposed

to exhaustion from bearing: requires the same careful culture. It is a fruit of fine quality, though not fully equal to Easter Beurre.

Duchesse de Bordeaux of recent introduction, promises to be valuable. Dr. Houghton, of Philadelphia, who has for several years been experimenting, specially with winter pears, regards them as the best he has fruited. I am indebted to him for specimens, and as far as I may form an opinion from them, I think it will be a valuable sort. The skin is very thick, which gives it good carrying qualities. It is melting and vinous, something like the Easter Beurre.

The class of pears known as baking pears, the flesh of which does not become soft and melting, are not yet in demand, but I have no doubt they will be in a short time.

Such varieties as Uvedales St. Germain, Catillac, Easter Bergamot, Leon le Clerc de Laval, and many others are all excellent for baking, stewing and confectioners; and as the uses of pears become better understood there will be demand for them. It is probable that the high prices of pears at present deters confectioners from attempting to use them.

Pears that are Failing.—Our once famous White Doyenne, the finest of all pears at one time, and yet if in perfection, has generally fallen into decline. It has been attacked with a sort of fungus on the skin, which destroys it. It is now abandoned in all the Eastern and Middle States. In some parts of the West on new soils it seems to flourish yet.

The Flemish Beauty is threatened with the same misfortune, and is now planted very sparingly. Ten years ago it was one of the most popular.

The Beurre Diel, a noble fruit, has also ceased to be reliable, and is very little planted. Other varieties will doubtless go the same way. We must expect it and be prepared. When a variety fails, the remedy is graft over—lose no time. Trees can be changed with a loss not exceeding two or three crops, and with comparatively little labor.

Finally, we may sum up the chief conditions necessary to success in pear culture as follows:

1. A deep, dry, fertile soil.
2. A sheltered situation.
3. Good clean tillage of the soil, including manures or fertilizers when needed.
4. Judicious pruning and training.
5. Thinning the fruit and removing and destroying all wormy, diseased and deformed fruit.
6. Prompt removal of trees or parts of trees affected by blight.
7. Fill up the places of dead trees with new ones, and of dead branches with grafts if necessary to restore balance of the tree.
8. Keep some reserve trees on hand to fill vacancies.
9. Graft over promptly such as fail, with one that has proved valuable.
10. Select varieties as far as practicable that have proved successful in the locality or the nearest locality where experience may be had.
11. Make an experimental plot where all the varieties of great promise may be tested, and thus ascertain what is and is not adapted to the locality.

Dr. Hull—You speak of pears being frozen. Do you think 10 or 12 degrees below zero would injure them?

Mr. Barry—I should think not, if the barrel was not opened. I took up some that were at 8 degrees below zero, and they were entirely uninjured, lying on the ground.

Mr. Daggy moved that Dr. Hull resume his report. Carried.

Dr. Hull—I will take a track through our State to show the conditions that operate upon horticulture. One of the difficulties I find at Villa Ridge is the apple curculio, a new insect—a formidable insect—which makes a small round puncture just under the skin, and drops an egg, and they are so small that I would not know from the examination of a hundred apples, that they existed. As the little worm gnaws his way out he simply perfects himself as a larva. In my own grounds I have not put a sound Janet in my cellar. I did not get the Janet in my cellar at all, because they will certainly not keep. My Janets are not worth anything. Then further north we find this curculio again. We find it in Michigan and in Missouri, and it seems pretty generally disseminated.

Mr. Nelson—Is that the one called the apple maggot of the East?

Dr. Hull—No; it is distinct from both the apple maggot and the curculio. He looked to me like the plum curculio, but I found he had too many humps on his back. After two runs of my catcher I did not have any. I am satisfied that it is good-bye to apple culture unless we have some instrument that will catch these insects. As it is, I think the apple is going to be the most troublesome of any fruit, unless we can control this matter.

I want to show you something of the probable ratio of increase and the probable necessary effort. I wish I could emphasize it so that there would be never a thought directed to any other course. Now it is no longer possible merely to plant and to reap. In connection with the Missouri *Ad Interim* Committee, I visited some orchards this year; every peach was stung to the extent of 40 to 150 cuts. We then went down to a point a few miles away where there were no peaches until that year. We got there, and lo and behold every peach was wormy and the most of them were on the ground and not sent to market. We went from there to another, and found the same thing. Mr. Murtfeldt

is here, and he can say if that was not the fact. They wanted to show us a beautiful collection of fruit at one point, and I took one and pulled it open and there were two worms, and several had crawled out. I state this to show what may be the possible condition of things when we furnish the conditions necessary for our insects. Hence you must have your curculio catcher. I have very carefully run my curculio catcher to determine this point, and I have never found a curculio able to rise when the thermometer was at 70° . I have only known of one at 72° . They never fly under 75° of their own accord, but when the sun is 75° they begin to fly freely.

My own place has peach orchards north of it with wood land between. I burnt over this intermediate space—that is, the ground it was supposed the curculio might be in. I burnt it over in the month of May, so as to burn up all the little rascals, but I did not succeed. If I caught all my own curculios next day, when it blew from my place on to these, I should get a solid quart of curculios. They scented the plums on the trees and came where they were.

Now you will say it was impossible for me to get fruit next year? And why? Along down the road near there are two rows, or one row around a farm, of Morello Cherries. I asked a friend how many cherries there were? He said 40,000, and I said there were probably 20,000. I said is there any one that contains the larvæ of the curculio? Not one, he said. Now if they are to take the wind as it blows from my place over there next year, what is the chance of their getting fruit? "Well," he said, "I think it is very little." Now that is just the condition my orchard is in, and which thousands of others are in, in this State. Do not you think it necessary that something should be done? I don't know what. I wish it was possible for us to have some law by which we could reach them—that the legislature would enable us to do as they have done with the Canada thistles—make people do their duty.

In going from Chicago to Galena we were surprised and delighted—we felt we had got into the true fruit region of Illinois. I there found the best exhibition of fruit since I was at the North-

western fruit show at Burlington. Why is it so? Because these pests are not there—not even the apple curculio in any but small force. I see no reason why they should not grow fruit there, better than in any other portion of the State. From Galena we came down the river and stopped at several of the river towns. At Warsaw we found the apple crop in very good condition. There was nothing wrong except that they were scabbed, and yet some of the kinds that we had at Alton were not so much scabbed as ours.

We will have to unite against the insects, and wherever there are two or more persons adjoining, they will have to use the curculio-catchers. You can control three orchards of a thousand trees each, and in all probability you will not have to apply them over two or three times, unless you are so situated with regard to other parties that they will fly over.

Mr. Earle—How much jarring does it take on a large apple tree?

Dr. Hull—We illustrated that last summer on our Ad Interim Committee. When I have employed men to do it they are apt to drive it too much. We always want to approach the tree by the same path. Now take an eastern peach tree and they are not so large as one of our side branches. I could jar them by striking them with my hand. Now I have trees a foot through, and I find that my curculio-catcher must weigh about 75 to 100 pounds. If I have a light instrument then I knock the bark off.

Mr. Riley—My experience in your orchard and in other orchards is, that the curculio-catcher does great injury to the trees. I advise the use of a spike driven into the larger trees, and it may be made with a shoulder to it. I think the great objection to the use of the curculio-catcher is that in time it would cause great bruising of the bark.

Dr. Hull—Mr. Riley is right, if the work be done by a green hand. It is not a light blow that will answer—it must be considerable of a blow to produce a jar on the remote branches.

Mr. Barry—We have the curculio in great abundance, and our own method of fighting them is, in the spring of the year to spread a sheet which we have made for the purpose, and jar the trees. We

have a mallet, and we strike that on the tree and the jar is sufficient. We secure, every year, fine crops of plums. The principle is just the same as that practiced by Dr. Hull, except that we use a sheet spread upon the ground, and a mallet. The man takes a pail of water to put the curculios in. There is a slit in the sheet, so that it can be put around the tree. When he has done with one tree, he gathers the sheet up and goes to the next one. We have two hundred trees altogether, and he goes over them every morning. We never fail except when it is raining. The trees are pretty old trees but not very large; they are from 12 to 15 inches diameter. They are the oldest orchards we have.

Dr. Hull—State how long the curculio season lasts in your region; that is, how long are you obliged to operate?

Mr. Barry—I could not say. Our man who attends to that could tell you. Unless he is sick he attends to it every morning.

Mr. Barler—What time does he finish it?

Mr. Barry—I think in about two hours.

Mr. Murtfeldt—Have you made any estimate of the cost of plums when you get them?

Mr. Barry—I know we should not get any plums without such investment.

Mr. Murtfeldt—Would it be worth while for a private individual to do that?

Mr. Barry—If he valued them it would. He ought not to have them if he would not give them attention. A man not willing to enter into these details will never succeed. They are not very troublesome on the peach, but they attack all the fruits we have, more or less. I have seen their marks on pears, apples, peaches, etc., but they are only troublesome on the apricots, nectarines and plums—these smooth-skinned fruits.

Mr. Riley—If your orchard were ten times as large, could not you expedite your operations by putting your sheet on a frame?

Mr. Barry—Yes sir; and I have been looking over this in the plans of the Doctor.

Mr. Earle—I see the statement made by Mr. Barry impresses gentle-

men here with the idea that the plan is very expensive. In figuring up, the time occupied is 60 hours per month, and if the curculio season is as long with him as with us, it would make about 15 days' work in the season. It seems almost impossible to me for one man to go over 200 trees in two hours; if he does so, he is a rapid worker. I desire it to be understood that the cost is exceedingly small as compared with the results. I know gentlemen in my neighborhood who have kept strict accounts, and they are astonished to find how little the cost is.

Dr. Schroeder—The trouble is they neglect it. Private individuals who have a few trees in a garden, and if they are Americans in the bargain, will not do it.

Dr. Hull—There were not over four or five points when I first came to Illinois at which curculios in any numbers could have been bred. The whole country was one open field, with fires running all over it, and hogs running all over it. I recollect distinctly the fencing-in of my orchard, and gradually they increased until finally the whole country became dotted over with orchards, and precisely in a ratio with this increase of orchards was the increase of insects. The moment we began to fence in then the fields became breeding points for curculios. Just in the ratio of food for anything will be the ratio of increase of the animal. This is an additional reason for co-operation. In the Alton district we are just as badly off as you are at South Pass or any where else.

Mr. Freeman—Hale's Early ripens with us about the time the black-berry ripens. That is just the period when this humid weather comes; and it is just then that the rot appears so destructive in the peach. Dr. Hilgard has shown that the fungus is the cause of that rot; it is developed by heat and moisture. You stated that the curculio attacked the fruit and thus afforded a nidus for the fungus to attach itself. Hale's Early ripens when the conditions are most favorable for the spread of the rot, and that is the reason. I would say further that I was informed to-day that one of our neighbors who has followed out the recommendation of keeping all his rotten peaches gathered has been very successful.

Dr. Hull—The statement about hogs being a remedy against the

curculio appeared in the Entomologist. When Dr. Walsh visited us last year, through a mistake, he put me down as saying so, and he applied the statement I made about the peach borer to the curculio. I took him over the ground to show him that the hogs were a protection against the peach borer, but he put me down as saying so of the curculio.

Mr. Brown—I do not know that I can say anything about this matter particularly. There was one point I desired to have Dr. Hull speak about—and that was the damage to the apple crop. No one who has not tried it would have any idea of the amount of it. I got about 50 curculios and put them in a box with a glass top on it and put green plums, peaches and apples in with them. Some of them dug holes deep enough to bury themselves. Now with regard to the apple. I have never seen the larvæ of the curculio in the apple or pear, but they do attempt to deposit their eggs in both of them. These marks produce a scar upon the fruit; they will nip out little patches of the skin. That this is done by the curculio I have no doubt. I have a number of Janet apple trees in one part of my orchard. In gathering the fruit I found they were all perfectly fair, without a single mark on any of them, until I came to a tree next to an old peach tree, and a large proportion of that fruit was marked so as to be almost worthless. Then I went to another where there were no peach trees and there the fruit was entirely fair. So that gentlemen will find that they must not only protect themselves against the curculio for their peaches and plums, but also for the sake of their apple trees.

I will close by saying, that this whole matter is no great thing. It is an easy matter to protect five or six hundred trees before breakfast by using Dr. Hull's machine.

Mr. Baldwin—I move to adjourn until nine o'clock to-morrow morning, instead of half-past eight, so that we may see the fruit on exhibition.

Adjourned.

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THIRD DAY—MORNING SESSION.

The Society met at 9 o'clock, pursuant to adjournment. President McWhorter in the Chair.

The President—The first thing in order is the list of Ornamental Shrubs, etc. It is an interesting subject, but there is a question whether we have time and opportunity here to attend to it, with the vast amount of matter pressing on our attention.

Mr. Earle—I was about to suggest that the last item this morning is a subject of very great and universal importance and interest. We have gentlemen here from several of the older States, who are very competent to assist us in the discussion. They are not all in the room just now, and I wish the reports of Committees could occupy us half an hour or so.

Mr. Brown—I move that the Ornamental Shrubs, etc., be passed. Carried.

REPORTS OF VICE PRESIDENTS.

District No. 2.—Mr. Woodard—Mr. Crow is not here and could not get here in consequence of business.

District No. 3.—A letter from Mr. Hausen was read.

The crop of apples generally was very poor. The wet weather was, in my opinion, the cause. This season has been the wettest in twenty years. The following varieties of apples were good: Keswick Codling, Red Astrachan, Maiden Blush, and all of the Russett family. The rest were poor. Small fruits were generally good, with the exception of grapes. The early Richmond cherry produced abundantly, but was injured by wet weather, by being very watery, and rotting somewhat on the trees. The Black Caps yielded abundantly. They are beginning to be quite extensively cultivated.

The crop of Pears was good. Every tree large enough bore abundantly. They are also being generally planted.

Tree peddlers continue to be a pest. They are too generally succeeding in gulling those inexperienced in their system of deception and fraud. This imposition calls for a loud condemnation.

WM. H. HAUSEN.

District No. 11.—Report from Mr. Fletcher read.

The Centralia Fruit-Growers' Association still hold their regular meetings, with the interest and attendance reasonably sustained. Mr. B. Pullen was chosen President in January last, and makes an efficient officer.

THE FRUIT CROP

For the summer of 1869, in our locality, should be considered a satisfactory one, taken as a whole, and may be summed up as follows:

APPLES

Were abundant and of excellent quality. Much too large a proportion of our varieties are fall apples, but a few years will remedy this, as the apple trees that are now planted are largely of those kinds known to be winter fruit.

PEACHES

Will have to be reported as a short crop. The yellow-fleshed peaches were nearly a failure, excepting the Smock variety. The injury was caused by a severe snap or two at the critical time. Hale's Early were pretty thoroughly used up by the curculio and rot. Heath Cling and other late varieties gave a good crop.

STRAWBERRIES

Yielded bountifully, though parts of some patches were seriously injured by an insect supposed by some to be a species of chinch-bug. Taking odor as a test, they have a strong, pungent reason for their opinion. The shipment of strawberries from Centralia this season foot up to the grand total of 497,875 pounds, or nearly 249 tons, or 10,372 bushels, or 331,904 quarts.

BLACKBERRIES AND RASPBERRIES

Were as abundant as could be reasonably expected. Very few blackberry vines have been cultivated, but quite a number of acres will soon be planted.

GRAPES

Rotted considerably and were of not much account generally, except the Concord, which had a full crop of fine fruit.

THE UNION FAIR ASSOCIATION,

comprising the counties of Clinton, Washington, Jefferson and Marion, held their first exhibition at Centralia in October. The display of apples was said to be superior in quantity and quality to that shown at the State fair. Of pears, grapes, quinces, late peaches, etc., the show was creditable. Grain, vegetables and canned fruits were not unworthy of the good company in which they were placed. Altogether it was a creditable representation of the resources and capabilities of Southern Illinois, as well as the enterprise of its citizens. The Association intend to make considerable additions to the buildings during the present year, adding another amphitheater, fifty new

stalls, and other improvements. B. Pullen, of Centralia, President of the Association; Ed. A. Blum, Secretary.

W. A. Goodale has recently made a valuable improvement to his Patent Spring Fruit Crate, dispensing with nearly half the lumber, thereby reducing cost and weight. It is also equally convenient for either drawers or boxes.

Our winter weather commenced unusually early this season, and up to the present writing has made a thorough business of it. On the 19th of October we were favored with a furious flurry of snow, which caught a large quantity of apples on the trees, not gathered, as well as potatoes still in the furrow, resulting, however, in no serious injury. The present prospects for fruit another season are good.

J. WARREN FLETCHER.

A letter from Mr. Fletcher, inviting the Society to hold the next annual meeting at Centralia, was read.

CENTRALIA, December 15, 1869.

T. McWhorter, Esq., President State Horticultural Society:

DEAR SIR:—I was requested by prominent citizens of Centralia to extend an invitation to your Society to hold their next annual meeting at our place, proffering our best efforts to make the visit of the members pleasant and comfortable.

Hoping that the Society will accept the invitation,

I am, yours respectfully,

J. WARREN FLETCHER,

Secretary Centralia Fruit-Growers' Association.

Mr. Periam—Vice President at large. I am sorry to say that I have no report to make. My business has kept me so closely confined that I have not had any opportunity of gathering any information, and so far as my own neighborhood is concerned, I think the less said of this present distressing season the better.

The President—I notice that in almost every instance the reports speak of the cherry as having rotted from the wet weather. This is so universal that it seems as though the report of one vice president was repeated by the next.

Mr. Galusha—I move that the report of Mr. Freeman be made the special order for 10 o'clock.

Carried.

ORNITHOLOGY.

Mr. Periam—I had hoped that Mr. Minier would have been here to put in a plea for the birds; also Dr. Hull might have got some informa-

tion in regard to the matter. I have not made any report on the birds, because I have discovered that heretofore the experience was so contradictory that I did not know how to do it, except to go the same ground over again. The only thing I would say is, that if we would pay as much attention to keeping birds off the fruit as we do the curculio, we would not only have the benefit of the birds during a certain season, but we would save our fruit.

ORNAMENTAL TREES, ETC.

Mr. Edwards submitted a report.

LA MOILLE, ILL., Dec. 14, 1869.

Hon. Tyler McWhorter, President Illinois State Horticultural Society:

Being one of the Committee on Useful and Ornamental Trees, I would offer a few notes.

For some years past I have noticed a diseased appearance of the foliage on one lot of large Austrian Pines on my grounds. Presuming it to be the work of some minute insect, specimens of the foliage were sent, in June last, to the lamented Prof. B. D. Walsh, State Entomologist, who kindly came and made a thorough examination, coming to the conclusion that it was a fungus attaching itself to the leaves. The remedy proposed was the application of sulphur when the foliage is wet. I hope to be able to report its efficiency, as the damage to foliage is very serious, and if not arrested must apparently destroy the tree.

The Scotch Pine, White Pine, Balsam Fir, Norway Spruce, Red Cedar and Arbor Vitæ, standing among and near the Austrian Pines, show no symptoms of being affected.

The Silver Maple has been very largely planted throughout our State as a useful and ornamental tree. Are we to suffer serious loss of them by injury done by the borer which in many places is attacking them?

The Norway Spruce retains its place at the head of the list of evergreen trees to plant for screens and shelter. It is being planted in many parts of our State as a hedge.

White Pine will doubtless ever remain a leading tree for the uses to which it is now applied in our State. Owing to the fact that its leading shoot is often lost in the tender, growing state, it is deemed advisable to plant some rapid-growing deciduous tree around or interspersed through the timber lot as protection from this injury.

♣ Balsam Fir, in all localities in our State where it has been my fortune to see it, except in the grounds of Gov. Wood, of Quincy, proves one of our finest ornamental evergreens to plant as specimens on the lawn. The prairie soil appears to be specially adapted to the growth of this tree in perfection, enabling it to retain its beauty until arrested by its decline, after maturity. The ragged appearance of old specimens, as complained of in some parts of the country, is probably owing either to some deficiency in the constituents of the soil or the shade of other trees.

Douglas Spruce, from Colorado forests, proves perfectly hardy with me, though from repeated trials of the variety raised in Eastern propagating houses, I long since pronounced the variety tender, and am delighted to reverse my conclusion.

European Silver Fir, at the place of Mr. Douglas, at Waukegan, and my place, in shelter of large evergreens, gives hope of our realizing its beauty with similar protection in all parts of our State. Japan Ginko similarly sheltered is hardy on the grounds of Mr. Douglas.

Our people are being enlightened as to the value of the European Larch, both as a useful and an ornamental tree. Glad of it!—think there is no danger of their planting too largely of it.

Norway Maple is giving satisfaction as a fine variety for the lawn. What better street tree have we than the white elm?

The importance of planting timber extensively on the prairies has been so often demonstrated in former volumes of the transactions of this Society it is not deemed necessary to allude to the subject except to carry out the scriptural injunction to give "line upon line" and "precept upon precept," to "provoke each other to good works."

Mr. Brown—I had intended to make some remarks on the value of our trees for ornamental use as well as for timber, but have neglected to prepare them; but with the permission of the Society, I will write something for our Secretary to insert in the Transactions. [Judge Brown subsequently furnished the following report:]

REPORT OF A. M. BROWN, OF PULASKI COUNTY, FROM THE STANDING COMMITTEE ON ORNAMENTAL AND TIMBER TREES.

Presuming that this Committee was created for the purpose of ascertaining and calling attention to such trees and shrubs as may be made available for planting in the prairies, either for use or ornament, it seems worth while to notice a few of the numerous varieties that go to make up the splendid forests with which this portion of Illinois is clothed. Of all the trees, vines and shrubs, indigenous to our State, perhaps three-fourths, or more, are found growing within twenty miles of the confluence of the Ohio with the Mississippi river, many of them of great value for their timber, and many others highly ornamental. Of these, some are found growing on the hills, exclusively, some only in the bottoms, while others are common to both localities. I will specify a few of those that seem to me likely to meet the wants of planters. Passing by the Oaks, Hickories, Walnuts and Maples, in their several varieties, I will notice those only that are rarely found, if found at all, in the more Northern portions of our State.

Tulip Tree, (*Liriodendron tulipifera*).—This tree, commonly called Poplar, is found only upon the hills or on rather dry ridges in the lowlands. It is the largest of our timber trees, and, if we except the White Oak, the most valuable, vast quantities of lumber being made from it. It grows to an immense size, often reaching six feet in

diameter at the stump and 150 feet in height, with a clean, straight trunk free from limbs for the greater part of that distance. When standing alone, however, it sends out limbs at regular intervals, and forms a remarkably beautiful and symmetrical head. The flowers, which appear in early spring, are about the size of the tulip and bear a striking resemblance in form and color to some varieties of that fine flower. The leaf is large, peculiar in shape, and very handsome. This tree is hardy, and the growth vigorous and rapid. As a lawn tree it cannot be excelled.

Catalpa (Bignonioides).—This tropical looking tree is found in our river and creek bottoms, preferring a wet soil. The largest trees are about two feet in diameter, and, when grown in thick groves, 60 to 70 feet in height. Grown by itself, it is low and spreading. The timber is much sought after for posts. It seems to be almost indestructible by decay. Green limbs thrown upon the wet ground will lie there for years and until covered with moss and yet appear as sound as when they fell from the trees. Posts, said to have been set 30 years, are apparently perfectly sound.

The growth of the *Catalpa* is exceedingly rapid, and there seems to no reason why it should not be of great value for planting in the more southern prairies especially. The tree is ornamental as well as useful, the foliage being very large, and the blossoms pretty and conspicuous. The seeds are numerous, enclosed in long, bean-like pods.

Sweet Gum (Liquidambar styraciflua).—This is a large tree. The timber is used for making bedsteads and other furniture. It is a beautiful ornamental tree, with peculiar star-shaped leaves. The seeds are borne in a curious round burr, one and a half inches in diameter. The twigs and small limbs, especially on trees growing singly, are feathered like those of the winged elm, presenting a very unique appearance.

Beech (Fagus ferruginea).—No one of our forest trees is so much admired by Northern men as this. It is of large size, often measuring two and a half feet in diameter, and more than 100 feet in height. The lower limbs are long, slender and drooping, making a most delightful shade. This would be a perfect lawn tree but for the fact that the foliage usually becomes musty toward the latter part of summer. The seeds are small, edible nuts, triangular in shape, enclosed in pairs, in a burr.

Black Gum.—This is a tree of medium size, rarely reaching two feet in diameter. The fibres of the wood are so interlocked that it cannot be split. The growth is peculiar, the limbs mostly coming out of the trunk at right angles, long, slender and drooping. The foliage is very pretty, having a gloss that makes them glitter in the sunlight.

Dogwood (Cornus Florida).—A small tree, very abundant. In the spring our forests are made beautiful by its numerous large white blossoms. The fruit is a red berry, in bunches, something like the seed of the coral honeysuckle.

Red Bud or Judas Tree (Cercis Canadensis).—Another small tree, covered in early spring with reddish purple blossoms; very pretty.

Cucumber Tree (Magnolia acuminata).—This is a remarkably fine ornamental tree, attaining considerable size. It is, however, very difficult to transplant, and is seldom found in the forest small enough to be removed.

Cypress (Taxodium distichum).—This is a large and valuable timber tree, growing in the wildest swamps and attaining a very large size. It is a very handsome ornamental tree, but would probably not thrive very far North.

I might describe many other kinds of trees, such as Sassafras, Persimmon, Pawpaw, Waahoo, etc., but those specified above seem to me the most desirable.

Mr. Pierson submitted a report from the Seventh District :

The Vice President of the Seventh District would respectfully report on the present condition and prospects of Horticulture in his district, as follows, to-wit :

The year has been one of striking peculiarities throughout. The spring opened with a fine promise of fruit of every kind. Grapes were especially promising. But early in May the heavy rains set in, and continued throughout the months of May, June and July. The rain-fall of those three months in the Seventh District was probably as great as that of the entire year in ordinary seasons. This immense rainfall was also remarkable for the quantity that often fell in a very short time. On several occasions three and four inches of water, by actual measurement, fell in less than an hour. During all this long period the temperature was very low, and vegetation of nearly every kind, even weeds, made a feeble and sickly growth. Strawberries were about the only fruit that did not seem to suffer from the drenching rains and the low temperature. This fruit seems to delight in cool weather and frequent showers. Some beds that were on ground that was constantly saturated with water for weeks, suffered some, but more apparently since the fruit was gathered than while it was maturing. Some vines thus situated that bore a heavy crop of fruit have since died. But a large proportion of the strawberry vines in the region of Onarga, and as far as I can learn, in the Seventh District generally, have produced fine crops of fruit, and when properly taken care of, have made an unusually fine growth during the fall. The prospects for a heavy crop of this fruit the coming season are now very flattering. As the Seventh District is located midway between Southern Illinois and Southern Michigan, and our fruit goes into the market between the gluts annually produced by the superabundant supply from those regions, our small fruit usually brings good and remunerating prices.

Raspberries have suffered severely from the wet season. While the bushes were well loaded with fruit, it matured very imperfectly. Some of the fruit soured on the bush.

The Purple Canes have done much better this season than the Black Caps, both in fruiting and in the growth of new wood. H. J. Dunlap reports that the borer is at work in the cane of the raspberry in Champaign county. There is also a white grub at work on the root of the raspberry in many locations. On the whole, the experience of the season has not increased our faith in the successful culture of this fruit in the Seventh District.

Grapes have been, to a large extent, a failure the past season. They promised well in the spring; but an insect which I have not been able to identify soon commenced its depredations upon the fruit, leaves and vines. The fruit nearly all fell off early in the season, the leaves rolled up, and much of the new wood died. A few vines on well underdrained land produced fair crops, but the fruit was late in ripening, and was not as sweet as usual. The fall growth of grape wood was fair. Young vines set out last spring have not done well.

The Pear Blight has prevailed quite extensively in the district, and many trees have died. Some varieties seem to be nearly proof against this disease, and the experience of the year suggests great caution in the selection of varieties. It is believed that a dozen varieties embrace all the kinds that it would be worth while to plant for commercial purposes. Among these the Lawrence, the D'Anjou, the Belle Luerative, the

Buffam, the Howell, the Seckel, and the Sheldon on the pear stock, and the Louise B. de Jersey on the quince, may be regarded as the most reliable for most localities in Central Illinois. In my own locality trees of the above varieties bear more constantly and more abundantly than most of the apple trees in our orchards, while they seem to be quite as healthy.

B. O. Curtis, of Paris, Edgar county, reports a nearly total failure of the apple the past season, while the peach and the grape were unusually abundant. The early rains damaged the apple, while the severe drouth, later in the season, greatly lessened the crop of small fruits. From facts stated in a communication from Mr. Curtis, it is evident that the horticultural history of Edgar county should be written out and published in our annual report. It was in this county that the first nurseries of the State were planted. Mr. Curtis promises to give us this history.

Stillman Barber, of Millmine, Piatt county, reports: Grapes promise well here. The Concord is the best and most hardy. Pears do well so far, and farmers are generally setting out more or less pear trees. There are some old pear trees near the Sangamon river that are about thirty years old, that have been good and regular bearers. The Early Richmond cherry, currants, raspberries, strawberries, gooseberries, all do well in this county."

M. C. McLain, of Charleston, Coles county, reports: "Our prospects, horticulturally, are brightening. Many of our apple trees dropped their fruit badly in the months of June and July by reason of the work of the Codling Moth. The Wine, Fallawater, Wagener, Baldwin, Large and Small Romanite, and the much abused Yellow Bellefeur, of the winter varieties, and the Early Harvest, Red Astrachan, Carolina June, and Golden Sweet, all carried and ripened their fruit splendidly. The peach was a failure. My prospects for grapes were never better than during the past season, up to the first of July. At that time we had prevailing southwest winds, and warm and foggy weather for some five or six days together, when considerable rot appeared on my Concords and Hartfords. Mildew also appeared on my Delawares and Ionas, and before the month was out my Delaware vines were as bare of foliage as a regular tramping tree-peddler is of conscience, and they ripened no fruit, although loaded to the ground with the finest looking berries I ever saw upon that variety. Concords and Hartfords rotted slightly, but bore fair crops of excellent fruit. The subject of draining our lands is beginning to receive some attention among our people, and so far as tested the labors in this direction have given very satisfactory results."

E. Daggy, of Tuscola, Douglas county, represents that there is a steadily increasing interest in the subject of horticulture in his county. The May cherry and small fruits generally did well the past season. The Kittatinnny blackberry is especially promising with him. Grapes yielded a fair crop, but were more or less injured by mildew and rot. While fruit-growing is receiving increased attention among our people, all are becoming deeply impressed with the fact that even the fascinating art of horticulture has its shady side.

H. J. Dunlap, of Champaign, reports that strawberries ripened at that point on the 5th of June, this being eight days earlier than the season of 1868. He has demonstrated that it required just forty days from the first blossom for strawberries to ripen at Champaign. There were some 1,200 bushels of this fruit grown at this point the past season; price from five to forty cents per quart. The early May cherry bore abundantly. The trees are all top-grafted on Morello stock. There were about four

hundred bushels of this fruit sold the past season, at an average of about eighteen cents per quart. Extensive cherry orchards are being planted, one of 3,000 trees. The curculio has commenced its work of destruction on this fruit. Lawton blackberries that were well cut back bore good crops. Kittatiunny promises well. Grapes rotted badly, but those spiral trained less than others. Apples bore full crops. The Stanard apple is by far the most profitable apple grown in this county. Tree and hedge planting is largely on the increase.

All of which is respectfully submitted.

WM. P. PIERSON.

Mr. Galusha—The situation of my family is such that I shall not be here at the close of Mr. Freeman's address, and there is one item that I wish to speak of. In my visits I discovered an apple new to me; a very fine fall apple, resembling the Northern Spy very much. I could not identify it from the books, and procured some specimens to bring here, and see if they could be identified. It is the most valuable fall apple we have in our district this year. I have a few scions which any gentleman can have to graft and try. [The scions were distributed among the members.]

REPORT UPON SOUTHERN ILLINOIS SOILS.

The hour of ten having arrived, Mr. Freeman addressed the Society as follows :

Mr. President and Gentlemen :

My report will be confined to Southern Illinois—that part from Centralia to Cairo. At the annual meeting of this Society in 1867, when it was held at South Pass, there was a very animated discussion on the subject of pears, and some remarks so directly contradictory as to the merits of the same pear in different localities, that it satisfied me, at the time, that much of this difference was due to a radical difference in the soils; and it led me to follow up this matter until the present time. I had opportunities at the time, to investigate it in the North, and lay the foundation for discoveries in the Southern part the following year; and it will show the exceeding difficulty of arranging fruit districts for different varieties of fruit with any hope that the same variety is going to be universally applicable to any district, even if you confine it to one county, and as Judge Brown said when he was President, the cultivation of the soil cannot be made specific in any one direction, but it must be regulated by the peculiarities of each particular plot of land.

In the lecture of Mr. Shaw last evening, he showed to you the "drift." We have, since the drift, several other descriptions of soil in other localities. The diagram which

I have presented here, very roughly illustrates what I believe represents the connection in a north and south direction from Centralia to Cairo. Here is the Grand Chain sloping to Cairo, which we will suppose to be at the bottom of the paper. Here is the lowest point, representing the Big Muddy river. Without going into details of the geology of the country there, it is sufficient to say that it is in the form represented there, with exaggeration. The Big Muddy, at Carbondale, is only 16 feet above the Ohio at Cairo. Well, then, this elevation is 600 feet; between these points we have six different soils, and in some places they can all be seen at once. Besides that, we have a sandy soil belonging to the tertiary era, and then alluvial soil at Cairo. I have tried to represent these several soils superimposed on each other. I call them all soils, although the lowest of them is a white clay which can only be prepared for vegetation artificially. We have then No. 1, which is the black loam of the prairie, of the timber ridge, on the margin of the prairie. No. 2, a whitish clay, which often is the prairie surface, particularly in the Southern prairies. No. 3, a chocolate colored clay. No. 4, a white clay, similar to No. 2. No. 5, a yellowish drift clay, something like that underlying the clay of your Northern prairie. No. 6, a whitish clay before referred to, and lying on the rock formation beneath.

You will notice but two lines, representing 5 and 6, as running over this whole country. The soil of that ridge is this No. 5. It appears in this basin—in these little elevated points, where they are just high enough to be above No. 6. The entire section is eleven feet ten inches, but this was taken from near the north line of Franklin county. No. 5 is a very finely comminuted, arenaceous clay. It corresponds with the clay further north under the black loam, except that, as we go south, that intermixing of particles has caused it to be much finer than it is further north, and practically makes it a different kind of soil. Nos. 5 and 6 belong to the drift era. All these others were later than the drift; they were formed at a later period. They came in from the eastern part of the drift to the Big Muddy, and probably the Saline.

These white clay lands—the lime mud-drift of our friend Rural—are No. 2, mainly. No. 5 is very similar to it, but No. 5 represents the soils that are seen further north, as far as Neoga, on the Illinois Central Railroad. No. 3 is the same as I see down here. (“T” on diagram). It is an entirely different soil from any other, and it has a splendid system of under-draining; it all rests on a bed of open ground. The hills are only about sixty feet high from the bottom, and it is apparently a uniform kind of soil. It is such a peculiar soil that wells are dug in it and do not require to be walled up.

Now, when we come to apply our horticultural knowledge, as directed, to kinds and varieties of fruit, we are totally in the dark except as to these soils. The location of these soils presents such different meteorological conditions, so that what would apply in one case will not apply in any other. Coming from the north to this point (“S” on the diagram), there is nothing more than the absence of the generally overlying yellowish clay which constitutes the general surface of the prairie land. In the course of deposition, in some cases, this No. 5 may not have been distributed equally. In other cases it may have been washed away by currents of water after it had been deposited. I cannot give you a distinctive character except as persons have noticed how different the timber is on these different lands. It is not distributed over any continuous district, but it is continually broken into different patches. The absence of No. 1 makes No. 2 the surface. Where they are small they are often called “licks.” It is an efflorescence of alum, which cattle like.

Mr. Bryant—I believe that this abounds in the northern part of the State.

Mr. Freeman—So far as my observation goes it is not No. 2, but No. 5. They are subsequent to the drift era, and deposited by still water. Referring to this “loess” here, I suppose the origin of that (No. 3) is up towards the Colorado region. From what I have been told by persons who have lived in the Platte Valley; from the evident great denudation there, and the fact that the composition of the country there is much more recent than ours, and would present a different soil when mingled and washed down, this soil is to-day traceable up the Missouri river and its tributaries. It would seem that these white clays, when they were deposited, must have been under different influences—either the current was shut off, or that this was a side bay, and the water could be more still, and the coarser matter was not set in so far; for these white clays are very fine, close material, and entirely different from the several beds that lie between. I do not think the Missouri river has ever crossed the State, but this depression does run across the State. We know the elevation between the Big Muddy and the Saline, so that the flow of water, when it was considerable, would be to the Ohio river. My object was simply to direct your attention to the constant care necessary in the apportionment of fruit in different districts, instead of making an arbitrary list. You know, as yet, almost nothing of what they are capable, for the reason that there is so much diversity of soil and climate, and that will be found almost in the range of one county.

Mr. Murtfeldt—I have a question of privilege to propound, which I think the gentleman can answer. I have understood that the Mississippi is constantly making inroads upon the shore.

Mr. Freeman—It is the character of the Mississippi to form elbows and to eat in.

Mr. Bliss—I think if the geologists and the analytical chemists would come together and decide this question of soils it would be the shortest way of arriving at it; or perhaps it would be well to make this a feature in our education.

Mr. Freeman—I would say this : that it is necessary to do both—to make it a branch of instruction in our State University, and embrace the subject in the range of our investigation by consulting the results obtained by individuals throughout the State. No doubt many who do not now do it would take part in that labor if these materials could be worked up into practical results.

Mr. Pierson—Do these remarks about soils relate entirely to the country below Centralia?

Mr. Freeman—What I have said will, in some respects, apply to the whole State.

Dr. Hull—Which one of these strata appears at Du Quoin?

Mr. Freeman—I suppose it to be No. 6. The white clay there corresponds with that a little further north. The superimposed soil there is too fine.

Mr. Douglas—I would like to ask Mr. Freeman whether taking a few inches of this black soil and spreading it over the local soil would do any good?

Mr. Freeman—Where that No. 6 is the surface, the action of the rains and the weather have washed away some of it, and it is generally found covered. It is also disseminated through the body of it. It is an arenaceous clay.

Mr. Douglas—Impregnated with lime?

Mr. Freeman—I do not know. I have not been able to analyze it yet.

Dr. Douglas—We use it on our low black soil. We cart it half a mile and spread it over our black soil three inches in thickness.

Mr. Freeman—As it appears at South Pass just above the railroad bridge, the white clay is No. 6. I would suppose it would be beneficial, for it has something of the nature of marl, from appearances.

Mr. Earle, of the Committee on Pears, submitted the following report:

REPORT OF PEAR COMMITTEE.

Your Committee have been pleased to find a much larger collection of pears than has been commonly seen at our meetings, and while they regret the poverty of our

own State in the exhibition, they have been much pleased and interested with those sent us by our neighbors.

Messrs. Ellwanger & Barry have, with usual and commendable enterprise and liberality, shown us forty varieties, nearly all of which are in a good condition of preservation, and many of which are firm enough to keep through the winter. The first pear examined was the new and much talked of late keeping winter pear, the Duchesse de Bordeaux. Your Committee believe that the fruit of this variety has never been before seen in the West. It is a fair sized, good looking, though rather rough pera, of a marked high flavor, vinous and refreshing. It is said to keep as long as the Easter, and while it is not as rich and buttery as that variety, it possesses more of that aromatic and lively acid, which will commend it to many buyers.

The Beurre d'Anjou is exceedingly fine, and their firmness at this time indicate good keeping qualities. Your Committee would particularly commend this variety to planters as very reliable in all respects.

Beurre d'Arcberg.—Specimens good size, rough, and flavor a little rough but vinous and aromatic.

Doyenne d'Alencon.—Specimens very good size—not ripe enough to eat, but your Committee believe this to be one of the few excellent and reliable winter pears.

Delices d'Hardenpont.—Good looking, but specimens shown of poor flavor.

Beurre Gris d'Hiver.—A pear of very noble appearance; specimens too hard for test of flavor.

Lamartine.—Specimens small and inferior looking.

Black Worcester.—A fine looking pear—said to be good for cooking. Your Committee have the impression that it is not desirable to multiply varieties of cooking pears very largely; two or three of the best, like Vicar of Winkfield and Pound, being better than many kinds.

Doyenne Rose.—Apparently worthless.

Niles.—Unattractive in appearance; specimens hard. This pear is said to have good points.

Jones' Seedling.—Medium sized; fruits of fine color and form.

Souvenir d'Esperen.—Samples of very coarse quality.

Winter Nelis.—Specimens of moderate size and quality; one of our best pears for the North, but wont do in many localities South.

Vicar of Winkfield.—Specimens were quite good. Your Committee believe that planters will do well to become acquainted with the merits of this pear before planting.

Beurre Diel.—Specimens small, but of very good flavor; a very unreliable pear.

Lawrence.—Specimens of good size, although not equal to those grown in Southern Illinois, and the flavor not equal to ours. A pear of undisputed excellence, which improves in size and quality as it goes South.

Oswego Beurre.—Not very attractive in appearance

Compte de Flandre.—Of coarse texture but high flavor; worthy of attention.

Willimoz.—Large, green, handsome.

Leon le Clerc de Laval. Large, showy pear; handsome; not ripe enough to eat.

Dix.—Specimens of good size. If we were to judge from external appearance, we should be slow to learn the delightful qualities of this pear, as the specimens before us are of rather unattractive exterior, but we judged the Dix as the best pear on the table, in point of flavor. Your Committee would here suggest that the temptation to

select all early bearing kinds of fruits to the exclusion of those more tardy and more hardy, is liable to carry us too far. Let us try the Dix, and although we illustrate the old maxim of planting for our heirs when we plant pears, we shall be sustained by the hope that our heirs will be gratified by their inheritance.

Beurre Langelier.—Fair skinned, handsome, green; a promising pear in the West.

Epine Dumas.—A very fair and beautiful pear; as good inside as out.

Columbia.—A large, noble pear, possessing some important advantages as a market fruit.

Duchesse d'Angouleme.—The specimens shown are not large, and only fair in quality. This pear demands thinning and high culture, when it is truly great and as good as great.

Beurre Clairgeau.—A pear that looks better than it tastes.

In addition to these, we would merely mention the following varieties in this collection, but lack of time forbids any extended notice:

Josephine de Malines, Jaminette, Figue d'Alencon, Bezi Sanspareil, Fortunee, Chaptal, Prince's St. Germain, Lagaret, Belle de Moire, Beurre Duhaume, Cadette de Vaux, Doyenne Sieulle, Doyenne d'Cele, Doyenne Goubault.

Your Committee found fair specimens of Winter Nelis and Lawrence from H. J. Hyde, of Alton; Vicar of Winkfield and Doyenne d'Alencon from Mr. Earle; of Josephine de Malines, Beurre Langelier, both especially fine; also, Sheldon, past season, from D. F. Kinney. We also found two or three collections for name from unknown parties.

Several varieties of California pears were on exhibition through the kindness of I. S. Platt, Esq., of Chicago. These pears have peculiar interest at this time. Among them the Pound is most conspicuous, but don't seem to be superior in size to what we often see in the old States.

The Beurre Easters are very fine in smoothness of skin and in size, some specimens being larger than your Committee have before seen, but they do not prove of high flavor, though buttery and good; and they have a texture of flesh much coarser than with us.

The Chaumontel is well calculated to delude a pear hungry public by its beautiful cheek of crimson and gold; it eats about as well as a poor turnip softened by decay.

The Flemish Bonchretien has the appearance of a Duchess d'Angouleme, and the quality of a pumpkin.

The Winter Nelis, among all California pears we have tasted, seems to have no delusion about it; it don't look well, and it does taste well. On the whole, we think that California pears possess admirable qualities for—*exhibition*.

The Committee found interesting specimens of preserved gooseberries grown by Henry Barker, of this city, embracing the Whitesmith, a seedling from the same, and the English Green.

We also notice specimens of the Chinese Quince of immense size, grown in Louisiana, and exhibited by V. Gerber, Esq., of St. Louis.

Judge Brown read a paper, as follows :

NOTES ON PEARS.

If the Apple is king of all the fruits, the pear is certainly entitled to share his throne as Queen Consort. In its choice varieties, it is one of the most delicious of all the products of the orchard. It has large size, great beauty of form and coloring, and has for its home a very wide range of latitude, withstanding the rigors of a New England winter and ripening, to the highest perfection, beneath the hot suns of Mississippi. It will grow wherever the Apple grows, flourishing under the same kind of cultivation, and, like the Apple, by its numerous varieties, it extends its seasons of maturity through three-fourths of the year.

The tree is, naturally, thrifty, long-lived and productive, attaining, under favorable conditions, a greater age and larger size than any other of our fruit bearing trees.

Yet, notwithstanding all this, the pear, even in our most favored markets, is still a luxury attainable by the rich only. There are several reasons for this that will occur to every one, chief of which is the liability of the tree to certain diseases, and especially to that fatal form of blight called, by way of pre-eminence, the pear tree blight.

I have nothing to add to what has been already said upon the prolific subject of this malady, except to express the belief that the true cause of it has at last been found in the parasitic fungus so well described by our able State Horticulturist in a recent number of the *Prairie Farmer*. I may add that this disease can be, to some extent, prevented and in a great measure mitigated by the careful cutting away of affected branches, or by shaving off the bark when the fungus has fixed itself.

The varieties of the Pear are very numerous, the catalogue embracing many hundreds of names. Of these, comparatively few have been fully tested in the United States, and fewer still have been fruited in the West. Of this latter number, perhaps not more than a dozen kinds have been found, in any given locality, adapted to the wants of the commercial orchardist. Indeed, it is doubtful whether more than half that limited number have been found really profitable in any one locality in our State. In this respect, however, the Pear is not singular. The same is true, approximately, at least, of the Apple, and indeed of all our orchard fruits.

A profitable market pear must combine several qualities, in all of which it must be reasonably constant. The trees should be thrifty, and as capable as possible of resisting the attacks of the blight; it should be persistent in retaining its foliage throughout the growing season; it should be productive, yielding, with proper treatment, regular and abundant crops. The fruit should be large or of fair size, handsome in form and color, of good flavor, and not disposed to rot at the core. To those might be added, as a very desirable quality, a tendency to early fruitfulness. The list of varieties that have been proven to possess all these qualities in our Western soil and climate is exceedingly meagre. That it will, in time, be greatly enlarged by the introduction of varieties as yet untried there can be no doubt, and this enlargement is to be most hopefully looked for in the numerous new American sorts that are constantly coming into notice.

It is of the utmost importance that every one who plants pears with a view to profit should know what kinds will best answer his purpose, for upon this will depend his success or failure, and this can be ascertained only by experiments made by himself or

others. And the space allotted to this essay cannot be better occupied than in a detail of my own experience with the few kinds I have grown. My trees are from seven to ten years planted, partly on pear, but mostly on quince roots. Of the latter, many have partially established themselves on their own roots.

VARIETIES.

Madeleine (Standards)—Bore fruit at eight years from planting, of good size and excellent quality, ripe on the 4th of July. The next year the best trees died of the blight, and the other was saved only by prompt pruning. The wood of this variety is peculiarly soft and sappy, rendering it too susceptible to the attack of blight.

Bloodgood.—Trees (standards) now ten years old, vigorous, handsome and healthy, retaining the foliage until frost. They yielded their first crop, a very fair one in quantity and of excellent quality, the past season; ripe July 11th.

Julienne.—Trees (standards) ten years old; bore their first fruit in 1867; trees healthy and moderately vigorous; fruit of fair size, handsome shape and color, insipid in 1867, but of very fair quality the past season. Ripe about the 1st of August.

Buerre Giffard.—This is one of the very best of the early pears, as well as one of the most beautiful, but the tree is a feeble grower, and during the past season failed to retain its foliage. Ripens about the 1st of August.

Rostizer.—Trees ten years old; have borne no fruit.

Bartlett.—This variety stands at the head of the list for profit. The trees grow rapidly and bear early, and continue to grow and bear. I have seen thrifty, vigorous trees produce a dozen fine pears each the fourth year from the seed. This variety is set down in the books as very liable to blight, but with me it has proved one of the healthiest. I have never lost a tree of it by blight or any other disease, or had one seriously affected. Of the fruit it is unnecessary to speak. Ripens from August 10th to 30th.

Flemish Beauty.—This variety is very productive after the trees have reached the age of ten or twelve years, and the fruit is very large and handsome, but the tree is liable to blight, and also to premature loss of leaves. Ripening about the same time as the Bartlett, and inferior to it in most respects, I consider it an unprofitable sort.

Belle Luerative.—This delicious pear would be more worthy of cultivation if it did not, like the Flemish Beauty, come in competition with the Bartlett, to which it is greatly inferior in size and appearance, especially in color. The trees are reasonably healthy, very productive, and come into bearing early.

White Doyenne, or Virgalieu.—Trees on quince roots, planted in the spring of 1862. They began to bear the fourth year afterward, and have produced full or partial crops every year since. Both the trees and the fruit have been healthy. That peculiar cracking of the fruit of this variety which has rendered it valueless in New York and other localities has not, as yet, appeared in my orchard, except in an occasional specimen. This ought to be a profitable sort in my locality, but coming in competition with Bartletts, grown a little further north, and being small as compared with that fine fruit, it fails to bring the prices its high quality ought to command—another proof that modest merit does not always receive its just reward.

Gray Doyenne.—This is fully equal to the preceding variety in quality, rather larger. It is entirely covered with a coat of orange-colored russet, giving a very

attractive appearance. It is not quite as productive as the white, but not inferior to it in any other respect. These kinds ripen together in the latter part of August.

Buffum—Trees of a vigorous, upright growth, and remarkably fruitful, though somewhat tardy. The fruit is apt to be quite small as the result of excessive fruiting. When taken from the trees at the proper time, this pear is of excellent quality, being almost as sweet as honey. If left to ripen on the tree it is mealy and nearly worthless. It has not the size and appearance to make it a profitable fruit in markets where size and color are everything, and quality only a secondary consideration.

Buerre Diel.—Trees, on quince roots originally, now seven years planted, produced their first full crop in 1867. The fruit was magnificent. The trees were exceedingly vigorous in growth, but the past season they have shown a tendency to drop their leaves prematurely and the fruit was inferior. Season, latter part of September.

Buerre d' Anjou.—Trees on quince roots, ten years old, very moderate growers with rather meager foliage. They have proved, with me, very shy bearers, but what fruit they have produced has been as near perfect, taking size and quality into account, as it seems possible for a pear to be. The trees are healthy, and with greater age may fruit more freely.

Seckel.—The only possible objections to this well known pear are its small size, and the tardiness of the tree in coming to bearing. Certainly, nature never elaborated in any other fruit a combination of flavors and juices so delicious as she mingles within the modest coat of the Seckel pear. Fortunately, the tree is remarkably healthy, forming a well-shaped, symmetrical head almost without care. With me, the fruit has been of unusual size for this variety, many specimens measuring two and three-quarter inches in their transverse diameter. On older trees this large size can only be kept up by judicious pruning and thinning.

Steven's Genessee.—Tree handsome and moderately healthy, but mine have proved unfruitful, producing only a few specimens of very large, handsome and delicious pears.

Onondaga.—My trees of this variety on quince roots, were outcasts or ought to have been, in the beginning, and have made a very poor scraggy growth. They have, however, been productive of very large, handsome fruit, very highly flavored, but too acid for most tastes. Ripens in October. I shall try this kind further with better trees.

Louise Bonne de Jersey.—This well known variety succeeds with me, as it seems to do almost everywhere. The trees are vigorous and productive, but somewhat subject to blight. The fruit is large, handsome and good, and brings good prices in market.

Vicar of Winkfield.—I have discarded this much lauded kind, for the reason that the tree is one of the very worst to blight, whilst the fruit, when you get it, is generally of precious little value.

Glout Moreeau.—My trees have all died with the blight, after producing a single crop. The fruit is very large, or rather part of it is very large and part rather small. It is also variable in quality, sometimes very fine and sometimes exceedingly astringent.

Duchesse d' Angouleme.—This is the only pear I should care to cultivate on the quince stock. The tree is entirely healthy. Fruit very large and plenty of it. Ripens with me in October, and always brings fair prices. I consider this, next to the Bartlett, the most profitable of all the market sorts in my collection.

The foregoing comprise all the varieties that I have fruited, with three or four unimportant exceptions. One of my neighbors has found the Passe Colmar very healthy in the tree and exceedingly productive of large, fine fruit, ripening in October. The Easter Buerre has also been fruited in my neighborhood for several years. The trees are healthy and moderately fruitful. This variety we regard as very valuable on account of its fine quality and late period of maturity—January to March.

Mr. Minkler moved that Mr. Barry and Dr. Furnas have the privilege of taking from the collection such apples as they may desire.

Carried.

Dr. Henry Shimer, of Mt. Carroll, read

AN ESSAY ON THE BARK LOUSE.

Mr. President, Ladies and Gentlemen:

By previous arrangement, we will now take up the study of the Bark louse, very briefly, in the following order:

History and Classification.

“*Kinds,*” or methods of making distinctions, as of genera and species.

Special Bark Lice, of various kinds, concluding with the Apple Bark Louse.

- 1st, Its nature and organization.
- 2d, Its food, consequences, etc.
- 3d, Methods of propagation and distribution.
- 4th, Restraining influences.

In studying the “Bark louse” on the present occasion, it is necessary that we have some fixed and definite limits for the term. There are certain peculiar and well defined characters that mark a class of insects that have usually been found upon the bark of trees. They are well known among gardeners and others, under the name of “scale insects,” “mealy bugs,” “shield lice,” etc., and are erroneously supposed all to be entirely destitute of legs.

When this same insect takes up its abode upon a leaf, or on the fruit of a tree, we apply, for convenience sake, an arbitrary rule and still pronounce it a “Bark louse,” just as we all persist in pronouncing the *pediculi capitis*, a head louse still, although it has so far transgressed the rules of decent behavior, as to wander away from its more natural home in that nicely braided or well powdered hair, and by accident, perchance, may be caught on the fair neck of that beautiful young lady, or on the glossy collar of that very exquisite and attractive young dandy in the public assembly.

The late learned Entomologist of our State, whose sad fate and untimely end we all mourn with sorrowful hearts to-day, was very particular to separate the terms, “plant lice” and “Bark lice” so that they might have a comprehensive appellation. Applying the former to the *Aphidæ*, and the latter to the *Coccidæ*, and thus, if possible, have an English name for each of these great classes, as definite as are the scientific names themselves.

The Bibliography of the Bark louse extends back for more than a century through the writings of the fathers of Natural Science, *Linnaeus*, *Burminster*, *Geoffroy*, *Fabricius*, *Latreille*, *Burchard*, etc., and were all arranged under one natural family *Coccidæ*. They have been looked upon as, "inert and fixed masses of animal matter, motionless and apparently senseless, resembling nothing more nearly than the vegetable excrescences called galls;" and were supposed to lose all traces of articulations in the body as well as of articulate limbs as they approached the imago state, much of which, although the works of *Westwood*, *Curtis*, the fathers above named, and many others, I have already been compelled, after close scientific investigation, to pronounce incorrect, (Trans. Amer. Ent. Soc., Jan. 1868), and many more perhaps, still more surprising contradictions of these standard authors may be found in my unpublished notes, and thus we find it all along the Entomological highway proving conclusively that we can only arrive at primary truth by the most persevering toil.

All this comes out of patient study, for the *Coccidæ* themselves have not changed. The Bark louse of to-day is without doubt the same as those lice in the gardens of the ancient Romans, Babylonians, or of the Pharaoh kings of Egypt at ancient Memphis, on the Nile, or going farther down the vista of time, the Bark louse may have been found on the wild fruit tree in the morning of creation, calling upon Father Adam to give it a name.

Upon a closer examination of these insignificant creatures we find many "kinds." These separate varieties, whether real or imaginary, we are in the habit of distinguishing as species, and here in general I would say that I, with the leading Entomologists of our country, have been far too much inclined to consider each Bark louse, as well as Plant louse, on a different food plant as a distinct species, without other sufficient distinguishing characters; this I have, latterly, by studying their habits, proved to my own satisfaction to be an error, as I have already intimated, (Transactions Northern Illinois Horticultural Society, 1868), and by subsequent investigation I have been able to breed the same Bark louse—an individual species on the "Linden" (*Silia Americana*) (order *Tilacæ*), on the "Ash-leaved Maple" or "Box Elder," (*Negundo aceroides*, order, *Sapindacæ*; suborder *Acerinæ*); and on the "Hornbeam," "Iron Wood," (*Carpinus Americana*; order, *Cupulifera*), trees that are in all respects entirely different in wood, in fruit, in flower, and in taste of their juices, and their natural botanical relations are entirely different. The first bears a woody, globular nut, and is arranged in the first (A) department of the *Polypetalous* division of the *Angiospermsæ*, by Dr. Gray the standard author of American botany. The second bears a winged, one seeded fruit, and is arranged under the second (C) department of the same. The third bears a small ovoid nut, flowers in Catkins, belongs to the *Apetalous* division, and is of the Oak family.

With these facts before us, we cannot longer adhere to the time-honored custom of manufacturing species of Bark lice or Plant lice out of the same, because we find the individuals on the various food plants. And the time is coming, with advancing science, resting on close unprejudiced observation, when we must rely upon more substantial characters for distinctions. It were just as wise to pronounce the rabbit to-day one species, which is feeding upon grass; to-morrow, another species, because found feeding upon cabbage; the following day another, because it is eating an apple, and in mid-winter another species, because it is barking the young apple trees in your nursery.

These confessions of former errors I can freely make, because I am not wedded to any opinion or wish, except that grand axiom, *the love of truth*. Truth is mighty and will prevail, and I never hesitate to adopt it, however humiliating it may be to my former errors.

Having found a number of species with some general resemblance, for convenience in study, we group them together and assign to this group a name; this is a genus.

When we find in the course of study that the characters of a species are such as to differ from all these groups, we create a new group—genus; and in the same way out of genera we make families. But we soon weary of the dry details of Comparative Anatomy and the rigidity of Scientific Classification. But with the practical we find an unending field of pleasant amusement. As we approach the study of “*Special Bark Lice*” we promise only to glance at the unfathomed ocean that lies before us. Here we have devoted much time and made many notes, many yet in an unfinished state; some have been made public and others are in process of publication. On the bark of the “*White pine*” (*Pinus strobus*) we often find a downy substance inhabited by a coccus-like insect. This heretofore has been considered a bark louse, but a little patient observation will convince you that it develops into a true four-winged two-clawed plant louse. See my forthcoming report in the Transactions of the American Entomological Society. Another on the leaf of the same plant, supposed to be identical, is a true bark louse. The *Lecanium*, which we find on many trees—linden, boxelder, ironwood, oak, hickory, prickly ash, etc.—is probably but one species, as I have proven for the first three named trees. I have also observed it on the osage orange. The editors of the *American Entomologist*, Vol. 1, p. 14, represent another species on the osage orange, a down-producing species, and another quite similar one, which we find abundant on the maple all over the country, has a different specific name assigned, and Dr. Fitch in like manner names one on the grape (*L. vitis*); another on the pear (*L. pyri*); for what good reason we can not conceive. Certainly not because they are on different trees can this be sustained; for that, as we have just shown, is no reason at all. These are all naked insects, crawling about on the limbs of the trees, not being protected by a distinct scale, as is the apple bark louse; they are greatly troubled by the parasitic chalcis flies, numbers of which I have bred while studying the habits of these bark lice. We often find on the tree the dry shell of the *Lecanium* with a small round hole in its back. This is the work of the parasite as it escapes from its ruined victim. But for this fortunate phase in its natural history, this species would become more numerous and injurious than the apple bark louse; for I have observed them to produce a much more numerous offspring.

The gall-producing insect (*Dactylo sphaera vitifoliae*) on the grape leaf has been considered a bark louse, as well as another of very similar habits on the hickory. These have lately been the subjects of much useful controversy. I have studied them all with the greatest care and desire for truth, and am entirely convinced that they can never be arranged with the bark lice. See my report in the proceedings of the Academy of Natural Sciences, Phila., Jan. 1867, where I show from bred specimens that the grape leaf louse, in the perfect state, has four just as ample wings as any other plant louse, and for a more complete discussion I must refer you to a forthcoming report on the hickory leaf gall lice, where I show that many species of hickory gall insects develop their young from eggs in June, and still are plant lice.

APPLE BARK LICE.

Usually known as *Aspidiotus Harrisii* and *Asp. Conchiformis*, are more despised, especially the latter, by the horticulturists of this and other Northern States than any or all other species of bark lice among us. The former I have known from my youth up; it was pointed out to me when a small boy by my father on the fruit trees, pear, apple, etc., on the farm where I was raised, in Chester county, Pennsylvania. It was somewhat abundant, and injurious on young trees, but not to be compared with the latter in Northern Illinois. This has been called the American or "White Bark louse," because of its broad, flat, grey scale. This scale serves to protect a few purple eggs during the winter. I do not find this any more numerous there now than 25 or 30 years ago, and only on the young trees. On the old moss-covered trees that were planted long ago, some of them probably before the revolutionary war, I could find no bark lice. Four years ago I saw there some of the imported or "Oyster-shell bark lice" on young apple trees imported from New York State. When I again visited my old home last May, I did not observe any increase in this insect on these same young trees. I saw a few on an old tree in a neighbor's orchard, and on a seedling by the roadside, one-fourth of a mile from any other apple tree. Why this failure to increase? May it not be because the climate is too warm and damp? Our imported oyster-shell bark louse has long been arranged under the coccis family. The coccids are *scale-like* insects, either *movable* or *immovable*, and the *tarsus* has *one joint* and *one claw*, according to the construction of the family, as arranged for us by the old authors. But after studying this bark louse in the most careful manner, I found that it was not a *scale-like* insect any more than is a common meat-maggot, but that it is a *scale-building* insect. It lives under its scale, which is its house of covering or protection, and there lays its eggs in autumn, and the same scale that had protected the body of the mother during the summer, protects the eggs during the winter, the mother having dried away to a small particle in the anterior part of the scale—the eggs, occupying the greater part of the cavity beneath the scale. (Mr. Riley also observed this fact simultaneously). All previous authors believed that the *scale-like* shield was the actual body of the mother, and by studying dry specimens, could not well come to any other conclusion. Therefore the eggs beneath the scale were supposed yet to be in the body of the dead mother. If they had studied their specimens in the living state as I did for the purposes of gaining practical and unmistakable information, they long ago would have obtained the same results as I made public on the first of November, 1867.

On studying the newly hatched young bark louse with a microscope, the only state in which they are found with legs, I find the one-jointed tarsi without claws—without even the trace of a claw. After such revelations, how could I retain it in the coccis family where the insects are all declared to be *scale-like* and the *tarsus* has *one claw*?

The Homoptera are arranged under three sections:

1. *Fiviera*.—Tarsi 3-jointed.
2. *Dimera*.—Tarsi 2-jointed.
3. *Monomera*.—Tarsi 1-jointed.—Westwood's Introduction, Vol. 2, p. 419.

This last section (*Monomera*) heretofore has embraced only the Coccidae, Tarsi one-claw. When I studied the vitifoliae insect on the grape leaf, and in connection, part

of the hickory leaf insects, I found species in which the tarsi had one joint and two claws. (Proc. Acad. Nat. Sciences, Phila., Jan. 1867). From these and subsequent discoveries, we have the Monomera with the following characters:

MONOMERA.—*Dactylosphaeridæ*, Tarsi, two claws.

Coccidæ, Tarsi, one claw.

Lepidosaphidæ, Tarsi, no claw.

This I at once saw filled up the vacancies under this section. Hence I proceeded with considerable modesty to propose names for these vacancies according to the discoveries I had made, and subsequent researches have made me strong in the position I then took.

For a full history of this important subject I must refer you to my original papers—Proc. Acad. Nat. Sciences, Phila., Jan., 1867, and Trans. Amer. Ent. Soc., Jan., 1868. With these papers before them, see what the editors of the *American Entomologist*, Vol. 1, p. 248 say under the head of “*grape leaf gall louse*.” From that article I have selected the following as an example of their method of publishing the views of other writers:

“Dr. Shimer, of Mt. Carroll, made some interesting observations on the habits of this insect, and made it the type of a new family (*Dactylosphaeridæ*) and of a new genus (*Dactylosphaera*). The distinguishing features of this supposed family are certain appendages attached to the legs, which Dr. Shimer calls digitali;” and further on they add, “But we will say here that Dr. Shimer is unfortunate in grinding out new genera and new families, for he has proposed a new family (*Lepidosaphæ*) for the common apple tree bark louse (*Aspidiotus [Mytilaspis] Conchiformis*, Gmèl.) based upon similar appendages which he found on its legs,” etc., etc.

Here they would like to make the public believe that these appendages, digitali, are the characters out of which I have proposed two families in Entomology; whereas, the leading character upon which I propose my family, *Dactylosphaeridæ*, is two claws on a one-jointed tarsus, and the leading characters in *Lepidosaphidæ* are a tarsus without a claw, and a *scale making* not a scale like insect. The digitali from their globe ended extremities I consider of some importance, but by no means of primary weight in the first named family, and in the second family I give them no more than secondary importance. What reasons the junior editor, for he alone now becomes responsible, can assign for so gross misrepresentation I am not able to anticipate. He certainly, however, will be able to give some reason for the faith within him. I advanced those principles for the sake of science, and science alone; are they adopted, I have gained no pecuniary good; are they rejected by the scientific world, I have lost nothing by intimating the propriety of their adoption. What I did, grew out of pure, independent scientific research, from the love of truth for its own sake, and not to battle with any principles that the editors of said *Entomologist* were endeavoring to maintain, for I am not aware that they ever advanced any principles of importance on this subject. I have not the slightest personal feeling in the matter, and I hope that my much respected friend, Mr. Riley, State Entomologist of Missouri, will be free to defend the position he has thus taken against me. When convinced by sound argument that the position I maintain is wrong I will most cordially yield the point. The adoption or non-adoption of those families and genera is nothing to me personally, but everything to the science of the subject they comprehend; and here allow me to remark that it is a good rule for us

all to remember and observe, that while discussing scientific subjects we can never gain anything worth having by departing from the paths of science and stooping to personalities and misrepresentation, and were it not for the sake of the cause I would vindicate, I would not think their strictures worthy of notice.

For *food*, this oyster shell bark louse, in the main, adopts the cultivated apple tree, sucking the juices from the bark by means of a proboscis adapted to its purposes; neither is it confined to the apple, but as has often been proven, has been found on the currant, plum, pear, mountain ash, etc. and was originally described from the elm, all of which have frequently been made public by various authors. That is we have it in the genus *Ribes*, order, *Grossulaceæ*; on the genus *Prunus* and sub-genera *Malus* and *Sorbus* of the genus *Pyrus*, order, *Rosaceæ*, and on the genus *Ulmus*, order, *Urticaceæ*: That is, in plain English, the "oyster shell bark louse" feeds on members of the *rose* family, *currant* family, and *nettle* family. These families are as widely separated, botanically, as in the example already given of lecanium, and is another reason why we cannot name even bark lice on account of the food plants on which they are found, being of a different genus or of a different family. All of this I endeavored to make plain in a paper offered to the Northern Illinois Horticultural Society at Aurora, Feb. 16, 1869, entitled "*The Apple Bark Louse in 1868*," misprinted 1866, which was published in the Transactions of the Illinois State Horticultural Society for 1868, page 227.

That paper was written 1,000 miles away from home, when I was closely pressed with other duties. I neglected to notice the fact that the bark louse was found on the currant, intending to do so in the proof sheets, giving an authority, should the paper go into print. The proof sheets were not sent to me, and I knew nothing of the fate of the paper, although I had made inquiry, until I saw a galling stricture upon it in the *American Entomologist*. The omission just noted made a logical error of but little moment, for the whole paper makes its own explanation, but which the *Entomologist* greedily laid hold of in an article headed, "*Ash and Mountain Ash*," the main object being to flatter me with the assurance that, after years of botanical study, I did not know to what family Dr. Gray assigned the mountain ash, all of which you can read at your leisure, as I do not care to copy any of it or make further comment. In my paper on "*The Apple Bark Louse*" in the Transactions of the American Entomological Society, Jan., 1868, I gave a minute description and date of observations of the method of *propagation*. I followed the insect, day after day, from its first hatching on the 9th of June, through every phase of its development to the perfect state. After about two months they commenced laying their eggs, and continued egg laying for about one month, having finished their work, died.

In my paper already alluded to in the Trans. Ill. State Hort. Society for 1868, I have given very precise data regarding the *distribution* of the bark louse, and prove that they spread chiefly by instrumentality of winds, by crawling on the ground and other objects, and to this I will add, running water may carry the young bark louse a great distance during a shower, and it yet survive and ascend a tree. During the last summer I have observed that a creek transported young lecanium insects a long distance, and gave them access to trees of a different species on which they developed successfully.

Regarding the methods and instrumentalities that *restrain* the spread of the "*Apple Bark louse*" much has been said on all sides. Washes and applications of various kinds, patented and otherwise, have been resorted to, many of which, especially the alkaline washes, have proven useful, and but for the difficulty in applying them at the

right time to every limb and twig, might be an entire success. No remedy applied to the trunk of the tree ever was, or ever will be, destructive of the louse on the limbs, no matter how it may be applied, either by applying on the surface of the bark, or by depositing in a hole in the body of the tree, except it kills the tree, and then, of course, it will be effectual in killing the louse also. It is just as reasonable to suppose that we can kill lice on the body of an animal, or on man, by using internal remedies, as to suppose that we can kill the lice on a tree by medicating the tree. The greatest bark louse exterminator ever discovered, is *Aurus malus*, an insect belonging to the mite family. It feeds upon the eggs and young bark lice, as I have shown in the Transactions of the American Entomological Society, Jan., 1868, and in the Trans. Ills. State Hort. Soc. for 1868, published in 1869, and as Mr. Walsh has also shown in his "First Annual Report on the Noxious Insects of the State of Illinois," page 44, from his own independent observations. We both discovered this very important parasite independent of each other during the summer of 1867. No other insect, or device, can compare with it for efficiency, and probably nothing except inclement weather will ever excel it. The desire among us all is to discover something that we can apply at will by our own art that will destroy the bark louse effectually. But what shall we use or try that has not been tried already. Among parasiticides, corrosive sublimate has no equal; it will kill the bark louse. But the only question is, can it be applied so as not to kill the tree also. According to Bouchardat, plants are poisoned by solutions containing a thousandth part of this drug—*Stille Therapeutics*, Vol. 2, p. 659. In 1867 I commenced experimenting with this, using it at the rate of one pound to the barrel of water; this applied in the month of June killed all the bark lice, but appeared to injure the bark of the tree. Since then I see that the cuticle was destroyed and peeled off. I also made applications at the rates of one ounce, and four ounces to the barrel of water, without any effect on the "*bark-lice*."

Weak solutions of carbolic acid, sulphite of soda, and such like drugs, might reasonably be tried. Another great desideratum is a machine to apply any agent safely and at the same time economically. I have often thought that a large machine that would operate on the principle of the medical spray apparatus might be effectual and useful in applying lotions and washes of any kind to the small limbs and twigs of trees.

I also ascertained that strong solutions of soap will kill the young bark-louse, when it is running on the tree, but very soon after it attaches itself it is protected by an impervious case from such mild applications. Such applications will be quite effectual if applied just the right day, as in a year like 1867, when I saw most of the bark-lice running on one day—June 9th; but as is usual, when they hatch on successive days, during a week or ten days, it becomes more difficult to kill them by local applications, for, as I have heretofore shown, the young bark louse attaches to the tree and forms the first segment of its scale before sundown of the day of its birth, unless prevented by accident; and it would be a great task to syringe the trees over with soap suds every day for ten days at the hatching time of the young bark louse. Mr. Walsh, in his Annual Report, p. 46, after a series of experiments, also concludes that soap suds will kill the bark louse shortly after it is hatched, but it has no effect upon the perfect scale; that scrubbing the trees with a stiff brush will break up the young scale, but that the old matured scale can only be removed by the edge of a knife or other such tool; both of which methods are not very practical on the small twigs or branches. He also concludes that strong alkaline washes and tobacco water

have no effect whatever on the scale insect, whenever they may be applied. He also believes that petroleum or kerosene oil, or probably any oily or fatty substance, will most effectually kill every bark louse and its eggs that it may come in contact with, without injuring the trees, and cites in proof of the efficacy and harmlessness of oleaginous applications, the experiments of Dr. Mygatt, who used lard in 1854, of Dr. Fitch; who used grease or oil; of Mr. Cavanach, of Brooklyn, who used kerosene; of Mr. J. L. Budd, of Iowa, who used benzine and soap, and of Dr. Pennington, who applied pure petroleum to the trunks of one hundred trees without injurious effects. Immediately in the same connection Mr. Walsh gives the opinions of other men in different places to the contrary, who had killed trees and other vegetables with oils, and concludes that nothing but actual experiment will settle the matter, which he promises to do in the following year, *i. e.*, 1868. After this time, when he hoped to complete his experiments, Mr. Walsh, in February, 1869, at Aurora, before the Northern Illinois Horticultural Society, declares that the best remedy he had found against bark lice was one part domestic soap and six parts of water, to be applied, as I have heretofore set forth, soon after the insect is hatched. From these reports, in the absence of further evidence, it is probable that Mr. Walsh did not find, after all, that oleaginous applications were reliable.

For my part, I can say nothing about it from actual experiments. Grafting men and others tell me that oils invariably injure young scions. I confess that I have no belief that fatty oils can be safely used, except it may be in moderation on the thickened dead epidermis of the trunks of rough old trees, and there it can do good, because the bark louse can only be found thriving on somewhat tender bark, and best on the young tender branches, where fatty oleaginous applications, without doubt from the evidence, would be entirely ruinous.

In all our experiments it becomes us to be very cautious lest we be led into error from the many causes that might be at work silently and unobserved destroying the bark louse. And like the maxim of Mr. Paget, the great English surgeon, who upon seeing good results after administering a remedy for disease, asks himself the question, what would have happened if he had not given it?

This I appreciated most forcibly in 1867 while I observed the work of the acarian parasite at the same time that I was experimenting with soaps, corrosive sublimate, etc., and finally the great work the parasite was doing led me for the time to desist from experimenting. Had I not discovered the parasite, my applications would have been lauded as eminently successful, and the following year the parasites were so numerous that experiments would have been still more uncertain. Kerosene and other volatile oils may not always kill the trees, and may also fail to kill the lice.

About three years ago Mrs. Shimer had pure kerosene applied to two trees in Mt. Carroll Seminary orchards with great care to every limb and twig, in the spring, before the appearance of the leaves. The trees have not been materially injured; have fruited since, but still have many bark lice on them. One tree badly infested with bark lice on body and limb was headed in closely so as to make sure work. The trunk and limbs were most faithfully treated with a mixture of kerosene and tobacco decoction, thought to be strong enough and greasy enough to kill all the lice if there was any kill to them; and yet when the young shoots came out they were found to have bark lice on them, and now the limbs are about as badly infested as other trees of the orchard, and moreover the body of the tree, which was very healthy when the

treatment was instituted, is now partly dead and in a decaying condition, thus proving in this case that the medicine was worse than the disease. It has borne no fruit since and in all probability never will. Upon looking over a tree full of bark lice I often see scales that are torn open on the outer surface, as if the work of some small bird, and without doubt, as Dr. Harris assures us, birds lend us a helping hand even against bark lice.

The advice that Mr. Walsh gives in his 6th statement, (p. 52 Report) *to always plant a clean tree*, is most excellent. A clean orchard isolated by a few hundred yards will be likely to escape if care is taken not to introduce infested trees to fill vacancies. Cut down all old orchards with bark lice as soon as they cease to bear profitably. Mr. Walsh also (p. 53 of his Report) advances two most excellent tenets:

1st. That cultivating the tree does not discommode the bark louse.

2d. That drugs of any kind can not be introduced into the circulation of the tree and have the same effect on the bark louse as when applied directly upon the insect.

These appear to be as evident as the axioms of geometry themselves, and yet they have always been a stumbling block to many. And thus after all you see that I have not given you a universal panacea against bark lice.

The ancient Alchymists long sought the elixir of life, and found it not. The Spaniards, in the times of the early discoveries in America, sought in vain for the fountain of youth. Ponce DeLeon expected that when he should discover this fountain and plunge beneath its waters, that his gray hairs would turn black, and that he would come out a rosy boy again, but he was only rewarded with a mortal wound by the savages; and Ferdinand De Soto, by plunging into the unexplored wilds of America, found a hollow log in which his mortal remains were committed to the Father of Waters.

Reversing this picture, although we have not found a universal panacea for exterminating bark lice, yet we will continue to hope that we may find some "hollow log" that will float the apple bark louse away from the shores of time.

Dr. Shroeder—I will give two remedies here for the bark louse. It happened that I had a thousand gallons of poor wine, that did not have sugar enough in it that a man would take it. I put the barrels outside in order to get the rays of the sun into the wine. One of these barrels burst, and it happened that we took a sack to stop the crack in the barrel, and it came in contact with the sour wine. I hung that sack on a tree, and the sour wine ran down on the tree, and I tell you, the bark lice were killed. [Laughter.] I went to work and tried another tree, and I found they could not stand it. [Renewed laughter.] Now, there is no joke about it. [Loud laughter.] I just want to throw that out to our friends. Try vinegar. For everything there is a remedy. You can kill the devil if you like. [Cheers and laughter.] We killed slavery, why should we

say we cannot kill the bark louse? [Laughter.] There is another thing will kill him—American whisky will do it. [Loud laughter.] You try it, and you will find that the bark louse will skedaddle.

Mr. Douglas—Did your wine kill the tree?

Dr. Schroeder—Oh! no, no!

Dr. Shimer—I have said that corrosive sublimate would kill the louse, and I say that I most heartily rejoice that we have this bark louse parasite. It is doing good work. We must remember that there are some things else at work besides ourselves. Whisky will kill them, perhaps; that this wine will kill them is also probable. It always becomes us to remember that the scales on the trunk of a tree may be old bark lice. I hope the Doctor will be able to find a remedy to kill the old gentleman he speaks of.

Mr. Dunlap—The bark louse in our neighborhood has nearly disappeared. I found a few on carefully looking over one orchard, but none in my own.

The President—It disappeared in my neighborhood sometime ago.

Mr. Humphrey—Dr. Shimer says the bark louse deposits on young bark because it is tender. Now, if we undertake to do away with the injury, shall we not injure the bark by our remedies?

Mr. Riley—I will simply state that I would take great pleasure in discussing some of the points Dr. Shimer has made, in a scientific manner. I do protest against many of his ideas. I should like to ask him what he means by the term “species.” If the Doctor will explain that to me, I may be able to understand some of his opinions. Otherwise I do not understand all the positions he has taken. Also, do you mean the “atomizer” when you mention the “spray instrument?”

Dr. Shimer—Yes, sir. Richard’s atomizer works with a ball. I think that a rabbit is a species, and so is a dog, but there are a good many different kind of dogs. If I can take the bark louse from a hickory tree and breed it upon the linden and upon ironwood, as I have done profusely, then it proves to me that they are the same species, although fed on a different food-plant. It is the same with

plant lice. We used to think that the louse on one plant was different from the louse on another, but as Mr. Walsh admitted, it might at least be partially admitted, that we had one species instead of two.

The President—I commend the idea of Mr. Riley not to bring matters up that are still in dispute, when they are purely scientific. When we adjourn, it would perhaps be well to know the names of delegates from other horticultural societies.

INVITATIONS FROM OTHER ORGANIZATIONS.

Dr. Furnas—On behalf of the Indiana State Horticultural Society, I cordially invite you to come to our meeting, which occurs at Indianapolis on the 4th of January.

Mr. Foster—Our meeting in Iowa takes place the second week in January. As we have derived much benefit from your Society, we should be glad if you would call over to see us.

Mr. Murtfeldt—On behalf of the Missouri Association, I invite you to attend our meeting at St. Louis on the 11th, 12th, 13th, and 14th of January.

Mr. Daggy—I would like to see you all at the meeting of the Central Illinois Association at Mattoon in the first week in February. We have made arrangements with the railroads to return members and delegates free.

Mr. Scott—On behalf of the Northern Illinois Horticultural Society, I would extend invitations to the members of this Society and of the societies of adjoining States, to meet us at Dixon on the last week in January.

Mr. Flagg—On behalf of the Trustees of the Illinois Industrial University, I would announce that it is the intention to hold, this winter, three sessions of agricultural lectures and discussions, the first one at Champaign in the first week in January, the second at Centralia about the 24th of January, lasting three days, and the third at some point in the northern part of the State, not yet fully determined upon, on or about the beginning or middle of February. We

shall endeavor to make the times not conflict with other meetings, and shall be glad to see our farmers and friends present.

Mr. Baldwin—Mr. Bowman, the artist of Ottawa, would be glad to take pictures of this assembly. As you pass out he will take pictures of us on the steps of the court house, so as to immortalize us.

Mr. Flagg—This Society has now been organized 13 years. We have had a number of eminent men as presidents, and I think it would be interesting to future members of the Society, and certainly it would be to us, to have the pictures of them all. I therefore move that the ex-presidents of this Society be requested to furnish the Secretary with their photographs, and that he be authorized to procure a photograph album for them.

Carried.

Dr. Schroeder—I move that we do now adjourn until 2 o'clock.

The motion prevailed, and the meeting stood adjourned.

THIRD DAY—AFTERNOON SESSION.

The Society met pursuant to adjournment. President McWhorter in the chair.

Mr. Dunlap submitted a report from the

COMMITTEE ON NEW FRUITS.

CHAMPAIGN, ILLS., December, 1869.

Saml. Edwards, Chairman of the Committee:—The undersigned, one of the members of the Committee on Selection of New Fruits, would respectfully report that, of the small fruits, I have in course of trial the following:

KITTATINNY BLACKBERRY.

Have had it two-winters, and thus far proves hardy, but as the Lawton is equally hardy at this point, that fact determines nothing for points north of this, and in grounds not sheltered, my small-fruit grounds being sheltered by belts of forest trees thirty feet high.

The season of the Kittatinny appears to be about the same of the Lawton, though the main crop ripens more freely in the early part of the season. The mode of training

is to cut back the new growth in June and July to three feet, and in August to shorten in the side shoots. This treatment is favorable to large crops of fine berries, and no doubt has much to do in preventing winter killing.

MISSOURI MAMMOTH.

This fruit is of less size than the two named above, and gives evident promise of a failure at this point. I shall continue it another year, but not with a view to extend its culture.

RASPBERRIES.

Among the mystifications and swindling that have pervaded the history of this fruit for the past three or four years, the public have at last reached solid ground. Any person can go to the forest in the fruiting season and run the whole gamut of native, Doolittle, Miami, etc., except the Mammoth Cluster, which only exists in the imagination of the genus shyster among plant dealers. This bold attempt at re-naming a standard variety of fruit has come to public exposure, and richly deserves the scorn of every cultivator of fruit. For these attempts there is no good reason why the parties engaged in them should not be indited and punished like other cheats for obtaining money under false pretenses. The statutes of our State are plain on this subject, and all it lacks is their enforcement.

THE MIAMI.

This variety is a few days later than the Doolittle, and when well grown is large. The canes grow strong and are armed with sharp spines.

THORNLESS.

This is a good grower, and is nearly destitute of spines. It has not been fully tested by fruiting, but has the appearance of a vigorous if not productive plant.

PHILADELPHIA.

In regard to this fruit, it is similar to Purple Cane, and is too soft to ship any distance on our roads. With steel rails we may have an improvement, when it may be possible to ship even the Purple Cane.

Thus far the raspberries have not met the expectations of planters in this part of the State. A general system of mulching may have a good effect. I now plant in rows eight feet, and three feet in the row.

STRAWBERRIES—THE MICHIGAN.

Hathaway's Seedling No. 1, or as now named, the Michigan, gives promise of being valuable. It is very vigorous, and, like the Wilson, has little tendency to throw off runners, and thus not to exhaust the bearing plant. I look upon that habit of the Wilson as the secret of success. Should the Michigan prove as productive as I have hopes it may, it will have some advantages in flavor. Mr. Hathaway has sent out two or three of his seedlings to prominent fruit-growers, who will no doubt report on them in due time.

Of the Michigan, I have saved all the runners for my own planting, but shall not continue the No. 2, on account of its disposition to throw out runners. Plants of this new variety were sold last year, or at least offered for sale.

ONARGA,

Or Owen's Seedling, has been on trial four or five years. The plants are very vigorous, more inclined to runners than the Michigan, but less than most varieties. The fruit is very large, rather soft, but yet carries well; on the whole, a very promising fruit. It will need be cultivated in hills to succeed the best. Mr. Owen persisted until this year in growing this fruit under his apple trees, and hence it has not had a good chance to show what it is capable of doing.

THE ALPINES.

Among these we have what is claimed to be a new seedling under the name of

MEXICAN EVERBEARING.

Whether this is a new variety, the effect of growing in hills, a favorable season, or the effects of liquid manures, is not fully settled. Certainly it has puzzled the horticultural world, and put several of its members by the ears. In my own grounds it is so nearly identified with the old Red Alpine that no visitor, not even those dealing in the plants, have been able to say which is the Red Alpine and which is the Mexican. I have fancied that the fruit of the Red Alpine is a deeper red and its terminal more round or less pointed, and also smaller; but all these differences may be due to newly set plants. Both have borne through the wet periods, and both have bloomed and failed to perfect their fruits during the dry periods. Both have fruited on the new runners, and thus far, both to me are equally worthless; and so far as this part of the State is interested, I think it is of little importance whether they are identical or not, unless we can have new light on their culture further north and in moist locations. Cultivated in hills, it may be of more value. At Detroit, Mr. Whiting has grown fine crops, samples of which I have seen, and which were large and showy, though not of the highest flavor; very pleasant to have out of the strawberry season. Its history in Michigan has been so remarkable, that such men as Warder, Meehan and Elliott, think that it must be of value, and should have a more extensive trial. Because it has not succeeded in Central Illinois this season there is no reason why it should not have a further trial with a view to most thoroughly test its value.

APPLES.

This fruit is of the greatest value and deserves our best attention.

BEN DAVIS.

This fruit continues to please us. Tree hardy, a young and profuse bearer, and a long keeper. The quality is not so good as desired, but its other points are too valuable to be overlooked, and it must occupy a high position in the commercial orchard.

STANARD.

This apple is beginning to attract attention, as it proves to be the most valuable of all the fall and early winter varieties. This year I had about seven hundred bushels of this fruit, which has given me an opportunity to test it on the market. By the owners of fruit-stands, train-boys, and all the lovers of good apples, it is pronounced number one. The variety is now pretty well disseminated; so much so that no speculation can be had with it. There are few trees of it for sale, as the nurseries have been stripped of them. Those desiring the fruit should top-graft some seedling of a less valuable variety. I have sent out several hundred small lots in letters to those who have sent a stamp to prepay the postage. It has now been sufficiently tested in Central and Northern Illinois to be put in the list for general market and family use. I have some doubts of its value south, as I notice in that section a tendency to rot on the tree and to crack at the stem. It is an apple of the North, originating some eight miles from Buffalo, New York, and first disseminated by Benjamin Hodge, of the Buffalo Nursery.

ROME BEAUTY.

This fruit scabbed the past season, but on the whole appears to do well, and should be largely planted. None of the new summer apples can compare in value with the

SOPS OF WINE,

Which may be safely put at the head of the list of early summer market apples.

We cannot be too careful in adopting new fruits. These come to us glowing with poetic embellishments of imaginative charlatans, or are the pets of some over anxious godfather. All of these should be submitted to rigid tests, and their merits and demerits fairly presented. A person who buys a new fruit to propagate for sale is not generally the most disinterested person in the world, and his opinion may be taken with some caution.

New fruits of value have, in almost every case, been the result of accident, and they have been a long time in obtaining the confidence of the planter. Nature has been a better cross-breeder than the artist. The Concord, Ives and Hartford grapes can lay no claim to design. The Wilson strawberry, Miami, Black Cap, and our fine apples and pears have all come in the due course of nature, obeying the law of variance. We may, therefore, question the right of any one making a fortune out of them, and the re-naming of old varieties and palming them off as new, should have more than the scorn of the innocent purchaser; it should be treated on the same footing with similar crimes, and subject the vendor to the pains of our statutes.

M. L. DUNLAP.

FAILURE OF APPLE ORCHARDS.

Mr. Flagg presented a letter from Mr. Thomas:

UNION SPRINGS, N. Y., Nov. 15, 1869.

Tyler McWhorter, President Ill. Hort. Soc.—Respected Friend: Illness and other causes have prevented me from replying sooner in relation to the deterioration of the apple

crop, and diseased eyes will compel me to answer briefly. I am sorry that I cannot give a clear and decisive answer, founded on statistics, showing the present condition of the crop as compared with the same many years ago.

There is no doubt, however, that we obtain smaller and poorer crops in most places than formerly; but some of the statements that have been made are greatly exaggerated or apply to certain small localities. The deterioration, where it exists, is probably owing to the following causes:

1. The apple worm.
2. Decline of old trees.
3. Neglected culture.
4. Settlement and hardening of soil perhaps. Possibly there may be some constitutional deterioration of the trees, but I think not.

The first mentioned cause, the apple worm, I think does most of the damage. It has increased greatly of late years, and hardly a sound apple is found. The moth lays its egg at the calyx end, and the worm enters the core. Many apples drop before maturity, and those which remain are poor. I would like to learn the result of experiments in turning in sheep in *large numbers* during the growing season to eat the fallen and infested fruit continuing year after year without interruption. A single season's trial would not probably amount to much.

2. Orchards older than 50 or 60 years are unreliable, the limbs die in part, the crops are uncertain. There are many such orchards now.

3. Orchards generally are left entirely to take care of themselves. I have seen trees however standing in gardens 70 years old that still bore well, showing that the life of the tree is prolonged by good culture.

4. Since the land has been cleared off and cultivated long, the original freshness, fertility, and the porous character for roots and vegetable mould have partly disappeared, soils have been more compact. Where there has been an opportunity to observe, it is found that most soil has actually settled some three or four inches. Probably this may have affected the health and vigor of orchards in the same way that the cultivation of the surface or its neglect may influence growth.

Some talk of the exhaustion of the soil by the trees, but I can not see the force of this reason, as the roots extend yearly into new soil. Of course no one would plant an orchard immediately after *another* orchard, where this exhaustion would be repeated and the new roots would have to pass where the old had been.

Very truly,

J. J. THOMAS.

Perhaps I ought to add that the apple crop here, most seasons, is still heavy and highly remunerative to owners, notwithstanding these drawbacks.

The President—We should like to hear from Mr. Barry, of Rochester, as to the cause of the decline of the apple crop in the older States.

Mr. Barry—My opinion is that the decline is owing to the want of cultivation. There never was a time, in my opinion, when there was such a demand for apple trees as at the present moment. I was

telling some of the gentlemen to-day, at noon, that if a million trees were offered—for instance, such as the Baldwin—they would be purchased at twice or three times the price at which they were formerly to be had; but they can not be got. I know of an orchard twelve years old, the trees in which are nearly all Baldwin. It is situated on a hillside, so that by going to one end of it you can see nearly the whole one hundred acres. They are nearly all equal in age. It belongs to Oliver Chapin, in the county of Ontario. The land there is being rapidly taken up for similar orchards. There can be no stronger proof that the apple can be grown as successfully as ever it was. The reports as to its being decaying are from old orchards which have had no attention. There is, of course, a decline in *them*. A large portion of the fruit is unmarketable, and a great many are wormy. Again, a great many people will say, “Still, apple orchards are not what they used to be.” They are not, in their case, because the trees have passed their prime. People in New York and Pennsylvania, and I believe in New England, all agree that apples can be cultivated there as well to-day as thirty or forty years ago. I would remark that there is a great improvement in the character of the fruits, which shows there is an improvement in cultivation. I do not know that I can state anything further.

Mr. Flagg—I would like to hear from Mr. Meehan.

Mr. Meehan—I find that the failure is on the grounds of persons who have not time to do anything. If they have time to do anything, apple culture is no greater failure now than fifty years ago. In all the interior counties of Pennsylvania you would find that it was quite as successful. In Lancaster, Montgomery and other counties, there are as many apples grown as in any county in the Union, and the markets of Philadelphia are, to a great extent, supplied from them. Where cultivation is neglected—where insects are allowed to do just as they please, there you see failures, and there only; and so far as I am able to judge, neglect is the only cause of failure in that State.

Mr. Barry—In the county of Niagara I took some pains to get the statistics of the apple crop, and I ascertained, from reliable figures,

that there was half a million bushels (?) of apples that were thrown away, and another half million that were injured. This year, in the city of Rochester, I am sure I saw acres of apple barrels that were shipped by canal during that cold weather. They were piled up there—thousands and thousands of barrels, and it was supposed they were injured; but I found afterwards that they were not.

Mr. Humphreys—I would like to ask if the apple tree would be as long lived as the old orchards, or will they die out twenty-five or thirty years hence?

Mr. Barry—I do not see why they should be any shorter lived than old trees. Probably in new soils they might live longer.

Mr. Humphreys—I ask it in reference to orchards in the West. I find that trees die within twenty-five or twenty-six years. I speak of the city of Henry, or within five or six miles thereof. The trees grow thriftily until they are five or six years of age, on Sandy river, emptying into the Illinois river, five or six miles from Henry.

Mr. M. L. Dunlap—The geologists told us, last year, not to plant there.

Dr. Hull—There are abundant reasons why they should not live. I do not know as to the gentleman's locality, but there is no cause operating there that would not have operated one hundred or one thousand years ago, or twenty years ago. Its manner of growth is such that we can readily see why this is. We are subject to great extremes of cold and heat, and moisture. Now, in the Alton district, a few years ago, our trees were subjected to a temperature twenty-seven degrees below zero (?), and they did not suffer at all. The next autumn was moist and warm, and all our trees took on a second growth; and while that growth was immature, a frost occurred and lifted the bark just at the trunk, and our trees died. There was a cause and an effect. It is just so in regard to these other causes.

We were disposed to throw over the Yellow Bellefleur, as it scabbed; then we went into Winter Pearmain, and were disposed to do the same with that; and so it is to the end of the chapter. There is no deterioration. It seems to me that is illustrated in the Duchess

of Oldenburg. Why is it a success? Nature had done to that tree what we ought to be able to do for any other. It tends to fruit spurs, not to wood. It spreads out, naturally, to the air and to the sun. We find similar examples in other things.

The summer having been very warm and dry, followed by a warm and moist autumn, we get that condition which induces growth at the end of the season, and that is the cause of the destruction of trees.

Mr. Bryant—I have come to the conclusion, in my experience in orchard culture, which has been about 35 years, that it is better to plant an orchard about every 20 years and cut down the old one. It is well known that most of the varieties in favor in our State are those which bear early, and it is a principle of nature that early maturity invites early decay. I have old trees which have produced little or nothing, and the fruit is worth little or nothing, and the crop is small. If you planted them in blocks as put forth by our Secretary, they might be preserved, and the others destroyed. I have no doubt that that would be the best way of doing these things. The labor of gathering fruits and keeping the trees in condition is very great, where the persons employed are so entirely ignorant as with us. You can not get a hired man to prune an apple tree for me. Our rich soil produces tenderness in the tree, and the extremes of cold and heat destroy it, so that they are not to be depended on for more than ten or fifteen years, after they come into full bearing, for profit. That is the result of my experience.

Mr. Hilliard—I have an orchard of 40 acres, from 20 to 30 years old, which is as thrifty and makes as large a growth of wood generally as it ever did. There is but one variety that has failed, and that is the Sweet Bough.

Mr. Murtfeldt—I have been attempting to compare the preaching and practice of some of our orchardists. I went into the orchard of Mr. Phoenix, and I found there open tops—very high tops. I have seen the same in other orchards. Some of the handsomest trees I ever saw were root-grafted and top-worked. I know this is not very palatable speech generally to our nurserymen, but it is the truth.

I will give them credit for being as honest a set of men as there are, but I think trees are better top-worked on old stocks.

Mr. M. L. Dunlap—As a gentleman has been mentioned who could not be here, it may be well enough to put in a word to explain this matter. It may be that Mr. Phoenix has a number of trees stock-grafted. Nurserymen will often find that there are certain varieties not good bearers. Now, Mr. Phoenix has a very large nursery, but not a large orchard, and he is always trying to get good varieties, but he sometimes fails, and then he does the best he can with them.

Mr. Murtfeldt—I want to say nothing against Mr. Phoenix; but that was the particular orchard which I remember having seen.

Dr. Schroeder—I am acquainted with Mr. Phoenix's nursery. At the time he planted his orchard the wholesale manufacture of the things—that is, the little root grafts—was just started. I do not think he was rigged out at the time for the factory business as he is now. Now as to this top-grafting, I have lived on the oldest orchard in Illinois, and I just tell you the trees are sound and healthy, except as I told you about the bark lice, and I could not get them off. This year I did my best, and they bore in abundance. Another lot which were root-grafted did not do it. I am an observer; I look here and there and everywhere. I know I do not have to live very long, and I think to take up a good deal of knowledge—as much as I can get here—before I go away. Now that is my observation—the top grafts bear the best, and they are the oldest trees. I do not know if the lice business has something to do with it—perhaps it has.

Mr. Bryant—I have been a nurseryman for 20 years, and I do not want it to be understood that the mode of propagation is the cause of the short life of trees. I adopted the notion that stock-grafted trees were more hardy than root-grafted trees, but experience has shown me that there is no difference whether they are stock-grafted or root-grafted. Properly cultivated, without stimulating too much, they will live as long one way as the other. In the winter of 1855-6 I had stock-grafted trees that were destroyed, while root-grafted trees escaped.

Mr. Earle—I would like to hear from Mr. Barry something about the cause of failure in New England and Eastern New York. Is there anything in the climate or in the destruction of forests? The failure, as I understand, has been more in regard to the New England States.

Mr. Barry—The failure in the New England States is just about the same as in New York. In the New England States a man told me the demand for trees was greater than it had been for many years. I think the orchards had been a great deal neglected in New England. There are very few people there engaged in orcharding as a profession, and any one traveling through New England would see what a total neglect there was of the orchards; but they are now planting new orchards, and no one believes that it is worse there now than it was formerly.

As to this question of root-grafting or top-grafting, it has nothing to do with it. I do not care whether it is root-grafted or top-grafted, nor whether you grow it in Maine or California, if it is a good tree, with good roots; I do not care where it was raised. [Cheers.] The younger you can get grafts the better they are.

Mr. Flagg—Is there any difference between grafting on pieces of roots and whole roots?

Mr. Barry—I think a good root will make two good grafts, but beyond that I think no nurseryman, studying his own interests, would use them.

Mr. Riley—I will simply ask one question, which may throw some light on the deterioration of the apple. Is there not a true cause in the difference between the insect enemies of the East and the West? Have we not in the West the root aphid and the bark louse in more abundance than they have in the East?

Mr. Barry—We have not so many difficulties in the way of insects as you have. The scaly aphid I have seen in Canada, but not much in the East. I do not remember having a greater degree of cold in Western New York than 18° below zero.

Mr. Earle—Do you think that the general destruction of forests has had any evil effect on the growth of apples?

Mr. Barry—I think not.

Mr. Shearman—It seems to me very apparent that the great cause of failure has been want of adaptation of soil to the variety. Now with all due deference to our friend here, who says we should plant a new orchard every twenty years, the oldest trees planted in our county were planted by Dr. Haskell as long ago as 37 or 38 years. There are certain varieties he planted there, and there is no such thing as failure in them. I think the healthfulness depends on planting the right variety.

Mr. Huggins—I was born and brought up in New Hampshire, and I remember that in my early boyhood we had seedling apple trees, and plenty of fruit. I came to this country 35 years since; there was then plenty of fruit in New Hampshire. Returning about three years ago I was struck with the stunted appearance of the fruit orchards that I had seen so many years ago, and I saw the trees were covered with bark lice. On all sides I saw a lack of care and attention. Each one would tell me the same story—"we cannot raise it, but over yonder there is one man who always has fruit." I remembered in my youth that that family was a thorough working family. I visited their orchard and I saw the reason for the fruit; the orchard was well taken care of, thrifty and in good condition; there were no bark lice.

AMENDMENTS TO THE CONSTITUTION, ETC.

Mr. Flagg offered the following amendments to the by-laws, which were adopted:

AMENDMENTS TO BY-LAWS.

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 Assistant Secretary, in the case of the absence or disability of the Secretary, shall perform his duties, and shall aid him at the annual meeting in making the reports.

VII. Standing committees from each district :

1. On Meteorology in its Relation to Horticulture.
2. On Geology and Soils in Relation to Horticulture.
3. On Botany and Vegetable Physiology and Disease.
4. On Entomology.
5. On Ornithology.
6. On Ornamental and Timber Trees.
7. On Fruit Packages.
8. On Ad Interim.
9. On Testing New Varieties.

ELECTION OF OFFICERS.

Dr. Schroeder nominated Willard C. Flagg as President for the ensuing year.

On motion of Mr. Wier, the nomination was made unanimous.

The President—There is one subject which it is proper the Society should now consider. We have, for the last two years, elected a vice president at large, and I can find no provision in the constitution for it. I notice this, however, that we have never got very badly tangled in the constitution, and I do not feel very strenuous myself in regard to any doubts that may arise, but I would rather have a vote of the Society before we proceed to the election of Vice President at large.

Mr. Baldwin—I suppose we elect one for each Congressional district; there are thirteen districts, and then the fourteenth will be the State at large.

Dr. Hull—I would wish to ask if the Secretary has not re-districted the State? If so, that matter should be taken up first.

Mr. Brown—The constitution provides that it should be from each Congressional district.

Mr. Flagg—The proposition I made was this: that the vice presidents ought to be chosen according to these fruit districts. A district like Alton or South Pass has its peculiar characteristics, and it ought to have a vice president representing its peculiar soil, climate, &c.,

and have a local society also. This division which I propose in our circular aims to do this. Congressional districts are arbitrary. If it is possible to get at it, we should have our fruit districts—districts founded on known differences in climate, soil, configuration, vegetable productions, rain-fall, &c.

Mr. Brown—We might take the sense of the Society as to re-districting the State.

The President—It would be necessary, in such a case, to amend the constitution.

Mr. Kinney—It strikes me that in carrying out the plan of Mr. Flagg, it would be a good plan to have the vice presidents from those districts, and also the *ad interim* committee from there.

Mr. Flagg—In order to bring the matter before the Society, I move that we take up the question of re-districting.

Mr. Periam—In relation to the selection of vice presidents, it seems to me that it makes very little difference whether they embody in their report a particular fruit district or a congressional district; and inasmuch as the Constitution would have to be altered to meet the new scheme, it would be a long way of going about to do that which would do no real good in the end.

Mr. Flagg—I will call Mr. Periam's attention to some facts. Here is a district—I think it is the tenth. In that district we find the county of Fayette in with the county of Jersey, whose conditions are entirely different. The Vice President reporting upon it would find that he had to report on conditions entirely alien.

Mr. Periam—I can not see the pertinency of that, for the Vice President, in his report, simply shows the status of horticulture in his district, and consequently there would be no conflict, but, on the other hand, I think it would have a good effect, because he would get testimony from one county and from another upon the same subject. If that testimony conflicts, we are not necessarily compelled to make up our minds that there is a conflict of actual facts.

We have spent a long time in discussing the question of root or top-grafting. Now the question occurred to me as to whether the real

difference—the real trouble in this case—may not arise from the effect of root rot in the South and the bark louse in the North, and various other local causes; not in the stock itself, but from local causes. I will explain a circumstance which comes to my mind now. In a certain lot of trees, thoroughly infested both in the root and in the top, coming from one portion of the county and going to another, they might die or they might recover according to local causes; in one case they would make healthy trees, and in the other they would make firewood.

Dr. Hull—I want to explain one object of re-districting the State: It occurred to me that if we could harmonize the several interests, it would be better to do so. Then you may form your organization within those limits, and reports will be made with special reference to that locality.

Mr. Pierson—I do not wish to show any zeal against it, but I am skeptical as to whether a new districting can be effected. It strikes me that it will be difficult to do this.

Mr. Flagg—I do not claim that this districting is the best one, or even that it is a good one, but I claim that it is better than the one we have now, and I hope it may lead to something still better.

Mr. Pierson—I have not heard the plan suggested, but I hope it will be better than the one we have. If we knew of these boundaries geologically and otherwise, that would be a true way of districting, but with the inadequate knowledge we have, it would be ineffectual and impracticable. And again, my experience shows that we must depend largely upon other individuals for the reports from the respective counties. Now this is as well done if there are two or three different fruit districts in our circuit as if there were one only.

Mr. Brown—I move that the plan of districting proposed by Mr. Flagg be adopted.

Mr. Earle—Mr. Flagg has paid attention to that subject for years, and knows more about it than any one else, and therefore I second the motion to adopt his plan.

Mr. Freeman—I do not know how we can get at it better than in the plan Mr. Flagg has presented. The division he has presented, and

which is printed on our programme, comes as near as it is possible to get at it at present, a homogeneous division.

Mr. Flagg—In relation to this subject I will read from the report of 1867, and I will ask Mr. Freeman or any one else to correct me in any statement I may make. I would make this districting first, according to geography, the degrees of latitude; second, according to meteorology, temperature and rain-fall; third, according to geology, as seen in the out-croppings of the soil; fourth, according to plant growth, and fifth, according to configuration. [See proceedings of 1867, page 223.]

I have read that as being a shorter mode of stating my case. I would now add to it that I have changed a very little, Districts 5 and 6. I propose that the divisions in our circular be the divisions; that divisions 1 and 2 be recognized as Northern Illinois; divisions 3 and 4 as Central Illinois, and divisions 5, 6 and 7, as Southern Illinois. In that way we can have the advantages of the three-fold division now used, as well as of these local divisions.

The question then being on the motion to adopt the plan of redistricting the State according to the plan submitted by Mr. Flagg, it was adopted.

Mr. Brown—I move as an amendment to the constitution that instead of “one Vice President from each Congressional District;” it be made to read, “one Vice President from each fruit district.”

Carried.

The election of Vice Presidents was then proceeded with.

1st District—Mr. Douglas nominated Mr. Woodward, who was unanimously elected.

2d District—Dr. Schroeder nominated S. Edwards, who was unanimously elected.

3d District—The President nominated A. C. Hammond, who was unanimously elected.

4th District—Mr. Daggy nominated Tyra Montgomery, who was unanimously elected.

5th District—Mr. Flagg nominated J. W. Fletcher, who was unanimously elected.

6th District—Dr. Schroeder nominated Jonathan Huggins.

Mr. Huggins declined and nominated H. J. Hyde, who was unanimously elected.

7th District—Mr. Holcomb nominated A. M. Brown, who was unanimously elected.

SECRETARY.

Mr. Dunlap, Jr.—I nominate P. Earle as Secretary.

Mr. Nelson—I nominate O. B. Galusha.

Mr. Flagg—I move that the Chair appoint two tellers. Carried.

The President appointed as such tellers, Messrs. Nelson and Dunlap.

The whole of the ballots having been received and counted, the tellers announced that the vote stood as follows :

For O. B. Galusha.....	42
For P. Earle.....	27
Total.....	<u>69</u>

Mr. Earle—I move that the election of Mr. Galusha as Secretary be declared unanimous.

Carried.

ASSISTANT SECRETARY.

Mr. Pierson nominated H. J. Dunlap as Assistant Secretary, and on motion of Mr. Kinney, the nomination was declared unanimous.

TREASURER.

Mr. Minkler nominated Jonathan Huggins as Treasurer, and on motion of Mr. Flagg, the nomination was declared unanimous.

EXECUTIVE COMMITTEE.

Mr. Flagg—Under the Constitution the Executive Committee will be composed of the President, Secretary, and three Ex-Presidents,

viz. : Flagg, McWhorter, Brown, Baldwin, and Galusha. The Standing Committees are appointed by the Executive Committee.

Mr. Flagg—I propose the name of J. L. Russell, the professor of botany of the Massachusetts Horticultural Society, as an honorary member of this Society. He is a man of eminence in his department.

The motion of Mr. Flagg being put, was declared carried, after some discussion as to the propriety of electing a stranger not in attendance.

The President—Inasmuch as Charles Downing has made a present to this Society, of his noble volume, and disseminated varieties of fruits very generally, I would propose that he be made an honorary member, and that a vote of thanks be tendered him.

The suggestion was adopted.

PLACE OF THE NEXT MEETING.

Mr. Flagg read the letter from J. W. Fletcher, of Centralia, suggesting that place for the next annual meeting.

Mr. Humphreys—The city of Galesburg would be glad to have you there; and on behalf the citizens I promise that gentlemen shall be well entertained, and an ample hall provided for their accommodation.

Mr. Schroeder—I am here on two special businesses—one is to save the Catawba grape, and the other is to propose Bloomington for the next meeting. You will be aware that we will have nine railroads in two months; and we have a horse railroad now. We will have our meeting, not in Normal, but in Schroeder's Opera House. You shall have all the wine, and all the beer you want, and I will appoint you as a committee of the whole upon them. [Laughter.] Bloomington is the railroad center of Illinois, and it is also the educational center. You find there the most schools, and there also is the Soldiers' Home and the Normal University. You have several other things; and when you come that magnificent building, our new court house, will be built, and Dr. Schroeder's wine cellar, costing about \$100,000, will

be done. [Laughter and cheers.] The city of Bloomington makes ready to entertain strangers who may come in there, and we want this body of enlightened men—for a horticulturist must be an enlightened man—he takes the papers and posts himself up on every subject and object—and why should we not have you there to partake of all these good things with our wives, and children, and fathers?

Mr. Baldwin—Two years ago you said if we would go over there you would have a railroad and a hotel built, or you would forfeit a barrel of wine. Have you that barrel of wine ready yet?

Mr. Daggy—I am afraid he will drench us with that sour wine.

Mr. Douglas—How about that barrel of exterminator?

Mr. Schroeder—I will roll it out. The citizens of Bloomington will be delighted if they see that you have granted their special wishes, presented to you by me—they will be delighted, and I will take care that you have a good show in Bloomington.

Mr. Flagg—In order to test the feeling of the Society on the matter, I would move that as we have our meeting at the north this year, we meet at Centralia next year.

Mr. Edwards—I would suggest that our meetings have for several years been had at the north or south, but not in the central part. I would therefore second the motion to make it Bloomington.

Mr. Woodward—I would say on behalf of our northern country, that it is a long distance to Centralia, and I think that Bloomington would accommodate more horticulturists than any other point.

Mr. Brown—I think it would be good to go to Centralia and see their fine orchards.

Mr. Earle—The two branches of the Illinois Central railroad meet there, and the Ohio and Mississippi crosses there; and being there, we should meet many of our St. Louis friends. It would also secure an attendance from Southern Ohio. These considerations would induce me to vote for Centralia.

Mr. Baldwin—The invitation from Centralia is from a source that is entitled to a good deal of respect.

Mr. Edwards—I have not any great hope of educating the adult

population in matters of horticulture. At Bloomington and Normal we are preparing a good many young men and women to become teachers in our State. For that reason, I feel that it is necessary to begin there to instruct these people in the great science of horticulture, so that they may spread it through the high schools and district schools throughout the State. I know the kind-heartedness of the people of Centralia, but I feel it is a duty this Society owes to the rising generation that our next meeting be held at Bloomington.

Mr. Humphreys—I hope that Mr. Edwards will not forget that Galesburg is the college city of the West.

Mr. Wier—Galesburg is a railroad city, and it is a college city, and it is a beautiful country, and I know we shall be hospitably treated there.

Dr. Hull—I have traveled through this northern district this past summer, and I have found a great many persons who have not attended our meetings for several considerations. They have felt themselves much neglected, though I think they were not entitled to that consideration from the fact that they were not well represented. Now, in our selection of officers we have taken them chiefly from parts south of this. I would be in favor of going to Galesburg; there is a very large fruit interest at the north, and the men have not presented themselves at our meetings. From that fact they are not entitled to as much consideration as if they had put in an appearance at our meetings.

Mr. Humphreys—The Galesburg Horticultural Society is composed of some of the best horticulturists in the West, and they will spare no pains to make the meeting a success.

Mr. Holcombe—I was for over ten years a resident of Galesburg, and I know no more hospitable people could be found anywhere. I know where the whole membership could readily be disposed of on good terms, and certainly if you consider the amount of territory that lies west and north of Galesburg, you will find that there can be no better place for the meeting.

Mr. Hammond—If we consider the place where we can do the most

good, I think Galesburg is the point. It is a prominent railroad and educational point.

Dr. Schroeder—Bloomington is a railroad point more than any of them. We have one by Lafayette to the East; we have one to Champaign and Indianapolis; one to Chicago and the North; one to Egypt; one to Galena, and one to Pekin. I do not think there is one place in the State that has so many railroads. I know very well that our old President said we must do something to plant it in the hearts of our young men. Here is your place, gentlemen, if you want to set a good example, if you want to bless them, go where they are assembled. See our school teachers in Europe; they study horticulture, agriculture and chemistry; they take that and plant it in the hearts of the little boys they teach. How much more should they do so in this country? Go there, and give them one lecture in the evening, and they will be glad, and will bless you when you are gone. Go there to the Soldiers' Orphans' Home, and see the little ones made fatherless and motherless, a good many of them, and you will have another blessing to take hold of. I tell you they will not forget you; they will see that your Society is composed of the ablest men in the country. I do not come here to make any speculation; there is no speculation in it.

Mr. Wier—We have had one meeting at the South and one at the North, and it appears to me we ought now to have one at the Center.

Mr. Bryant—I admit all the advantages of Bloomington, and it would be a very pleasant place to me, but I wish to be assured before I vote to go there, that some one wants us there besides Dr. Schroeder. I have no doubt he would do all in his power to make us welcome, but I wish to have more than one individual interested in making us welcome wherever we go.

Dr. Schroeder—I feel very sorry that I am all alone.

The President—I think it is high time we proceeded to take a vote, and I would suggest the idea that we call for the vote by calling each place and asking those in favor of the place to rise, and try which place will have the most.

Mr. Flagg—I will withdraw my motion.

A standing vote was then taken, resulting as follows :

For Galesburg.....	45
For Centralia.....	15
For Bloomington.....	1
Total.....	<u>61</u>

Mr. Flagg moved that Galesburg be declared the unanimous choice of the meeting. Carried.

Mr. H. J. Dunlap moved that the Executive Committee be authorized to fix the time of the next annual meeting. Carried.

Mr. Edwards—I have a resolution I would like to offer :

Resolved, That our Secretary be requested to communicate to Governor Palmer the desire we all feel that the valuable entomological collection of B. D. Walsh be secured to our State, and we would respectfully suggest that the Governor cause correspondence to be opened with Mrs. Walsh, or other proper person, to retain possession of the collection until the next meeting of the legislature.

Mr. Kinney—There is a gentleman appointed there for correspondence; it is so announced through the papers.

Mr. Baldwin—The interest of other persons in the State has already been expressed to Mrs. Walsh. The Board of Public Charities at Champaign did this last week. In discussing the subject since I have been here, I find that a collection of that kind should have proper care, or it will be soon lost. It has been suggested by Mrs. Walsh that Mr. Riley should have the care of it, and he promises to prepare from them a collection of all that is valuable to the State. The Executive Committee had intended to talk with Governor Palmer, but I am not positive as to the best course to be taken in the premises. The question of a successor to Dr. Walsh has yet to be considered, and whether it is policy to pass such a resolution at this time I leave to the discretion of the meeting.

Mr. Periam—It appears to me that the only point in that resolution is the holding of that collection until the next session of the Legislature. If that be done, it should be in the possession of some one who understands how to take care of it.

Mr. Holcomb—I move that it be referred to the Executive Committee.

Mr. Edwards—It seems to me that the expression of this Society would have a weight greater than that of the Executive Committee.

Mr. Brown—It seems to me that these resolutions can do no harm. The object is to secure the collection in such a position that ultimately we may get it.

Mr. Earle—It is because I think a resolution of this Society would have a good deal of weight with the Governor that I would not have this resolution passed. I estimate the value of that collection to depend upon its being placed in proper hands. It would be a poor thing to have at Champaign or Springfield, where no one knows anything about it. I am informed—and it is a consideration that should weigh somewhat with us—that it was his desire that this collection should go into the hands of Mr. Riley, and as negotiations have already taken place between Mrs. Walsh and Mr. Riley, I do not think we should try to defeat these arrangements or interfere with them.

Mr. Riley—I did not suppose this subject would be brought up before this Society. It is a matter to me of vital interest, in memory of Mr. Walsh. The resolution of this Society will have great weight with the Governor. The whole matter, however, rests with Mrs. Walsh. She is made sole executrix, and that the State has no claim upon the collection of Mr. Walsh, I think is obvious. Mr. Walsh, however, did intend to prepare for the State of Illinois a duplicate collection of the noxious insects of the State. He would always capture as many specimens as possible, so that he could provide duplicates. I do not know whether any cabinet was presented to him for this purpose. I know how the State of Illinois feels in this matter, and as one who has lived for years in your State, and is heartily in sympathy with you, I shall use my influence to further your desires. I know that, as members of this Society, you would like to have the collection of Mr. Walsh retained in this State. But I ask you all, what benefit will it be to you to have Mr. Walsh's collection in its present condition? You know that at present it is arranged scientifically—with the latin names of every insect; and every little note which was to him intel-

ligible, would be unknown hieroglyphics to you. I want it to be somewhere where it will be preserved. Individually, I would like to have it to aid me in carrying out an enterprise which Mr. Walsh and myself began, and also to guard against the possibility of the cabinet perishing. You know how easy it is for collections of insects to be destroyed. The collection of Dr. Harris, no one having any real interest in it, has not been well preserved, and to-day that collection is partly a ruin, so that many of the type specimens that belonged to this father of practical entomology in our country are actually lost to science. The same may be said of the collection of Thomas Say. Now in Mr. Walsh's collection there are numbers of insects that are of great scientific value and interest, but of no practical value whatever, and unless you can put them in the hands of some one who can appreciate and understand them they will do no good. I told Mr. Swiler that I would like to have it, and besides paying the sum required, I have promised—as a condition of the bargain—to prepare from it a duplicate collection of the noxious and beneficial insects for the State. The fame of Mr. Walsh was greater abroad than it ever began to be in Rock Island, and I want the scientific world to feel that they can refer to that cabinet in the hands of some one who can make the best use of it to my late associate's name and honor. Whether that party be myself or Mr. Walsh's successor, is not of such moment.

Dr. Shimer—I may state that I wrote a letter to Mrs. Walsh about this cabinet. I made a proposition of this kind: that it be left it in the hands of the State Entomologist, whoever might be appointed, until the duplicates had been taken, and then they might dispose of it. My idea was that it could then be disposed of to the highest bidder. Mr. Walsh was a great man as an entomologist—more than any man that has ever lived in America; and this State ought to lay hold of the work not only for the sake of the injurious and beneficial insects, but for all of them. He said he intended to duplicate all the insects for the State. This State, I hope, does not intend to secure merely those which are injurious or beneficial. We ought to have a duplicate of every insect in the State. In the meantime, I hope

something will be done to induce Mrs. Walsh to keep this collection until the Legislature meets, and then I have no doubt that a liberal sum will be appropriated. Here are the labors of twelve years; this State can afford to give a sum of money for this collection; it can be placed in the hand of the State Entomologist, and a duplicate can be furnished for use at Springfield.

The question being on referring the resolution to the Executive Committee, it was so referred.

Mr. Baldwin moved an adjournment until 7 o'clock P. M., which was agreed to, and the meeting stood adjourned.

THIRD DAY—EVENING SESSION.

The Society met at 7 o'clock, pursuant to adjournment. President McWhorter in the chair.

Mr. Edwards, of the Ad Interim Committee, submitted the following report:

LA MOILLE, BUREAU COUNTY, ILLS., Dec. 10th, 1869.

To W. C. Flagg, Secretary Illinois State Horticultural Society—SIR: As one of the Committee Ad Interim of your Society, with J. W. Cochran, chairman of the committee, and Dr. E. S. Hull, State Horticulturist, I was at the Stephenson County Agricultural Society's Fair, in Freeport, 16th of September last. We were cordially received and cared for by the reception committee and officers of the society.

A lignarium of one hundred and nineteen varieties of woods indigenous to Stephenson county is in the highest degree creditable to the interest in this important subject, and perseverance manifested in its collection and skillful arrangement by Mr. H. H. McAfee, of Freeport; especially, when it is remembered that only some eighty-two varieties have heretofore been considered as native to the State by our highest authorities. Ordway and Parker exhibited eight varieties of evergreens and larch; L. H. Scofield the same—all evincing good management. The display of apples, and pears, and grapes was good. Apples are generally much affected by scab. C. H. Rosenstiel has a hedge of Norway spruce two and a half feet apart, ten feet high. He is fully confident it will make an efficient fence against all stock except hogs. Dr. Hull lectured in the evening at the court-house, followed by discussion.

Morning of 17th September we were met at Galena by Mayor Brand, J. G. Soulard, President of local Horticultural Society, and others of reception committee, escorted to the De Soto House; thence, after breakfast, carriages were provided, and the

vineyard and nursery of Jacob Zins, some three miles northeast of the city, was first visited. Two and a quarter acres in grapes, mostly four years planted, one-half Concord, which is a favorite with Mr. Zins. Delaware is growing in favor, and the vines appeared in best condition of any Delaware seen on our tour of observation. Hartford Prolific is first in ripening; Concord and Delaware, second; Blood's Black, third; Rogers' 2, 15 and 19, fourth; Diana and Perkins', fifth. He rejects Taylor's Bullitt. Vineyard is on the hillside, S.S.E. slope; friable loam, clay subsoil; was plowed eighteen inches deep; rows eight feet each way, trained on trellis; clean culture, and vines are vigorous and healthy. Wine of '68, from mixture of Concord, Delaware, and Rogers' No. 19, is very popular with the German population. Twenty acres of apple orchard in bearing is well cared for; but little fruit this year. Rawle's Janet, Northern Spy, Perry Russett, and Hoss Apple are leading varieties—the two latter remarkably productive.

We next visited the vineyard of Hon. James G. Soulard, who, in vigorous health at seventy-two years of age, is zealously putting forth his energies in horticultural pursuits, which for most of his active life have engaged a large amount of attention. The soil is mostly clay, prepared by plowing and subsoiling eighteen to twenty inches deep. Six acres are one year planted, two more in preparation for setting next spring. One-half are Concord, balance Ives' Clinton, Delaware, and all tried sorts. Culture is thorough, and his example is worthy the emulation of our young men. His first planting of grapes here was thirty-five years since. Catawba and Isabella succeeded finely some twelve years, when he sold the property, and from neglect they failed. In deep, porous soil near St. Louis, forty years since, he planted fruit trees one foot or more deeper than they had stood in nurseries. Trees have succeeded well; believes it advisable for such soils.

The lovely home of Mr. J. M. Ryan was next visited. The well-kept lawn, bordered and interspersed with flowers and statuary, is entered by a drive through an avenue of fine evergreens. The apple, pear, and cherry orchards are in admirable condition, bearing full crops this year. Mrs. Ryan takes an active part not only in management, but in the actual handiwork of making and keeping these lovely grounds in order. Underdrained thoroughly.

F. Chetlain has forty dwarf pear trees, planted six years, in very fine condition, probably have rooted from the pear; are mulched eighteen inches deep every autumn. Full crops of Louise Bonne de Jersey, Seckel, Vicar of Winkfield. He has one standard pear tree of an unknown variety; fruit small size, ripe in August; brought by J. G. Soulard twenty-five years since; has never known any symptoms of blight. Apple trees are vigorous, but few are bearing crops; one, of a variety not recognized, a medium sized, red, acid, winter fruit, is loaded with none of the scab or blight so generally prevalent this season.

The Galena Horticultural Society made a fine display of fruits and flowers at their rooms. The Soulard Crab was on exhibition, as large as a fair sized Red Romanite, though quite similar in flavor to the wild crab of this section; yet their large size, keeping qualities (having been kept until the second year), extreme hardiness of the tree, cause those familiar with it here to recommend it highly for sauce at the North. From the extreme hardiness of tree, it has been formerly recommended as a stock on which to propagate more tender varieties for the North. For a few years they thrive, but soon after coming into bearing, trees on this stock fail. It will be used no more

as a stock near Galena. The Soulard apple, also brought by Mr. S. from St. Louis, is highly valued as an acid dessert apple, of very delicate texture, juicy, agreeable flavor; tree very hardy; believed to be synonymous with Gros Pommier.

The tree invigorator man has been through this section in his quiet unostentatious manner. One individual paid him \$25 for driving nails into the trees of a small orchard, which are to drive off the bark lice, expel borers, prevent ravages of caterpillars, and all ills which fruit trees are heir to, when exposed without the ægis of his invaluable protector and panacea.

Prof. J. Wernlei, a graduate from an Austrian Normal University in which Horticulture was taught, is introducing its theory and practice here. Some eleven acres are attached to his school house, which it is proposed to plant with trees, shrubbery, vines, and flowers, giving his pupils as good an opportunity as possible to obtain a good practical knowledge of the elements of the art. May such schools multiply.

The Fair, which had been well patronized in the afternoon, was graced with a full attendance of earnest listeners to Dr. Hull's interesting lecture on Vegetable Physiology, and an outline of observations of the committee made thus far, by Mr. Cochran.

In a hurried run through the city green houses and grounds of D. Wilmot Scott, the genial Secretary of the Normal Illinois and the Galena Horticultural Societies, we found a fine stock of trees, shrubbery, vines, and plants. The Townsend or Miner plum is a specialty with him; long been extensively grown in this vicinity; is highly valued and very profitable. The soil in the city and vicinity is generally a loamy, porous clay, well adapted to fruit growing, as was attested by the abundance of fine fruits on exhibition. The practical articles furnished the *Gazette* by Mr. J. W. Robson are of great value in aiding to develop the horticultural taste of this community.

Early on the morning of the 18th September we bid adieu to the cordial hospitalities of our Galena friends, taking cars to Dubuque, thence on steamer Hawkeye State down the Mississippi. At most of the towns on its banks are extensive saw mills, manufacturing lumber of logs rafted from pineries of Minnesota and Wisconsin. The water being high, large numbers of rafts of boards loaded with lath and shingles are on their way down. How important that immediate steps be taken to replace material for this extensive, rapidly increasing demand for the products of the forest.

At Rock Island we had a chat with the lamented Walsh on his favorite science, little thinking, at our parting, that we should meet no more on earth. As we are passing away, may we learn to value more highly our friends and co-workers whilst spared us, and act well the part allotted us in life.

With much regret we found ourselves compelled to pass New Boston, the landing for reaching the orchards and nursery of President McWhorter at Alledo, as by stopping it would prevent meeting our future appointments. It was apparent to us that there was a rich field for research by future *ad interim* committees, in the orchards, vineyards, nurseries, and gardens along which we pass, with only an occasional glimpse on our trip from Dubuque to Warsaw. At the latter place, Sept. 20th, we were cordially received by President A. C. Hammond, Secretary T. H. Gregg, Dr. Hay, and members generally of the Warsaw Horticultural Society. The grounds of Mr. Lewis Stracke, (a mile southwest from the city) ten acres, have been trenched three feet deep, underdrained with tiles forty feet apart, four feet deep. Two thousand five hundred grapevines, most largely of Delaware; 750 Ionas. These are both considerably defoliated. Ives' Seedling are doing finely, all only two years

planted. One thousand three hundred pear trees, also two years planted, three-fourths dwarf, balance standard; Mr. S., following directions of Eastern authorities. A vast amount of money has been spent in fitting and planting this place, in accordance with instructions referred to, but for selection of varieties of fruits to plant in any locality, especially as to dwarf pear trees, the home experience of an honest wayfaring man should be valued more than the advice of the most intelligent and practical, whose experience has been in a distant part of the land.

E. McCune has a fine orchard of forty acres, planted by Dr. Griswold some twenty or more years since. All are stock-worked; Yellow Bellefleur bears well, much better than President Hammond's trees of same variety root-grafted. Baldwin, R. I. Greening, Rawle's Janet are full of fine fruit. Red Canada is esteemed best by Mr. McCune. Orchard now in grass is to be broken up. A. C. Hammond has fifty acres of apple orchard, largely of Ben Davis, which is esteemed very profitable. Wine Sap is troubled here as elsewhere on our route, with leaf or spur blight; fruit much affected by scab. The Snow is very much scabbed. Maiden's Blush and the different varieties of Russets are fair in all localities visited. Trees of Rawle's Janet are failing in this orchard. Some of the "rotten root," which has been so prevalent in Southern Illinois, is noticed. Delaware grape is full of fruit of no value; leaves mostly gone.

A good attendance of the members of the Warsaw Horticultural Society in the evening, at the mansion of Dr. Hay. The lecture of Dr. Hull was well received. A very fine display of pears and apples was made. Mark Aldrich planted the first orchard in Warsaw 1834; trees appear healthy and vigorous.

September 21st, visited G. B. Worthen's vineyard of thirteen acres, some four miles southwest of Warsaw. Several acres of Catawba are worthless. Clinton, Norton's Virginia and Concord are his favorites—have a fine crop of best quality. His wine cellar is a model structure, well stocked with wines and brandies, pronounced by judges to be of excellent quality. Some half dozen old apple trees at his house were breaking down with their loads of fair fruit—Pennock and Rawle's Janet. H. Worthen has eight acres adjoining his brother's. Clinton and Concord are fine; Catawbas are to be dug up. Seedling peaches are more productive and profitable than budded trees. These vineyards are on ridges elevated several hundred feet above the river—appear to be well adapted to general fruit-growing. Hill & Knox, of Warsaw, have an apple orchard, recently planted, near Messrs. Worthen of over a hundred acres.

At Galesburg, September 23d, we were cordially welcomed by Messrs. W. S. Balch, C. E. Carr, T. G. Hull, Capt. Fuller, R. W. Hunt, and D. Mason, a committee of reception appointed by the local society. The nursery of Messrs. Hunt & Mason is well stocked with a general assortment of fruit and ornamental trees, shrubs, vines, and plants; some seventy-five acres in good cultivation. At the nursery of Adnah Williams Sons is a moderate quantity of fine evergreens of proper sizes for transplanting, and acres which have grown up into a fine timber lot. Humphrey & Hester's nursery is well spoken of—was not visited. Captain Fuller has for family use some remarkably thrifty grape vines, among them the Eumelan. At Mr. T. J. Hale's and Prof. Standish's are fine collections of choice and rare ornamental trees, shrubs and plants, well cared for. Mrs. Standish presented us figs well matured in the open air. In the evening a fine display of fruits was made at Caledonia Hall, and a good audience gathered, who were well entertained by Dr. Hull. The street trees, liberally planted at the first settlement of Galesburg, were mostly black locust. Some fifteen years

since they fell a prey to the borer, and have been replaced with silver maple and elms. The public square is planted with them and evergreens. The latter are used freely in private grounds—succeed admirably. At Adnah Williams' residence, and one or two other places, hedges of the Norway spruce have recently been planted.

My visit to Waukegan, the place of most interest to me, was deferred until the 6th inst. Of course, the special object to call us to this corner of the State was the well known evergreen propagating nursery of Robert Douglas & Son. The senior partner was promptly at the depot, with a carriage to convey us to their different plantations. In their frost-proof greenery, well lighted, we found over a million evergreens, nicely packed in double tiers, roots together in damp moss, tops ventilated. This mode of wintering has been thoroughly tested by them, and is a perfect success. The recent mild weather has probably permitted them to put in another million or two, which the unprecedented early closing up of the ground prevented. Specimens of a large number of varieties on the lawn are faultless in form, if we except a large balsam fir with a singular contortion in the growth of the limbs of one side—very unique, its fault a beauty. There are several well grown screens of Norway spruce, American arbor vitæ, hemlock, and the red cedar—last is least desirable. European silver fir and Lawson's cypress, in the shelter of larger evergreens, are enduring the winters. Three-year old plants of the latter are being wintered with only partial protection, to test their hardiness. The beauty of foliage and rapid growth of this variety make it very desirable where climate is not too severe. In their six or eight acres of transplanted American arbor vitæ are several choice sub-varieties of striking and marked form and foliage—silver-striped, gold-striped, or tipped, and dark bronze-tipped; several with fan-like foliage of pyramidal form, some of the Tom Thumb or Hovarge type. A number of them are much finer than any of the old varieties of like character, and it is hoped they will be propagated and disseminated. The fifteen acres of evergreen seedlings and European larches, in beds, with the cost of seeds, by tons, at near two dollars to as high as sixty dollars per pound, labor requisite for planting, shading, watching from birds, weeding, pulling, assorting, counting, packing, shipping and correspondence, give evidence of the perseverance of the Messrs Douglas, and their faith that these prairies are to be supplied with screens and hedges of evergreens, groves of larch and pine for the rising and future generations. A free admixture of sand with the soil is essential, unless it is already of that nature. The seeds are sown early in the spring as land can be worked, in beds four feet wide, slightly raised above the alleys, at the rate of about two pounds of the size of Norway spruce, Scotch pine, white pine, or larch seed to the square rod; cover to a depth of twice the diameter of the seed. Screens made of lath with spaces of half an inch between them, are used, where only a small quantity are sown; but since their business has become so extensive, brush screens are made, supported by posts high enough to admit of walking erect under the brush. The "damping off" of the plants has always been a great source of loss to the uninitiated; in fact, has very generally destroyed the entire crop. Many times early sowing prevents this, as the young plants attain the woody fibrous state of growth before heat is excessive enough to cause damping off. When they fail to do this, the injury by "damping off" is held in check by sowing liberally of dry sand over the beds. On the approach of winter the beds are slightly covered with leaves or prairie grass. Transplanting is generally done when two years old; if longer deferred, unless standing very thinly, they are root pruned by two men running sharp

spades near the surface, meeting at the center of the bed. The flexible young plants do not receive any injury by using a roller over the beds or tramping them, to fix the dirt firmly about the roots. Some five or six millions of one-year plants of the larch will, without doubt, all be cleaned out at two years old, with as many more of Norway spruce; a like number of other varieties assorted. To a novice at the business this looks like one of the fancy ways of making money we read of in the advertising columns of the daily press, but not to one familiar with the frequent and serious losses in failing to get seeds to vegetate—loss by “damping off,” or drouth; birds are extremely fond of both seeds and the tender plants; forty men and boys have been busy regularly in weeding, five times over, these fifteen acres—I see in the anticipated future groves all over these prairies, monuments to the patient, persevering toil of him who has at this hour of our need been raised up for the purpose of carrying to a successful issue this important industry. Having the general accompaniment of merit, extreme modesty, I know that Mr. Douglas will not thank me for telling right out in meeting my views of the great value of his work. Besides the seedlings there are many acres of small transplanted evergreens. Apple, pear, mountain ash, and birch seedlings are all extensively grown. Apple and pear orchards have been productive; the older trees of the latter show some blight this year. In passing, I would say that, in my opinion, the climate on the border of Lake Michigan is much more favorable for this branch of business than that of our prairies distant from a body of water.

Berries of all kinds, and currants have, so far as learned by the committee, borne good crops the past season in all parts of the State. In my own locality the Lawton blackberry had a full crop for the second time in thirteen years. Cherries have also been loaded with fruit, though there has been a general complaint of an unusual amount of loss by rotting. The cause of this is believed by some to be the curculio. Apples, except in a very few localities, have been almost a failure, the yield light, and what few there were mostly unfit for table use, from injury by cracking and scabbing. Pears, so far as noticed, have generally borne full crops of fine fruit. Dwarf pear trees are almost universally discarded at the North. The planting of fruits appears to be progressing about as rapidly as is advisable until our people are generally fully aware of the fact that our insect enemies will render our labors nearly abortive, unless a constant, vigorous warfare is maintained against them. Many are planting screens of evergreens for shelter to their houses, orchards and stock yards. Hedging with Osage orange is being almost universally adopted. Timber planting is, in comparison with its importance, receiving far too little attention. It is believed that the cause of horticultural improvement can be advanced by—

1. The forming of local societies at points where sufficient interest can probably be kept up to maintain a working organization.
2. By extending the circulation of our horticultural papers, and inducing our local papers to devote regularly a portion of their columns to horticulture.
3. By encouraging its study and practice in schools in the vicinity of each one of us, in giving them trees, shrubs and plants, with practical instructions in transplanting, grafting, budding and after management.

All of which is respectfully submitted.

SAMUEL EDWARDS.

Mr. Earle submitted the following resolution, which was adopted:

WHEREAS, the labors of Dr. E. S. Hull, our State Horticulturist, tend directly to the benefit of every industrial interest of the State; therefore,

Resolved, That this Society respectfully solicit the several railroad companies in Illinois to grant him free passes for the year 1870.

Mr. Shepherd offered the following resolution, which Mr. Flagg moved be made the special order for to-morrow morning at 9 o'clock: Carried.

WHEREAS, The educational interests of the agricultural and mechanical portion of our citizens imperatively require an education specially adapted to their several callings, we hereby declare and resolve as our judgment, that an amendment to the Charter of our Industrial University—restricting its teaching to the declared leading objects of the Congressional grant for the endowment of such institution, and admitting to a classical course of education those and those only who have taken a full course in our own or in some similar Institution founded under the same grant as our own, in some sister State—highly important to secure the main object of the grant, and absolutely necessary to prevent the perversion of the trust to ends not designed.

Resolved further, That we ask our Legislature to grant us an appropriation from the State Treasury sufficient to publish and furnish to the library of each common school in the State ——— copies of our proceedings for the year 1869, and ——— copies to each graded school, and ——— copies to the Normal Institution, and ——— copies to the Industrial University.

REPORT OF COMMITTEE ON WINES.

Six samples by Dr. Shroeder, Bloomington, Ill.

Concord and Norton's Virginia Seedling, vintage of 1868. This sample contained the properties of an excellent wine, but had received too much sugar.

Herbemont and Catawba mixed, 1868. This sample contained sugar.

One sample of Perkins, of the vintage of 1868. A light red wine, possessing a fine aroma. This wine also had been too highly sugared.

Delaware. Good to very good; of the vintage of 1868.

Concord, 1869; quality good. With age and proper care, it may become very good.

Catawba. Quality excellent.

By E. Sanford, Morris, Ill.

Clinton, of the vintage of 1866. A small quantity of sugar and water had been added to the must before fermentation. Quality good to very good.

We also found on the table one sample of cider, highly relished by all.

SMILEY SHEPHERD.

E. S. HULL.

A. C. HAMMOND.

Mr. Meehan read an Essay on the

PRINCIPLES OF FRUIT CULTURE.

You of the West are famous for your fruits. When we of the East come amongst you, it is as students and earnest enquirers after truth—that is, some of us, for there is in every section of the globe a class which thinks that the sum of all knowledge has been attained, and that that sum has been reckoned up within their fortunate selves. I was pleased to receive the invitation to address you for this reason, and accepted it the more gladly on that account, for, said I, though these people are more successful than we are in raising fruits in general, the effort to learn something from those who probably in many things know less than themselves, is worthy of all honor. This is after all the proper road to excellence. It was Sir Walter Scott, I believe, who once said that he could learn something even from a Tarpaulin hat, or the wearer of the worst pair of corduroy breeches. Coming thus amongst friends like you, without any pretensions to superior knowledge, I am yet not without hope that I may in some measure interest you.

I purpose to speak on the *principles of fruit culture*; and first I would suggest that the usual division of art into two divisions, the theory and the practice is imperfect. These two classes are perpetually quarreling. The man of science only is contemptuously styled a mere *book learner*, while the man of principles looks down in disgust on him who goes through the world *clod hopping*, or *plodding along*. I sympathize with both of these, and yet differ from both. Theory is some good, and so is practice; but neither is much good without a third branch of knowledge—the *application of principles*. It has been said by those of old time that there are three great virtues—faith, hope, and charity, and that the greatest of these is charity. In like manner I would say, there are three great virtues in a successful fruit grower—theory, practice, and common sense, but the greatest of these is the last.

It is very common to hear intelligent men say that principles are the same all over the world, and that if we will only trouble ourselves to master these principles we can become successful fruit-growers anywhere, and wherever we go. I know, and you know, that this is not so. If I had to choose between the mere practical man, and the man of principles—the pure breed of each, and no mongrel—I would exclaim, “Give me the block-headed, hard-fisted turner of the sod, and let the learned man go.” And I know that you will agree with me. So, though to-night I am to speak to you on “Principles,” I would warn you that no amount of principles will make a good fruit-grower; but that your success will depend on your application of these principles—in your judgment—your common sense.

Whatever great object the great Creator of all things may have had in the plant’s creation, there can be no doubt the great object—the leading principle of its life—is to reproduce itself—to bear fruit. Secondary and subservient to this great end is the effort to procure food.

With regard to reproduction, there are two grand principles in nature, both working in contrary directions, yet to a considerable extent acting in harmony; the one determined to reproduce nature exactly as it was—resolved that like shall produce like, and which we may call the conservative force, the other the radical, as determined

that the world shall move on—that there shall be changes, and that if possible no two things shall be reproduced exactly the same.

It is a misfortune to our correct understanding of things, that identical terms are given to principles which are similar but not alike. Thus we say of plants as of animals, that they have sexes, and speaking thus we should say of these two grand forces of the vegetable kingdom, that the conservative standstill, like producing-like power, was the female influence, and that the radical, onward-developing power, was the male. The parallel of the sexes in the animal and vegetable worlds is so far perfect, but the analogy ends here. The female influence in plants is of such a nature that it is capable of reproducing itself in many ways without the intervention of another sex; and in such cases producing, reproducing, and continuing to produce itself exactly like its former self. Cuttings of roots, and stems, and leaves; buds, tubers, offsets, suckers, and the many other modes known to propagators, are the natural processes by which the female influence seeks to manifest the peculiar conservative power God has assigned to it. Wonderful is the wisdom which has confined this form of reproductive power to plants. If the higher order of organic beings had the privilege of reproducing themselves independently of the change-leading influence of the male, as plants have, *mutual recognition would be impossible*; and thus you see that the thousands of pleasures which social intercourse brings us have been made dependent on this one little principle, that a certain property given to the female influence in plants has been made to cease before crossing the threshold of the higher order of the animal world.

In our studies to-night, the great value of this principle is, that it strikes one solid and effective blow at the old theory of Knight, as to the wearing out of varieties. He thought plants were exactly like animals in their sexual relations, and that growing from seed obtained by the mutual action of stamens and pistils was the only natural mode of reproduction. Grafting and other modes were, he said, "mere extensions of the individual," which, reasoning from animals, he thought could not naturally continue beyond a definite period of existence. Now that we know nature's object in the sexes, and that all extra seminal reproductions are natural and legitimate forms of pure female power, Knight's theory is no more. We may go on in security with our grafts and our cuttings, assured that here at least, so long as we do not propagate at the same time from a diseased stock, we are not violating any principle of sound fruit-culture.

Now as regards nutrition, let us take note of how the plant feeds. This we can pretty well understand without the use of technical terms, or without going very deeply into abstract principles of vegetable physiology. At least, I shall try to make it clear to any observing mind in plain every day language. You know that a plant in a cellar, if it grows at all, grows pale and weak. Therefore to be healthy, it must have light. This we know well enough when put in this extreme way; but we forget it when it comes to a question of degree. If one leaf partially shades another, the one shaded by so much sickens, and only that tree is in perfect health, *which has every leaf so displayed to direct light, as to get its full share of it*.

But the roots detest light; their constant effort is to keep away from it. Cultivators of Dutch bulbs know this so well that they either keep their water glasses with the roots in a dark closet until the roots have pushed; or select colored glasses instead of unstained ones to put the roots in. Indeed, so well is this known that I am sure I

need do no more than just present it as a fact to you. But though the roots hate light, they have a strong affection for the gases of the atmosphere, and invariably keep as near the surface as it is possible to get, without coming into contact with light. To prove this you have only to lay a flat stone on the surface of the ground under a vigorous growing tree, and lift it a year afterwards. You will find the surface covered with a dense net-work of roots, the like of which you will not find anywhere else about the surface under that tree. We who live near old towns, and who walk about with our eyes open, see this continually when pavements under old trees are taken up.

Besides this air and darkness, there is one more thing necessary as a preliminary to plant nutrition. This has been called water, but this is a mistake. Water, roots do not like; in water they soon die. It is rather what an intelligent friend of mine delights to term atmospheric humidity, but which we will simply call damp air; the roots permeate the air spaces through the little masses of earth, and draw all their food into their system in the shape of gaseous vapor. Thus we have a principle without which success in fruit growing will only be comparative, namely, that we must *keep the roots always in darkness, but yet as near to the atmosphere and to vapor as possible.*

I know some will say that this position is not altogether sound, for they have found roots ever so many feet below the surface of the ground, which is quite true; but the roots they mean are not the roots I mean. What they mean are the woody structures of the trees—the analogues under ground, of the woody branches above ground—what I mean are the fibres which are borne from these woody roots every year, and die every year, just as the leaves do above them, though not at the same time.

One of the most prevalent errors in fruit growing is the belief that a warm soil is as necessary as a warm atmosphere to the growth of the tree. If it were possible for the soil in your orchards to be frozen three feet thick, and to stay frozen in that way throughout the summer; yet if the atmosphere were to range from 55° to 90° as it does now, I think the trees would grow, and bloom, and bear fruit nearly as well—not perhaps quite as well, because there is some loss of heat when the little fibres, by the aid of their own internal warmth, have to thaw the solid ice into vapor before they can make use of the moisture, and it is no doubt some saving to have all this ready done for them; but I said nearly as well, because I have seen grapes forced in vineries where the roots were all outside and frozen solid, and the tops in a summer temperature inside growing and blooming as if everything accorded with the best popular notions of right or wrong. Now what we call a *cold* soil is usually a *wet* soil, and that *is* injurious; not because it is cold, but because it has *water* and not *vapor*, as it should have; and we make the very grave mistake of attributing to a want of heat what is really the fault of a superabundance of water. Our own common sense may tell us that this is wrong; for we know that heat evaporates moisture, and we never have any to spare in our hot summers to lose in this way. All the evaporation we want is the evaporation from the healthy leaf surfaces.

Now I am come to a point when I may try to impress you with my idea of the main *principles of fruit culture.*

You must have the trees so trained that every leaf shall have the best possible chance to get the full benefit of the light.

You must have the soil of such a character that it will hold abundant moisture, without holding water, and be rich in manures.

You must have the roots on the surface where they can have the full benefit of the gases of the atmosphere.

You must keep the surface absolutely dark, and as cool as possible.

Now, my friends, I should like to stop here; for in these four grand divisions lie all the law and all the prophets of success. There are, to be sure, hundreds of other things principles, but they rather belong to that other matter to which, as you know, in fruit-growing I claim the immortal honor of the first discovery, namely, *common sense*. If, however, you will print these four leading maxims on a card and nail them up in your orchard, where even through your sleep you will scarcely lose sight of them, I will go a little further into these common sense affairs.

It must be manifest to you that very rarely do the common modes of fruit-culture accord with the main principles which I have given. The trees grow any way they choose, or are "trimmed" after somebody's system without any regard to the advantage of light to the leaves. The earth is as hard as a brick, and soon dries out. The trees are set wide apart, so that the sun dries and heats the ground, and the surface is kept so bare of shade that the little rootlets have to go down away from the light to where there are few gases to act on the manure, and the furnace heat will almost allow you to fry a beefsteak, and of course evaporates an enormous amount of moisture which would be of immense benefit to the crop.

Now I see what you are thinking about. You imagine I say rather than all this, put the orchard in grass. But I do not say that, mind you, unless it will accord with my four great *first principles*. Sometimes—very often—it will do this: sometimes not. That is for *common sense* to decide.

If the ground is heavy, and water does not pass away freely, grass would be bad. I could scarcely forgive any one who would put an orchard in such a place at all, but if in addition he put grass on its surface, I am sure that would be the unpardonable sin. If you want to see yellow trees in grass, that will be the place to find them. Then, again, there are some grasses, like blue grass, which in some lands otherwise favorable, will make a hard impervious crust, which it takes days for water to get through. In short, anything that will keep water from running away rapidly is a sin against the first great principle, and must be avoided. In such soils you must have orchard grass, sweet vernal grass, or any tussocky thing that will not defeat your one great object. In all these matters you must *use common sense*. Grass, remember, is of no use only as it serves to darken and cool the surface, and encourage the roots to keep near the air. If it brings on some other evil—if it soddens your soil, or impoverishes the trees, as in some half starved lands it may—or if you can cool and darken the surface in some better way, avoid grass by all means.

Sometimes you can do much better than grass in various ways. Some soils are so rich that you can plant them, without danger of starvation, so close that their own branches will make a grateful shade for the roots, which will then hover very near the surface. At other times you can cut weeds, briars, or trash from the hedges, fence rows and swamps, and strew on the ground between the trees. It matters not, gentlemen, what you do, only give plenty of shade to the roots, plenty of food, plenty of vapor, plenty of oxydizing gases, and you have mastered the alphabet of fruit-growing, and your success will be chiefly in the common sense you apply to it.

I say chiefly will your success depend on common sense, but not altogether; for there will always be some local or accidental causes which will operate to your disadvantage. But with the greater health of your trees, you will be astonished how they will improve. It is remarkable how people will declaim against climate and everything else but their own ignorance of first principles with the facts directly against them. You have no doubt heard men say their locality would not grow grapes, when if they would go to the nearest wood, where by the shade of the neighboring branches, or the abundance of other trees about it, the roots were tolerably dry, cool and shaded, a grape vine would wander in profuse luxuriousness. Or apples, perhaps, would not do now as formerly they would, while in the nearest neglected fence corner, where perhaps a specimen has got into a patch of blackberries or elders, whose branches keep the fallen leaves together to rot for food, and shady, to let the roots reap the advantage from the fortunate circumstances, you may find an apple tree in vigorous health and loaded with fruit. Pears, peaches, raspberries, gooseberries, currants—all tell the self-same story. I will venture to say that I will go into any part of the United States, and wherever I go point out to you specimens which have got somehow out of the ruts of what is sarcastically called good cultivation, and into some happy spot where they can push forth their roots on a rich, cool, shaded, and regularly humid surface, that you will say with me, that you have the best soil and climate in the world for fruit-culture—a perfect paradise of good materials; and that if you fail it is not the fault of this Elysian field, but of your own inability to use wisely the tree of knowledge, of good and evil.

There is yet another principle of fruit culture worth considering, which has a great influence on success. In practice it would come under the head of the *use of the knife*.

Let us begin at the beginning of plant life. You know that plants are made up of single cells, which, uniting together, make up the various forms we see. We have a fashion of talking about the lowest forms of life of plants and animals as well. Now these lowest forms are nothing but single cells, which perform every function of nutrition and propagation within themselves. Can you imagine that in these little floating cells are beings like ourselves—like these majestic trees which we see everywhere about us? Yet by the latest researches in science there is little doubt but that in these simple forms every function and every attribute exists that finds a home in the highest aggregated forms. They have their loves and their hates, their hungers and their thirsts, their love of life and their dread of death, as much as any of us. This fact cannot be appreciated by our senses, but by inductive reasoning there is little doubt of its truth. The whole cannot be greater than its parts; what it possesses it receives from them. These cells, having all the functions of large aggregates, find that they are to go into situations where they cannot protect themselves against the elements and other enemies, and they join together for mutual aid and defense, just as individuals do when they proceed to form a strong central government. Rights and functions which in their highest individualized conditions they enjoyed, they now sacrifice for the good of the whole. It is exactly the same with these cells. Those of animal nature each give up their little breathing organs, digestive apparatus, circulating mediums and so forth, and concentrate them in one central, governing part of the organic form; and thus the motion which we can see in animals, the taste, smell, touch hearing, and all the faculties which they possess, are but the total sums of the single contributions of millions of cells. Is it not wonderful, when we contemplate

the ultimate conclusions from these remarkable facts. These eyes, which enable us to perform such wonderful works; these hands—all that we have—are the contributions of all these little cells, given to us in this highly concentrated form because we can better take care of and protect them all from injury in the circumstances in which they are placed, than they could possibly do for themselves—and as others of their kind do when left in circumstances which do no violence to their individual existence.

The tree is like the animal. The nutritive and the digestive organs, and all the reproductive functions which it exercises, originally belonged to each single cell: and each of the cells which go to make up the organic form of the tree still continue to have an interest in all the operations of tree life.

I do not know that all of you are acquainted with these new revelations of science; yet they have been proved as conclusively as that the world goes round the sun, and in nothing perhaps is the proof greater, than that it makes many of the operations of nature clear which was once mysterious; and as we shall see to-night, enables us to understand the right and the wrong courses in fruit culture almost as clearly defined as day is from night, and to reconcile the conflicting experiences of excellent observers whose contrary opinions often amuse much more than they edify mere lookers on.

You know that one of our most intelligent friends has reduced the science of pruning to this aphorism: "Prune in winter for wood, in the summer for fruit." But on the cell theory I have given you, wood can not be had by pruning at any season. I know—we all know—that when we cut away a branch in the winter time, the parts just about the spot cut away will push stronger than if such cutting had not occurred, but the rest of the tree will be weakened, because the immense number of buds cut away will be prevented from doing their duty to the millions of cells which depended on their future action for existence. Branches push out strong after winter pruning, we all admit, but it is a temporary effort—a shock to vitality. Just as any of us pursued by a mad bull, might make a mighty leap for life. It would be perhaps a wonderful effort and exhibit our great strength; but like the battles of many nations, a few more such victories would be death to us all.

. That this holds good exactly as I have put it, you can find proofs every where about you. If you live in an old established town, where some of the inhabitants annually lop off the heads of their trees, compare them with some neighbor's across the street who never cut them down, and you will find that the untrimmed trees in ten years are *double the size*. Or go to a willow field where ozers for baskets are made, and the tops cut off every year, you will see that in twenty years, if the stocks have not given out entirely, they are scarcely a foot thick, and you know how large the White or Red Willow should be in twenty years. Or nearer home—examine some neglected Osage orange hedge in ten or twelve years, the stems are timber trees, but in a hedge cut low every year the stems would hardly be as thick as one's wrist in a whole life time. Pruning therefore for wood is an error, whether done in winter or summer. *It must be so*, from the principles of cell growth which I have explained to you, and that it is so, you have seen from the examples I have given you. Yet pruning, as a temporary escape from a greater evil, like a leap from a mad bull, is often of great service; but we need not be leaping or pruning forever. Common sense must tell us when to jump or when to prune.

It is just so with *summer pruning for fruit*. You will get Osage orange balls from

your unpruned trees in twelve years: but you may summer prune your Osage hedge for twenty years, and never see a flower.

I have drawn a parallel between the existence of a government and the life of a tree. the likeness is perfect, and it enables you to understand the principles of fruit culture better than anything I can say. We say of governments that they are supposed to be created for the benefit of the individuals who are governed; and of tree life we say that leaves, and roots, and branches—the officers which compose the government of the tree—are for the benefit of the individual cells which conferred the power on them. Great wars are violent efforts to right some wrong, when it seems necessary to sacrifice many individuals for the good of the whole. So in pruning, there are many occasions when a sacrifice of a portion of the aggregated cells is a benefit to those which are left; but it is just as rational to say that systematic war would be a benefit to a nation, as that systematic pruning is a benefit to a tree.

There can not be the least doubt but that continued pruning weakens vitality, and lays the tree open to the attacks of numerous diseases and foreign enemies; and that the continued propagation from everlastingly pruned trees is one of the great causes of the modern failures in fruit growing.

Mr. Meehan—While I was reading this address it occurred to me to remark further, that very often customs and habits remain in existence long after the reasons which induced them have passed away. It seems to be the case in many things connected with this question of fruit culture. It seems strange that at this late day we should have to show that the keeping of roots near the surface is right, and that one of the leading practices in planting fruit trees is that we should never plant them deep; and yet, after planting them in that way, we seem sometimes to take especial pains to destroy them. It seems sometimes necessary to show that roots will not grow healthily except near the surface. I have brought with me some suckers which were taken off last spring. These three specimens had a few roots at the bottom, and were planted down eighteen inches, and they scarcely came out at all until the part of the plant near the surface of the soil came in contact with the atmosphere, and roots sprung from it there.

Mr. Wier—I wish to make a few remarks on this lecture. It seems very strange to me that our State Horticulturist and brother Meehan have found out how to make the leaves of trees grow better than God Almighty. They say you cannot have leaves grow well unless they have the light of the sun. Now, it seems to me that our great

Creator made a mistake in having leaves grow on the north side of a tree.

[Mr. Meehan said light, not sun's rays.]

Mr. Barry—Speaking of the ground being frozen, you say that the tree would grow having the roots all frozen. Is that your statement?

Mr. Meehan—Yes, sir; that is my statement.

Mr. Barry—I could hardly agree with you there. I think our trees would make very poor progress if the roots were frozen all summer. You know the trouble we have to get bottom heat. We all believe that a certain amount of bottom heat is necessary as well as top heat; otherwise we should expect the tree to fail. The instance of the grape-vine would hardly answer for an illustration; but even they are found to bear much better when the borders are warm. They cover them and they heat them in England, so that I think your statement would bear modification.

Mr. Meehan—Yes, I know that English grape-growers do take pains to keep the heat in their borders. My statement was that people frequently attributed to wet what ought to be attributed to heat. Keep them warm and tolerably dry. The statement I made was simply an illustration, and I should be quite willing to let it stay where Mr. Barry has left it.

Mr. Barry—There is another point, which is in regard to maintaining moisture in the soil. Now one of the best ways to keep moisture in the soil is to keep the surface of the ground well stirred—in a finely pulverized condition. I have always found that where the ground was constantly stirred and kept finely pulverized it was moist even in drouth. I am only stating my own experience now, and I would like to hear you explain that point a little further, because I got the impression that I should keep it covered with grass instead of exposing it to the sun, according to your views.

Mr. Meehan—Your experience agrees with mine partly, and partly not. I get my information from thermometrical experiments. I find that our observation deceives us. I tried particularly with the ther-

mometer about four years ago, and gave an account of these experiments in Mr. Harris's *Rural Annual*, at Rochester. I found the soil was 115°; and the soil under a closely-mown grass lawn, not, perhaps, a dozen yards from it, was not much more than 85° or 90°. There was a very great difference between the two, and every circumstance of exposure to the sun was precisely the same, and the soil under grass was colder and moister by a considerable degree than that with the loose surface. It appears to me there is no getting over these figures. You may imagine the soil is moister, but you will find that it is not really so. We think this loosening of the surface is favorable to moisture instead of a hard baked surface. Letting the grass be long I admit that it bakes the surface hard, but when you keep the grass mown short the state of affairs becomes different. If you take an Osage orange hedge and let it run up twenty-five or thirty feet high—then you will find that the roots are only about as far away as the branches grow. Keep your grass down, and you will find that the soil is looser and cooler than in the other way.

Mr. Earle—Have you seen tested what effect clover has compared with common grass? We, in Southern Illinois, are trying red clover.

Mr. Meehan—I should think that a crop of clover would do as much harm as by leaving the soil entirely exposed. I should think that the soil would be made particularly dry by the roots of the clover.

Mr. Earle—It leaves a very perfect mulch, does it not?

Mr. Meehan—It is simply returning to Paul what has been taken from Peter.

Mr. Earle—Would there be any compensation to the soil by the decay of the clover roots?

Mr. Meehan—It seems to me that you would do better by covering it with mulch, and you would do more good by applying a top dressing than by relying on the destruction of the roots.

Mr. Bliss—If I understand it, the moisture is drawn from the atmosphere. The atmosphere is kept moving very slow, and in sum-

mer the air will be condensed on that pitcher of cold water. It is not drawn from the ground, but the ground only receives moisture every night, and even at ten o'clock, or at mid-day, you may wet your boots in the clover while the common ground is throwing off its steam from the great heat.

Mr. Meehan—Yes, I think that is correct, and perhaps the plants absorbed a little of that moisture. It preserves the plants from withering away until such time as they can draw some moisture from the soil. I should not think that they draw much from the atmosphere, but simply to supply the deficiency from the soil.

Mr. Bliss—I think our knowledge here is that it may teach us a different lesson in the West from what you learn in your district. The surface with us is always moister with clover than with any other crop.

Mr. Meehan—The surface for half an inch or so, no doubt, is moister, from condensation of what was in the atmosphere, but I should not think that there was as much moisture in a general way.

Mr. Pierson—If a fruit-grower has an abundance of mulch, in the form of forest leaves, or straw, or hay, would you use it or let the ground go over to grass?

Mr. Meehan—Use the mulch, of course, especially in the West, where you have to burn so much.

Mr. Pierson—You would prefer it, of course?

Mr. Meehan—Yes, sir; considerably.

Mr. Humphreys—Do you think that mulching would be preferable to stirring the soil?

Mr. Meehan—Yes, sir; I think so, considerably. I should prefer mulch to anything.

Mr. Nelson—Did I understand you that we were not to prune any?

Mr. Meehan—Under certain circumstances it might be an advantage. If a man broke his leg, it might be advantageous to cut it off, but otherwise it would not. To prune with the idea that you help the vitality of a tree is simply an error.

Mr. Barry—There is a point where we do help the vigor of a tree

by pruning. Now, take a yearling tree, or one two years old, and the leaves are very feeble. Cut that tree back to one or two eyes, and you will slowly start a very fine foliage, which will draw vigorously from the sun and air; whereas, if we had left it with the little leaves all over it, it would have made very poor growth; and it is on that very same principle, precisely, that we prune a few buds away in order that the remainder may fulfill their work perfectly. That is my notion as to the benefit of pruning.

Mr. Meehan—That is one of those cases where, of two evils, we prefer the least. There are many operations going on in plant life. There is evaporation where there is no growth, and in some cases where there is a reasonably quick growth, the leaf growth is out of proportion with the stem growth. Cutting off a portion of it, there is less work to be done. That is a choice of evils, as I said before. This continuous pruning, which is kept on forever, will weaken the tree. So, also, in transferring trees, we prune for the same reason; the roots become disproportioned to the branches, and we cut off a portion of the evaporating surface so as to give the roots less work than they would otherwise have to perform. It is an evil, and a continual succession of these evils would produce a diseased body.

Dr. Hull—I do not know whether I understand your statements correctly or not. Do roots have the power, in winter, of forming cellular growth—adding a single cell?

Mr. Meehan—I do not know. They have very late in the fall—up to winter time. Yes, they do add cells through the winter season. Plant a hyacinth root four inches in the ground, and it comes on to freeze, a foot thick if you like, and it continues to do so until February, and you will find that its leaves are level with the surface—that it has made roots six inches deep—thawed its way right through the ground. That is a beautiful experiment. It thaws its way by its own internal heat. I did not recollect this experiment at first, but I fortunately remember so much as, I think, answers the question completely.

Mr. Earle—I would like to ask Mr. Meehan what is the practical

effect of this grass system in the orchards he has been in. Do they succeed in grass? are they longer lived? and do they bear fruit that is worth having?

Mr. Meehan—If you travel through Pennsylvania you will be astonished at the great number of pears, apples and cherries which are healthy and bear large amounts of fruit, and you will find that they are protected by briars, raspberries, &c. On the other hand, if you will look at the cultivated ground you will scarcely ever see a healthy tree. This will show that these trees are better than when cultivated on the regular garden plan. In the latter case they are almost always affected with leaf-blight—the leaves fall off at the end of August, and then there is no more ripening for the fruit.

Dr. Hull—Explain the cause of the leaf-blight—this peculiar form of it. I think you mentioned something about it once to me.

Mr. Meehan—It first makes its appearance about the middle of July. You have to look closely to observe it. You will, by holding the leaf up to the light, see faint yellow patches, and if you place them under a microscope you will see a yellow, round fungus. As each fungus develops itself, the tissue in the immediate neighborhood dies, but whether it breeds in the tissue, or whether it is drawn into its system through the roots, or whether the spore attaches to the outside of the leaf, I have not seen any experiments that would prove it to me. There is one thing you can observe in connection with it, and that is, that the weakest fruits and the weakest trees get attacked by it first, and that would seem to show that the tree whose vitality is weakest is more favorable to the progress of the disease than if the trees were perfectly healthy.

Mr. Pierson—In the case of a pear or apple orchard, at what age in the history of that orchard would you commence the system of mulching, either by grass or artificial mulch?

Mr. Meehan—That would depend entirely upon the peculiar circumstances of the case. The physician would have to see the patient and that is exactly how I should be situated in judging of the time when I would commence mulching. If the surface of the soil was

porous, you need not commence mulching for many years—you need not, in some cases, commence mulching at all. You see it depends altogether upon the peculiar circumstances of the case.

Mr. Earle—I would like to ask Mr. Meehan this question: Do you find the grass system to be a remedy for leaf-blight, almost uniformly? Do these pear trees which are so subject to the early loss of their leaves, hold them when in grass?

Mr. Meehan—I do not know how that would be. After once having contracted a disease, by bad climate or any thing else, I do not know whether any amount of grass or good treatment would restore them. But I do know that trees raised in grass from beginning to end have the leaf-blight far less than others. All those who are in the habit of raising pear seedlings know that that is so. When they are in open ground, as soon as the weather gets very hot, leaf-blight commences. But if the pears be shaded, by having apples growing between them, they do not get the leaf-blight; therefore, the probability is that they would not have the leaf-blight when shaded so much as when exposed. Last year I put some pear seedlings under a hot-bed sash, and some in the open ground alongside of them. The latter were completely destroyed by leaf-blight, while those under the hot-bed sash were not one of them destroyed; so that it shows that keeping down the intense heat of the surface keeps down leaf-blight.

Mr. Douglas—I would ask if the leaf-blight on the seedling of the pear is what you speak of?

Mr. Meehan — That is my understanding. Some commence by having a yellow patch in the leaf, and there are some which I am well acquainted with where it commences on the edge of the leaf.

Mr. Douglas—The leaf-blight on the pear seedling—the leaf gets spotted and falls off—the sap of the tree does not seem to be affected by it. Generally it puts out new leaves. This leaf-blight we are speaking of generally blackens the stem.

Mr. Woodard—I should like to ask a question. In our northern climate the frost is so intense that our orchards suffer damage from

it. We plow the ground—raise it—sometimes to the depth of a foot next the tree. Now, as he spoke of planting the trees on the surface, and keeping the roots near the surface to strengthen the tree and its foliage, I would ask if keeping the roots near the surface would not cause them to be injured by the frost in our cold climate?

Mr. Meehan—If the tree were unhealthy, I should think it would be injured, but if the tree were healthy, I do not think there would any danger. If the tree were not adapted to the climate it would make some difference.

Mr. Woodard—Two years ago the frost was so intensely severe that some trees were frozen so that they were dead in the spring; that was when the soil was dry in the preceding summer.

Mr. Meehan—Destruction seemed to follow quicker after a dry summer than after a wet summer?

Mr. Woodard—That is true.

Mr. Meehan—The atmosphere is made so intensely dry that it is just the same as if it were to be a burning sun. In a state of low temperature there is just the same result as in a state of high temperature, and we frequently see that plants die in the winter just in the same way. If the summer is very hot and dry there is not anything to keep the plant alive during the winter, and those that are left alive are unable to apply themselves to recuperation.

Mr. Woodard—Would it not be well to cover the roots in winter? Would it not be best to raise the earth above the roots, perhaps a foot in winter?

Mr. Meehan—It would have the effect of lifting it out of the water, but I do not think it is of much benefit. Mr. Hubbard, of Detroit, told me his cherry trees died as much that way as they did the other way.

Mr. Woodard—You will find that James A. Wakeman has an orchard of 80 or 90 acres. His orchard looks like the waves of the sea. He says that by this process he gains temperature, and his trees bear late in the fall and commence early in the spring. He says he gains temperature, and by that means produces good fruit.

Mr. Meehan—That is exactly in accordance with the principles I have advocated to-night. If the water will drain away it is an excellent plan. I thought he had simply reference to raising it in the summer and depressing it in the winter.

Dr. Hull—I have been very highly entertained by this subject of drying out as a killing process, especially in our evergreen trees. I would have it borne in mind that this is no test of hardiness in the trees. Now out of about 80 varieties tested in Illinois, nearly every foreign variety has gone by the board, simply by this drying out process, as it is well understood that the leaves of evergreen trees are the receptacles of plant food. Now the conditions here are such that our winters dry up the foliage on our evergreens, not by hard freezing, but by drying. I hope that will be recollected, and that persons will not consider that because it was taken from an altitude where the temperature was many degrees below zero, it would necessarily make them hardy.

Mr. Pierson—What is your opinion, Mr. Meehan, of tile draining?

Mr. Meehan—I would not put an orchard where it required tile draining. I never found any profit from tile draining in fruit orchards.

Mr. Earle—I would like to make a statement as to this ridging up. I have found that plowing up to trees—and that is what, I take it, this means—unmistakably furnishes the conditions of this root fungus growth. In all soils that furnish the conditions of decaying wood—which I think is the main cause of fungus—I think it will be found fatal to the trees to do this. I would like to say this too, that we have a good many facts in our neighborhood to show that the seeding the ground about trees by clover—and I presume that grass is the same—has restored the health of trees in regard to leaf-blight. I instance the Louise Bonne de Jersey in particular. This past year, and the year before, the leaves were well held on the tree, and maintained a fair color, and the fruit was of very fair quality, the clover having been sown two years ago last spring. I know some others that have sown clover on their land for the last six or eight years, and the trees have regularly held their leaves and matured fruit of excellent quality. It

is simply this spot on the leaf which Mr. Douglas has named. Now if the grass system will enable us to keep the leaves on the trees, I am going for the grass.

RAILROAD FREIGHTS ON NURSERY STOCK.

Mr. Wier—I am requested by Capt. Mann to introduce the following resolution :

WHEREAS, It is a well known fact that the railroads in this and other States discriminate unjustly, as we think, against the shippers of trees and other nursery products in the classification of their freight tariff tables ; therefore,

Resolved, That a committee be appointed by this Society to confer with the officers of the railroads of this State for the purpose of procuring from them a lower and more just freight tariff on nursery products.

Mr. Douglas—We are not a society of nurserymen, and I shall object to it on that ground, and also on the ground that it is only fooling away time.

Mr. Wier—There is not a man in the State of Illinois but that is interested in this resolution. Pack them as closely as you please, and they charge double first-class freights.

Mr. Brown—Do you think it would do any good ?

Mr. Periam—They take up the room. On all through freights they will give you as cheap rates as they can, but to local tariffs they will put on all they can.

Mr. Wier—I move that the resolution be adopted. The motion prevailed, and the resolution was adopted by ayes 21, noes 16.

Mr. Daggy—For the convenience of parties going away, I move that when we adjourn to-morrow, we adjourn at 11 o'clock A. M. Carried.

TILE DRAINING.

Dr. Hull—Tile draining in orchards is not worth a fig. In the State of Michigan I have been in one hundred and fifty orchards in which it was resorted to, and in all of them the ditches became filled

up. I expected to hear a paper on that subject, showing the uselessness of tile draining. You cannot take it up when defective, in consequence of the roots.

REPORTS OF COMMITTEES.

Messrs. Wier and Edwards, from Committee on Testing New Varieties, submitted reports as follows :

OTTAWA, Ills., December 15, 1869.

HON. TYLER McWHORTER, *President Ills. State Hort. Soc.*

But little opportunity has been enjoyed by me for observation of the value of new varieties of fruits, during the past year.

The Kramer Strawberry with me, fruited for the first time, is of small size; an abundant bearer; of fair quality; vine hardy.

Michigan, a seedling originated by B. Hathaway, Little Prairie Ronde, Michigan, is the only variety of fruit received for trial by me, in accordance with the solicitation made in the *Prairie Farmer*, by the committee. The vines promise well. Jucunda, on all soils, tried for years, is worthless.

Miami Raspberry is considerably larger than Doolittle; a little later in ripening.

Philadelphia bore abundantly of good fruit; too soft for shipment.

Clarke, of finer quality and less productive.

Long Bunched Holland Currant is still thought desirable, as the latest variety in ripening, and retaining its fruit and foliage until late in the season; it is thought by some that it bids fair to succeed farther south than other varieties.

Cuttings have been freely distributed by me at several of our horticultural meetings. The first sent out must bear, in many localities, the coming season.

The committee have had a strawberry presented in alcohol, and photographs of same size as the fruit, by Wm. B. Neff, of Ottawa, which has been fruited three years. Full notes of this variety are presented by Mr. D. B. Wier of this committee. The testimony before us is such as to warrant us in recommending it for trial, by those who are testing new varieties, with a probability of its becoming more valuable in our State than those originated in foreign lands or distant points of our own.

Finley Pippin apple presented by Mr. Neff, is described in notes of Mr. Weir; is of fine quality.

D. F. Kinney, of Rock Island, presents a seedling apple under name of Black Hawk. Fruit of medium size; crisp; juicy; mild sub-acid flavor; form, very heavy; color, red; keeps till May. Tree gives indications of being very hardy, making short joints between buds; leaves hang very late.

Respectfully submitted.

SAMUEL EDWARDS,

One of committee on testing new fruits.

REPORT OF THE COMMITTEE FOR TESTING NEW FRUITS.

At the last meeting of this society, a committee was appointed to receive and plant any new fruits that might be sent them, and report on their value. This committee, for the northern district, gave notice through the horticultural press of their willingness to receive such fruits and to report on such officially to the society, as to their merits. Individually, I received no fruits of any kind from originators, therefore properly I have nothing on which to report. But having procured some new varieties, and having seen some others in fruit, I thought an opinion on their merits might be interesting to some.

STRAWBERRIES.

Charles Downing.—This is a fine fruit, originated by J. S. Downer, of Kentucky, and appears to be peculiarly adapted to the climate of the west. It is a sturdy and vigorous plant; fruit of the largest size, highest flavor, and brilliant color; quite late in season; it will, without doubt, I think, prove valuable.

The *Mexican Ever-bearing.*—I procured this *great wonder*, and planted plants of it in different soils and in different exposures. The result has been just what I had anticipated. I had paid my little three dollars a dozen for the old Monthly Red Alpine, or perhaps a seedling from it. This species of Strawberry reproduces itself almost exactly from seed; and the seedlings, for a few years, show more vigor and productiveness than the parent, but they invariably return to the normal type. But so long as our most prominent nursery firms advertise and sell the Alpine varieties, why persecute individuals for doing the same thing?

Nicanor.—This variety has proved to be all that was claimed for it by its originators, with me, planted on different soils, after two year's fruiting. I think it worthy of general cultivation.

Seedlings grown by W. D. Neff, of Ottawa.—My attention was called to these last winter, and I intended to have visited Mr. Neff's place while they were in fruit, but could not find time to do so. But from testimony placed before me, and collected by myself, I am convinced that the varieties under the names of Ottawa and Prairie Farmer, are remarkably fine fruits, in size, productiveness, flavor and vigor. They were raised from the seed of the Agriculturist; the flowers were probably fertilized wholly or in part by the Wilson, which was growing near.

Among those that we have tested, that have shown no desirable qualities, I would name Dr. Nicaise, Ida, Stinger's Seedling, Philadelphia—in fact every one of the newer varieties tested.

RASPBERRIES.

I have procured and fruited as many of the new varieties as my *very* limited means would allow. If any are slighted in this report, it is their fault, not mine. Of the varieties fruited, I would recommend as promising well, for family use, Elm City, Clarke, Philadelphia, Minnesota, Davison's Thornless, Large Miami, (the McCormick of this society, Mammoth Cluster of Purdy and Johnston). For a home market, Elm

City, Clarke, Philadelphia, Davison's Thornless and McCormick. For shipping, perhaps Philadelphia, (though a little soft), Davison's Thornless, McCormick. I have fruited all of these two seasons, most of them on different soils, and cannot see but what they are all of them worthy of general cultivation—certainly worthy of extended trial.

BLACKBERRIES.

I have succeeded in getting together quite a collection of the newer varieties of the Blackberry, but have received none from parties wishing them tested.

The *Kittatinny*.—The more we see of this fine variety the more we think of it, and I do believe that all who plant it and care for it properly will be rewarded. Perfect under extreme drouth, wet, heat and cold. But I do hope for a variety as good in every way, or better, with less briars.

Missouri Mammoth.—This still proves hardy with me, summer and winter. It does not fruit young like the Kittatinny, but the fruit is of most excellent flavor, though not of so large size as we had reason to expect, but it is of fair size and handsome appearance. It may prove of value, but we cannot recommend it for general cultivation without further trial.

Wilson's Early.—This has so far with me proved utterly worthless, being tender summer and winter. In the three years we have had it, it has given no perfect fruit. I have many other varieties that have fruited but little, some of them showing great promise. One in particular, which I received without name, which is entirely without briars, shows promise of hardiness and productiveness. If it should prove to have these points to a desirable extent, it will prove of great value.

Crystal White.—A bright yellow variety; has shown good promise.

CHERRIES.

Bernard.—This is a seedling of the common Black Morello, grown in our town, which I have taken the liberty to name after the person in whose garden it originated. The tree is a very strong grower, perfectly hardy; an upright grower of beautiful form; foliage light green; young shoots slender, of a light brownish-yellow color; fruit of the same shape, size, flavor, color and season of the English Morello, but with the pit much smaller and round. This is the most vigorous Morello I have yet seen; will make a most beautiful ornamental shade and fruit tree. I hardly think it productive enough. I think that this tree, owing to its great vigor and hardiness, will make the very best stock on which to top-graft the tender varieties.

I have seen in fruit this season a seedling of the Kentish family, said to have been produced from seed brought from Connecticut twenty years ago. It is said to have been in bearing fifteen years on the open prairie, and never failed to produce a full crop of fruit. The tree has the same appearance as the Early Richmond; the fruit is the same size, shape, color and flavor as that variety, but ripens about two weeks later. Though not very distinct from the old late Kentish, it appears to have more youthful vigor and hardiness.

GRAPES.

I have fruited none of the newer varieties, except my own seedling, the Lacon. This seedling is of 1862. of the Concord. It fruited slightly the second year, and has fruited each year since, continually increasing in size of bunch and berry; has withstood our late extreme seasons as well as its *noble* parent. It is not quite so large in bunch and berry as the Concord. The berry is round, or a little oblong, entirely without toughness in its pulp, the seeds separating freely; its flavor has generally been called first-rate. It has never failed to ripen from a week to ten days earlier than the Hartford Prolific. The vine has also been fruited near Chicago and at St. Louis, and has attracted favorable mention at both places.

POTATOES.

Early Rose.—I have fruited this variety—which has been “blowed” as thing was never “blowed” before—two years. We find, perhaps, six days earlier than the Early York. but not of near the value of that old variety, for the reasons that it is no better in quality; it keeps in a fit condition to eat but a short time, and rots seriously.

APPLE.

Finley Pippin.—Presented by William D. Neff, of this city, who will be pleased to furnish scions to any persons wishing to test it. We think it well worthy the attention of all fruit-growers, especially north. The apple was brought many years ago from Judge Finley's orchard, Hancock county, Indiana, where it is supposed to have originated. The tree has been in fruit in this neighborhood for twenty-five years, and during that time has never failed of producing a full crop of fruit. The tree is perfectly hardy and vigorous, and has the peculiarity of uniting freely with the common wild crab of the woods, making a fine tree when grafted thereon. The fruit is of full medium size, of fine form and color. The fruit matures early in winter and remains in perfection a long time. As Mr. Neff is present, we would refer members to him for further information.

Respectfully submitted as one of the committee,

D. B. WIER.

COMMITTEE ON TREASURER'S REPORT.

Mr. Hilliard reported:—

OTTAWA, December 15, 1869.

Your committee have examined the Treasurer's report, accompanied with vouchers, and find the same correct. There is now remaining in the hands of the Treasurer \$1,174.58.

All of which is respectfully submitted.

A. A. HILLIARD, }
W. T. NELSON, } *Committee.*
J. W. FLETCHER, }

COMMITTEE ON DECEASED MEMBERS.

Mr. Bryant submitted a report:

WHEREAS, we have learned with deep regret the decease of Benjamin D. Walsh, A. M., State Entomologist;

Resolved, That, in view of his scientific acquirements, which had secured for him a national reputation; his zeal in investigation, and his practical mode of communicating his discoveries, we consider his death, in the vigor of intellect, as a loss to the public not likely soon to be repaired.

Resolved, That, by the death of Albert S. Coe, of Rock Island, this Society has lost a most worthy friend and co-laborer—a man, alike esteemed for his public and domestic virtues.

ARTHUR BRYANT, *Chairman*.

FAIR.

Mr. Flagg offered the following resolutions:

Resolved, That the Executive Committee be instructed and authorized to confer with the officers of the State Agricultural Society, and to propose to join them in holding their annual fair; provided they can do so on the following conditions:

1. The Horticultural Society, through such superintendent as it shall select and the Agricultural Society shall approve, shall take charge of the horticultural department, and use all diligence to secure a good exhibition, properly arranged and decorated, of that department.

2. The Agricultural Society, in preparing the premium list for articles in the horticultural department shall consult the Horticultural Society as to the suitable objects and amounts of premiums, and make them proportionate to those offered in other departments.

3. The Horticultural Society shall receive a dividend of the profits or pay an assessment of the deficits of the fair, proportionate to the amount of premiums awarded in the horticultural department.

Mr. Flagg—I would like to offer these resolutions, because I think that under our appropriation it is our duty to do something, and I also think it is better to do it in co-operation with the agricultural fair than attempt it by ourselves. We have made at least two attempts to hold a fair without obtaining a financial success, although we succeeded otherwise, and the Agricultural Society is not making a very good success of its horticultural department.

Dr. Hull—I think a condition ought to be inserted. I think the payment of a dollar to the State Agricultural Society constitutes membership, and also admits them to the grounds. Now, the payment of our membership ought to admit us.

Mr. Flagg—Is there any membership of the Agricultural Society?

Mr. Daggy—There is not any.

Mr. Flagg—I would accept an amendment in that direction.

An additional resolution was then added.

Mr. Emery—I do not see that a man's being a member of one society should constitute him a member of another society.

The President—As the chair understands this question, there has been one motion made first, and then an amendment, and then there must be a vote made on the amendment.

Mr. Flagg—I will not accept the amendment, but let the Society vote on it separately.

The question then being on the adoption of the amendment, it was lost.

The question then being on the original resolutions, they were adopted.

On motion of Mr. Flagg, the meeting adjourned until to-morrow morning.

FOURTH DAY—MORNING SESSION.

The Society met at 9 o'clock, pursuant to adjournment. President McWhorter in the chair.

The proceedings were opened with prayer by the Rev. Mr. Lewis.

SPECIAL ORDER.

The special order being the resolution of Mr. Shepherd, it was called up.

The President—It will be necessary to hurry things through, and we should only devote about fifteen minutes to that subject.

Mr. Brown—I move that the vote be taken on that subject not later than half-past nine. Carried.

The resolution having been read,

Mr. Flagg called for a division of the question, which was allowed.

The first section being read, the following discussion ensued:

Mr. Flagg—I am of opinion the organic law of the State now corresponds with the organic law of Congress, and anything which looks to a change in the present framework of the University must go clear back to the organic law.

Mr. Brown—I did not wish to argue this question, but I hope the resolution will not pass, for the reason just given by Mr. Flagg. For another reason—that it seems to me illiberal. The object seems to be to exclude all classical and literary studies. If we could do that, I do not think it would do any good. I do not see why a farmer's son should not study the languages as well as other branches of knowledge, and if the scheme is to teach classics, we must have all the machinery for it, and therefore it is just as easy to teach a large number as a small number. I think there is no necessity for this resolution whatever. The assertion that this institution was a mere classical institution, running in the old ruts is not true. No reasonable man would expect that an institution of this sort would spring full grown and fully armed into existence, as Minerva sprang from the brain of Jupiter. Now, we assert that there are no men in this State of Illinois who are more determined to make this institution what the people expect it to be—that is, an institution for the horticultural, agricultural, and mechanical interests of the State—than the trustees and regent of that institution; for I do think that there is no man in the State who has a fuller appreciation and a wider comprehension of the subjects to be taught than Dr. Gregory. There have been false impressions gone abroad about it, but I can say that they are rapidly bringing the institution up to a point to which public sentiment says it should come. Only a few days ago we appointed a director of mechanical industry, and he will be there on the first of January.

Mr. Periam—I, for one, do not imagine but that the board of trustees are doing everything in their power to forward this enterprise, in the fullest acceptation of the term; but I am not one who believes that Dr. Gregory has this great comprehension of industrial education which he has been said to have. I do not say anything about classics. I do believe, however, that the student of that college should go there from other colleges, rather than that he should go there to obtain the knowledge that he can obtain elsewhere. The institution has been carried on against the wishes of the people of the State of Illinois, and the course of study at that college, at the time of the commencement of the present term was such, that just one hour per day was devoted to agriculture. But, sir, I say also, to-day, that the State of Missouri, in sending gentlemen over the country to examine into this question, ignored the State of Illinois entirely, and directed them to make investigations in Michigan, Wisconsin and Iowa. It looks as though there was good ground for this action, when the institution is not carried on as it ought to be.

Mr. Flagg—Do you consider the Wisconsin college in any respect an advance upon Illinois?

Mr. Periam—I do not know. I simply state this fact. I hope, sir, that this matter will continue to be brought up before our body, until we get a radical change in industrial education. If our students go there with a full knowledge of the classics, so much the better. But give them so much of chemistry as will enable them to understand the composition of the soil, so much of botany as will enable them to understand the structure of plants, so much of medicine as to understand the diseases of their stock.

Mr. Shepherd—I want to talk some on this subject. I believe it is well to hear all that can be said for or against a subject, and I think it is well to spend our time in long and patient hearing on this subject. I went to Bunker Hill last time to ventilate this subject. I came here, and waited patiently, and now I do not know how to say what I should on this subject. Well, sir, I was one of those who aided in eliminating the idea that has brought the agricultural and mechanical education of the people to be considered a great national matter. I gloried in its

attaining some position. Notwithstanding the popularity of the question, I have received as much mean treatment for doing this as I have done for being an abolitionist. I have been contemned and derided for advocating this—for telling the people to come out and say what they need to know. Not what a classical man would love to teach them, but leaving many of these things, when the limit of three score years and ten does not allow a man to spend ten or fifteen years in classics, and then set about digging in the dirt and doing all these things; he will have been so much engaged in acquiring knowledge that is not necessary for him, that he does not fall to the other properly. The lectures that we have heard here, at the same time that they have demonstrated that the understanding of the laws of light, and vegetable growth, and social intercourse, are imperative, show clearly that a classical knowledge, great and good as it is esteemed by many of our eminent men, has no tendency to develop this knowledge. Why has it not, in the two thousand years that it has gone on, spread out a knowledge of agriculture or the mechanic arts, as more important than anything that has ever been known? Why is it that it does not do this? I do not care how classical your education—if the farmers and machinists stop, we are gone. It is imperative that we have our own farmers educated in these things. Look at the productions of the soil: wheat has gone down fifty per cent, corn nearly in the same ratio. I remember the time when we could go next summer and reap 30 to 50 bushels per acre with much more certainty than we can now. We use up our fields and go further west, instead of improving our land by scientific farming. How much further west will you go? One more State to the southwest, and we get to the verge of civilization. At the present rate of progress in destroying our soil, in less than 75 years the question will be: Where shall we get bread to put in our mouths? The Almighty did not see fit to make another Mississippi valley in any part of the world. If we despoil this territory, woe be to us.

Notwithstanding the projectors of this scheme might be poor uninstructed dunces, they cast about and they thought we ought to have such knowledge of geology as was eliminated by the professors here the other

day, that we ought to know something about botany. They found that there was nothing known—that we had first to begin and build up a knowledge of these facts by long continued reiteration, and a lifetime would not be long enough to meet the matter successfully.

Now we ask no place of honor or profit about it—we hope to see and know, and let those who come after us know, that their advantages and future prosperity here will be better and more respectfully treated than we have been.

Dr. Hull—I move that the resolution be laid on the table.

Mr. Baldwin—I have been one of those who thought the plan pursued not the best, but on investigation last week, I am satisfied that the course pursued is much better than it has been, and that the course pursued by the trustees is deserving of a good deal of charity, because they had no data by which they could be governed. I want it to be just such as father Shepherd desires it to be.

Mr. Shepherd—I do not impeach any of the trustees; that is far from my thought.

The question being on Dr. Hull's motion to lay the resolution on the table, it was carried.

DETERIORATION OF THE APPLE.

Mr. Flagg read a letter from Robert Manning, of Salem, Mass. :

SALEM, December 8, 1869. •

MY DEAR SIR:—You ask my views on the causes of the failure of the apple in the older States, and though I have had but little time to give to the subject, I lay before you such thoughts as have occurred to me, in the hope that they may prove a small contribution to a full understanding of the cause, and the discovery of an effectual remedy.

Though there are men who boldly deny any such deterioration, I think an overwhelming majority of orchardists will justify you in assuming it. It appears to me that the first thing to be done is to define, if possible, exactly wherein this deterioration consists, and that if we could agree upon this point, a great and necessary step would be gained towards ascertaining the cause.

So far as I am aware, it is not asserted by any one that the young trees in the nursery are any less healthy or vigorous, or that the raising of them is attended with any more difficulty than heretofore. Nor do I know that the trees when planted in orchards exhibit marks of decay, except it may be with a few varieties. The deter-

rioration appears to be confined to the fruit, and here I may particularly specify: 1st, A greater liability to the attacks of fungi of different kinds; 2d, a want of fairness—an outside knurliness, accompanied by hard concretions within; and, 3d, where no unsoundness can be discerned by the eye there appears a tendency to earlier ripening, or as is more commonly stated, “the apple don’t keep,” indicating a change in the constitution or “make up” of the fruit. I confess that my ideas on this point are not so clear but that I find difficulty in expressing them with precision, but I think many others must have noticed the same changes. I know of some who have—and who will understand what I mean. Connected with this appears to be the change before mentioned in the texture of the skin, rendering it more liable to the attacks of fungi.

There is no doubt that with careful cultivation, as good apples, to all appearances, can be grown now and here as ever could be grown any where, but they no longer have that almost spontaneous growth of former times, when trees in swarded pastures, entirely neglected and abandoned to the mercies of the caterpillar and borer, and only visited annually in the autumn for harvesting, yet yielded a marvelous abundance of sound, fair fruit, never ripening prematurely. And it is to be observed that the change in the “make up” of the fruit is found not only in that from neglected trees, but perhaps even more in that under the highest cultivation, as if the fertilizers used had warmed up the soil so as to produce a similar effect to that caused by a warm sandy soil, as compared with a strong loam or clay.

Now, what is the cause of this deterioration? I do not think it can be laid to insects. With one or two exceptions, it is questionable whether there has been any increase of insects within the last fifty or even one hundred years. About seventy years since the canker worm prevailed in many parts of New England, and appears to have been quite as destructive as at present. Orchards were entirely defoliated, and for several years the crop of apples was much diminished or entirely cut off by these insects. It is believed that very little was done to check their ravages, but they were finally destroyed in the larval state by a June frost, and their extermination was literally complete. For more than half a century following the canker worm was so rarely seen that on its re-appearance it was scarcely recognized. The borer, codling moth, tent and autumn caterpillars, are no new enemies of the apple, and can scarcely have aided in the work of deterioration. The last two are sufficiently disgusting, and I have spent a good deal of time in destroying both, but I have never known any permanent injury to result from them when looked after to any reasonable extent. The borer undoubtedly has inflicted lasting injury on trees, and, perhaps, along with other unfavorable influences, destroyed their lives, but I do not think it can have had generally a pernicious effect on the fruit. So also the canker worm, when allowed to continue its ravages for a series of years, stripping the trees of their foliage and forcing them into late growth in the attempt to renew it, has, especially when the trees were allowed to stand in grass ground and unmanured, caused the death of many trees, but the deterioration of the apple crop is far more general than the spread of the canker worm.

The insects before alluded to as forming exceptions to the general rule of non-increase during the present century, are the cur-culio and apple maggot (*trypela pomonella*). (See *American Journal of Horticulture*, Vol. II, p. 338.) The former is too well known to require comment; the latter, whenever it has appeared, is one of the greatest

pests known to the orchardist. The codling moth confines itself to the core and a single passage outwards, but this comparatively minute insect perforates every part of the apple, rendering it a mass of honeycomb as far as structure is concerned. They appear to be especially fond of the portion next the skin, through which their tracks may be observed, and I think they are also partial to sweet apples. I have gathered bushels of summer apples, hard, and, to all appearance, sound, but by the time they were mellowed sufficiently for eating—only a few days—every apple was utterly spoiled by these pestilent insects. I think they were entirely unknown here twenty—certainly thirty—years ago. This view of the non-increase of insects, I should suppose, would hardly apply to New Jersey, for the only insect mentioned by Coxe in 1817 is the caterpillar, to which he devotes a chapter of just twelve lines. It is equally incredible to me that there could have been no other insects there, or that so careful and accurate an observer could have failed to notice them. At any rate, one has only to read Dr. Trimble to feel sure that there are enough there now.

Thus far I had written, when I found my time would not allow me to finish as fully as I had begun; and perhaps you will think I have made my story too long already. I do not think the *stocks* on which trees have been grafted will account for deterioration. *Fungi* and *bitter rot* have greatly injured the fruit, but why some varieties and locations are free from them and others not, is difficult to determine. I have lately examined a collection of apples from Nova Scotia which were so fair that it was a pleasure to behold them. I believe the only one showing any fungus was the Fall Pippin, which had a few spots about as big as a pea, of a grayish, scaly fungus. There were about fifty varieties, many of European origin, and old sorts. On the contrary, apples from Nebraska, no doubt from young and thrifty orchards, were badly infested with a fungus taking the form of little black dots, about the size of a pin-hole. Perhaps, however, the season was exceptional in both these cases. As to *soil*, I doubt whether an orchard planted in newly cleared ground here would produce more perfect fruit than our old gardens, though further information is needed on this point. *Climate and atmospheric changes* have not been observed with sufficient accuracy to judge of their effect. There is great need of investigation of this point, and I think it will be found to have exercised a powerful influence. Much is due to *varieties*. Whatever view may be taken of Knight's theory, or any other theory, the solemn fact remains that varieties do become practically worthless, and must be replaced with new kinds. The Danvers Sweet, which originated in an adjoining town, and was a great favorite there, had, a dozen years ago or more, so far degenerated that the farmers reluctantly grafted over their trees. And this deterioration is not confined to fruit, but is common to flowers and vegetables, and is not local, but is, or will be, common to all parts of the country.

DAMAGED OSAGE ORANGE PLANTS.

Mr. Daggy—I would like to call the attention of the meeting to the damage of the Osage Orange by the frost.

Dr. Hull—You will see that that was overtaken by the force of extreme cold when it was still growing, and it caused the bark to burst.

STANDING COMMITTEES.

Mr. Flagg announced the list of Standing Committees, as follows

Meteorology—Jas. W. Tollman, W. M. Baker, John H. Tice.

Geology and Soils—J. Shaw, W. F. Bliss, H. C. Freeman.

Botany and Vegetable Physiology—H. H. McAfee, T. J. Burrill, Geo. Vasey.

Entomology—Wm. Le Baron, C. V. Riley, T. A. E. Holcomb.

Ornithology—J. Periam, G. W. Minier, J. E. Starr.

Ornamental and Timber Trees—Samuel Edwards, J. W. Fell, A. M. Brown.

Fruit Packages—H. D. Emery, E. A. Riehl, P. R. Wright.

Testing New Varieties—1. J. W. Cochran; 2. Samuel Edwards; 3. D. B. Wier; 4. M. L. Dunklap; 5. B. Pullen; 6. H. J. Hyde; 7. P. R. Wright.

Ad Interim—J. W. Cochran, D. B. Wier, Parker Earle.

REPORTS OF COMMITTEES.

Mr. Bryant, Jr., presented Report of Committee on Apples Exhibited, which was adopted:

The Committee on Apples would beg leave to report an unusually fine display of fruit on exhibition, one that would have done credit to former years, before the ravages of the codling moth and curculio had become so prevalent.

Mr. A. C. Hammond, of Warsaw, made the largest exhibition—41 varieties, finely grown and correctly labeled; among them, one variety, called Monte Bello, of great promise.

S. G. Minkler showed 10 varieties of very fine specimens.

A. Bryant & Son had 10 varieties on exhibition; among them, the Jonathan Broadwell.

Dr. John Paul showed specimens of 9 varieties of very splendid apples, grown by Gibbons Parry, M. D., of Ohio. One of the most showy collections on exhibition.

Nickajack, from California, attracted universal attention by its smooth, highly polished appearance; also, Broadwell and W. S. Paradise, shown by Parker Earle.

Cullasaga—Sparks' Late and Terril's Late, long-keeping Southern varieties, were on exhibition.

Several other small lots of fine fruit that the committee did not learn the names of the exhibitors, were worthy of mention.

There were several lots of seedling apples, exhibited by different parties, that seem to promise well, some having unusually good points.

Two varieties of seedlings, shown by W. T. Nelson, Wilmington; one, a long-keeping sweet apple, which if as good as it promises, will be a great acquisition.

D. F. Kinney, Rock Island, exhibits a late winter apple of fine flavor, and apparently a long keeper.

E. C. Hathaway, Ottawa, Ill., shows two or three varieties of seedlings, that seem worthy of further attention.

A. BRYANT JR.,	} Committee on Apples.
G. E. KIMBALL,	
D. F. KINNEY,	
S. G. MINKLER,	

Mr. Holcombe presented the report of the committee on final resolutions, which was adopted.

Your committee beg leave to offer the following resolutions:

Resolved, That the increased attendance at this meeting evidences a zeal in the cause of Horticulture which is pleasant to ourselves, and will be profitable to the State of Illinois; and we hope it will continue until the society shall embrace within its membership all the horticulturists of the State.

Resolved, That the thanks of this society are due to the citizens of Ottawa, for their kind and generous hospitality, which will be long remembered by every member of this society; to the Chicago, Rock Island and Pacific railroad, Chicago, Burlington and Quincy railroad, the Illinois Central, and Chicago, Alton and Saint Louis railroad, for their liberality in returning members at reduced rates; to the retiring officers, for their able and faithful services to the society, and especially to Hon. W. C. Flagg, who as secretary of the society has so ably edited its proceedings, and contributed in so many ways to the advancement of the science and art of horticulture. Thanks are also due to the Chicago daily papers, and to the various horticultural papers of this and adjoining States, whose reporters have diligently attended to spreading the doings of this society before the world.

Resolved, That we will spare no pains, as members of the most important horticultural society of the great west, to disseminate the principles of the elevating science of horticulture.

T. A. E. HOLCOMB,
A. BRYANT, JR.,
MARK MILLER.

Many thanks are also due to Major Taylor, clerk of the supreme court, for the use of the court room in which the session has been held.

Mr. Brown offered the following resolution, which was adopted:

Resolved, That the interests of horticulture throughout our State demand that systematic and persistent efforts shall be made to extend among the masses of the people, and especially in the rural districts, the knowledge of the general principles of tree and fruit culture, and the means of defending trees and fruits from insect enemies and common diseases.

Resolved, That the plan of schoolhouse lectures, which has proved so effective in spreading political and other information among the people, is equally available in the cause of horticulture and agriculture, and that we recommend to the members of this society to secure the delivery of familiar lectures or talks on horticulture, at the several schoolhouses in their respective neighborhoods.

Mr. Emery submitted a report of committee on fruit packages:

FRUIT PACKAGES.

There has been little noticeably new on the subject of fruit packages. The large mass of peaches and pears from a distance have reached the Chicago market in the usual slatted boxes, which are in my mind the worst possible form of package, the

edges of the slats almost invariably injuring and bruising a large proportion of the fruit. The round package with smooth inside is much more desirable: for instance the slatted basket; but the carrying of these packages by railroad cannot be properly done until the transportation companies will make the necessary arrangement of cars for packing so as to be protected from injury from being piled more than one tier high. The experiment of bringing fruit from California has been tried the past season, some car loads having come through in excellent condition, comprising pears, peaches and grapes. The size and shape of the first shipments are now considered faulty, and the size of packages for the larger fruits now thought best are boxes of convenient size for handling, not to exceed eight inches in depth, and that for grapes not to exceed four inches in depth. As the *condition* in which fruit reaches market has much to do with the profits of the business, it is evident that more attention can profitably be given to the subject, always packing so as not to be injured by irregularities of package, and remembering that neatness and taste in the package always has a good effect in the pocket.

H. D. EMERY.

Mr. Flagg offered a resolution, which was adopted, and at his request added to the final resolutions. [This resolution, which was mislaid, was a vote of thanks to Messrs. Barry and Meehan.]

The President—It is proper for me to mention that Mr. Barry was written to to come here, and he has declined to accept any compensation for it. He has shown great generosity in coming here, and I know that every member of the society will return him thanks for it.

On motion of Mr. Flagg, members of the society attending the meetings of the horticultural societies of other States were authorized to act as delegates from this.

After brief congratulatory addresses from Mr. Murtfeldt and Mr. Periam—

The President said: Allow me to express my sincere thanks for the good attention and order which have been shown. Of course, toward the final break-up, we always expect to have a little confusion. That, however, is nothing, and I feel thankful for the respect and good feeling which has been manifested.

Mr. Flagg—I move that we do now adjourn, *sine die*.

The motion prevailed, and the society adjourned.

REPORTS, ETC., RECEIVED AFTER THE MEETING.

VICE PRESIDENT'S REPORT OF 11TH DISTRICT.

The large extent of territory which includes the 11th District, together with my absence at the East during the late autumn, precludes my furnishing a report of any but a small part of the District, and that of my own locality only.

The season has been a singular one. The spring was backward and continued rains delayed plowing and planting. We were not, however, troubled with such excessive rains as were experienced in a more Northern portion of the State during the summer.

Perhaps it would not be out of order to say something in reference to the success of the fruit growers' operations in this vicinity (Marion county) during the past season. I am the more inclined to do this, as the whole matter is ready furnished to my hand, in the shape of a letter written by our President and published in the *Western Rural*, who, from his own experience and knowledge, is so much better qualified to give a reliable statement, that I shall offer no apology for appropriating it :

* * * " We have had an abundant crop of all-kinds of fruit grown here, except peaches. The loss of this crop is not so much felt as formerly. The more hardy fruits are coming into profitable bearing. Our apple crop I do not think could be excelled either for quantity or quality. The early and severe cold caught many on the trees, and rendered them worthless except for cider. Pears were a full crop, but rather under size on account, I think, of overbearing. We have much to learn here about the management of this fruit, if we wish to obtain fine fruit and preserve the trees. Over bearing is against both. Thinning out must be resorted to. A better knowledge of the time to gather this fruit, and more careful handling, will add much to the net profits of the producer.

" Although we did not have a full crop of peaches, yet a great many have been shipped from this place and points near by. A few orchards have borne full crops of very fine fruits; nearly all had more or less fruit, there being but very few entire failures. All cherry trees were loaded with fruit. The Early May variety is almost exclusively grown here. The weather during the ripening season was very unfavorable, and they rotted badly. Grapes, a full crop, but damaged much by rot; strawberries, raspberries, gooseberries and currants, all full crops. Prices obtained were generally satisfactory; so you see we have not much to complain of.

" The most gratifying news I have to chronicle is our comparative escape from the depredations of insects; even the birds that usually take the lion's share of our cherries passed us by unmolested. Curculios were not near so numerous as last year. Codling moths have done us but little damage. Last year it was almost impossible to find a sound peach or apple. This argues well for the future. A new insect, to us here, has appeared on our strawberries for the first time the past season, damaging the crop very much. It resembles somewhat the chinch bug, so destructive to our wheat and corn, and judging from the peculiar odor they emit on being mashed, should think

them very nearly related. Some claim that they are of a different species altogether. Whether this be so or not, those interested in the cultivation of the strawberry are anxiously looking forward to another season to see if they are to continue their depredations. I observe much less of the pear and apple blight than formerly.

“The correctness of the opinion expressed by Dr. Hull, our State Horticulturist, that the spur blight on our apple trees (especially the Wine Sap variety) and the deformed and imperfect fruit, were occasioned by the apple tree aphid, is about to be demonstrated. There are no eggs of this insect to be found on the trees at this date; and I hardly think there will be any deposited after this. Should this prove true, and the Doctor’s opinion correct, we will have no spur blight next season. Last fall, our trees, at this time, were lined with the eggs of this insect. In the spring, as soon as the buds began to push out, they hatched apparently as by magic, and covered every shoot and fruit bud on the tree. I notice that this blight is spreading more and more to other varieties than the Wine Sap; Rome Beauty, Red Baldwin, and others are becoming badly affected with it. Fruit orchards generally promise well for next season.

“B. PULLEN.”

Dr. N. W. Abbott, who owns a large farm near Kimmunity, in Marion county, has sent me the following statement in reference to his orchard, manner of cultivation, varieties of fruit, productiveness, &c.:

LETTER FROM DR. N. W. ABBOTT.

* * * In relation to my orchard, I have to say, that at the time I bought the farm, there was a *small* orchard of *large* trees, several of which are the large Romanite. The trees are fifteen to eighteen inches in diameter. They bear annually large and fine crops. I generally gather about forty bushels from each tree. There is never anything the matter with the large Romanite.

“I have set on the farm about 1,500 apple trees since 1862. Most of them are now in bearing. My manner of cultivation is as follows: I plow a ridge by back furrowing. I start with the ‘Peiler plow,’ which consists of two plows on one beam; one following the furrow of the other. It plows a furrow twelve to fourteen inches in depth. It requires four heavy horses. I plowed a space of some eight feet in width. In the center of this I set my trees, twenty-five feet apart each way. I might tell about my method of setting, &c., but will not, as that subject has been discussed so often. I cultivate corn for the first five years between the rows.

“My trees have grown finely. The Willow Twigs have so far done better than any other variety, not only as to growth, but as to bearing qualities. My Willow Twigs have for the last three years been loaded down with large, fine-looking apples, of quite uniform size. They keep well until June or July. The Snow apple has been next to this in productiveness. It is a fine apple in its season (fall). The Fall Pearmain has done well with me. It is a splendid apple. The Yellow Newtown Pippin is slow in coming into bearing, but is a fine, showy apple when you get it. The Yellow Bellefleur is a shy bearer with me. I have some trees fifteen years old, bearing very sparsely good, first-rate apples. One cannot afford to grow them for sale. On the contrary, the Maiden’s Blush is a good bearer, and there is no apple that brings a better price in Chicago. It is not a first-rate eating apple, but looks well and cooks

well. Like the Ben Davis, it will do to sell to those who do not know what a good apple is.

“My manner of protecting young apple trees from rabbits is the oiling process with crude oil. It is no protection against field mice. Cleaning the weeds, grass and other rubbish from about the trees will protect them from the ravages of mice. I protect from depredations of the borer by rubbing the trees in May with common bar soap. It is effectual.

“My peach orchard consisted originally of three thousand trees. Some died in consequence of the wet winter of 1866 and 1867. My cultivation had been too level for that unusually wet winter. Three-fourths of my peach trees are still living, and are rallying from the shock.

“I have some six hundred Early Richmond and some sweet cherries; all of which seem to do well so far. My pears blight, I think, for want of care.

“N. W. ABBOTT.”

The fourth annual meeting of the Centralia Fruit-Growers' Association was held January 1st, 1870, at which time the following persons were elected as officers for the year 1870:

For President—G. L. Brunton.

Vice-President—A. Mitchell.

Secretary—J. W. Fletcher.

Treasurer—T. R. May.

With the exceptions of a few nights in June and July, when the weather was hot, the nights short, and the members busy, our meetings have been fairly attended, the discussions spirited, and the interest well sustained. That they have been of advantage to the members and useful to the public is the opinion of

Yours, respectfully,

J. WARREN FLETCHER.

REPORT OF VICE PRESIDENT 12TH DISTRICT.

MR. PRESIDENT: In making a report for the 12th district, I would first remark that the district is a very large one, having the whole length—north and south—of the counties of Madison, St. Clair, Randolph and Monroe, lying on the Mississippi river and extending eastward to, and a little beyond the Illinois Central railroad, affording a great variety of soils, locations and exposures for horticultural purposes. In some portions of the district, as in Madison, St. Clair and parts of Clinton counties, the severe weather of December last, at the time of our annual meeting at Bunker Hill, proved nearly fatal to the Peach crop; while in Washington county, and especially the eastern part of it, this desirable fruit almost wholly escaped, the yield being large for the number of trees in bearing, and the quality superior, the curculio even not appearing in numbers sufficiently large to cause serious damage. As to horticultural matters in the county of Madison, you are respectfully referred to the proceedings of the Alton Horticultural Society, which will doubtless be incorporated with the doings of this body, and to which I shall not presume to add anything of value or interest. Some portions of the district are so remote from railroad travel—as the counties of Randolph and Monroe, that I have not been able to gather much information horticulturally from

them, even by correspondence. In Clinton county, I am informed, a moderate degree of success has been met with the past season. The apple and pear crops have been very good, while small fruits and vegetables have been unusually abundant, and of superior quality. The general subject of horticulture is receiving more attention than formerly. St. Clair county presents a strange mixture of failures and successes. Peaches, the past season, were almost a total failure. Many cultivators are becoming greatly discouraged as to this fruit. Apples give greater promise of success, but are subject to scab and bitter rot in some varieties. Pears blight, and grapes rot. Notwithstanding all this, progress is made and difficulties overcome. Small fruits thrive with more or less certainty almost everywhere. In Washington county—as in Madison—direct railroad communication with the large towns of the north has developed an interest in horticultural enterprises which, the past season, has been reasonably well rewarded. Insect enemies of various sorts, blight in pears, scab in apples, rot in grapes—all these have been encountered in a greater or less degree, as usual—and yet the average result is fairly encouraging. Washington county has one horticultural society.

All of which is respectfully submitted.

G. WILGUS, V. P. 12th Dist.

WILLOW CULTURE.

The subject of willow culture is one which is deserving of as much investigation and explanation as any other branch of our horticultural or agricultural pursuits. When we consider that about \$250,000 are annually sent to Europe for an article which we can grow here as good, if not better than there, the question very naturally arises, why do we send this amount of money to Europe? and why do we not raise this article of commerce ourselves?

It is the object of the undersigned to answer this question by saying: We can and ought to raise all the willows needed ourselves. The culture of the willow is not only simple, but very profitable; it requires no great capital to start a willowry, and not even the best land we have is required; on the contrary, wet land is not only desirable, but may be reclaimed and improved by planting rows of willows, or alleys of willows, on such wet land, to absorb the superfluous moisture, whereby the adjoining land is put in a condition to produce crops, which otherwise would not grow. But it must not necessarily be wet land; any land that produces corn will produce willows. The average yield per acre is from 3,000 to 4,000 pounds, and the average price from six to fifteen cents per pound.

There are something like forty varieties of willows known to the botanists; about twenty-five are found in our country, and named by Gray as follows, to-wit: 1. *Salix*, Willow Osier. 2. *S. candida*, or Hoary Willow. 3. *S. tristis*, or Dwarf Gray Willow. 4. *S. humilis*, or Low Brush Willow. 5. *S. discolor*, or Glaucons Willow. 6. *S. eriocephala*, or Silky-headed Willow. 7. *S. sericea*, or Silky-leaved Willow. 8. *S. petiolaris*, or Petioled Willow. 9. *S. purpurea*, Purple Willow. 10. *S. cordata*, Heart-leaved Willow. 11. *S. angustata*, Narrow-leaved Willow. 12. *S. rostrata*, Long-beaked Willow. 13. *S. phyllifolia*, Smooth Mountain Willow. 14. *S. alba*, White Willow. 15. *S. fragilis*, or Brittle Willow. 16. *S. nigra*, Black Willow. 17. *S. lucida*, or Shining Willow. 18. *S. babylonica*, or Weeping Willow. 19. *S. longi-*

folia, or Long-leaved Willow. 20. *S. pedicellaris*, or Stalk-fruited Willow. 21. *S. waursi*, or Bearberry Willow. 22. *S. repens*, or Creeping Willow. 23. *S. herbacea*, or Herb-like Willow. 24. *S. viminalis*, Basket Osier. This last is the willow which is deserving our attention, and which I would hereby recommend for general cultivation everywhere, and at least to the extent of the demand for the same.

The next question would naturally be the preparation of the soil, and perhaps it would not be out of place here to give a description as I find it in Johnston's Encyclopaedia, to-wit: "The mode of planting is very simple; it is, first to dig the land from six to twelve inches, and then to prick down cuttings of four years' growth and eighteen inches long, at about three feet distance from each other. The soil may be moor or clay, or any that is low and wet."

Now I will give you my own *modus operandi*: I plow the land as deep as I can, (always bearing in mind the deeper the better), and make it as fine as rolling and harrowing will do it. This is all that is and can be needed by way of preparation of soil. It should be done in the latter part of April or the first days in May, according to the season. Now we are ready for planting, which is done in rows of 30 to 36 inches apart, for the purpose of using a small one-horse cultivator between the rows, the young willowry requiring very clean culture the first year.

The cuttings in one hand, a line having been previously stretched where the rows are to be, we proceed to stick them in the ground about 8 or 12 inches apart; and if the cuttings are kept fresh, and are of good size—about 6 or 8 inches long—and receive sufficient cultivation, 99 out of every 100 are sure to grow, mostly reaching a height of 4 or 5 feet the first season. During the winter or early spring they are cut down to within 3 or 4 inches of the ground, and the cuttings can be used for small baskets, or for the purpose of tying grape vines, roses or the like; they are, however, not so valuable for that purpose as the yellow willow, not being so tough as the latter.

The ground should be again kept clean the second year, as well as ever after, though each succeeding year less and less labor is required. Your willows are cut down the same as the first year, and prepared for market or use. Care must be taken not to cut them after the sap rises, as that will prove injurious to your willow stump or stalk. When cut down they are tied in bundles, and put upright in a pond or brook one or two feet deep in water, so as to make them grow or keep the sap rising, when at any convenient time—especially on clear days—they are taken out, peeled and sun-dried, after which they are ready for market, or can be kept for years in a dry, airy place.

But let us not stop here, with the practical and useful only; but let us rather proceed to the both ornamental and beautiful, by recommending the planting of the *salix Babylonica*, or weeping willow. In my opinion no dooryard is complete if there is not one or more of said trees in it: it is of a rapid growth, a beautiful green, and withal one of our handsomest ornamental trees. Nay more, it might be grown for the purpose of wood, it making the best charcoal in use.

MASCOUTAH, St. Clair Co.

G. C. EISENMAYER.

HORTICULTURAL HISTORY.

EDGAR COUNTY.

This county was represented in the last Transactions of this Society as having a Horticulture, but *that no farther intelligence could be obtained of it*. I propose to *break that silence*, and to enlighten the fraternity a little as to what has been done in that line, in this part of *the Eastern Egypt of Illinois*. I am a native of this county, my life has been devoted to its Horticulture since my earliest recollection, and not the study of the language, by which I may convey that intelligence to others.

The first orchard planted in this county was that planted by Daniel Lane, of Mass., (three miles east of Paris,) in the year 1817, with seedling, yearling apple trees. At that time grafted trees could not be obtained west of Ohio. These seedlings were grown from seed taken from apples brought from Mrs. Vandeburg's orchard, at Vincennes, Indiana, in the fall of 1815—planted at Terre Haute—where Mr. Lane lived two years before he came back to this place.

The original plat contained 178 trees, of which 39 are now living; are in moderate vigor, apparent health, and productive. One-third of these are sound, and look as if they would stand while several generations of men pass away. The largest tree now measures seven feet six inches in circumference one foot from the ground; another six feet nine inches; one six feet four inches. A Golden Willow, at this place, in perfect health, supposed to have been planted about the time the improvement was made, measures eleven feet and six inches around the body, anywhere six feet above ground.

This was a productive orchard, and proved remunerative to the planter by the sale of fruit, until orchards of grafted varieties came into plentiful bearing; after which there was no sale for the seedlings, and he made them into cider. In this he was particularly successful. He possessed a recipe or process by which he prepared the liquid, that it kept in its original purity or sweetness for years, as many yet bear witness. This process was known to him alone; his most intimate friends and acquaintances could not prevail on him to give his management. At his death his family were uninformed as to it.

He used to argue that seedlings were about as good as any, and the most profitable; but when the fine fruit drove his out of the market, (about the year 1842) he abandoned that notion, and the writer, then a boy, was engaged to graft a few hundred seedling stocks that stood in his garden, with which he intended to plant a new orchard, which was done with the best varieties. While thus occupied, he frequently brought out his pitcher and glass of that excellent cider, (to which we did full justice) remarking that the 'Curtis' could beat him with apples, but he guessed he could beat them on cider. The orchard was in grass at my earliest recollection. Martin Housome, the present owner of the place, says it has been thus treated since his knowledge of it.

Although seedling, it has produced three varieties worthy of notice: one a winter sweet apple, (Mrs. Lane's favorite) which she called Pumpkin Sweet. This was taken to Massachusetts by Jas. Dudley as Lane's Sweet, and to the north of this State by L. Montague as Illinois Pumpkin Sweet. As fruited upon the original tree, it was very delicious; but as far as I can learn, grown elsewhere, fails in its fine flavor. Another named by my father, Lane's Redstreak; very large, bright red, striped dark red, beautiful and first-rate; season of Fall Pippin, and much more productive; compares favorably with the best autumn varieties. There is also another variety, a late keeper; tree of great size, 50 years old, *without a blemish on it—an immense annual bearer*. Fruit large and always smooth, of very superior quality.

Augustine Boland, (from Connecticut) who now lives on the east border of this prairie, (79 years of age, having lived here 52 years) was one of the first two settlers, planted the second orchard, and taught the first school in this county. He planted his first orchard on the farm now owned by M. Step, and disposing of his claim, in 1824, planted another of 140 trees, where G. W. Kinble now lives. From these, in 1829, he gathered five bushels of apples, and the following season the orchard produced considerable of fruit for market.

He gives an interesting account of those early times, the perils and privations of the settlers, their energy and determination. They used husk collars, linn bark traces, truck wheel wagons, and wooden moldboard plows. The snakes were so numerous that they had to plow furrows across the prairie to the schoolhouse, to make paths for the children to get to school. So rapid was the growth of the settlement, that in 1823 the first school was attended by from thirty to forty pupils. The prairie wolves were in force, and bears in less numbers. The panther was also frequently seen in the great forest that extends from this prairie to the Wabash river, and like the wolf carried off pigs and lambs.

The first nursery in this county, and also *in the State*, was that planted by my father, Joseph Curtis, in the spring of 1818, on the north arm of the grand prairie, four miles east of Paris.* He was a native of New Jersey, removed with his father when a boy to Manchester, Adams county, Ohio, where he lived some fifteen years. Made an experimental nursery, devoting much of his time to fruit raising and *experimenting in a horticultural way*: he raised new varieties from seed, collected and tested—both in orchard and nursery—the best varieties that could then be procured. He grafted and budded on stocks above ground; but not having as many as desired he thought: Why not graft on pieces of roots? and trying it, found that they did well. So far as he knew this was an invention of his own, which he continued to practice many years; and also to graft small stocks at the collar by tongue or whip grafting, and large ones by cleft grafting. Neither of these methods 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 my father, 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

*John Smith, of Greenville, Bond county, planted one in same year. (Gardener's Monthly, Vol. 3, p. 112.) Also, Wm. B. Archer same year, in Clark county.—SECRETARY.

the lower part of the scion to put out roots freely. These grew stronger than the seedlings below, and were esteemed genuine and preserved for multiplying the variety. Pear grafts, thus managed, did particularly well; and in three years made good sale trees, on their own roots. Early in April these roots were planted in borders, six feet wide, by laying them flat on the surface full length across the border, one foot apart and covered with three inches of soil. The following spring to be 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 get the genuine roots. A supply once obtained, they were cut in pieces four inches in length, and planted in nursery rows, upright, with the top of the root barely above ground. He believed that trees on their own roots were the most valuable, and grown with the least labor.

The following are the varieties which he collected in Ohio, New Jersey and various other States, and brought to Fort Harrison on the Wabash, in the year 1816, and planted where they made two seasons' growth; and in the autumn of 1817 they were removed to this place, and planted in nursery and orchard.

Winter Apples—Jannette, (or Neverfail), Yellow Pippin, Milam, Smith Cider, Sweet Rhode Island Greening, Winter Queen, Hannah, Newtown Pippin, Newtown Spitzenberg, Large Romanite, Little Romanite, Winter White, Black Gillyflower, Ladyfinger, Hard Red, Shaker Red, and Priestly. *Autumn*—Rambo, Fall Winesap, Fall Pippin, Harper's Sweet and Taylor. *Summer*—Sweet Harvest, Early Pennoek, Sour Harvest.

Pear—Pound, Early Sugar, Mammoth, (or Miller), from the great Mammoth Pear tree, near Vincennes, Indiana; and the Harvest, (or Large Bell).

Cherry—Black Morello and Virginia red, a dwarfish heart-shaped sort, of the Morello class.

Quince—Orange and Italian.

Plum—Large Damson.

Peach—Large Yellow Free.

Grape—White Cape and Black Cape.

These varieties composed the first orchard of grafted fruits planted in Illinois. After the lapse of half a century, not more than ten per cent. of these are living. The largest tree, the Edgar Russet, measures eight feet and five inches in circumference one foot from the ground; is forty-five feet high, with diameter of the head sixty-one feet. Another tree eight feet and two inches, diameter of head sixty feet. These two trees, I presume, are the largest fruit trees in this county. The original Bellefleur Pippin six feet four inches, diameter of head fifty feet. A Hannah apple tree, six feet seven inches; Sweet R. I. Greening, five feet; Newtown Pippin, five feet three inches; Romanite, six feet three inches; Smith Cider, five feet three inches; Jennett, four feet nine inches. A large proportion of the trees living are sound and in lively condition.

The Milam has been planted more extensively in the orchards of this county than any other. There are to-day more bearing trees of it than any other six varieties. It is a staple production; there are no orchards without it, and although a tender tree, there are many orchards of from one to ten acres, and not a tree but Milams. It is as popular here among apples as the Bartlett is among pears. This fruit has been so abundant that I have seen them cribbed like corn, in rail pens, by the thousand bushels in a single orchard, with no other protection than a lining of straw and covering of

boards: and to keep through winter in this manner with the trifling loss by freezing of a few inches on the out edge. Some of the learned nurserymen of the West have kindly suggested that the Milam was not a very good apple; but the farmers in old Edgar continue to grow and to appreciate it as one of the indispensable varieties.

The Pear.—Strange to tell that the pear, the most delicious of all fruits, should have been neglected as it has in this country to the present time. When I was a boy there could be seen on most of the old farms a few large bearing trees of the Pound Pear, Sugar, Great Mammoth, or seedling pear trees. But on a recent tour of three days, in examining these old orchards, I find that not one of them are not living. (The same may be said of the first generation of Morello Cherry trees.) A tree of the Pound Pear, planted by F. Freidy, west of Paris, some forty years ago, did good service until the last year; it was broken down in a storm. The largest pear trees that I can find in these parts are in an orchard of 176 trees, planted by my father in 1840, for the express purpose of proving the value of the various varieties. At that time there had not been a half dozen sorts in bearing in the county. A part of these trees were root-grafted, most of them stalk worked, four feet high, when in the nursery; a few were seedling stocks planted in the orchard, and budded in the limbs a few years later. Over fifty varieties were planted, most of which came into bearing; many of them finally blighted, or otherwise died back to the stalk, and have grown up seedling. About three-fourths of the original trees planted are yet living, in good bearing condition, from twenty to thirty feet high. The following are the *only survivors* except the seedlings: White Doyenne, Flemish Beauty, Urbaniste, Bartlett, Julienne, Colmar's Van Mons, and Winter Baking. These have not *only resisted the blight*, but have *withstood the terrible winter of 1855-56*, in which the *mercury fell to thirty degrees below zero* (the lowest degree ever felt in this county—so said the oldest inhabitant at that time), which proved so destructive to all tender trees, and to many previously thought to be hardy. They have been as *free from blight and other diseases as the hardiest apple trees*, and have failed in but three crops in the last twenty years. The largest tree, the White Doyenne, measures in girth three feet six inches; a Bartlett, three feet five inches; a Colmar's Van Mons, three feet three inches; an Urbaniste, two feet seven inches, and the largest seedling tree, three feet five inches. This orchard was cultivated for six to eight years, and then put down in grass, and has not been cultivated but one season since. The White Doyenne is pre-eminently hardy; its close, firm and well-matured growth has been entirely free from blight; a great bearer, fruit scarcely surpassed in quality, but not as large as desirable for market. On dwarf trees, for a few years past, this variety has been affected considerably with scab and cracking of the fruit: but on *standard trees invariably smooth and fine*. The Bartlett, a young, full and annual bearer of large and handsome fruit, has proven to be the most valuable, though the Flemish Beauty, nearly as large, hardier, freer from blight, superior in quality, and scarcely less productive, is a strong rival of that variety for the popular favor.

Elijah Bacon brought thirty varieties of pear from New York, and planted on his farm, in the north of this county, in 1845. These were (every tree) killed, by the severe winter above named, except the Flemish Beauty, and they were injured, but produced abundant crops, many years later, of as fine pears as I have ever had the pleasure of examining.

Among the pioneers of this county, who settled on the north arm of the Grand Prairie, I would also name R. Blackman, Elijah Austin, Col. J. Mayo, John Stratten, who came in 1818; and Col. J. M. Blackburn, Gen. J. Sandford, Wm. Murphy, Laban Burr and E. Pursell, who arrived in 1819; all of whom planted orchards. That of Col. Blackburn was one of the best of these *early orchards*, being planted of grafted varieties and suckers from trees that had been known to produce good fruit. He was the *originator* of the *Red Hughes' Crab*, from seed of the Hughes' Virginia Crab, which is larger and superior to the old sort, and decidedly the best cider apple known in this country.

Paris and Vicinity.—The city of Paris was laid off in 1823, by Samuel Vance, who planted an orchard the following spring of seedling trees, brought from Wm. Archer's nursery, in Clark county. In this orchard originated the Vance's Harvest, a popular midsummer apple, which has been extensively disseminated.

Smith Shaw, who settled in 1822 in what is now the east part of Paris, and removed a few years later to the beautiful site where E. P. Shaw now lives, was the first inhabitant of the place. Of the trees and fruits that he planted none remain but a few very large apple trees—the city having extended over the orchard and much of the farm.

Nathaniel Wayne was the first tavern keeper; planted the orchard now in the southwest limits of the city; sold out to the late Gen. M. K. Alexander, who was an ardent amateur Horticulturist. Wm. Means and Adriel Stout, settled in the vicinity of Paris in 1822, and planted orchards in the spring of 1824, of which there are now living some very large trees.

Wm. Shrader, John Shrader, and Joseph Hite, were the first to plant orchards in the southwest part of the county. The *latter* brought the May Cherry from Jefferson county, Ky., in the year 1827, *this being its first introduction into this State*. Tradition says that it was brought from Virginia to Kentucky by a man by the name of Reynolds; and I have no doubt that it is a native of that State; as many of our best fruits are known to be of Southern origin. It was obtained on its own roots, and has proven to be the most valuable cherry yet *thoroughly tested here*. Its great hardiness and value was not known until after the memorable winter of 1855-56, in which almost all other varieties were entirely killed. The May is productive, hardier, and ten days earlier than the Early Richmond.

Grape.—The Black and White Cape were the only varieties cultivated here till 1836, when my father introduced the Catawba, Isabella, York, Madeira, and Clinton. These all did well until about the year 1853, when they began to be affected with the rot, except the White Cape, which is yet free from that malady.

Evergreens.—This county has no native evergreens except the Cedar. There was a considerable of a grove of these at what was called the Cedar Cliff, on Bruelitt's Creek, in the northeast part of the county. Many small seedlings were taken from these and planted on the farms by the early settlers, where they have grown into nice shade trees, and make pleasant many a cottage home.

The first evergreens of the finer sorts in this county were planted by my esteemed friend, Elijah Bacon, a quarter of a century ago. His Fir, the Pines, and the Spruce, are of majestic size, and beautiful to behold. His experience of over fifty years, his zeal in the introduction and cultivation of fine fruit, nice trees and shrubs, and his

great liberality in the distribution of seed, buds, and scions, has done a vast deal to *build up the Horticulture* of this part of the State.

In 1852 the Curtis Brothers planted specimen trees of a variety of evergreens in their nursery grounds north of Paris, and began to import and propagate them for sale. These specimens are from 25 to 38 feet in height; the tallest tree is a Balsam Fir, 38 feet high and 37 inches in circumference: the largest one is a White Pine, 37 feet high, and 45 inches in girth.

NURSERIES OF THIS COUNTY.

Joseph Curtis commenced the nursery business here in 1818, and continued in it until 1845. From 1835 to 1840 he received from the Indiana and Ohio nurseries, 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 possessed of far less value than where grown, from whence he obtained them.

Jas. Dudley planted a small nursery in 1820, and continued to propagate trees for some three years, and sold out to Mr. Olmsted, who removed the entire stock to Coles county.

Ebenezer David commenced a nursery on Clay's prairie, in the northeast part of the county, in 1832, and continued up to 1852.

P. D. Elliott was also in the tree trade from about the year 1836 to 1853.

D. S. and B. O. Curtis kept an extensive nursery from 1845 to 1855, when D. S. Curtis withdrew from the business, and your correspondent continued in it until 1868.

I know of but two nurseries at the present time in this county: Wm. B. Caldwell, of Paris, has been engaged in the nursery business here for some nine years. He cultivates a very select list of the leading and most valuable varieties of fruit and ornamental trees, shrubs and plants. He is also extensively engaged in the culture, keeping and sprouting of the Yellow Nansmond Sweet Potato.

D. S. Curtis has returned to the loved avocation of his youth, and has for several years been getting out a large stock of trees and hedge seed on the old home farm, where our father commenced the nursery fifty-two years ago. He cultivates only the best, hardy, most reliable varieties in both fruit and ornamentals. He has had large experience in the tree trade, and acquaintance with varieties adapted to this climate, and now has superior facilities for obtaining every new fruit for propagation as soon as it is known to be of undisputed value.

With these nurseries to select from, I indulge the hope that the farmers and fruit growers of eastern Illinois may at least have the privilege to plant largely of the best quality of home grown trees and plants.

Time and space fails me to tell you of the more recent condition of our horticulture.

PARIS, Ills.

B. O. CURTIS.

REPORT OF ELIJAH BACON.

BLOOMFIELD, Edgar Co., Ills., 30th of the 12th month, 1869.

In the fall of 1844 I brought from my little nursery in Steuben county, New York, a lot of very small grafts chiefly worked on roots, and set them on this, my present farm.

They consisted of several varieties of choice fruit. Apples, fifty varieties, of which I select the following: Duchess of Oldenburg, Maiden's Blush, Rambo, Henry Sweeting, Northern Spy, New Leathercoat, Black Winter Sweeting, Rome Beauty and Jennetting are all hardy, good bearers, saleable and good fruit. Pears, thirty varieties; the Flemish Beauty is my best pear. Peaches, seven varieties; the Early York and Honest John are the best and most salable. Plums, thirty varieties. Cherries, sixteen varieties; the Early May and English May Duke are both hardy and good bearers. In the fall of '46 I commenced setting an apple orchard of twenty acres, planting the trees forty-four feet apart at right angles east and west by north and south. Many of my trees, both stationery and nursery, were destroyed by the rabbits, early frosts and severe winters; so that I now have but few trees of my first setting. The present year however, I had of early and late near one thousand bushels of choice apples. Yesterday I measured more than one dozen apple trees (mostly of my first setting), measuring girth, one foot above the ground, forty-two to fifty inches. They branch out from the main stem three to four and a half feet above ground with spreading, well-balanced tops, about seventeen to twenty feet in height, having a good show of health and vigor. My pears, peaches and plums have not succeeded very well; indeed, my plums are a total failure, and most of my cherries have also failed; and as for pears and peaches I cannot loudly boast without a blush. My quinces have not been very healthy or productive, but my grapes, currants, gooseberries, and raspberries are unexceptionable, and taking my fruit and ornamental trees as a whole, I have no cause of complaint, but much cause of ascription of praise and thanksgiving to the Author of all Good. At the time of my beginning here I had knowledge of but one orchard of much consequence in the north part of this county. That belonged to John Somerville, and was beginning to bear. It is now the property of that worthy gentleman, Charles T. Caraway. It is situated about two miles east southeast of me. Orchards of promise have since sprung up, and are springing up on every side of me. In the fall of '44 I also brought both deciduous and evergreen ornamental trees. They were small—ten to fifteen inches high; and, for aught I know, evergreens were first introduced into this county by me, but now they are everywhere to be seen. My white pines now measure (one foot above ground) thirty-three to forty-five inches in circumference and forty-five feet in height; Norway pines twenty-five to thirty-two inches girth, forty-five feet high; fir balsam thirty to thirty-five inches, and fifty feet high; European weeping spruce forty to forty-five inches in girth, and fifty feet high; red cedar thirty-five to forty-two inches, and forty-five feet high; larch, a deciduous pine, twenty-five to thirty inches, forty-five feet high, very durable timber; Chinese silverleaf, raised from slips and cuttings, of nineteen to twenty-two years' growth, measure sixty-five to one hundred inches in girth and fifty to seventy-five feet high. It is valued for shades and summer wood. I am having some logs sawed, and think it will make good lumber for many uses, if kept dry. Used for posts set in the ground it will not last more than five years.

Respectfully,

ELIJAH BACON.

P. S.—In hastily sketching the foregoing, I forgot to state that I was a frontier settler for some two or three years, all north of me in this county being an expanse of virgin prairie, abundantly stocked with wild flowers, grasses and venomous snakes; but now much of it is in a good state of agricultural and horticultural husbandry. I

also forgot to say that two eminent pioneer settlers near Bloomfield (Elisha Holt and John McKee), had at the time of my arrival some apple, peach and cherry trees beginning to bear fruit, but many of their trees by severe winter, want of care, and other contingencies, have since become unfruitful and ultimately perished. E. B.

LOGAN COUNTY.

As regards the early orchards, nurseries, etc., in this section, my father, Jabez Capps, who settled in Sangamon county about fifty years ago, informs me that previous to that time he lived a short time in St. Louis, and while there he became acquainted with Governors Soulard and Chouteau, the old Spanish and French Governors, and that he brought from their gardens a few currant and grape cuttings and other things, and planted in his garden. This, he thinks, was the first effort towards Horticulture made in this part of Illinois. He afterwards removed to Springfield, being one of the first settlers of the place, and had some choice fruits for those days in his garden. He got scions and plants from St. Louis, and from older settlements in Illinois. The grape which he introduced, he thinks, was the same as the Isabella. The rose bugs were so troublesome that up to 1850 it was a rare thing to see a bunch of cultivated grapes. We never see a rose bug now; the race seems to have become extinct.

My maternal grandfather, Oliver Stafford planted seed of apples and damson plums which he brought from the shores of Lake Champlain about the year 1825, and raised an orchard from them; most of the fruit was inferior.

A Mr. Dryer had a small nursery in Springfield where Armstrong's woolen mills now stand, from about the year 1830 to 1837. My father bought out the remnant of his stock. During those years the Springfield market was supplied with apples principally from Smith's apple orchard in Bond county.

A Mr. Lapham also had a small nursery on Friend's Creek; he got his scions of my father; he used to peddle his stock through the country. My father says he has seen him out budding his stock using at the same time a chair and umbrella. This county was then part of Sangamon. My father was the first settler at this place in the year 1836; he acted for a short time as agent for Prince's nursery, of Flushing, N. Y., and ever since that time has done a little at the nursery business himself; we now have about thirty acres of nursery.

The oldest orchards that I have heard of are two orchards of seedling apples planted about the year 1826 or 1827, by John Downing and Jeremiah Birks. John Van Devender and Robert Downing planted seedling orchards in 1830, and about the same time Carter Seroggins planted an orchard of grafted apple trees, mostly Pennock, Gilpin, Fameuse, Janet and Horse Apple; and Wm. McGraw planted some apple trees (that he brought from Kentucky in his saddle bags) in the old town of Postville. The fruit of the old seedling orchards was very indifferent. During the past twenty-five years we have introduced many choice varieties of fruit into this county.

C. S. CAPPS.

CORRESPONDENCE.

ARENZVILLE, December 6, 1869.

DEAR SIR: Some time ago you requested me to give my experience in rearing new varieties of grapes from seeds, but I believe you will have to excuse me for not complying with your request, for two reasons: The first reason is that I do not consider myself enough master of the English language to undertake the task of writing an article for such an intelligent body of men as the Illinois Horticultural Society; and the second reason is, that I must have a few more years' experience with most of my seedlings before I can form a definite opinion about any of them. I will, however, say this much to you individually: that my present experiments are almost made exclusively with the Creveling, of which I have some three hundred seedlings, besides a few of other kinds. My former experiments were mostly made with Concords, but the seedlings from it that I had in bearing had all, more or less, that flat, foxy, Concord flavor, which some people delight to call rich and aromatic; as in the case of the Martha, which is praised almost into the heavens, of which I had the pleasure of fruiting twice, and which is probably a little sweeter and also a little more "aromatic" than the Concord, but can not, in my estimation bear comparison with the Delaware and Creveling, my two favorites. I have this fall planted about one pound of seeds again, of the following varieties: Delaware, Creveling, Cynthiana, Louisiana, Rulander, and a few seeds of the Riesling, a German grape which I fruited in the open air.

As to other fruits, I have not much personal experience. I will, however, mention a cherry called the Belle Magnifique, which I think valuable, if grafted on the Morello stock. I grafted a few trees at my former place, (at Beardstown), which has never failed since the grafted top was three years old to produce enormously. It blossoms two weeks later than almost any other cherry, which made it bear here, in 1868, a full crop; while the Early Richmond and the common Morello were a perfect failure, because they were in full bloom when we had a hard frost. There is another cherry here, without a name, that I am propagating a few from. It also belongs to the Duke family, is almost as sweet as a Heart cherry, and is a good bearer. From description that I have of the Belle de Choisey I would pronounce it that, but is more productive, which they claim is not the case with the Belle de Choisey.

Of Strawberries I tried over fifty varieties, including Jucundas, Golden Queens, Agriculturist, Ida, Brooklyn Scarlet, Rippowan, Durand's, &c., &c.; but my three best are the Green Prolific, French Seedling and Wilson Albany.

Yours truly,

HENRY TIEMEYER.

DEAR SIR:—You ask for my experience with individual varieties of apples, and I will attempt to give the facts with pleasure, premising that this northern fruit district is adjacent to the south banks of the Fox river of the North, in 44 degrees north

latitude. The country is as fine a farming section as can be desired, nearly all the lands being from rolling to fine swells and elevated ridges, with scattered hills of considerable extent. This wheat and apple country, with Green Lake county for its center, comprises, perhaps, from 900 to 1,000 sections, nine-tenths of which has good natural drainage, with a strong infusion of available lime in by far the larger portion of both its fine prairies and variable timber soils.

In an orchard set by me on the north slope of a white oak ridge, in 1852, Fall Wine bears well; fruit fair and good; tree a medium grower, and passably hardy. The Fall Pippin, of Philadelphia, is doing finely. The tops of the trees are now fifteen feet across. The tree seems to be hardier than when younger, and now produces paying crops of fair-skinned and magnificent apples. The present owner, Henry Vine, prizes this apple highly. Rhode Island Greening is also doing pretty well, yielding paying crops of unblemished fruit since the trees recovered from the pinching winters of '56 and '57, and the more recent injury inflicted by millions of the cicadæ in the summer of 1863. The bark louse also inflicted a severe check to the same orchard from '64 to '67, but now these oyster-shell sap-suckers are well nigh gone. Esopus Spitzenberg does well as to tree; a medium grower, but hardy, while the apples are the very best of the old winter varieties; but only a few of them. I shall suggest root-pruning to induce fuller bearing, the tree being sufficiently hardy and vigorous in this climate. The Northern Spy are the finest trees, and evidently the most hardy and rapid growers in the orchard. But while large enough to produce two barrels, if fairly loaded, they yielded only three or four bushels each in '69. Root-pruning is here again suggested as a corrective. Three trees of Northern Spy, growing on an adjacent ridge, more fully exposed to wind and weather, bore five barrels to the tree last season; trees same age as shy bearers. There are other varieties of good apples that do well; and also three varieties of pears that bear fair crops in this orchard. But time fails me.

In another orchard northwest of my house, set out also in 1852, and very badly managed for eight or ten years—a part of which is on too low ground, bringing the roots too near a wet subsoil for the best health of the trees—the following facts are established. American Golden Russet, of Barry—the branches interlock at twenty feet between the trees; the tree is vigorous, hardy, and an annual bearer of moderate crops of unblemished and first-quality fruit; and, I may add, this apple is very much grown in this district of country for long keeping. About thirty Yellow Bellefleur trees—more than half of them vigorous and healthy, and their heads interlocking at twenty feet—supply from forty to seventy bushels per year; about half the years bearing well, and then lightly, alternate years. This is a popular and profitable apple hereabouts; and a man, who is a good judge of apples, planted out six or seven hundred of them in a young orchard, three year ago, a couple of miles distant.

In our orchard, setting of 1852, Spitzenberg is a healthy tree, full in the middle, but quite a shy bearer. I will try root-pruning in spring with it. Newtown Pippin exhibits the same medium rate of growth and fair hardiness as Spitzenberg, but is much more productive, only a little spotted. Several trees of Rhode Island Greening, that seem to have taken on a new life since the terrible visitation of cicadæ in 1863, bear abundantly of perfect, large apples. I find there are also a number of bearing Greening trees in other orchards within a few miles. Westfield Seek-no-further is a vigorous tree, and in several years has yielded full crops of fair, unblemished fruit, not nearly as salable as Bellefleur, from not being near so good a cooking apple. Bark

lice attacked one or two trees two years ago, but the vigorous growth last year has defied injury from their suction. Black Detroit is a vigorous growing tree and hardy, but apples only third-rate; still, as M. L. Dunlap says, it sells simply because it is a *red* apple. Hold a red rag before a cock turkey and he will "gobble, gobble." Winter Swaar bears well annually, but the tree is too tender in branch and too weak in the roots to be profitable; in fact, like some other organic things, they are dying out. An apple that tastes like the Cranberry Pippin grows on a vigorous, hardy tree, and the apple is a good and late keeper.

Speaking of "keepers," one of my old townsmen, Col. David Lee, has one hundred bushels of Gilpins now in pit, precisely as potatoes are pitted, which he expects to take out and sell at \$1.75 per bushel first of June next, having done this with this "best apple in the market when others are gone" last year.

Returning to the orchard aforesaid. The *Mother* apple, though only a medium vigorous tree, bears excellent apples abundantly; and they are now in good condition in my cellar. In other orchards within a mile, Roxbury Russet, Twenty-ounce Pippin, and Winesap, are moderately vigorous in tree, and productive with us.

Fall Strawberry has done well, the tree being handsome and moderately hardy; giving annual crops of first quality table fruit for seven or eight years in succession. But some of the trees have fallen victims to a cankerous growth, extending from the roots upwards to the main branches.

The Fall Orange, with its very large shoots, and thin open head, bears annual crops of large unblemished fruit, which is always readily saleable. The tree is a trifle tender; but still it pays well.

The Famense does tolerably well with me, but not first rate. But in this section *generally* the tree is thrifty and hardy, a *good bearer*, and the fruit *very* popular.

In the northeast corner of this county Fall Wine is equally good in tree and fruit.

Tallman's Sweet does well with me, both in tree and fruit. This apple is in season here from November until April. It is valuable for baking, or boiling and baking first and second. Sold them in perfect condition at our State Capital, Madison, last week, sound as a rock, in condition to keep a month. But so abundant is this fruit, that it is sometimes a drug in the market in this vicinity. It is both a fall and winter apple.

Now that Duchess of Oldenburg; a hardy tree, moderate grower, second class fruit, for any purpose but drawer ripening for eating; with this treatment the Oldenburg (won't you strike off their long handle "Duchess" at your next annual meeting?) is good. But the Oldenburg *apple*—there is a Duchess pear—can never be made either popular or profitable; and be it understood I speak of the *true* Oldenburg, which is pretty widely in bearing in this (Greenlake) county.

Early Harvest—a slow grower and sly bearer. This apple is, in my opinion, an old English variety, as a friend of mine recognizes the flavor and color as familiar to him in his boyish days.

Red Astrachan is hardy and very vigorous in tree; just coming into bearing in this vicinity. The fruit is large and good, but not quite enough in quantity. More age may improve it in this regard.

Sops of Wine is vigorous in tree, healthy, and good bearer of excellent and popular fruit. A great favorite, and being much propagated hereabouts.

Baily's Sweet is doing well in the prairie orchard of Col. Lee, before mentioned. Also, Maiden's Blush; the Blush being a little tender in tree however.

I have not seen the Prior's Red here; but as Dr. Warder calls this variety a Southern apple, I may say that it is. Was long ago grown in considerable quantities in a number of orchards in Hereford county, England, while the Early Harvest is grown, as stated, four or five miles west of the old battle-ground of Tewkesbury, on the east side of Malvern Hills or mountain, which tower up to the height of 1450 feet or more.

There are many other varieties of apple grown in this vicinity. Amongst them Domine does fair; also, Perry Russet, a hardy tree and good fruit. I have these and several other varieties in a young orchard not yet in bearing, Met with Cranberry Pippin last week at Madison. A third rate apple, but large and hardy, and a good keeper.

An apple of fine quality, known as the Genesee Flower, does well in a near neighbor's orchard; and I identified the Herefordshire Pearmain in the same orchard; but this tree is deficient in vigor.

At some future time I may be able to write you as to other varieties; at present space and time dictate a close.

J. W. CLARKE.

MANCHESTER, Greenlake Co., Wis., March 10th, 1870.

TRANSACTIONS OF LOCAL SOCIETIES.

PROCEEDINGS OF THE THIRD ANNUAL MEETING OF THE
NORTHERN ILLINOIS HORTICULTURAL SOCIETY,

Held at Dixon, January 25th, 26th and 27th, 1870.

OFFICERS, 1870.

PRESIDENT—Samuel Edwards, Mendota.
VICE PRESIDENTS—D. C. Scofield, Elgin; J. B. Bubach, Princeton; Lewis Ellsworth, Napier-ville; E. G. Mygatt, Richmond; Edgar Sanders, Chicago.
CORRESPONDING SECRETARY—D. Wilmott Scott, Galena.
RECORDING SECRETARIES—Charles Andrews, Marengo; H. D. Emery, Chicago.
TREASURER—E. H. Skinner, Marengo.
EXECUTIVE COMMITTEE—J. W. Cochran, Blue Island; Saml. Edwards, Mendota; J. G. Soulard, Galena.

STANDING COMMITTEES, 1870.

METEOROLOGY IN ITS RELATION TO HORTICULTURE—Dr. C. C. Miller, Marengo; B. N. McKinstry, East Summer; T. Hunt, Ridott.
GEOLOGY—James Shaw, Mt. Carroll; Capt. E. H. Boebe, Galena; Dr. L. S. Pennington, Sterling.
ORNITHOLOGY—J. W. Robson, Galena; J. W. Cochran, Blue Island; J. S. Little, Dixon.
BOTANY—H. H. McAfee, Freeport; Edgar Sanders, Chicago; Alex. Strachan, Rockford.
ENTOMOLOGY—Dr. Wm. LeBaron, Geneva; Dr. H. Shimer, Mt. Carroll; Dr. E. G. Mygatt, Richmond.
FRUIT LISTS—T. McWhorter, Aledo; Elmer Baldwin, Farm Ridge; A. R. Whitney, Franklin.
ORNAMENTAL AND USEFUL TREES—Arthur Bryant, Sen., Princeton; D. C. Scofield, Elgin; Lewis Ellsworth, Napierville.
ORCHARDS AND VINEYARDS—S. G. Minkler, Oswego; Robert Douglas, Waukegan; W. T. Nelson, Wilmington.
VEGETABLE PHYSIOLOGY—Dr. E. D. Kittoe, Galena; Jonathan Periam, Chatsworth; D. B. Wier, Lacon.

It is expected that each member of above committees will give an individual report.

LIST OF MEMBERS

OF THE

NORTHERN ILLINOIS HORTICULTURAL SOCIETY FOR 1870.

<i>Name.</i>	<i>P. O. Address.</i>	<i>Name.</i>	<i>P. O. Address.</i>
John V. Cotta.....	Lanark, Illinois.	W. D. Neff.....	Ottawa, Illinois.
D. W. Adams.....	Waukon, Iowa.	Tyler McWhorter.....	Sterling, "
W. & T. Smith.....	Geneva, New York.	John McKay.....	Mt. Carroll, "
E. Sharpe & Sons.....	Lockport New York.	H. C. Graves.....	Sandwich, "
Reville Rice.....	Sandwich Illinois.	J. G. Bubach.....	Princeton, "
L. S. Knowlton.....	Byron, "	Abijah Powers.....	Palmyra, "
Dr. J. Doran.....	Mt. Vernon, Iowa.	H. Dwire.....	DeWitt, Iowa.
W. E. Lukins.....	Sterling, Illinois.	E. J. Thomas.....	Mt. Vernon, "
A. A. Gatchell.....	Winterset, Iowa.	S. H. Whitmore.....	Dixon, "
Henry Shaw.....	Fremont, Illinois.	Edmond Bowman.....	Sterling, "
E. E. Bacon.....	Rochelle, "	I. S. Platt.....	Chicago, "
Edgar Sanders.....	Chicago, "	Martin Allen.....	Mendota, "
H. Gillmore.....	Lindsar, Wisconsin.	S. Powers.....	Cedar Rapids, Iowa.
Wm. C. Pearsall.....	Port Byron, Illinois.	H. N. Bliss.....	Providence, Illinois.
W. W. Pearsall.....	"	W. J. Branden.....	Rochelle, "
H. P. McMasters.....	Leonardsburg, Del. Co., O.	E. Ordway & Co.....	Freeport, "
Fred. L. Merrick.....	Manteno, Illinois.	S. M. Shale.....	Elgin, "
Dr. Ed. Kittoe.....	Galena, "	D. S. Dunning.....	Jefferson, "
J. M. Harris.....	"	Suel Foster.....	Muscataine, Iowa.
Wesson Holton.....	Willow Creek, Illinois.	John Swanzy.....	Ridiot, Illinois.
Thomas Stuterd.....	Geneseo, "	J. W. Robson.....	Galena, "
C. C. Wamsley.....	Polo, "	H. D. Emery.....	Chicago, "
Jas. Halleck.....	Momence, Kankakee Co., Illinois.	D. C. Scofield.....	Elgin, "
T. McWhorter.....	Aledo, Illinois.	S. L. Keith.....	Paletine "
A. Bryant, sen.....	Princeton, "	H. C. Chapman.....	Sublet "
A. Bryant, jr.....	"	B. Hathaway.....	Little Prairie Ronde, Mich.
G. T. Smith.....	"	Chas. T. Allen.....	Mendota, Illinois.
James Mathews.....	Knoxville, Iowa.	J. B. Sausman.....	Peru, "
G. Wright.....	Rock Falls, Illinois.	A. R. Whitney.....	Franklin Grove, Illinois.
J. T. Little.....	Dixon, "	T. V. Hyde.....	Dixon, "
G. M. Reed.....	Cambridge, Henry Co., Ills.	J. W. Stewart.....	Florida, "
Samuel Edwards.....	La Moille, Illinois.	J. E. Enis.....	Lyons, Iowa.
David Long.....	Mt. Carrol, "	J. R. Chapin.....	Kewanee, Illinois.
Lewis Ellsworth.....	Napierville, "	W. R. Fairbairn.....	Ridiot, "
Dr. E. G. Mygatt.....	Chicago, "	G. W. B. Morgan.....	Polo, "
Brown Munroe.....	Peru, "	M. B. Spafford.....	Dixon, "
B. N. McKinstry.....	East Sumner, "	S. Shepard.....	Hennepin, "
H. J. Dunlap.....	Champaign, "	S. J. Davis.....	Freeport, "
E. Embree.....	Springfield, Linn Co., Ia.	Dr. Pennington.....	Sterling, "
M. S. Ellsworth.....	Napierville, Illinois.	L. B. Wetherbee.....	"
D. F. Kinney.....	Rock Island, "	Dr. H. Shimer.....	Mt. Carrol, "
S. G. Minkler.....	Oswego, "	D. B. Wier.....	Lacon, "
M. L. Dunlap.....	Champaign, "	J. M. Goltman.....	Sterling, "
W. H. Hausen.....	Franklin Grove, "	A. H. Vail.....	Marengo, "
Ellis Askey.....	Ridiot, "	C. C. Miller.....	"
G. R. Long.....	Freeport, "	Jas. Hallett.....	Mt. Carroll, "
E. F. Curtis.....	"	Wm. Van Epps.....	Dixon, "
H. H. McAfee.....	"	W. Wicks.....	Mt. Carroll, "
T. Hunt.....	Ridiot, "	Chas. Andrews.....	Marengo, "
T. Hallett.....	Galena, "	A. Giddings.....	Sabula, Iowa.
Norman Hawks.....	Polo, "	E. L. Lege.....	Chicago, Illinois.
J. L. Budd.....	Shellsburg, Iowa.	D. L. Harris.....	Mendota, "
J. P. Brubacher.....	Shusha, Illinois.	Henry F. Burkett.....	Dixon, "
Capt. E. H. Beebe.....	Galena, "	J. S. Shearman.....	Rockford, "
J. G. Fleck.....	Dixon, "	Jas. Shaw.....	Mt. Carroll, "
L. Woodard.....	Marengo, "	Geo. L. Merrick.....	Dixon, "
J. L. Moore.....	Polo, "	M. L. Sullivant.....	Chatsworth, "
R. Douglas.....	Waukegan, "	W. T. Nelson.....	Wilmington, "
N. Sweet.....	DeKalb, "	J. W. Brown.....	Mendota, "
J. E. Barnes.....	Young America, Illinois.	H. A. Mills.....	Mt. Carroll, "
Wm. A. Nourse.....	Moline, "	J. Hallett.....	"
J. W. Pierman.....	Davenport, Iowa.	Ira L. Bailey.....	Clear Lake, Iowa.
		Thos. H. Springer.....	Fairfax, "

FIRST DAY—MORNING SESSION.

The third annual meeting of this Society convened in the Court House in this city this morning. A. Bryant, Jr., Vice President, presided. D. Wilmott Scott, of Galena, Secretary. The session was opened with prayer by Rev. Mr. Sickles, of Dixon.

Maj. J. T. Cheney welcomed the members of the Society to the hospitality of the citizens of Dixon, in a brief speech:

ADDRESS OF WELCOME BY MAJ. JNO. T. CHENEY.

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

The very pleasant duty of welcoming you to the hospitalities of our city has been assigned to me; not because I am a practical horticulturist, nor because I can say to you beautiful words, smoothly spoken; but this I can and do say to you, Welcome! thrice welcome! to our city; and you will at least find in the band of horticulturists in Lee county, not only a little, but very much, of the love for the beautiful in nature, as seen in the field and garden.

Your work is a work of love; and if every man can be induced to plant a tree, under the shadow of which he and his children may sit, who shall say that many a home that might otherwise be blasted, by the recklessness of a child, shall not be made a solace for our riper years?

We are performing no irksome duty when we ask you to accept the hospitalities of our city; but, on the contrary, feel that we will each and all be benefited by a mutual interchange of courtesies.

We would have you think kindly of us and our city, and we trust that our intercourse and deliberations will be such that we may with pleasure revert to the third annual meeting of the Illinois Horticultural Society, holden in Dixon.

Again, Mr. President and gentlemen, I offer you a sincere, hearty, and cordial welcome.

The Vice President in behalf of the members returned thanks for the kindness extended, and begged the indulgence of the members for any short-comings of his own. The President, Mr. J. W. Cochran, of Blue Island, has been confined to a bed of sickness for a long time, and he had been unexpectedly called upon to preside in his place.

The first business in order was the Vice President's address, which was short and to the point. Much stress was laid upon the need of planting more timber trees upon the prairies, both for use and ornamentation. The importance to fruit-growers having a knowledge of geology, so as to be able to determine the most suitable soil for their business was also alluded to.

Gentlemen of the Northern Illinois Horticultural Society:

On account of the illness of our worthy President, quite unexpectedly to me, I have been called upon to perform the duties of the presiding officer. It is with a good deal of embarrassment that I appear before you, as the position is one entirely new to me. I must beg your kindest indulgence in my attempt to perform the duties devolving on me.

We have assembled to hold our third annual reunion. The good citizens of Dixon have invited and welcomed us to their hospitalities. Grateful for these kindnesses; and thankful to a kind Providence for the many blessings we have received during the past year, we enter on our labors with renewed energy and zeal. Here we have an opportunity to meet old friends and fellow-laborers in the good cause, to form new acquaintances, and enjoy that fellowship and good feeling that constitutes one of the principal benefits of such gatherings.

This society was organized for the purpose of studying into the necessities of horticulture in the northern part of the State, to assist in developing its resources, and to learn how to put forth our energies and labor to accomplish the greatest amount of good. Our State extends over so large an

area of country, has such a great variety of soil and climate, that it is impossible for one society to investigate the especial requirements of each particular section.

The soils and climate peculiar to our portion of the State must have varieties of fruits and methods of cultivation to correspond. This knowledge can be obtained only by practical experience. Theories make very good starting points sometimes, but must be carried into actual practice to be of much benefit. For these reasons we must go directly to the cultivators of fruit in each particular location, and learn from their success or failure how to proceed in future.

We of the northwest are under the necessity of working out our own pomology. With all due respect to those that have grown grey in the service, we have scarcely made a beginning. The field is but just fairly opened for investigation. We have learned much, but it is mostly of a negative character; have found that many methods of cultivation pursued in other parts of the country will not do with us; that most of their best varieties of fruits are not profitable for us to cultivate. But what varieties we can grow with certainty and profit, and how to treat them, are questions we have come here to discuss and endeavor to settle.

In regard to varieties of fruits adapted to our particular region, we have a great work to accomplish. We have kinds enough, but nearly all have some serious fault that it seems almost impossible to remedy: almost all are natives of entirely different soils and climates from ours, and need the particular elements in those soils in which they originated to perfect them. Indeed, it has long been my opinion that we shall never be fully successful in fruit growing until we raise varieties from seed on our own soil—varieties that will hold the same position with us that the Baldwin, Greening and Russet do in their native localities.

Another subject that deserves our careful attention, and one that is of vital importance to the necessities and convenience of our whole country, is the planting of trees for timber belts and forests. Our native forests are fast disappearing before the axe, and if the demand for lumber goes on increasing in the ratio that it has for the last few years, the supply—vast as it is—will soon be exhausted. The editor of the *Western Pomologist* says: "It has been estimated by a careful observer, that the pine timber within the limits of the United States and accessible territories will be exhausted in less than fifty years. Already immense quantities of pine lumber are imported from the Canadas, and yet scarcity increases and prices rise. All varieties of timber composing the American forests are alike disappearing, and it requires no prophetic ken to foresee what is to be the fearful desolation a century hence, if no measures are adopted, and prosecuted vigorously, to supply by art what has hitherto been so abundantly supplied by Providence." If such is the case, and the facts seem indisputable, should not we as a society of practical, thinking men use all the means in our power to supply this prospective deficiency? We found our land reasonably well supplied with timber ready grown for us: are we doing justice to our country, to posterity, if we leave it in a worse condition than we found it? There is one thing certain, that future generations will feel far more grateful to us for furnishing them an adequate supply of valuable timber, than for all the knowledge we can transmit in relation to fruit culture. They can raise their own fruit, but must find their forests ready grown for them; and although we may not see the dollars and cents when we plant our groves, we have no right to disregard the claims of those who come after us.

These remarks have been made, not with the expectation of offering anything new, but to call your particular attention to a subject which evinces its importance the more we investigate it. Would it not be advisable for the society to offer some special inducement to planters, and stimulate a work that promises to be of so much benefit to our country in the future?

The science of geology is one that should greatly interest the student of horticulture, but has not been investigated by cultivators generally so much as its importance deserves. The composition of different soils, the effect they have on vegetable life, are subjects that should enlist our attention and careful study. Again, the peculiarities of our climate, subject to extreme changes of heat and cold: the drying winds of winter, the scorching rays of our summer sun, the long seasons of drouth, varied by those of extreme wet, with cloudy weather favorable to the growth of fungi, the hosts of insect enemies that infest our orchards and gardens, bringing so much of our labor to naught, and which as yet have received no permanent check, are all subjects of great interest to us, and form a wide field for scientific study.

Gentlemen, I will not longer occupy your valuable time. You are fully conscious of the importance of the work that is before you, and the obstacles to be overcome, and have shown the faith that is in you by your attendance here at the present time. All men like to be appreciated, and it is encouraging to us as horticulturists to see that we are better understood than ever before—that the people are finding out that we are not working entirely for self-interest. This is shown in the increased attendance at our meetings, and the interest with which our printed proceedings are read. The railroads are beginning to realize somewhat of the importance of our meetings, and grant us facilities that they would not allow a few years ago. These facts should encourage us to push forward our work with energy, until our prairies shall be dotted with beautiful groves and orchards, our residences surrounded with fruits and flowers, and every man shall sit under his own vine and apple tree, with no borer to molest him or apple worm to make him afraid.

Mr. Tyler McWhorter, from the Committee on the Geology of Soils, read a report on the soils of Mercer county. In that county the lacustrine deposits occupied several narrow belts of what we now call modified drift, and the drift proper. These soils are liable to washing, and we lose more or less of the surface by its being washed into our streams. Hence we must plant deeper, and give surface protection. He would mulch old orchards with grass or weeds, cut them before they mature, and by all means avoid an open exposed surface.

ON THE GEOLOGY OF SOILS IN RELATION TO FRUIT-CULTURE. BY TYLER M'WHORTER.

Being associated on the Committee on the Geology of Soils with my able friend, Mr. Shaw, of Mt. Carroll, on whom you may rely for a more general report, I will limit myself to a few brief remarks on the surface soils of my own special locality, with relation to fruit-growing.

With the exception of the loess or lacustrine formation of our river bluffs, we have only the deep surface covering of drift spread over the old carboniferous formations.

The loess deposits being limited to the line of our bluffs, and often to very narrow elevations, constitute but a very inconsiderable portion of our surface soil. But these soils, being rich in calcareous matters, possess in a high degree the essential elements for fruit-growing. Hence, under proper management, these bluff lands may be profitably used for orchards and vineyards.

The idea that people generally associate with the term DRIFT, depends much on their geographical locality. In the Atlantic States, it is merely scattering boulders, and beds of sand, gravel, and coarse material, strewn hap-hazard over the country. With us, it is a deep superficial covering, consisting mostly of finely ground material; the upper stratum being nearly a homogeneous character of brown clay of great agricultural value.

At the late meeting of the State Horticultural Society at Ottawa, we were favored with an able discourse from Mr. Shaw on the agencies by which this compound of former rocks was comminuted, and transported from more northern regions, and spread over our State.

Prior to the drift period, the old surface had been exposed to atmospheric action through long geological ages, and had become worn and cut into water-courses on a very extensive scale. Since the drift, those old waterworn valleys became inland lakes of fresh water. Subsequently, these lakes became drained into the condition of our present rivers. Hence our principal streams are now flowing in the valleys of older watercourses.

Much of what was the DRIFT PROPER, has been displaced by the action of water, and now exists on secondary bottoms in the form of MODIFIED DRIFT; also much has been carried away by our present streams. Hence it often occurs that on our broken points of land the brown clays that properly form the upper stratum of the drift, has been removed, and we meet with the admixture of gravel of the lower stratas.

While much of the DRIFT PROPER has been thus worn and transported away by our streams, the surface has been greatly enriched by vegetable matter.

The prominent characteristics of the brown clays that usually constitute our sub-soil is, a combination of mineral elements of great value to agriculture; and a susceptibility of being easily washed and cut up by the action of water. And the point I wish here to impress, is, that in the peculiarities, our sub-soil is so very distinct from what occurs in the Atlantic States, that it becomes important for us to adopt quite a different mode of practice, especially that of DEEPER PLANTING. 1. Because the mineral strength of our sub-soil is inviting to deeper roots. 2. Our soil, being susceptible to deeper atmospheric influence, is more favorable for deeper planting. 3. So great is the susceptibility of our soil to the washing process, that with all our care to the contrary, much of our surface soil is removed from all our undulating grounds before orchard trees or vineyards attain age, bringing old roots to surface exposure. 4. Having usually less snow than in the Eastern States, the roots of trees require deeper earth protection.

From the circumstance of our soil being so easily washed, arises the importance of surface protection. All cultivated grounds, especially vineyard and nursery grounds, should have some surface protection during winter—the most excessive washing being usually at the breaking up of winter. When thorough cultivation is continued until midsummer, a cheap and valuable surface protection is secured by sowing oats thickly on the grounds in August. By this means we not only effect protection against the washing process, but we also protect the roots of plants and young trees against the severity of winter. In spring, when cultivation is resumed, the thin mulching of oats is no serious obstacle. And what is of decided importance, the ground is remarkably loose and mellow—very different from grounds that have been left naked during winter, and beat down by winter and spring rains, plowing up in a lumpy condition. On steep descents, if old straw is

available, mulching may be substituted for summer cultivation. When orchard trees have attained bearing age, continued surface culture is not advisable—at least on broken grounds. We would not advise any CONTINUED system of treatment for a succession of years, but rather something like a ROTATION OF TREATMENT. If grounds are seeded to grasses, the grass should be mowed and left to enrich the surface of the ground. Old straw and coarse manures should be applied to the thin soils of broken points. If the orchard is cultivated one year, it may be left the next to grow up with tall weeds; and after the weeds have attained full growth, and before the ripening of the seed, let them be harrowed smoothly down with a heavy harrow; thus flattened down they decay and form a surface mulching. Though this practice seems slovenly, it is very good in old bearing orchards; the weeds being thus harrowed down as the apples commence to ripen, are out of the way. If old orchards are plowed, let it be in June after a good growth of grass or weeds can be turned under. Follow up by a good harrowing, so that by winter the ground may be again coated by grass and weeds. In short, avoid naked surface as much as possible, and never take away any crop from the surface. Whatever grows, should decay on the ground.

Mr. J. W. Robson, of Galena, a member of the Committee on Ornithology, made a partial report:

ORNITHOLOGY—REPORT OF COMMITTEE. BY JOHN W. ROBSON, OF GALENA.

We feel that we are not exactly the person to present a report on this interesting science. Feeling this, this report shall not be presented if any of the other members of the committee are prepared to report. None being present, we proceed

Pleasantly, during the past forty years, while actively engaged in the culture of fruit, have we been studying the habits of the various feathered tribes, and been engaged in noting down the benefits which they confer upon man, and more especially upon the horticulturist. During these long years of toil, struggling for life, and for daily bread, we have read much and observed more on this interesting subject, for we early in life discovered that a large proportion of every crop of grain we sowed, and every fruit tree we planted, was not for ourselves alone, or for the mouths of our children, but for the fly, the bug, the caterpillar, the curculio, the cankerworm, and the endless host of insect enemies that prey upon vegetable life, and mar the hopes of the husbandman. Science is already teaching us not to wage equal war on our insect foes, and the parasite and cannibal insects which prey upon them; and it is cause for rejoicing to every ornithologist, that cultivators of the soil, in every country, are learning from experience that the birds can live without man, but man can not live without the birds.

Like many of the benefactors of the human race, the birds come in for more than their share of misrepresentation and abuse. and, strange to say, those who traduce their character, call for their destruction (and would proscribe them if they could), bringing against them the charge of theft, are often the very men—the drones in the great human hive—who never planted a strawberry bed, or owned a cherry tree. We seldom hear men complain of their ravages who make their livelihood by growing fruit, but generally by those who seldom see an orchard, or a garden of small fruits, and who never see the products of such but at the dinner or supper table: and while they are devouring the luscious viands, which never cost them a thought, or one drop of sweat, as far as their culture was concerned, they raise an outcry against robins and birds in general, as the destroyers of cherries and other fruits of pulpy character. We think the charge in question can easily be settled. Cherries have not a season of twelve months; three weeks to a month is the utmost extent of the cherry season. The robin and the golden oriole, the red-headed woodpecker and the brown thrush, the jay and the cat-bird, cannot fast the remaining forty-nine weeks of the year and survive. No. During this long cherryless period they are laboring for man, and that man must be mean, sordid, and a despot, who would deny them a small quota of those fruits they have labored so faithfully to preserve from the ravages of insects.

An investigation of the stomachs of a few of our fruit-eating birds will settle this question conclusively. The stomach of a robin in March contains worms, grubs of the terrestrial species of insects, and seeds; April, insects, worms, and grubs; May, the same; June, the same, with the addition of cockchafers; July, all sorts of worms, grubs, and fruit; August, the same; September, larvæ and seeds; October, he has left us. The red-headed woodpecker also steals cherries. His stomach in March contains beetles and ants; April, larvæ of tree borers and worms; May, ants and their larvæ; June, the same; July, cherries, ants, and caterpillars; August, and the remainder of the year, he exists upon insect life. Another bird which comes under the ban of the destroyer, and which has been proscribed again and again by those who ought to know better, were they not blinded by prejudice, is the Baltimore oriole. A close and unprejudiced examination of this bird will also show that he, too, is the friend, and not the enemy, of man. In May, his stomach contains bugs,

moths, especially the pea weevil (*bruchus pisi*). June, curculio, long-snouted weevil (*rhynchonemus nasieus*), and peas. July, curculios, weevils, beetles, cherries; August, weevils, chrysalids, grasshoppers, fruit. September, he has departed, and gone to his Southern home.

This bill of fare ought to satisfy every one that the bird is not the enemy but the friend of man. The presence of the insect is universal—in the ubiquity of its numbers, legion. To this universal monster birth responds the bird, incessantly active with the swiftness of his wing. The great moment is that when the insect, developing itself through the heat, meets the bird face to face; the bird multiplied in numbers—the bird which, having no other sustenance, must feed at this very moment a numerous progeny with her living prey. Every year the vegetable world would be endangered if the bird could suckle; if the aliment were the work of an individual, of a stomach. But see! the noisy, restless brood, by six, ten, twenty bills, cry out, more! more! and the exigency is so great, such the maternal ardor to respond to this demand, that even the little titmouse will carry three hundred caterpillars a day to satisfy the wants of its young; and even in the gloomy months of winter, when the sleep of nature so closely resembles death, we have birds who are actively engaged prying into the affairs of the insect world, often laying waste the prospects of a promising family by one stroke of the bill, and hunting up insect life so diligently as to entitle them to the honor of being the friends and co-laborers of man.

To-day, from our window, as we write, we see the active, cheerful chick-a-dee, engaged in this warfare against the insect; and though it is the depth of winter, are carefully inspecting every branch and shoot for the eggs of the tent caterpillar, and every cranny and loose piece of bark for the pupae of the codling moth.

We confess that we have noticed for many years, with painful feelings, the efforts of several eminent men in our State to influence the minds of our State legislators to repeal existing laws for the protection of birds; and some have even gone so far as to proscribe a number by name, and demand their destruction. This is all a mistaken prejudice. We hold, with Dr. H. Shimer, "that birds are Nature's scavengers, in the field, the garden, the orchard, everywhere; and that the man who kills one for mere sport, or from blind prejudice, is a dangerous man in the community."

We regret that so many practical horticulturists ignore ornithology, and think it unworthy of their attention and study; and do not know, or care to know, the injurious birds from those that are beneficial. In their ignorance they discover that some injurious insect is destroying their crops, and orders are immediately issued to shoot indiscriminately friend and foe. This ignorance ought not to exist any longer; it is high time, even now in this enlightened nineteenth century, that everyone engaged in the culture of fruit, and especially the intelligent members of this noble society, should know that the woodpeckers, the robins, the nightjars, the flycatchers, the titmouse, and wrens, the swallows, the swifts, the shrikes, the vireos, the nuthatches, and the rest of the creepers, the bluebird, the meadow lark, the cedar bird, the sparrows and the orioles are not deserving of death, but are the friends and co-laborers of the horticulturist.

Dr. Hull asked if the gentleman was certain that the oriole caught and ate the plum curculio?

Robson—Yes; all the statements made in the paper were facts; had observed them busily engaged among his plum trees, and on examination found they were catching curculios.

Dr. Hull replied that at Alton they had fully investigated this matter, and they had come to the conclusion that it was impossible for this bird to catch this insect on account of its habits. At Alton they had been compelled to shoot this bird in order to protect their fruit. He charged that this bird destroyed more of the cannibal insects, which were our best friends, than of the vegetable eating insects. To keep down the injurious insects we must rely more upon the cannibal insects than upon the good offices of the birds.

Mr. Robson stated that his remarks were intended to apply to Northern Illinois, and they might or might not be applicable to Alton. That the oriole did and could catch the curculio was a matter of fact. He did not claim that the curculio was caught on the fruit, but was caught after it fell to the ground.

Mr. Harris, of Galena, took up the matter, arguing that, though pleased with the bluejay and brown thrush, he could but consider them enemies.

Mr. Robson could defend the bluejay only because of its beautiful plumage. The

brown thrush he defended. All birds were native, and it was unjust, he argued, that we upstarts in their midst should expel them from their home.

Considerable punning and sharp shooting followed, when the subject was dropped for the time.

H. H. McAfee, of Freeport, read an essay on "How to Popularize Botany."

REPORT OF COMMITTEE ON BOTANY—HOW MAY IT BE POPULARIZED? BY HENRY H. M'AFEE.

That a science which embraces so much which pertains to man's well-being as does botany—the systematized knowledge of the whole vegetable kingdom—should be so far removed from the mind of the masses of mankind as it is may seem strange to us, upon a cursory view; and yet there are cogent reasons why such general ignorance prevails. To call attention to this general neglect of the science of botany, to assign reasons for such neglect, and to suggest some means of popularizing so useful a study, will be the scope of this report.

The unpopularity of botany in schools, and among scholars everywhere, is well known. Occasionally little classes of romantic misses are organized and drilled during the spring and summer terms of school, and a few showy flowers are analyzed; and just enough is learned to be forgotten without much effort. The profounder depths of vegetable physiology are not invaded by the amiable young ladies. Perhaps the language of flowers is studied, but rarely the mysteries of osmose, or the greater wonders of fertilization and embryonic growth. Such casual skimming over the surface of science is generally the extent of the progress of the botany classes in our schools, unless the prospect of a too rigid examination drive the unwilling student a little farther into the merits of his or her study. But few students really STUDY botany in school: in truth, most of the botanists are made such by self-culture, after the school days are over, and when the desire to penetrate the mysteries of creation becomes a motive power in the soul.

To the grasping, yearning intellect, never satisfied or satiated with Nature's lessons, a science, however, hedged about with difficulties, will not long be an obstacle to progress; it will be mastered in time; but put a few long, hard names, and a little intricate reasoning before the sluggish, unwilling student, and you have effectually fenced him out of the "green pastures."

Why is botany unpopular? Why do not the people know botany—the people who grow the grains, the grasses, and the fruits?

I answer, primarily because of defects in the arrangement of the science as now presented to the student; and, secondarily, because of the general faultiness of our present system of primary education, which crams the immature mind with dry masses of abstractions during all the first years of school life; crowding the natural sciences out of the primary school entirely, and making them "high school" studies.

As a rule, every technicality in any science or art is a direct bar to the acquisition of knowledge; and, indeed, it is a fact, that a large share of the technical terms used in the arts, and also in the sciences, were invented and applied for the express purpose of concealing material facts from the masses, and making the acquisition of knowledge difficult, thus securing to experts and scientists a sort of royalty. In botany this masking of meanings by the use of unfamiliar technicalities has been carried to a great extent, because there is so much of form and structure to treat of that descriptive terms accumulate, and form a great part of the bulk of the science. Without a glossary or technical dictionary, no student, not a classical scholar, could master botany at all; and the direct tax upon the perceptive faculties imposed by this mass of new terms is the means of driving off all but the most persevering students. Common people, boasting only of common sense, can hardly see why "aculeate" is better than "prickly," or why "adsurgent" is better than "ascending," or "alabastrum" better than "flower buds."

To say that these technicalities are derived from the classical languages is no excuse for such excrescences upon a most useful science; and the botanical author in the coming future who will have the courage to eliminate as much of this trash from his pages as has been introduced in the interest of exclusiveness and pedantry, will well deserve the thanks of all the thoughtful people. I know that the claim of a more perfect description is made for the present system, but if the definitions are true, and they are much shorter, easier, and more consonant with the common language of the people, there remains no vestige of a reason for using the technicality.

To popularize botany, then, the first step must be to rid it as much as possible of all the unfamiliar, unnecessary technical terms which it is possible to dispense with, and even then in the nomenclature (which, of course, could not be changed) we would have enough to task the memory. When this is accomplished, and when the primary education of our schools shall be made up of facts relating to material things, and deductions from tangible data; when the young undeveloped mind is strengthened and developed by feeding upon the pabulum of nature, not dwarfed, as now, by the abstract sciences—then will botany be a popular science.

To a horticulturist having any enthusiasm for his pursuit, it is always a matter of regret that the great science which underlies all organic existence is an unpopular study—that all these vital questions of "development," "variation," "inheritance," "hybridization," and "selection," are yet sealed and hidden from so many of our youth, who are to be in time the producers of the nation. As horticulturists, then, let us seek to simplify and utilize the science of botany, and make it a powerful agent in the development of the youthful mind.

Dr. Mygatt, of Richmond, made a short report on Entomology. He called attention to the oyster-shell bark louse, which was not now so destructive as it was a dozen years ago.

THE OYSTER-SHELL BARK LOUSE.

For sixteen years past the writer has watched the effect of these insects on our fruit trees—the apple and pear very closely. They evidently do less injury to the trees than they did twelve to fifteen years ago. This is accounted for by our late lamented Walsh and Dr. Shimer in the fact that a very minute insect, called a mite, pierces the shell and destroys the eggs before they are hatched. The aspidiotus conchiformis, or common brown variety, are found on the apple, currant, and mountain ash, also a very few on the pear and crab apple, but never do any damage to the pear and crab apple.

It is very important for all to know the time of hatching, as that should guide us in our remedies, as most remedies are much more efficient soon after hatching. I propose a rule which, to me, has been invariable. It is useless to try to find the young insects before the petals of the apple blossom have fallen and the young apple begins to grow, say the size of a large pea; then watch closely and you will see them—a minute white insect—crawling lively for a few hours. They then pierce the tender bark with their beak, and become sap-suckers for the summer, and never move after they have pierced the bark. They fix on every part of the tree, from the ground to the farthest branch. On the body and large branches of the tree they get under the rough bark and find shelter and succulent and tender bark to fix on. Some fix on the extreme branches, and even a few on the young apple, and young growth so far as it is developed. It is my opinion that the active state is very short if they find a place that suits them to fix. When you can see them numerous one day, you will find very few in motion the next day. When they get on the ground or dry limbs, or hatch on recently pruned limbs, they remain active longer. The time of hatching, of course, varies with the season, in Northern Illinois say from the 25th of May to the 10th of June. The insects were active in my orchard last summer on the 7th day of June. The growth of the insect is gradual, but by August it has its full size, and during the latter part of that month, if the scale of the new insect is lifted, eggs will be found, some twenty or thirty under each scale. If any one desires to see the egg, let them cut off a small infested branch and take it to a room out of the wind, and over smooth paper raise the scales with a point of a knife, and a white dust will fall, which, when examined with a common magnifier, will be found to be perfect eggs, a little oblong. Harris, in his excellent treatise on insects, states that there are two broods each year. In this I differ with him, having seen no evidence of it.

How do they get from one tree to another? This has been a perplexing question to the entomologist. Some think they are carried by birds. This, to me, seems quite improbable. It is my opinion—that is, I guess—that they are blown from the infested tree a part of the way to the clean one, and, if not overtaken by storms, a very few out of many hundreds reach another tree. I have seen them drop off from the end of a dry limb, and think that many might be blown off or some might crawl down the body to the ground. All this must happen in their active state, as after they are once fixed they never move again.

THE REMEDIES.

The remedies used before the hatching season, are:

1st. Strong alkaline solutions, as common lye, nearly strong enough to make soap, on the bodies and large limbs, applied with a broom or brush, with a suitable handle. But I do not strongly recommend the lye—prefer lard. The body and large limbs should be carefully scraped before applying it.

2d. Grease or oil applied to the scales will penetrate them and destroy the eggs. It is my opinion that lard or any kind of grease or oil will destroy them. Good observers have strong objections to the use of any grease or oily applications when the tree is in a dormant state in the winter. I have applied lard to many trees in April and May to the certain destruction of the eggs and no apparent injury to the tree. Applied with a brush.

Soft soap put on after the tree is scraped is only partially successful before the hatching period, but very sure when the insects are young—also through all the summer—one of the best known remedies.

The application of fish brine late in the fall, recommended by Mr. Robinson, of Galena, to addle the eggs, is worthy of further trial. It is probable that the small quantity of oil in the brine had some effect.

REMEDIES AFTER HATCHING.

The soft soap applied with a brush. It is better to apply it soon, but will destroy them after hatched during the remainder of the summer. The rough bark should be carefully scraped before using it.

Cobalt is certainly destructive to the young louse, but takes the leaves also, and requires so much care in handling that I cannot recommend it.

On the 7th day of last June, when the louse was in the active state, I applied to one tree badly infested, lye from ashes, which I judged to be half the strength used in making soap. It took the lice, leaves and young growth all off. The tree did not die but soon put out leaves, not so large or numerous as before, except on the fruit spurs—they were killed.

The same strength of lye was reduced half and applied to another tree with no perceptible effect on the lice and slight damage to the leaves.

One quart of soft soap to a pail of water, making a strong suds, was tried on another tree with no good result. This should be tried with a much larger proportion of soap, say one third. But it will then take the leaves.

Lime water has been used with the lime stirred up when used, and applied with a syringe. It took off the young apples, a part of the leaves, and a large share of the lice.

Carbolic Acid—A weak solution was tried without effect. The medicinal solution found at the drug stores is too weak and expensive. It is my intention to try the crude as being cheaper and more efficient. Six ounces of the solution (costing 50 cents) as found at the drug store, in eight quarts of water, had no effect on the leaves or lice.

A dry brush will destroy all it touches, but many hide out of its reach. We use the common blacking brush in applying lard or soap.

The infested branches soon after hatching have been dipped in a strong decoction of tobacco without any effect on the lice.

The decoction of quassa which I discovered by experiments over twenty years since as being so certainly destructive to the leaf louse or aphid, has no effect on the young bark louse.

The *Aspidiotus, Harrisii*, or American white variety, is quite as destructive to the apple and pear as the oyster shell or brown variety when it is as numerous. It looks something like a sprinkling of whitewash on the body and limbs. This kind is severe on the pear tree, whereas the brown is never numerous enough to injure it. The eggs are of a reddish color, and the young hatch only a short time later (a day or two) than the oyster shell variety, and are a red atom. The remedies the same.

GEOGRAPHICAL RANGE.

Mr. C. V. Riley, State Entomologist for Missouri, informs us that southern and central Missouri is exempt, but some are found in the northern part of that State. In Michigan the damage is slight. The same also in southern Illinois; but northern Illinois and Wisconsin are badly infested. The white variety cannot endure long-continued intense cold. All will recollect the first ten days of January about seven years ago. In my neighborhood there were many of the white variety—not one has been seen since that cold winter.

Nurserymen in grafting should remember that the newly hatched lice will go on to the young growth as far as it is developed. But as most of the growth is afterwards, they are only found from one to five inches on the young growth. Great care should be observed not to include them in grafting. As before mentioned the brush is used; also a large pewter syringe with a rose of tin, pierced with numerous holes and soldered to the spout. Page's hand pump, costing about five dollars, is an excellent instrument for wetting the tree with any liquid. As it will throw water twenty feet or more it is valuable in case of an incipient fire.

Not the least reliance should be placed on the various receipts and nostrums and poisoned nails vended by itinerant peddlers. They are as I know, sometimes backed up by forged certificates, and all undoubtedly are unmitigated humbugs.

Some entire young orchards, newly transplanted, have been destroyed by applying fish oil or strong solutions of potash to the bark of the young trees. We offer this as a caution.

E. G. MYGATT.

RICHMOND, ILL., Jan. 20, 1870.

Several members spoke on this subject. The result appeared that an insect called *acaricus malus* and the lady-birds are the most effective in their destruction.

AFTERNOON SESSION.

The Secretary read an invitation from the proprietors of the Grand Detour plow works to visit their plow factory.

The Recording Secretaries both being absent, Mr. Chas. Andrews, of Maringo, and Mr. M. A. Nourse, of Moline, were appointed to fill the positions while there were vacancies.

Arthur Bryant, chairman of Committee on Fruit List, read a report. The past season was characterized by some new features. Many varieties were scabby and defective, while the whole family of Russets were very fair; in fact, remarkably so. He doubted that the Soulard crab was a hybrid between the native crab and common apple. That the varieties are running out seemed to be a fact. The Winesap and many others had sadly deteriorated.

REPORT OF COMMITTEE ON FRUIT LIST.

The last summer was characterized throughout the greatest part of the State by excessive wetness and unusual deterioration of the apple crop. Many varieties heretofore almost uniformly fair and smooth, have the past season here been so badly cracked and scabbed as to be nearly worthless. Whether this was owing to the character of the season or to the increased ravages of insects, I shall not attempt to decide. On the other hand, all varieties of apples having a russet skin, not a few of which came under my observation, were larger and fairer than usual. One of these, a Golden Russet from the East, had for years previous been so defective as to be of no value. I have been assured by gentlemen from Putnam county that in that section the orchards within one or two miles of the Illinois river bore fair and handsome fruit, while in those more remote it was mostly defective. The above facts involve questions which remain for solution by those who consider themselves competent to undertake it.

The unfavorable influence of extreme cold upon the orchards of Northern Illinois—to say nothing of the States further North—renders it highly expedient to introduce varieties which combine complete hardiness with other desirable qualities. Experience is daily demonstrating that long-lived orchards of most of the varieties now generally cultivated need not be expected. Some thirty or forty years since William Kenrick published in the NEW AMERICAN ORCHARDIST a list of apples which he recommended for trial in Canada and the Northern States of the Union. These were nearly all of British origin; and though originating in a high northern latitude were yet strangers to the fierce extremes of the climate of our Northern States, and in all probability less fitted to endure them than native varieties. It is to be hoped that among the varieties of Russian apples which Mr. Skinner has so liberally presented to the Society, some may be found which with the good qualities of the Russian apples already tested, shall combine excellence of flavor and long keeping. Notwithstanding their hardiness, the Siberian apples will hardly find favor among cultivators where the common apple succeeds tolerably well, unless varieties should occur greatly exceeding in size any yet produced.

Has any one knowledge of successful attempts to hybridize the common apple with the Siberian or with the native crab?

If the thing is practicable, it appears as though something desirable might be produced. And here it may not be amiss to state the entire disbelief of this committee in the hybrid character of the Soulard crab. Not to enter into an argument upon this point, its essential characteristics are certainly those of the native crab; and its size, one of the principal reasons given for supposing it to be a hybrid, has been equalled by specimens found growing in the wilderness.

The Red June occupies a place among the early varieties recommended for cultivation by the Society. This fruit heretofore popular, has for the last three or four years shown an increasing disposition to blast and scab. So bad was it the last season as to be utterly worthless, and it is feared that it may be necessary to reject it altogether, as has been done with the Orley or White Belleflower. It seems proper therefore to suggest its omission from the list. Should the evil prove temporary, it can be replaced; if otherwise, the Society will escape the imputation of recommending worthless varieties.

Among fall apples the Fall Wine has of late years deteriorated in fairness and productiveness. It appears to be one of those varieties which do well while the trees are young, but fail as they grow older.

The Westfield Seck-no-further is recommended for family use and market. Is this recommendation based upon experience in Northern Illinois, or upon its Eastern reputation? Of its quality I shall say nothing, as there is no disputing about tastes; but a good market apple it certainly is not in the section where I live.

The Roman Stem is undeniably an apple of superior quality, but has, I think, been placed on the list as a market fruit by the strenuous recommendation of a single individual. I have raised it for thirty years, and it is one of the last among very good apples which I would select for market. When sold at all, it was at a price below the average.

Of the Wine Sap I shall merely remark that on rich prairie soil in Bureau county it has thus far disappointed the expectations of cultivators.

Among pears the Flemish Beauty has of late shown such a disposition to crack as to lead to the apprehension that it might be necessary to abandon its cultivation. Still we can not afford to give up a pear possessing so many good qualities without further trial.

No new fruits have come under my notice during the past year which I feel justified in recommending. The above remarks are respectfully submitted to the consideration of the Society.

ARTHUR BRYANT.

Mr. Scott, of Galena, gave a history of the Soulard crab, and claimed that it could not be a seedling of our native wild crabs, all of which are known to be uniform in character, and very different from this crab, which is a long keeper, keeping well into the summer.

Mr. Bryant stated that the wild crab is often a long keeper, and also, when fully ripe, of a yellow color. There was nothing that would lead him to consider it anything more than a native crab apple. The point was figured at length, without different results.

Quite a discussion arose on the Soulard crab. Several gentlemen from Galena, where it originated, spoke warmly in defense of its hybrid character and good qualities.

There is considerable disposition on the part of many members to ignore these crabs entirely, thinking that they are of very little value, except for jelly or preserves. Dr. Hull wished to know if a crab was good for anything until the crab was all hybridized out of it.

Mr. D. C. Scofield, from the Committee on Ornamental and Useful Trees, made a report. He regarded all tree planting as ornamental and useful; therefore those that were the most useful would be the most desirable: He urged the planting of trees along all the highways, and at least one-sixteenth of the whole area of the farm. He would ask that Congress provide for planting large tracts of both conifer and other forest trees in our Western plains; that the bill of Mr. Medill or one similar for the planting of trees along our roads, and one excluding stock therefrom ought to be passed. This report was received with hearty applause.

Mr. President and Gentlemen of the Convention:

Your Committee on "Ornamental and Useful Tree Plantations," fully aware of the importance of the duties imposed on us as relating to the future wealth and prosperity of our country, and our conscious inability to present to this honorable body a report that will be adequate to the great interests involved, respectfully submit the following:

1st. We regard all tree plantations as ornamental and more or less useful. In each, the varieties of timber which enter most largely into, and supply the wants of man, should comprise nearly the entire forest plantations. It is not presumed that this committee is to designate what these varieties are; your last volume of "Transactions," exhibits the varieties recommended by the committee for this purpose and the unanimous adoption of the report.

20. In view of the approaching end of the present pine forests of our country, and the increasing demand and consequent increasing price of lumber; the wide-spread timberless prairies and plains, as well as the already well nigh total destitution of the older eastern districts of the United States, where once timber abounded, we most earnestly recommend the adoption of a system of tree planting by every farm holder in the country, both in the form of protective belts of timber along the boundaries of farms and highways, as well as around orchards and farm buildings. Also in larger bodies, embracing at least one-sixteenth part of each farm.

3d. To encourage and facilitate this movement, we further recommend that the influence of this Society be extended to obtain such state and national patronage as shall encourage and secure an immediate prosecution of a work so essential to national prosperity.

4th. To secure this end we recommend that this Convention adopt measures to secure the passage of a bill in this session of Congress, extending such governmental patronage as will insure the planting of extensive pine and larch forests, as well as other valuable varieties of timber in every portion of the unthumbed public domain east of the Rocky Mountains, wherever it can be made to grow.

5th. That we urge upon our representatvies in both houses of Congress their support of any measure that may be introduced for the encouragement of a system of forest planting in any and every portion of the United States wherever scarcity of timber exists.

6th. We recommend that every State government (that has not already done so,) extend patronage by premiums or otherwise, to all who will plant forests within their borders.

It may not be out of place for this committee to state here, that an honorable Senator now in Washington is engaged in collecting statistics from the principal lumber manufacturers and dealers in the country, relative to the amount of pine timber land in the United States and their probable duration, thereby to enforce the claims of a bill to secure government patronage in planting forests on western plains and prairies.

Finally, your committee are happy to join in congratulating this Society and all who feel an interest in, and have long advocated the principle and necessity of general forest culture, and the country at large, that so deep and widespread interest prevails on this subject.

D. C. SCOFIELD.

Mr. Edwards stated that in the Convention there were some sixty lawyers, some half a dozen farmers, but not one horticulturist. He therefore moved that copies of the report just read be forwarded to the Chairman of the Committee on Agriculture.

Mr. Bryant, Sr., thought that the plan of planting trees alongside the roads, as proposed, could not be carried out, and that part of the report relating to Mr. Medill's amendment was stricken out.

Messrs. Bryant, Edwards, McWhorter, Ellsworth, and Scofield were appointed a committee to memorialize the Constitutional Convention in regard to tree planting.

Mr. S. G. Minkler, of Oswego, presented a report on orchards and vineyards. He reported that the Early Richmond cherry had been a failure the past season in Northern Illinois. Currants and gooseberries were abundant. Grapes poor, with an excessively abundant bloom. We have had a small crop, and he suggested that this matter of blooming might have something to do in indicating the coming crop. He also called attention to the value of thick leaves with a downy or pubescent growth on the under side of the leaf as proof against the thrip and leaf hopper. Those varieties with downy leaves had the finest fruit the past season.

Dr. Hull stated that dry lime sifted over a tree, or lime water thrown over it with a garden engine, would destroy the lice that cause the apple to scab. The lady bird feasts on the eggs of these lice, and when the lady bird is abundant the lice do little damage. The application should be made just before or after blooming.

Quite an interesting discussion took place on this aphid question. Many persons seem to be skeptical as to its being the cause of the scab, but Dr. Hull is confident that his theory is correct.

A discussion arose as to the hardiness of the Rhode Island Greening top-grafted. The general impression was that it is worthless.

Mr. Skinner, of Marengo, said that there were three Duchesses of Oldenburgs in Iowa, none of them being the true one.

Mr. Budd, of Iowa, said that they all came from Illinois originally. Persons planting this variety should be certain of the pedigree of their trees.

Mr. H. H. McAfee read an essay on Vegetable Physiology. This essay was mainly devoted to an endeavor to show that the accepted theory of spongioles and circulation of sap was, in a measure, erroneous. It was listened to with attention, and will doubtless be criticized at some future time by those competent to do so.

REPORT FROM THE COMMITTEE ON VEGETABLE PHYSIOLOGY—THE OFFICE OF THE ROOT—IMPRESSING THE VITAL FORCE. BY HENRY H. M'AFEE.

At our last annual meeting, a distinguished member from Iowa (Mr. Foster) raised several questions of an interesting nature in his essay named "Errors in Horticulture." One question especially—as to how far the small roots or rootlets were essential to the welfare of the plant in transplanting—has led me to study more carefully the subject of the "Office of the Root," and the deductions drawn from both experience and study are offered for your consideration.

The first and most important office of the root of a plant is a mechanical one; it is an "anti-matar"; it is the prop and the anchor by which an organism is held to a permanent place. The proof of the design of its use lies strongly in its form. Either a flexion of strong cords binds the plant down, or a tressle of strong and tough props and buttresses braces it up, or a massive central shaft is ready to resist force from any side.

The root is strangely impatient of motion. While the stem and the branches are swayed to and fro by the wind, and are not injured by the motion—are, it may be, benefited thereby—the root, in its normal condition, is motionless in the soil, and experience has proved that every flexure or contraction is a damage to it. This is a fact too little known, and where known, too little practiced upon. Most persons who have to do with packing or planting, are in the habit of treating roots in the same manner as twigs, bending them temporarily or permanently without thinking much of their structure or habits.

Whether we take the strawberry or the spruce from its native bed, every time we bend a root we inflict an injury upon the plant, and the injury is in proportion, greater or less, as the root is bent more or less out of its natural direction, or as the flexure is more or less permanent. If the plant is set with its roots bent or twisted, it is in a much worse condition than if they were cut off, for the contorted root may become an ever present disease, while if cut off its place will probably be filled with new and healthy roots.

When lateral roots strike off at right angles with their mains, it is very difficult to bend them much without rupturing and disorganizing the cell tissues at their axis. Careful examination has always shown some injury at such points; some packed trees showing a bruised and discolored appearance at the base of every lateral root.

Hence in many cases Mr. Foster's plan of removing the root branches would be a good plan, because the injured roots would injure by their presence.

The second office of the root is both mechanical and chemical. It is a feeder, taking up the food by simple imbibition of ready formed materials in its immediate presence, and also acting as a chemical agent to decompose compounds which are partly made up of substances required by the plant.

This latter capacity of the root, though not conceded by all writers, is nevertheless based upon sufficient evidence to warrant us in accepting it as proven fact. That the root extracts food from the soil every one knows, but just what the food required and taken up is, and just how it is taken up, are the questions which are before the vegetable physiologist for solution.

In the progress of knowledge some very fine theories which have had their day, come to be disproved, and have to be abandoned; among these exploded theories is the Spongiole theory and the theory of the regular circulation of the sap.

Some genius invented the spongiole, an imaginary little root with a spongy tip full of little mouths having suspended in them certain little valves which would open to let in the plant food from the earth, or close to keep out what the plant did not want; and the theory would have answered finely if the microscope had not proved it totally false, not so much as the valve of the mouth of the spongiole ever having been seen on a root.

The spongiole matter has died hard, for only within the year past the term, of course carrying its original meaning, has been used by some of our writing horticulturalists. The other theory, of a regular upward and downward flow of the sap, based apparently upon the circulation of the blood in animals, is yet a general belief among those who believe at all about vegetable physiology.

But assuming that such parallels exist between animal and vegetable physiology, is no proof that they do exist; and the proof being that there is no regular downward flow of sap at all, and that the upward flow depends upon temperature, leaf evaporation, and other intermittent causes, the idea of a regular flow in the sense of the circulation of the blood must be abandoned.

True, the plant food from the soil passes up and to all parts of the plant; and the plant food from the air passes down, and alike to all parts of the plant; but all this food passes from cell to cell, through the apparently continuous cell walls, and does not flow in streams, but simply diffuses itself by "osmose" or "membrane diffusion."

The power of the cell membranes or walls to absorb and give out liquids, called osmose, may explain some of the phenomena of growth, but will not account for all the acts of the growing plant, so we must acknowledge another force, namely, that of chemical selection. If all the required substances for the plant's growth existed in the soil, or in the air, in a state of solution, or as gasses, the theory of membrane diffusion might explain how and why they find their way to every part of the plant; but many of the substances required by the plant are not in a soluble state in the soil, and being solids they cannot enter the plant without being first dissolved. Take silica, for example. There is no evidence to show that soluble silica exists in all tillable soils; in fact, it is very rarely found in nature in the soluble state; and yet an analysis of the ash of most plants reveals its presence, sometimes to the extent of 75-100th of the whole ash. How does this insoluble substance find its way into the plant and there become an element of its growth? Clearly the plant itself attacks and dissolves silica out of the soil by virtue of its power of chemical selection. Grant, once, that a plant has within itself a power of decomposing chemical compounds, of rendering soluble naturally insoluble bodies, and of selecting food, and you explain the one great mystery of plant nourishment, namely: how the insoluble soil is transformed into organic bodies. Recent experiments conclusively show the selective power of plants; where, for example, plants were grown in solutions having a known chemical character. As growth progressed a constant change in chemical composition was observed to take place, soon rendering the solutions unfit for the further support of the plant, and even positively destructive.

Prof. Johnson says that "The roots of a plant have the power to decompose salts—e. g.: nitrate of potash and chloride of ammonium—in order to appropriate one of their ingredients, the other being rejected."

With these facts in view, we may readily see why soils are so strangely altered by continual cropping. First the roots use up certain parts of the soil, and secondly, they give rise to new bodies—their refuse or rejected matter.

Here are two good reasons for rotation of crops. One crop brings its power of chemical selection to bear upon the soil till the material to act upon runs short, when another kind of growth may step in and find food from the original ingredients of the soil and also from the bodies resulting from the chemical selection of the former crop. An apple tree may exhaust a soil for apple culture, and still leave behind the very substances most needed for a pumpkin vine. One thought further in reference to Mr. Foster's Errors in Horticulture, and I will leave this part of my subject. It appears to me that the greatest error in that paper is not an error exposed but an error committed. And it is this: That the surface of the larger, older roots absorbs plant food as well as the smaller, and hence it is better to cut off the fibrous roots in transplanting.

The large roots of perennial plants are not capable of taking up food to any great extent, nearly the whole nourishment of the plant being absorbed by the small young roots. This fact may be easily demonstrated with a microscope, which will show layers of empty dead cells covering the whole surface of the old roots and preventing absorption, while the young roots in the growing season have a surface of live, absorbent cells, from which the processes called root hairs project, thereby greatly extending the absorbing surface. Hence, if the young roots are not injured, we should keep them; but if injured, they should of course be pruned away. I now come to the grand question which overshadows all others in vegetable physiology, namely: to what extent, and in what manner, may we impress the life principle or organic force of plants.

This question covers the whole ground of plant culture, fertilizing the soil and the production of new and improved varieties. We know, in a general way, that plants vary in a natural condition, and we know further that they vary still more under domestication, but every effort to discover the exact causes of variation has so far been futile. We can by careful selection and breeding, secure a larger aggregate of variation after the specific variation has once commenced; but who has by any treatment potentially originated a trait of character possessed by none of the plant's ancestors. Thousands, millions of improved varieties have been originated somehow, but no man dare say "I did it." The most carefully conducted artificial hybridizations are by no means certain as to results, not even certain always to produce offspring resembling either parent.

Darwin in the "Variations of animals and plants under domestication," has multiplied proofs and deductions, but nowhere does he tell us how to impress the vital force so that a certain seed shall produce a flower with a new spot upon a certain petal.

Every act done to a plant which modifies it or its offspring in form or any other respect, is an

impression upon the vital force, and if the modification is capable of continuation by inheritance, it amounts to a radical change of the character of the vital force of that plant. Impressions upon the vital force are more or less permanent in their character, from the variegation of a single leaf to the establishment of a distinct variety or sub-species. Now by carefully considering the laws of inheritance and departures therefrom, so far as known among animal beings, we find that the most apparent cause of new forms or new proportions, are strong mental impressions of the parents. This being so, what is more reasonable than to suppose that the incidents or accidents which happen in the life of the parent plant, at or before the flowering season, should so impress the vital principle of the embryo as to produce a new form, color or flavor. Let us suppose a case for illustration. A strawberry of a good variety is planted in a poor soil, and is compelled to undergo all the adverse influences possible without actually killing it. Then, when inured to hardship, let it be brought to the height of its capacity of growth and productiveness by a favorable soil, temperature, &c. Now let the seed of its best berries be planted in medium soil, and it seems to me that the new seedling should possess hardiness and vigor and productiveness. This, of course, is only theory. I ask no one to take it as fact. But of one point it may safely be said that absolutely all the probabilities are in its favor, and that is, the principle that to impress the vital force of a plant, it is necessary to act upon the parent and through it, upon the embryonic life of the offspring.

Principally because so little that is positive is known upon this subject, I have brought it before you in hopes that every means of obtaining more definite knowledge may be exhausted before we give up trying to know how to impress the life principle.

In fact, every horticulturalist should constitute himself a committee of one, with full power to experiment upon his pet trees, shrubs or flowers, until he can tell us more than we now know on this subject. And if our Industrial University should organize a thorough course of experiments, under the supervision of its very best professors, for the purpose of adding to the sum of knowledge of vegetable physiology, it would, while doing a great work, only be doing just its duty in the premises.

The fruit list was up for discussion, some wishing to pass it entirely, while others wished to have the old ground raked over. A fruit list of any Society is of but little value. Dr. Hull says it would ruin any man to follow any fruit list in any given locality.

Mr. Hallett, of Galena, wished for a preëminent list of apples.

Mr. Edwards offered a resolution that no change be made in the fruit list.

Much time was here lost by discussing the apple list and attempting to get others added.

Mr. Budd called attention to the Haas apple, also known as the Soulard Grosse Pommier, and Maryland Queen. All present agreed that it was large, showy, productive, and hardy.

Samuel Edwards read an instructive essay on timber planting and shelter belts, and was followed by Suel Foster, of Iowa, with an essay on the subject of trees for our prairies, with regard to commercial use. He argued that the growing of forest trees would be one of the most profitable crops. He recommended close planting, say rows five feet and ten feet in the row, each tree to occupy ten square feet. Soft maple and black walnut he finds of the highest value.

TIMBER SHELTER PLANTATIONS.

A fact so patent to the eye of any one who visits our lovely prairies, as the one that timber planting is our greatest physical need, leaves no room for argument. Each of the twenty-seven years during which Illinois has been my home serves to strengthen me in this faith.

During the first half of my residence here the want, and latterly the enjoyment, of efficient shelter from the chilling blasts of winter has fully satisfied me of the home comforts to be derived from the protection afforded by belts of evergreens. Pear trees were formerly tender with us; now, all the varieties recommended for this part of the State succeed admirably; are never injured by severest winters. Heart cherries, tender without protection, pay the amateur well for culture. Apples are not blown off by high winds as when unsheltered. It is confidently hoped that many of our excellent varieties which have been a little tender, give promise, with protection, to be profitably grown.

Mr. John Crossman, of this township, an extensive feeder of cattle, believes that his evergreen grove, occupying less than an acre of land, was worth \$200 in sheltering his stock through one storm a few winters since. A thousand dollars, he says, would be offered for this grove; a strong argument in favor of the universal planting by residents on prairies of timber for shelter.

The attention of other stock growers in this vicinity is being turned to the subject, and many of them are preparing, by purchasing small evergreens at trifling expense, to plant shelter belts, preferring them to sheds, as owing to the limited space in the latter, they are occupied during storms by the strongest cattle to the exclusion of the weak ones, which need the protection most. Groves and shelter belts of rapid growing trees can be grown of size to be a good protection in five or six years, at merely a nominal cost.

If each owner of a prairie farm would plant for his own necessity, the country at large would, in a few years, be exempt from the full force of the terrible gales, which in some instances sweep over our prairies with but little let or hindrance from the Rocky Mountains to Michigan, when the mercury is twenty or more degrees below zero, before which animal life, without extraordinary protection, can not exist.

For one of the best cheap screens of rapid growth, the White Willow is recommended. A cutting of it, planted on bank of a sod fence, spring of 1845, never receiving any attention, now measures twelve feet and five inches in circumference, two feet above ground. It is a more desirable timber than has generally been supposed.

Mr. Jesse W. Fell, of Bloomington, brought from Chester county, Pa., last summer, a piece of White Willow rail, which had been twenty-seven years in fence; saw fence stakes in use which were set eight years since; were seasoned before setting. Ground intended for planting should be in good order for ordinary farm crop. Cuttings eight inches to a foot in length are set three-fourths their length in the ground—dirt pressed firmly at the bottom—are certain to grow, if in good condition when planted. A more rapid growth is obtained by using cuttings an inch or more in diameter, though those an eighth of an inch or even less succeed well with proper care. Rows may be four or five feet apart, running north and south, two feet apart in the row; cultivate three years. The thinnings first seven years will repay all cost, or if all cut down, enough can be grown on an acre to make three miles of fence five poles in height, which will last until an Osage hedge can be grown. Sprouts grow vigorously from the stumps; can be cut in four years again. It is largely grown in Germany for fuel, cutting it every third or fourth year. Evergreens are, of course, the best trees for screens, and are not expensive at present, but require more time to become of size for an efficient screen. Norway Spruce has no superior for large or medium sized screens. Double rows are generally planted, alternating the trees in one row with spaces in the next. They may be set ten or twelve feet apart—plants two to four feet in height are of desirable size. For single row, six to eight feet apart is suitable distance. Hedges are made of it in Denmark, plants three feet in the row. They bear clipping to any desired extent. The American Arbor Vite makes a good screen of medium height, especially in wet soils. Hemlock is very beautiful, especially in partially shaded locations. The Pines in general are well adapted for planting in clumps or groves.

It is well to intersperse and surround them when grown for timber, with deciduous trees of rapid growth, to protect the leading shoots from being broken off by high winds before they acquire woody fibre. For this purpose the European Larch is admirably adapted, and will doubtless be largely used in the plantations to be made on our prairies.

Enough has already been done by a few individuals to establish the fact of the practicability of the work, and that it will prove a very profitable investment.

Henry C. Chapman, of Sublett, Lee county, bought one thousand small Norway Spruce a few years since. He this winter refused an offer of the amount originally invested and one hundred per cent. per annum, preferring to plant them in screens for his own use.

The planting of timber for agricultural and manufacturing purposes will doubtless receive at the hands of this Society the pre-eminent place in its deliberations which its importance demands, as so ably set forth by our President in his opening address.

Whilst Kansas, Iowa, and Wisconsin have nobly led the way in giving encouragement to the performance of this imperative duty we owe ourselves and posterity, it is hoped that the Constitutional Convention of our State now in session, and future Legislatures, will follow the worthy example set us by our younger sister States, that future generations may not have just occasion to cast invidious reflections upon us for want of foresight, or the manliness to act for the benefit of others, even though we may thereby incur expense to ourselves.

May we as individuals and as a nation act from high and unselfish motives, endeavor to leave the world better than we find it; live not to ourselves, but for all time and eternity.

SAMUEL EDWARDS.

Mr. Scofield would plant forest trees three feet each way.

Mr. Foster, of Iowa, read an essay on the same subject.

FOREST TREES FOR THE PRAIRIES. BY SUEL FOSTER.

Our Iowa State Horticultural Society take a deep interest in this branch of their work; and to-night, while the piercing north-west January winds come whistling by, it reminds me of the comforts of the forests. The time is at hand when the farmer on the prairies, without a good supply of wood, timber and wind-breaks about his buildings and fields, will be considered as far behind the times as he who now takes the sickle and hand cradle to cut his grain. Who can live without timber? It is a product of the soil, and should be produced by every farmer, not only his own supply, but it enters largely into our commerce; and our villages and cities must be supplied.

When the best varieties of trees and timber are selected, and properly planted and cultivated, it is as much of an improvement on the native forests and scattering groves, as the cultivated fruits are improvements on the wild. Years ago I learned from the late Dr. Evan Pugh, of Pennsylvania, who had traveled in Europe, where they have been planting timber for centuries, that the Americans do not plant the trees for forest timber close enough together. He says: "They plant as close as two or three to the square yard," that they may grow up straight and tall and free from limbs. My own observation had long ago led me to know that four feet each way was none too close, and I am now of opinion that it is only half close enough.

The best and largest experience I have ever heard on this subject, was from Judge Whiting, of Monona county, Iowa, which he gave us at our annual meeting of the State Horticultural Society, January, 1870. His location is on the Missouri river bottom, eighteen miles wide, high and dry, clean and smooth, and his home farm is over two thousand acres, and his front yard is a twenty acre lot, all platted by the most celebrated landscape gardner in the United States, and tree planting commenced in his front yard. But the judge himself is a very practical farmer and forest tree planter, gardner and orchardist, and cultivator of flowers, shrubs and ornamental trees. He gathers his soft maple seeds by the tens of bushels, and plants them by the field as he does corn only twice as thick. In the fall he buys his black walnuts of the boys by the bushel, and this year he has sixty-five bushels for spring planting. He has been thus at work for twelve years.

First Judge Whiting planted cotton wood eight feet apart each way, but he soon found the tree spent nearly half its force in growing branches, a great waste of material, and not making height of body enough. He soon shortened his distance one-half each way; but of late his distance is rows five feet apart and two feet in the row, giving ten square feet to every tree, and rows wide enough to admit a horse to draw cut poles and thin out one half when the trees are five or six years old. He now plants mostly soft maple and black walnut, the maple averaging seven feet in height each year, and the black walnut five feet after a slow start for three or four years.

The soft maple yields abundance of sap, about half as sweet as the sugar maple, making sugar equal in flavor to sugar maple. I have heard it said that the sugar of the soft maple was inferior in flavor to the sugar maple. This is a valuable consideration. He has tried many other varieties of trees. So far as not succeeded with the chestnut.

BELTS OF TIMBER FOR WIND-BREAKS.

He is planting around all his fields, and well he may, for his experience is very favorable for this practical work upon his prairie farm. His soil is the light alluvial Missouri river soil, five feet deep, and the tree roots run very deep, so that the grain grows equally well up near the trees. The corn and small grain show the great benefit of these timber belts for fifty rods into the field, and this on both sides, whether the timber belt runs north and south, or east and west. The corn and other grain grows more thrifty all the season, and the harvest is quite perceptibly heavier. This is a valuable consideration. Many of these wind-breaks have grown in eight to twelve years from thirty to forty feet high.

How changed and how beautiful will our prairie lands be, when our farms are surrounded with timber belts. How convenient it will then be to take the axe and go to a grove of one's own planting, and cut his poles, hay-racks, stakes, posts, firewood and fence timber. Then the rigor of the climate will be modified, both summer and winter.

The European larch is no doubt the best tree that can be planted for wind breaks, and for timber of all uses. It grows about as fast as black walnut.

But the best of all trees for wind-breaks, and for modifying the climate, and for beauty, are evergreens. They may be planted one rod apart each way, and set as many pear trees among them if the land is dry, thus accomplishing two things at once. Capt. Jas. Mathews says he has a row of pear trees on the north side of a row of evergreens, which are healthy and bearing abundance of fruit every year, while his other pear trees have blighted and nearly all died. I last year commenced a pear orchard and evergreens together, and intend this year to go on with it until I have two acres covered, about three pear trees to one evergreen.

In Iowa they have a law for the encouragement of timber growing. It provides that any one who shall plant and keep alive one or more acres of timber, shall have credit on the assessment for taxes \$100 for each acre, and for shade trees by the roadside \$100 for each mile.

In Kansas they have a similar law, more liberal, and for hedge planting a very liberal credit on taxes. And when the hedge is first planted it is a legal fence, and cattle are not allowed to trespass on or across such a hedge.

The European Larch was highly spoken of as being very durable, and the time is not far distant when it will be used in great quantities for ties. It is a rapid growing tree and easily grown. Mr. Bryant says that the American Larch, or Tamarack, has been sold in large numbers for the European. It is not of much value when compared with the European.

A gentleman from Wisconsin spoke at some length on timber trees, but his views were not sustained by the Society. He seemed to be particularly spiteful against the White Willow and some others of our favorite trees for shelter-belts. He recommended the Weymouth Pine as the best of all trees for wind-breaks.

EVENING SESSION.

ESSAY ON TANKS AND PROPAGATING. BY EDWARD H. BEEBE, GALENA.

Mr. President, Ladies and Gentlemen:

Success in germinating seeds and striking cuttings depends upon the proper application of heat and moisture. The hot-bed in general use for starting plants for the early market is one mode of applying these requisites to propagation. Seeds are germinated and cuttings rooted or struck by the Florist in the green-house, under the same law, but applied in a different manner. The Florist uses a tank or long shallow box containing hot water. Boards are placed an inch or so above the surface of the water; upon them a bed of sand three or four inches deep. The seed pans are plunged and cuttings stuck in the sand. Heat is applied to the water in the tank; and as the heat is constant and uniform in temperature, so will be the success of growth. If the sand receives from the water an excess of heat, the seeds and plants will be partially if not wholly destroyed. An excess of moisture is equally fatal. In either case they will be burnt up or damp off. The usual mode of heating tanks by the same means by which the house is warm is, in my opinion, an error. The cause of much, if not all, the bad luck that Florists have is due to the fact, that in all tanks heated by the same fire that is used to warm the house, it is simply impossible to keep up a constant and uniform temperature in the tank without injury to the plants in the house. We have many days in the winter and spring that the temperature out of doors in our latitude ranges from 45° to 65°. On such days no fire is required in the furnace; on the contrary, the house becomes so warm that it becomes necessary to open the sashes. No fire in the furnace, the tank cools down, and the result of the decrease in temperature is that all in the tank gets such a check that they require three or four days to recover from, if they do so at all; more or less damp off, and we have a streak of bad luck, caused by bad management. Such has been my experience, and I presume it is that of every one who uses a tank heated in this way.

Mr. President, I am not a professional florist, neither do I think I know it all; but am very decided in the opinion that I have yet much to learn of the art of striking plants. As an amateur having a very small house, I have for a few years past experimented with my friend, Dr. E. D. Kittoe, who as a florist and horticulturist, has no superior in "our diggings." To him we are more indebted than any other, for he erected the first green-house in our city some fifteen years ago. In it he constructed a brick tank upon the old plan, and used his furnace for heating it. It worked as well as any of the kind usually do. Subsequently I put up a small house and experimented some in the same way, having very bad luck, and rather green, I had indifferent success. I had learned that seeds and plants to grow should have heat and moisture, but had not realized the fact that they should always be under a constant and uniform application of both. The Doctor and myself often

had occasion to talk over our troubles, and finally decided to experiment with a boiler heated with a kerosene lamp. Each of us constructed one on the same principles—a metallic cone running up through the center of the boiler, acting in the same manner that the glass chimney does upon the parlor lamp. The Doctor being more of a ladies' man than I, selected the Wardian case—I went in for the Tank. He took an ordinary size dry goods box, fitted in a metallic pan, divided off by partitions, so as to have a flue over its whole surface; made a box to set on it; in this plunged his seed and cuttings; placed the boiler on the outside of the box; covered the box with glass; obtained uniform, constant temperature and moisture, and it proved a decided success.

In the meantime I took a tank the size of my present one that had been attached to the stove in my green-house, and with a boiler constructed similar to the one before you, set it to work; my cuttings would not grow like the Doctor's. Some one had informed me that roofing slate was the very best article for a bottom over the water. I had procured it and cemented it. Searching for the cause of my sad luck, I discovered that slate, when heated, was always dry, and that cuttings, although receiving regular and uniform heat, had no moisture at the roots, except that from the sand surrounding them. I removed the slate, replacing it with boards three-fourths of an inch thick; they answer the purpose. The boards soon become saturated with water, and they passed both heat and moisture. This was three years ago. I thought it a success—I think so yet. I can strike anything any one else can equally as soon in point of time and at as small a per cent. of loss. My friends present, John W. Robson, a florist and horticulturist from his youth up—your Secretary Scott, nurseryman, florist, and printer, have seen the tank at work. The plants it turns out—quantity and quality—I refer you to them for particulars.

The Boiler—Made of copper (it can be made of tin at much less cost, say three or four dollars) is 15 inches in height, 6 inches in diameter, with a cone running up through the center $3\frac{1}{2}$ inches at bottom and $1\frac{1}{2}$ inches at top. It passes through a loose cover on the top of the boiler 2 inches. There is a ring around the bottom of the boiler $1\frac{1}{4}$ wide. In this ring is a door of mica $1\frac{1}{2}$ wide and 3 inches long, which enables you to observe the height of flame and to light after the lamp is attached by three hooks. The lamp is 6 inches in diameter and $2\frac{3}{4}$ inches deep. The top is convex, the burner (No. 1) is screwed into the top, and there is a small screw opening at the side to enable you to fill the lamp without removing the burner. A circular disk is attached to the upper side of the burner. The edge is slightly turned up. When the lamp is attached it fits closely around the ring. It consumes one quart of oil in 24 hours, and is trimmed night and morning. It requires no other attention. It is attached to the tank with 1-inch light lead pipe; about 6 inches from it the fine pipe is on a level with the water in the tank; the return is taken from the bottom of the tank; they are attached by flanges made from iron washers that fit over the pipe—a rubber gasket and wood screws. The tank is made of $1\frac{1}{2}$ inch white pine plank, put together with 4 inch wood screws—preferable to nails, as they do not draw. It is painted inside and out; sets inclined toward the boiler, $\frac{1}{2}$ inch in its whole length. Inside measurement—length, 10 feet; width, 15 inches; division board, 1 inch thick, 5 inches in height; boards for sand bed, $\frac{3}{4}$ inch thick; top of tank from board, $4\frac{1}{2}$ inches; capacity, $120 \times 14 \times 4\frac{1}{4} = 7140$ cubic in. = 30 210-231 gallons, which is heated to the temperature of from 65° to 70° , with one quart of oil in 24 hours. I use 12x18 of single lights, of glass, making a "lean to," to cover the whole length of the tank; the lower ends of the glass rest on a small strip nailed inside $\frac{1}{2}$ inch below the top of the tank, to keep them in place. By using the glass in single panes you can cover from one foot to the whole tank. Last month our friends Rural and Mr. Edwards visited our city. My tank had not been in use for seven months; never leaking. I always let the water stand in it. I filled it up to $4\frac{1}{4}$ inches— $30\frac{1}{2}$ gallons of water—at 4 p. m.; I lit the lamp; the water then was at 44° ; at 9 p. m. I removed the lamp, as the disk was filled with drip; I removed it and replaced the lamp, with water at 56° ; at 7 next morning I trimmed and filled lamp; water at 64° , and at 10 a. m. when they visited me the water was at 68° ; the bottom boards were heated, and it could then be run for months without a variation of 5° . One improvement has been suggested—making the tank of zinc or sheet iron; this would be an oversight. Metals are the best conductors of heat we have. Wood is among the worst. The object is to utilize the heat generated in the tank; not radiate it in the house. I do not think a quart of oil would heat 15 gallons of water up to 50° in a metallic tank.

Such, Mr. President, is the apparatus. I have given you simply the results of our experiments and observations. If any lover of flowers should from its use realize that we have added to their enjoyment in the growth of flowers and plants, the only and soft interest I have in it is realized. It is susceptible of so many modifications that it can be applied to either parlor or green-house. Nothing new is claimed for it. Tanks have been in use since how long, Rural?—I don't know. The Wardian case has been in use for years, and had lamp attachment. The natural laws by which plants are propagated have always been and will ever remain unchanged. What then has been done? Nothing else in my opinion but putting our tools to a better use—a better understanding of laws always in force—which may be stated thus:

1. The tank should have a heating apparatus separate and independent from that used for heating the green-house, thus securing constant and uniform heat to the roots of the cuttings.

2. The tank should be constructed with materials that are poor conductors of heat—that will retain, not radiate it—thus utilizing the greatest portion of the fuel used.

I am aware that every professional florist believes that his mode of striking is the best; that they look upon any innovations relating to their way coming from an amateur with distrust, and are very loth to believe any improvement can be made. Yet, if they will reflect a moment, they will realize the fact that the amount of fuel requisite to keep the water in the tank at 70° would not when the temperature was at 10° above 0° outside keep the house from freezing. Your Secretary, Mr. Scott, has had some experience, and can inform you that in his green-houses there are more days than one during winter when he could not raise the temperature in the houses to over 45°; that the water in his tanks heated by a coil in the house furnace was boiling up to 212°. This excessive heat destroyed all the stuff in his tank.

Mr. Groner, of our city, a florist and boot maker (he regularly makes one pair of fine boots every day), has two commercial green-houses nearly as large as Mr. Scott's. He propagates all his plants for sale in a single tank the size of mine, using the same size lamp boiler. He has had no trouble. On a cold day he fires up his stoves to keep his house up to the proper temperature; the tank takes care of itself.

I give you, Mr. President, a statement of facts as I have observed them, and believe that any one who will can succeed in starting cuttings, with but very little trouble; that ladies may, as a number of ours have, miniature green-houses constructed upon Dr. Kittoe's plan in successful operation in their parlors, thus adding to the beauties and attractions of home.

Propagation is effected by keeping up an equal temperature in the tank. A tank heated by the same apparatus, that heats the house. We are much indebted to Dr. Kittoe for the progress we have made in the growth of plants. The first tank erected by the Dr. was built with brick heated by the pipe which heated the house. We have now something better. The communication of captain Beebe was received with so much applause and approval that we entered into the enthusiasm displayed, and could not report correctly.

ADDRESS FROM JUDGE KNAPP, OF WISCONSIN.

We, the delegation from Wisconsin, thank you for the kind reception which we have received. Though coming from a sister state, I believe that we of Southern Wisconsin and you of Northern Illinois are twins. Our temperature, our trees, our insects, our birds, our interests are identical; but you have the advantage of us as regards numbers, and you being stronger, we invite you to come over and help us in our weakness.

Much encouragement is held out to farmers of that State to plant belts of forest trees. Any one who plants one-fifth of his farm with trees is entitled to one hundred dollars prize, but strange to say not one of our citizens as yet has claimed the reward. We fear the time is coming quickly when the country north of us on the Chippawa, the St. Croix, the Menominee, and other sections will be denuded of their trees. Why, the Mississippi at some points is entirely covered with lumber, while it escapes by Green Bay and other outlets, and many thinking men are beginning to fear that cold wind from Lake Superior will sweep down upon us and destroy our fruits; and if that should ever happen, Illinois would be exposed to the same extreme cold.

Gentlemen, we feel interested in you, and we want you to be interested in us. Our list of apples is comparatively small; raspberries and blackberries dry up with the extreme drouth, strawberries also, unless they are mulched. Among grapes, we are successful with the Delaware, Concord, and some of the Roger's seedlings. He referred to the timber question once more, calculating forty pine trees to the acre, it will only take twenty-five years to consume all the trees in the pine lands of Wisconsin and Michigan. This is rather startling, but it is true; and it is high time we are turning our attention to the planting of timber trees or make up our minds to give up the planting of fruits.

The rest of the evening was taken up by Dr. Hull, who treated of sun scald, cellular structure, and the rupture of cells, he recommended root pruning in the culture of fruit, by this system the early ripening of wood is secured, which is necessary to produce a fruit bearing tree.

Under certain conditions a tree can be made perfectly hardy, and productive, taking as illustrations, the heart cherries, the pear, and the peach.

SECOND DAY—MORNING SESSION.

The attendance this morning is largely increased, and we notice a larger number of new faces among the members. Some of the old stand-bys have staid at home this year. Prayer by Mr. Minkler.

The pear list was continued over same as last year.

The plum list was called up. It only consists of one, the Miner or Townsend. Quite a discussion arose between Mr. Robson, of Galena, and others on this subject. Mr. Robson says it is curculio proof, and the most valuable of all plums; others contended that it was valueless.

Dr. Hull inquired if it was of value enough to require any discussion.

Mr. Scott—It is the most valuable plum that we have.

Dr. Hull—Then I pity you.

Robson—Dr. Hull will be glad to grow this plum yet.

Mr. Scott, Mr. McAfee, and others spoke on this plum question, but no new facts were elicited.

A committee was appointed to collect facts with regard to the name and origin of this plum. Messrs. Soulard, McAfee and Beebe, committee.

CHERRY LIST.

Mr. McWhorter asked for information about a cherry grown successfully near Sterling, and known as Jeffries Duke.

The Early Richmond and Large English Morillo were recommended without debate.

Mr. T. McWhorter, of Sterling, said that the Jeffries Duke was in his opinion better than the Early Richmond; it is a sour cherry, but not so acid as the Richmond, ripening two weeks later.

Late Kentish was called up, but much confusion existed among members with regard to the true variety. The discussion took a wide range. All agreed that it is a good bearer, equal in quality to the Early Richmond, and very valuable as a late cherry.

The Early Richmond here referred to, is known as Kentish and Early May in different parts of the West.

Mr. E. H. Skinner, of Marengo, read an essay on Russian apples.

RUSSIAN APPLES.

The growing interest in procuring hardy varieties of the apple to supply the extensive region of the Northwest, of which the district embraced in the limits of our Society forms an integral part, has induced me to procure from Europe a number of varieties of the apple originating in a high northern latitude, some of them as far north as sixty-two and a half degrees.

Four hundred of these varieties were obtained from Dr. Lucas, of Germany, accompanied with a list of their names in the German language, which have been kindly interpreted for me and written in English, by Mr. C. W. Martfeldt, of St. Louis, Mo.

Nineteen of these varieties were of Russian origin, and are the ones offered by me as premiums to members of this Society. It now recurs to speak of the merits of this class of apples, and their necessity for the exigency of our climate.

I make no pretensions in science or pomology, but there is a class of men who seem to ignore the fact that the State of Illinois covers a number of degrees of latitude in extent, from north to south, and that the fruits and the varieties which may be adapted to the central and southern portions of the State, may not be adapted to its northern portions. And furthermore, as I understand it, this Society of Northern Illinois is organized for the particular purpose of attending to the wants of our own portion of the State, without any interference with or detraction from the views and measures of the organizations whose wants and conditions are different from ours. Indeed, we can safely say, as men who accept the situation and are proud of the capacities and future prospects of the section in which we live, that our Society should be made in every respect the peer of any organization of the same character, in the whole State. As horticulturists we have the brains, the soil and the means, and we should be ashamed not to possess the energy and enthusiasm which will not fail to make our Society self-supporting, independent and efficient for the purpose for which we labor. With so many resources as we possess, it is and ought to be a burning disgrace to us to allow our proceedings, as we did last year, to be printed in a volume which assigns to us only a subordinate and local position, not more prominent than some single county society.

But I am diverging from the subject, which was to consider some of the new varieties which promise hardness and productiveness beyond any older varieties, which for the last twenty years have caused so much disappointment, loss and discouragement.

The Duchess of Oldenburg is a perfect type of the class called Russian apples, and if crops that I have raised on sixty-two trees for the past five years may be taken as an example of productiveness of the new kinds which are now being tested, it is certainly a promising experiment.

This variety (the Duchess) is found quite hardy as far north as St. Paul, Minnesota, but unfortunately it does not fill the place of a winter apple, and if among the nineteen varieties which I now offer to this Society, should be found one winter fruit as hardy and productive as the Duchess, I should consider it a more enduring and honorable monument than to have a marble statue erected to my memory.

But it is objected to these fruits that they are coarse and not equal to the older sorts in flavor. Granted; but are we to reject the fruits which nature has placed within reach of the poorest and humblest citizen, who, but for these hardy fruits would as seldom know the flavor of an apple, as we do of the pine apple?

The great Northwest, including North Illinois, on its southern boundary, and the extensive wheat-growing regions of British America, on its northern frontier, is a region vast in its extent and important in its future destinies. In all this immense region, there is every reason to believe that the improved Russian and Siberian apples will find a congenial home, while most of the older and more tender sorts will be partially or wholly excluded.

We are aware that the whole of this great territory, including the northern part of this State, is looked upon by fruit culturists further south as the "natural market for their products." Hence, some have gone so far as to discourage and sneer at the idea of introducing coarse Russian apples and Siberian crabs into our discussions, and who, by certain fine spun theories and impracticable expedients, would induce us to believe that we can render hardy the old time favorites, which, during a quarter of a century we have found it impracticable to grow in our capricious climate. But the people of Northern Illinois have suffered too much in time, money and disappointment, to allow them to discard such promising sources of supply for that most indispensable of fruits for all seasons, the apple, and that, too, grown in our own orchards.

We feel here a common sentiment with our neighbors in Iowa, Minnesota and Wisconsin, one of whose delegates has so truthfully described "our trials, our soils, our climate and our condition" to be theirs.

The Northwest is undoubtedly the most promising, and at the same time the most difficult field for the fame of those who aspire to become our National Pomologists, a fact that some societies and horticulturalists further south may well take note of. Meanwhile, as true patriots and philanthropists, and genuine lovers of Nature's good gifts, let us continue our efforts to improve and disseminate the fruits which Nature distributes as the reward of patience and industry.

The growing interest we have in hardy varieties of apples should make this subject of interest to every grower of fruit. This Society was formed to meet the exigency of our portion of the State. We have the brains, and we have the energy also, to carry out those interests which will improve and bless this great Northwest. The Duchess of Oldenburg is a peerless type. Their excellencies are these: Hardiness, productiveness, beauty, excellence, suitability. Some are early fruit, some are late keepers, and though they may be rather coarse in flesh, they will always secure a profitable market. In closing, the essayist offered nineteen scions, one of each variety, to each

member and to any other who may become a member. Also scions of the true Duchess of Oldenburg to any person applying, enclosing an envelope with stamp. The liberal offer of Mr. Skinner was received with a vote of thanks.

Moved by Mr. Schofield that the Transactions of this Society be published in a separate form, and not attached to the transactions of any other. Lost.

Essay by Suel Foster, the veteran Iowa Pomologist.

He recollected when grafting was performed by inserting large branches, forty years ago. It is to our shame that even now we know so little after all the improvement we have made. Why are our young men not studying horticulture? How many of our schools are teaching this science? We know of no one who is a really and thoroughly practical professor of the science to teach our young people. He related an incident of an Iowa member of Congress who had deeded a deed of trustee to each of his daughters, for 160 acres, who would learn to graft an apple tree. Mr. S. urged upon ladies the propriety of practicing Horticulture, as being of immense benefit and interest to the sex.

The speaker then took up the production of new varieties of fruit, and in closing, lamented that Professors of Horticulture were so few. Indeed he did not know of one.

AFTERNOON SESSION.

Mr. I. S. Platt, a gentleman who has had considerable experience in handling and selling California fruit, entertained the Society for a short time. The Bartlett pear grown in California could not compare with those grown in Southern Illinois; in fact, most pears raised there are not equal to those raised in Illinois. There are some exceptions, the Winter Nellis and Gray Doyenne were excellent. The quality of most of them is about equal to a good turnip. He doubted that pears could be sent to Chicago from California at a profit. So far it has not paid. The grapes from California, however, are better than ours; and it is possible that grapes may hereafter be supplied to us in sufficient quantities to injure the raising of grapes for market in Illinois. The size of the California fruit has been much exaggerated.

The list of ornamental trees was passed without revision.

Mr. Budd, of Shellsburg, Iowa, read an essay on "Grafting Pears on White Thorn." He had not found anything so effectual to prevent blight as grafting them upon thrifty young White Thorn one foot from the ground. Some varieties form a good union with this stock. Some varieties outgrow the stock. The White Doyenne is one of the number that forms a good union. The reason of failure heretofore has been that pears had been grafted on our common bushy thorn. The stocks must be grown from seed, and it is necessary to get genuine White Thorn (*Crataegus coccinea*). The seed is mixed with cornmeal and fed to cattle; the droppings are gathered and planted. The experiment is worthy of trial, and if successful will be valuable.

GROWING THE PEAR UPON WHITE THORN.

Whatever disagreement there may be among those who have experimented, thought and written upon prairie pear growing, upon two points there seems to be a general unity of opinion: First, that fire blight is the giant obstacle in the way of profitable pear growing; secondly, that root-pruning, or neglected culture by way of shortening up the supply of sap from the roots, has proved the most available preventive to blight. For the purposes of this brief paper it is not necessary to philoso-

phise upon the mysterious causes of fire blight. Any plan that decreases the natural supply of sap, and yet which keeps the roots in a healthy, sound condition, seems to answer the required purpose to a sufficient extent to make pear growing a source of profit. During the twelve years past that I have given this matter close attention, I have known no practical plan so successful in preventing blight, as the grafting or budding the pear above the ground, upon young and perfectly thrifty white thorn stocks.

There seems to be no tendency on the part of the white thorn to a deep extension of roots, and the supply of sap thrown into the pear top seems never to be sufficient to develop blight to any serious extent. Hundreds of thorn trees have been grafted at the West to the pear, which have made a feeble growth for a few years, and after bearing a few pears have died out, root and branch. Yet, while nearly all experiments in this direction have resulted in more trouble than profit, we have no reason to say, with Dr. Warder and other noted tomologists, that "The pear rarely, if ever, makes a perfect union with the wood of the thorn." Facts are one thing, theory quite another. One perfect success, as the result of systematic effort, is worth more as a criterion to work by, than a thousand failures, which are the outgrowth of misdirected effort. The plain facts are that some varieties of the pear will make a perfect union with the true white or pear thorn, and develop into large-sized, long-lived and very fruitful trees. Isaac Brandt, of Des Moines, Iowa, and others have visited a noted tree of this kind in Ohio, of immense proportions. It is grafted upon the thorn trunk twelve feet from the ground. Its branches cover an area of thirty-five feet in diameter, and fruit is annually produced at a height of seventy-five feet from the ground. The circumference of the thorn trunk below the point of grafting is five feet nine inches. This tree fully illustrates the doctrine that where a perfect union is formed the pear top induces a larger growth than is natural to the thorn stock. Still the pear thorn is naturally quite a large and free growing tree. I have seen native specimens upon the banks of the Cedar river, Iowa, over thirty feet in height, and fully sixteen inches in diameter. It is now generally admitted by those who have given the matter attention, that a few kinds of the pear—prominent among which is the white Doyenne—will work upon the white thorn, either by budding or grafting, with fully as much ease and certainty as upon pear stocks. If upon further trial it proves that the list of varieties that can be successfully worked upon this stock is too restricted, the plan of double working can be adopted, and our list be increased as may be found desirable for our climate.

While it is true there is not a great number of healthy bearing trees of many years standing of pear upon thorn scattered over the prairies at this time, yet the trees that we have, exhibit so little of blight or disease, and are so continuedly productive that we have much reason to hope for a new era in prairie pear growing. During the past unfavorable season, when a majority of all the pear trees at the West upon pear or quince roots have been scourged with the blight, I have known no well established tree upon the thorn that has been injured. The general ill-success of working pear upon thorn, has resulted from two main causes: Firstly, nine-tenths of all experiments have been tried upon the common bitter haw of our prairie thickets. Worked upon this diminutive bush thorn, the pear soon outgrows and exhausts the stock. Generally a few pears are produced, but the result is never satisfactory. Secondly, when the true white thorn is used, old stocks of feeble vitality are dug up from the woods and top grafted. Those who know the difficulty of top grafting in our dry climate need not be told that failure upon such stocks must be the rule. If we expect to grow pears successfully upon thorn, we must go to work in a rational manner. The stocks must be grown from seed and managed precisely as is other nursery stock. It is necessary in the outset to be sure to get "simon pure" seed. I have been surprised to find that not one nurseryman in ten could distinguish with any certainty the white or pear thorn from our other native thorns. Yet once identified, no tree is more readily recognized. The habits of growth, twigs and leaves of the white thorn (*crataegus coccinea*), differ strongly from all other species of the thorn. The branches are much more crooked and spreading; the twigs or branchlets and thorns are of lighter color, and marked with patches of silvery gray and white. Its leaves, even when dry, are readily distinguished. Their serrations or notches are sharp pointed, and each tooth, as a farmer might call it, is pointed forward, and is of itself notched. Botanically speaking, the leaves are coarsely, doubly acuminate-serrate. Its fruit, though running somewhat into varieties, is generally scarlet in color, and of pleasant flavor for eating. The only successful plan I have yet known for germinating the seed, is by washing the berries and feeding them to cattle, mixed with meal; then saving and planting the droppings. The action of the gastric juice of the stomach seems to accomplish in a few hours that which heat, frost and moisture requires two years to perform. The seedlings will be large enough to bud when two years old, and will rapidly come forward into handsome, symmetrical trees.

The thorn is so perfectly at home upon our alluvial soils, and in size of trunk so evenly keeps pace with the pear in its growth, that if continued experience should determine that the blight can be mostly headed off in this way, we may soon expect that pears will become a common family fruit of all prairiedom.

JOSEPH L. BUDD.

SHELLSBURG, IOWA.

Mr. Bliss had grafted pears on a thorn and they had all blighted, but it might have been a different tree. Mr. Edwards has trees grafted on thorn 25 years ago. Has a White Doyenne that produces annual crops free from disease, while on their own roots they crack badly.

Dr. Hull said that it was useless to graft any tree on any other stock than its own, and expect to receive good crops. The first time that a tree overbears it will be sure to be seriously injured.

Dr. Pennington, of Sterling, would not like to encourage the propagating of pears on thorn, yet he had raised very fine on them. They should not be grafted nearer than a foot to the ground.

Dr. Warder wanted to know if any man present had ever known a Louise Bonne to root above the quince.

Dr. Hull said, yes.

Dr. Warder—Then you know more than I do.

Dr. Warder said he did not consider dwarf pears of any particular value; was an advocate of free stocks.

Dr. Hull was in favor of budding them on quince and then allow them to root from the graft. They usually bear fruit sooner.

Quite a rambling discussion took place on the identity of the thorn spoken of by Mr. Budd. The appearance of the tree was described by several, each one supposing his thorn to be the one meant.

Suel Foster moved that we recommend the cultivation of the pear on pear roots. Carried.

The committee appointed upon the report of Mr. Scofield on "Forest Tree Planting," considered the same, and recommended that the same be adopted by this Society after striking out the fifth section; and in view of the great importance of the subject of growing forest trees to the present and future welfare of the State of Illinois and its people, they presented the following resolutions:

RESOLVED, That the necessity of tree planting on the alternately wooded and prairie regions of Illinois to supply the present wants of the inhabitants of these regions, is absolutely demanded to insure their further development, or even to hold their present position.

RESOLVED, That this Society respectfully ask the placing in the Constitution of this State, about to be submitted to the people, a clause that shall provide for the planting of forest trees.

RESOLVED, That a committee of three be appointed, at the expense of this Society, to present this matter to the consideration of the Constitutional Convention.

ARTHUR BRYANT, SEN., Chairman.
WM. H. VAN EPPS,
SMILEY SHEPHERD.

Adopted.

A. Bryant, Sr., W. H. Van Epps, S. Shepard were appointed the committee to lay the above resolutions before the Convention.

The following gentlemen were appointed a Committee on Obituaries: Messrs. Minkler, McWhorter, and Robson.

The Society proceeded to the election of officers for the ensuing year:

ELECTION OF OFFICERS.

PRESIDENT.—Samuel Edwards.

VICE PRESIDENTS.—D. C. Scofield, J. B. Bubach, Lewis Ellsworth, Dr. Mygatt, and E. Sanders

CORRESPONDING SECRETARY.—D. Willmot Scott.

RECORDING SECRETARIES.—Chas. Andrews and H. D. Emery.

TREASURER.—E. H. Skinner.

MEMBERS OF EXECUTIVE COMMITTEE.—J. W. Cochran, S. Edwards, and Jas. G. Soulard.

PUBLISHING COMMITTEE.—Messrs. Edwards, McWhorter, and Scott.

Dr. H. Shimer read an essay on Entomology, illustrating it by drawings of several insects that are both injurious and beneficial.

ENTOMOLOGICAL NOTES. BY HENRY SHIMER, A.M., M.D., MT. CARROLL, ILL.

Insects the type of Articulate, are the primitive form of a walking, flying, intelligent locomotive machine. Wonderful invention—a machine moved by the chemical forces, possessed of a directing principle that we may only classify as mind. That first form of an articulate skeleton moved by muscles; an outside skeleton, the muscle within—an experiment in the progress of creation sublimely beautiful.

Articulate are indeed quite primitive among created life forms on the surface of the earth, having a venerable representative in the Trilidite of the ancient Silurian seas, and the true insect, as old at least as the Devonian. Created thus early without doubt in the plans of Supreme Wisdom, in part for the twofold purpose—Self-enjoyment and Fertilization of Plants.

In the progress of Creation on the surface of our planet (for we know nothing of life forms on this or other worlds during the eternity that has rolled away, except what history, geological and recent, afford us), conditions became developed that admitted of the existence of the insect form of animal life, and they were brought into being. The first object of their creation—self-life, self-enjoyment—has long been realized. Probably for millions of years—years only numbered as the sands on the sea-shores, have insects lived without interfering with the rights of man, reveling in the sunshine of the long ages thus passing away, feasting on the first fruits and fat of the land, welcome lords of creation, condemned and despised by none.

But to-day they occupy an unenviable position, despised and rejected by all, because they interfere with our comfort and rights, and ours are supreme and must extinguish theirs; not supreme from the right of possession, but supreme from a higher position in the scale of being.

Man usurps the supremacy over the entire animal creation, hence the lion, once king of the forest, can no longer rest at ease in his den or dwell within the range of civilization. The wild beasts that once roamed over our prairies and dwelt in our forests, and the wild Indian with them, have rolled back before the advancing wave of civilization, and the darkness of eternal death is destined to rest down upon them.

All this has been accomplished with ease and even pleasure to the hardy frontiersman. The lion has been defeated, the wild beast has been driven back, the Indian has been conquered, by virtue of that higher power, SUPERIOR INTELLIGENCE. But the insect scourge is ever in our midst: far more destructive, far more unconquerable than the king of the forest or the red man of our Western wilds.

Why is the insect thus unconquerable? It belongs to a different race of beings, a different department, I had almost said, of creation. While the rifle is very effectual against the lion or other wild beast, it is useless against our far more formidable enemy; although as an individual far less significant, the "chinch bug." Neither is it of any avail against the plant curculio, the potato bug or the codling moth. But although the rifle fails us shall we yet despair of seeing our wish accomplished and our right of supremacy maintained. Shall that power of superior intelligence fail us here and our last foe become our conqueror?

How have we been able to annihilate the wild beasts of prey over large districts of country? By becoming acquainted with their habits, and exercising our will against them. The trapper that would secure the beaver or otter must first become familiar with its mode of life. The panther or wild cat can not be taken by hand, but the hunter has learned how to subdue it. If we ever expect to accomplish anything against the insect enemies, we must "go and do likewise." Study thoroughly their habits, learn their assailable points.

When I last appeared before this honorable body at Freeport, we were considering "nature's method of controlling noxious insects." At this time it is entirely proper that we review a portion of this subject, and see how faithfully Nature has discharged this duty, and what we have done or may do to aid her in this great and important work. A brief history of some points in the economy of a few of our more common noxious insects and of their principal enemies, will therefore be more valuable to you in this direction than volumes of theorizing.

The great Western grain enemy, the "chinch bug," as I then demonstrated, had just been swept away from our midst. I informed you of the principal causes that operated so unexpectedly and so effectually against them, giving you the day and date of my observations, all of which you have kindly recorded for the benefit and information of mankind in the first volume of your transac-

tions. I then declared that the principal cause of their extermination was an "epidemic disease." I did not make this assertion to defend some pet theory that I had conceived independently of observations. I also informed you that the "lady birds and larvæ of "golden-eyed flies" had produced dreadful slaughter among the chinch bugs. It was by years of the closest possible observation of the chinch bug that I made these great and important discoveries in the natural history of this important insect. The principal part of my observations extended over the years 1863, '64 and '65. A few had been made before I was induced to make these observations, after reading the most able entomological reports on the chinch bug, which reports, although excellent, were not sufficient to convince me that all that might be learned was placed upon record. This insect has been written and commented on probably more than any other of our common noxious insects. Page after page from numerous authors in newspapers and other journals, scientific or otherwise, has been introduced to our notice, much of which has been profitable; some, no doubt, has been worthless. After all that has been said, I know that much more remains yet to be learned about even the closely scrutinized "chinch bug," which future years may yet reveal. If all this is true, and some obscurity yet lurks around the natural history of the chinch bug, what a vast unexplored field invites the student of Practical Entomology to step within its portals and reap the golden harvest. Untold numbers of insects swarm around us during the live-long summer, none or scarcely any of which have been studied at all as thoroughly as has been the chinch bug; and had not the chinch bug departed from among us, I presume that I would still be following it day after day into the wheat and corn fields, and every year adding something to our store of knowledge of its natural history.

What we want is more practical entomologists—working men, men who will go out into the fields and study insects in their native homes; men that live in the country, the home of the insects. We have a good corps of theoretical entomologists, noble-minded men, like Leconte, Cresson, Horn, Packard, Ostensachen, Uhler, Edwards, Grott, Robinson, and a multitude of others, who study insect forms from dead specimens in their closets, within the cloisters of great cities, where large collections are thrown together, and where libraries are at their command. They group insects together into orders, families and genera. Species are correctly named, and they are always ready to confer with the practical entomologist who studies insect life in the field. And in this way any observer of the habits of insects can get a correct name for the particular insect that he studies, and thus be able to give information that the world can comprehend.

The theoretical and the practical entomologist must go together hand in hand, for without true names the practical entomologist is not able to publish his observations.

Of practical entomologists we have two kinds. One who lives in the city and makes occasional excursions into the country, collects insects, and studies them in his breeding cages. The other lives in the country, and therefore can see his insects every day in their native liberties, as well as study them in his breeding cages. Both these develop much truth, but he who lives in the rural districts or a small hamlet has the superior advantage. Cage breeding is useful to each, but daily field study for years, is necessary in all cases in order that he may learn everything of any insect.

It was while studying the chinch bug in the field that I made the discoveries already alluded to—some within five minutes walk of my home. The epidemic disease that I described was first introduced to my notice on the 16th day of July, 1865, by an accidental circumstance. A farmer told me that a "black bug" was devouring the chinch bugs on his farm. He failed to show me the "black bug," but I observed that the chinch bugs were mostly dead and dying on the low, damp, creek bottom lands of his farm. Following the clue to the observations I there made, I soon learned that the disease was beginning to spread among the chinch bugs on the high lands. For one long month from that time the disease ravaged them without mercy. They melted away before it like the new fallen snow before the scorching rays of the vernal sun, until comparatively none were to be found. I gazed upon this interesting scene with enthusiastic pleasure, observing it almost alone, although a race of beings were in their death throes, immediately beneath our feet—a race outnumbering all the nations that have ever lived on the face of the earth. Alone! why observing it alone? The multitude from various reasons was neglecting to notice what was transpiring among the "little bugs" beneath their feet. Some because they apprehended that everything about a chinch bug had already been learned; many because they considered such study too small a business for them.

Enthusiastic; Yes, I was enthusiastic upon the subject. Well might I be. The staff of life was being consumed, and the pecuniary loss in the northern portion of the Valley of the Mississippi exceeded one hundred millions in the preceding year. Walsh computes seventy-three millions in Illinois alone, (*Am. Ent.*) with a prospect of still more fearful destruction then, which, if continued, my mathematics demonstrated unmistakably would to a sum amount as vast as the wealth of the world before the rising generation had passed away. The loss of former years was before us in the writings of Walsh and other close observers.

The law that insects will multiply as we multiply their food, as a general rule, was before us. In this instance the food of the chinch bug was our food. To discontinue its production was our destruction, if the law is uniformly good. Famine, poverty, with all its terrors, stare us in the face. Our lands of but little value, for if we can raise no wheat or corn where are we. And they will consume grass itself when pushed for food.

In view of all these things, to become enthusiastic over even a bug, was only to be natural. Studying the whole subject enthusiastically, the knowledge of the epidemic was thrust upon me at the time it was passing—a discovery of a result second to none on the American continent. We then had on our hands a civil war—a war that had never been equalled in magnitude. Yet the chinch bug question (omitting the destruction of human life,) was one of still greater magnitude. Of war we could see an end, but of chinch bugs none.

I was searching for something that would demonstrate the destruction of the chinch bug, and when I had found it in that great epidemic, I felt like an ancient philosopher who, upon discovering a long sought problem, ran bareheaded through the streets of his city, crying "Eureka! Eureka!"

After having thus, through long years of patient toil and close application, thoroughly studied the habits of the chinch bug, and beheld their sun go down, I was prepared scientifically to predict years of exemption for our farmers. This I first did in a public address before the Carroll County Agricultural Society, at Lamark, about the middle of September of the same year, 1865, by assuring them that they need not fear to sow wheat on account of the chinch bug. This assurance was useful to many who believed in my report, and they secured a large pecuniary reward, for wheat was a good crop, and prices were all that the most avaricious could desire. I repeated that prediction when I last met with you two years ago in the following language:

"I here stake my reputation as a naturalist on the declaration that for our region of country it will require many years of warm, dry summers and mild or snowy winters for protection, to develop such a numerous host of chinch bugs as we had in 1863, 4 and 5"—Transactions of the Northern Illinois Horticultural Society, vol. 1, p. 102.

My demonstrations have been more than realized. We have been entirely free from their devastations ever since. Last summer I saw two; the preceding summer I found, during the hot, dry weather, a good number of specimens about fox tail grass in the Mt. Carroll Seminary gardens. I saw very few in wheat, and heard of no damage being done. I saw, however, in some gardens, great multitudes of the larva of a shorter, wider species of heteroptera, of which I did not breed any to the perfect state.

Thus my predictions have been completely realized for four years, proving that they were not blindly made, to the great satisfaction of our farmers, who now have such confidence in the practical absence of this grain enemy as to lay aside all fear about its producing such destruction now as in those terrible years. For the truth of this I appeal to our farmers of Northern Illinois, Iowa, Wisconsin and Minnesota—the great spring wheat growing regions of the Valley of the Mississippi, notwithstanding any impertinent comments that may be or have been made upon it from time to time by jealous Entomologists or others, who even sacrifice science in their eagerness to pull down others and build up themselves. No personal allusions are intended.

OTHER FORCES THAT HAVE OPERATED AGAINST THE CHINCH BUG. CANNIBAL INSECTS.

Lady birds.—These are not the least among the insect enemies, and many an ill-fated chinch bug has been doomed to fill the stomach of the larva of the lady birds. As long ago as 1861, in an essay upon the injurious insects of Illinois (Trans. Ill. St. Agric. Soc., IV, p. 316), Mr. Walsh gave it as his belief, from finding larva and pupa of lady birds among chinch bugs, that the former preyed upon the latter, and points out four species that probably indulge occasionally in this kind of food. But it remained for me, in the autumn of 1864, to verify these reasonable conclusions by actually observing the larva of the spotted lady bird (*Hippodamia Maculata*) in the act of devouring chinch bugs in the field. I then caged many of these larva and supplied them regularly with chinch bugs and no other food, and thus succeeded in raising a goodly number to the perfect state. But many of the younger ones perished, which appears to denote that they need other aliment besides chinch bugs,—possibly lack of water was the difficulty. About the other species of lady birds I can say nothing positively, except that, after the closest observations, I have never found one that would eat such loathsome food. This spotted lady bird, always rather abundant, was much more numerous with us in those chinch bug times. But for want of time I must refrain from further expanding on this deeply interesting subject—the economy of lady birds. I have notes of my own observations of sufficient extent to occupy all the present time assigned me.

LACE WINGED OR GOLDEN EYED FLY.

Several species of this family of insects I have observed to feed on chinch bugs, that is, judging from finding them among chinch bugs. One species, *Chrysopa Illinoisensis*, or *plorabunda*, as Mr. Walsh supposes it to be, I have found in great numbers feeding upon chinch bugs, and bred a good many to the perfect state, during which time I recorded a series of observations, some of which will interest you. In the autumn of 1864, I saw many of these greenish-white larva, of lizard-like form, bodies being thick or swollen in the middle, tail sharp pointed and used in locomotion, and head armed with projecting sickle-like jaws, living among the chinch bugs and feeding voraciously upon

them. When they are alarmed by any disturbance, they curve the body forward and in a possum-like manner allow themselves to fall to the ground,—a habit quite common among many kinds of insects.

“Sept. 11, 1864.—I placed one of the larva in a vial, after having captured it in the field in the very act of devouring chinch bugs; I then threw a number of chinch bugs of all sizes into the vial, but they had hardly reached the bottom before it seized one of the larger ones, pierced it with its long mandibles, held it almost motionless for about a minute while it was sucking the juices from the body of its victim; it then threw down the lifeless shell. In this way I saw it destroy in quick succession about a dozen bugs; towards the last, as its appetite was becoming satiated, it spent five or more minutes in sucking the juices from the body of one bug. After this bountiful repast it remained motionless for an hour or more as if asleep. Never for a single moment during the feast did it pause in the work: when not in possession of a bug, it was on the search for or in the pursuit of others. It manifested much eagerness in the pursuit of its prey, yet not with a lion-like boldness, for on several occasions I observed a manifest timorousness—a halting in the attack as if conscious of danger in its hunting expeditions, although here there was none from the chinch bugs. Sometimes when two or more bugs were approaching rapidly, it would shrink back from the attack and turning aside go in pursuit of others. At length, awakening, it would renew the assault as before. On one occasion when it was on the side of the vial, two inches up, with a large bug in its mouth, I jarred the vial so that it fell to the bottom and rolled over and over across the bottom, but holding on to its prey it regained its footing and mounted up to its former position. Occasionally the chinch bugs would hasten to escape when pursued, as if in some degree conscious of danger.”

It is strange that chinch bugs, like plant lice, are so stupid when threatened by danger of any kind; the winged insect even will not take wing and fly away from the most threatening danger. The chrysoptera larvæ are naturally timorous, for in their avidity they often destroy each other, the successful combatant sucking the body of his vanquished brother. I never found it safe to put two individuals into the same breeding box, for like the larva of the “outworm lion” (*Calosoma Californicum*), they are sure to destroy each other. Even when attempting to carry two of the latter home in a box, only one usually is found alive.

Sept. 12.—My specimen in the vial which was feeding so voraciously yesterday that I feared it would burst, is less greedy to-day. “Evening.—I observed it in an angle formed by some paper at the bottom of the vial spinning a very attenuated web. It had just commenced the work, having thrown out some of the outer stays as a support for the intended cocoon; its body is curved in the form of a semicircle, its head drawn inwards towards its breast; fixed in this position it is spinning with its very pliant tail (a very interesting feature, and new to me then, regarding this insect, for very few insects proper spin with the tail), thrusting it out in all directions, bending it as freely and gracefully as the trunk of an elephant, but with great rapidity. As I silently thus watched it for a long time by the light of my lamp, I reflected that this is certainly a very beautiful sight to behold, so frail a creature constructing with such unerring and mathematical precision its temporary coffin, with a lid prepared that it may lift off when it sees fit to escape, and come forth from this temporary resurrection in a new dress, in a different form of life, in which it exchanges the meanness of the worm for the beauty of the lace-wing fly; and the thought very naturally suggests itself: has it an idea of its future resurrection in newness of life, and does this foreknowledge induce it to prepare its work accordingly? When accidentally jarring the vial it remains motionless for the space of ten minutes or more, now, if possible, more cautious than ever before, still true to its former nature, depending upon playing the ‘possum’ for safety. At length after all has remained still and quiet for a long time, it commences very slowly and cautiously to continue spinning its web, and now apparently feeling safe from danger, it works rapidly as before, occasionally shifting half way around in the direction of its head by a quick jerk: in this way its very flexible tail has access to every part of its cocoon. During my entire observation of several hours, it holds its body in the same plane—the plane in which it was curved when I saw it commencing its work, and doubtless remained in this position within the cocoon. Thus it worked, and on the following morning I found that the outer visible work was completed. In the centre of the thinly scattered outer fibres it has formed a closely woven subspherical cocoon, very smooth exteriorly, of a light gray color, about the size of a No. 1 shot, slightly prolate-spheroidal, 0.16 by 0.125 inches. After about one month the perfect insect lifted off a lid, which it had previously prepared, and came forth, at first quite tender but soon, by exposure to the air, hardened and developed into the perfect insect.

During the entire autumn I saw an unusual number of this and other species of the lace-wing fly on the wing, even as late as December 1st. May not the perfect insect live over the winter to deposit its eggs in the spring? The pupa, however, appears in a better condition to weather the storms of the frozen season. In the early part of September I beheld many of these lace-wing flies in the corn where I was conducting my observation, for I had an acre of thickly sown corn near at hand for a breeding cage, and I found it a much better one than I ever had in the studio. As I mowed this corn for fodder from time to time, every stroke of the scythe would cause three or four dozen of them to

rise on the wing. In the evening twilight I usually saw very many of them in voluntary flight, very many more than at any other time, presenting quite an interesting spectacle as they staggered along in their awkward, unsteady flight."—(Proc. Ent. Soc., Jan. 1865.)

But from these few remarks about golden eyed lace-wing flies you must not be led to believe that they are good for nothing except to murder chinch bugs, for this is but a minimum of the good work they constantly perform. The chinch bug has departed but the lace-wing fly is ever among us, feasting upon plant lice, etc. I have learned many interesting lessons from these lace-wing flies as I beheld them engaged in their work of destruction. Many kinds of them live upon trees, and in this way become more directly the friend of the horticulturist also. I have bred an apparently new and undescribed species from the larva which I found several years ago on the white pine tree, feeding on the downy aphid, often so abundant on the trunk and limbs of these trees.

My late observations have demonstrated that this louse is not a coccus as former entomologists had always taught, but a plant louse of my *Daetylosphæra* family. It is found moving about slowly and cautiously on the limbs. My attention was first called to it by a friend, who found it on a declining white pine tree in his door yard, he believing that the lizard-like larva was the cause of injury to his tree, overlooking the real cause, the minute downy louse, until I called his attention to it and gave him correct notions about the value of the larval lace-wing fly.

This creature has the wonderful intelligence that induces it to cover its body with the down of the aphid. I have often seen it in the very act of clothing itself in this manner: after devouring the louse that it may find in a bunch of down, it bends its head quite back over its body and deposits the downy substance from its mandibles on and among the hairs on its back so carefully and understandingly, that it sticks upon its body as if it were a part of its natural covering. Its grotesque appearance has given it the name of "sheep" among the common observers, but it was my duty to inform them that it was only a wolf in sheep's clothing, as a mask of its true character, or more likely a protection against enemies. They also make many a meal of grape leaf lice. I have often observed them in the vetifolice galls or with their heads in devouring the inhabitants. They are also found on apple or other trees where plant lice abound, and woe to the unlucky colony of plant lice that has such a guest introduced among them. It is more than possible that they are of as much use as even are the lady birds.

What I have said of the lady bird and the lace-winged fly will suffice for the present to give us some notion of their utility to the horticulturist, and although I have studied a portion of their habits in agricultural pursuits, yet the same natural history is equally applicable to the uses of the man who is only a fruit grower.

It is not fitting or proper that I should now repeat the often published stories of the natural history of the chinch bug. I have confined myself to a review of the great epidemic among them, bringing together the elements of proof that time has since afforded me, not alone for its bearing upon the chinch bug question, interesting as it may be, but for its general application to insect economy: for we have shown elsewhere and often demonstrated, although less vividly, that other insects—common flies, plant lice, colling moths, potato worms, grasshoppers, etc.—are the subjects of speckled diseases; and why is this fact so eagerly objected to? Is the love of science or the love of self the moving main spring? With many persons it unfortunately makes the greatest difference in the world who was the discoverer of a great truth. In this matter I hope that I see nothing but science.

I say, without fear of successful contradiction, that the chinch bug is the greatest enemy to man that has ever appeared on this western continent, by destroying the means that most of all others binds us together in the associations of civilized society, when it gets the upper hand of us. And that illustrious entomologist, B. D. Walsh, whose sun has unfortunately gone down in the zenith of its activity, and whose irreparable loss we shall never cease to mourn, taught that as the curculio is the most destructive to the crop of the western fruit grower, so the chinch bug is the most destructive and the most unmanageable insect among grain crops, the most difficult to combat, and undoubtedly the "meanest bug" of the whole crowd of grain enemies. Not satisfied with a little here and a little there, he sweeps the whole country with the besom of destruction. And that truly great and good man wrote more on this than on any other insect, perhaps more than any other author. And those useful and instructive writings have been the greatest stimulus to me. I shall ever look up to Walsh in his public writing and private correspondence as to a father who taught me the first lessons of close observation in entomology. His criticisms and my private correspondence with him during the many long years passed away. I shall ever hold most dear and sacredly preserve. His virtues were many, his errors were few; although sometimes keen as a two-edged sword, no one of true metal could ever meet him without receiving benefit; as steel sharpeneth steel, so his intellect those around him. (May he rest peacefully in his eternal glory, and reap the highest rewards of yonder world.)

There be those living writings in this connection (by whom penned I have never inquired—he or another)—that would bring forward pleasant discussion were he living and with us to-day. But while the grass grows not over his new-made grave, and his manly form now cold as the clay that

surrounds it, has not yet mouldered away into its primitive elements, this sad memorial of what our fate is soon sure to be, becomes no fitting scene for such display, and on the present occasion with our hearts draped in mourning we can not make the review, but upon some more fitting occasion we promise to review so much as will be thought useful to the scientific world, and not personally applicable to the illustrious dead; who was one of the associate authors of one rather harsh paper on this subject.

The causes of disease among insects lurking in the fluids in which they move, as well as drugs that are fitting applicants to carry disease and death into their ranks, are laudable and proper objects for the study of the practical entomologist.

Diseases.—Why should we not admit that fatal diseases visit these lower forms of life as well as the various departments of the Vertebrata. Fishes are not exempt; birds are not immortal; even the wild beast has no insurance agent. Domestic animals feel the sharp arrows of the king of terrors; hogs smitten down with cholera, cattle more than decimated with pleura-pneumonia and rinder-pest, horses afflicted with fevers and tuberculosis, and man himself the subject of a thousand ills. If man himself with his complex and most perfect organization—a machine that has more of the elements of self-repair than any other of which we have any knowledge—requires the aid of some physician at every turn in life, to help in producing these repairs, what may we say of the frail creatures of a day that are possessed of a less perfect organization. If man, so well fortified, is not proof against epidemic disease, what can we expect of these?

In answer to the main question if "Half the children that are born, die before they are one year old, does it follow therefore that they all die of epidemic diseases?" We reply, is this a fact? Among the healthy and naturally reared, how many families read a different history. And admitting that it be true, do not most of those who have had healthy parents and good food and pure air that thus die early die of epidemic diseases—cholera, cholera morbus, scarlatina, dysentery, fevers, etc.? And if the youths that have not yet attained maturity in all Northern Illinois, Iowa, Wisconsin and Minnesota should so effectually die off in one short summer (even in one month of it), as to depopulate all this district for a number of generations, although the extermination should not prove to have been for all practical purposes so entirely complete in Southern Illinois,* Missouri and Kansas, would it not look still something like an epidemic? The fact being apparent that they died not of fire, water, famine, or the sword! Let us always hail with delight the discovery of every great truth.

A few years ago, while I was brooding over the fate of our apple trees from the rapid increase of the great army of bark lice, I suddenly one day saw a beacon light of hope looming up before me in the form of my acarian parasite—a little stranger without a name appeared suddenly in our midst, and I received it into my arms, and became its foster father; nameless and friendless, I supplied it with my own, and first introduced it into public notice at your organizing meeting in our little village of Mt. Carroll. When I took my seat the venerable Walsh immediately arose in confirmation of my announcement. A flood of light thus burst upon you that you have and ever will hail with greater joy, as apple growers, than any other that has ever appeared in connection with the apple tree, and while the life of the bark louse lasts, I now predict it once for all, this little foundling will be more useful as an effectual "counter worker" of the apple bark louse than any agent or device that man can contrive. How many a patent nostrum has already unconsciously stolen the credit of much merit from this humble worker.

But do not become alarmed, it is not my purpose to torment you with a lengthy disquisition of the doings of bark-lice, after my paper on the "Bark-louse in 1868" which you published last year, and after all that I said on the subject a few days ago at Ottawa, and in anticipation of the Essay upon the same subject that I see by the programme you have, in the order for to-morrow.

But I have one thing to which I may be permitted to call your attention. A few days after I returned from the annual meeting of the State Horticultural Society at Ottawa, I was examining the contents of some wild bark lice-shells (*Oecocnemi*) from the woods, microscopically, and was delighted to find a form of acarian parasite with six legs, in the larval state, also the perfect or eight legged insect. This agreed precisely with the notes on this subject by the State Entomologist in his report, on the mites parasitic on apple bark lice, he describes the young of those he observed as having six legs. Subsequently when I visited him at Rock Island, he asked me if I had ever found any specimens with six legs, and when I assured him that after frequent microscopic examinations of specimens of all sizes I had seen none but eight legged specimens, he remarked that as he had not used a microscope but instead, a good coddington lens, it was barely possible that he had not detected one pair of legs. This discovery however confirms his written history of these mites, that there is a variety, with but six legs in the young state, although I erroneously had thought differently, and that those that I originally discovered and described as *Acarus? Malus*, probably always have eight legs, at least this is the appearance so far as I was able to observe. If this proves to be strictly persistent, in this manner, we must have two or more species of mites, and probably of different

*Even there my "prophecy" is good, because chinch bugs have not, so far as I can learn, been as numerous as in those of their palmiest days.

genera as cannibal parasites of the apple and other bark-lice, and in this event I propose that the variety with six legged young which I have lately found, which appears to agree with Mr. Walsh's described species, be named *Ar. Walshii* in honor of its discoverer. I see by Mr. Walsh's record that he discovered his species in May, which is a few weeks earlier than I became acquainted with these parasites, and therefore he in reality was the first to come to a knowledge of this great and important truth, and he kept it to himself until I first made it public in his presence at Mount Carroll. My description then being in manuscript and ready for type also.

After I had announced the fact, in his usual noble and manly manner Mr. Walsh arose and said that he was gratified that I had also discovered these mites of which he had not intended to speak until he made us a grand surprise by issuing his report. Thus it is all along the Entomological highway, a jewel here a diamond there, yonder a great truth blazes suddenly out like the light of the sun as a reward to the patient toil of long years. But like waymarks, in a wild country they are few and far between.

While at Ottawa I heard Mr. Riley announce in his Essay that he had discovered a new species of thrips feeding upon the eggs of "*Cureulio*." May it indeed prove a useful friend a "*counter-worker*" of the *Cureulio* in reality. But it seldom happens that, as in the case of the parasitic mites, two independent observers discover great facts simultaneously.

M. Leverrier of Paris and Mr. Adams of Cambridge, both independently and simultaneously discovered the existence and position of the planet neptune by mathematical computation. Theirs was an infinitely more sublime discovery, but not a more important truth to you as horticulturalist than the finding of the acarian parasite of the apple bark-louse or of an affectual enemy of the *cureulio*.

Judge Knapp, of Wisconsin, related an instance where a plum crop had been saved by placing horse stable manure under the trees.

Mr. Smiley Shepherd said that theory had been exploded 20 years ago.

Voted, that Governor Palmer be requested to appoint Prof. H. Shimer, of Mount Carroll, successor to B. D. Walsh, State Entomologist.

Resolutions on the death of Mr. Walsh and Judge Coe were presented and accepted.

OBITUARY.

WHEREAS, By a sad casualty our distinguished State Entomologist Benjamin D. Walsh has been taken from us, therefore:

RESOLVED, That in the death of Mr. Walsh, we have lost a valuable and earnest worker in a department of science of the highest importance to our whole country.

Our valued friend, by diligent investigation, had become distinguished as an Entomologist both in England and America. He was a man characterized not only for his high scientific attainments but also for his expanded and liberal mind, and the generosity of his nature.

With his bereaved family we join in sincere sympathy and sorrow for the loss of our departed friend.

Also RESOLVED, That in the death of Judge A. S. Coe of Port Byron, we have lost an intelligent and useful horticultural co-laborer—a man known and respected for his integrity and moral worth, both in public and private life. That we sincerely sympathize with his family and numerous friends in the loss of our brother.

Dr. Kittoe spoke on heating tanks. He gave an account of his difficulties in raising flowers and vegetables, being so often from home in the duties of his profession. He said the boiler exhibited was not his child, but a bastard. His next object in constructing his boiler was to make something suitable for ladies' boudoirs and bay windows. For this purpose this invention is just the thing. He would sincerely recommend it to every lady who loves flowers.

Mr. McAfee presented a magnificent Lignarium, or collection of the woods of Stephenson county. This was beautifully arranged in a rustic frame, each specimen being so prepared as to show the veins and rays of the wood, accompanied with the bark. This collection was much admired. It contained 150 species of timber trees and shrubs.

EVENING SESSION.

A most interesting lecture was delivered by H. McAfee on the Woods of Stephenson County, the large assembly being much interested. He illustrated his statements by the specimens displayed to the meeting, a number of questions being asked by his listeners. The question was a new one to them.

OUR NATIVE WOODS AND TIMBER CULTURE. BY HENRY H. M'AFEE.

Old Egypt, the land of the Pharaoh's, the Sphinx, and the Pyramids, is teaching us of the New World two vital lessons, lessons of such paramount importance that the very being of generations of men hangs upon our appreciation of them.

These lessons, the one of spoliation and its consequences, and the other, its antithesis, the lesson of production and its results, are so full of interest to every thinker that they well deserve our most careful study. In Upper Egypt the formerly fertile country along the Nile has been gradually denuded of its timber, and a decrease of the rain-fall has kept steady pace with the destruction of the timber, and the desert has steadily marched on, subduing the country to its wild domain till the sands of the Lybian desert now drift into the Nile. Here is the result of spoliation.

On the other hand, in Lower Egypt the last three Viceroys have given much energy to extending the canal systems and planting trees, and also the great engineer of the Suez canal, M. DeLesseps, has made tree planting a part of his policy, and the result has exceeded the largest expectations; rain-falls are increasing, indeed rain falls now where it has not been known to fall before for hundreds of years, and the desert is being reclaimed, the arable area is extending, and gardens and fields exist where once was only the drifting sands. This is the lesson of production.

Nor are these instances alone in their evidence as to the importance of tree growths. In every case where history has recorded the facts of forest denudation, or forest production, the same meteorological phenomena have followed, namely; After the destruction of timber, aridity and sterility; after the new growth of timber humidity and fertility. It is but fair, then, to conclude that if the rapid spoliation of the great Northern forests and of our local groves goes on, we shall ere long have the pertinent inquiry: "What shall we do for a climate?" As the production of trees and plants is, so far, the only means known by which man can to any appreciable degree influence the meteorology of a country in his favor, the question of timber production rises to the proportion of one of the grandest of our industries.

But with all the importance which a philanthropist or general economist may give to the arboreal industries in a money-getting country, and among a money-making people, there is an argument still more potent; in fact, all powerful, the argument of pecuniary interest. This argument successfully applied to any subject will commend it to the public ear, endear it to the public heart. The fact then that more money is involved in the tree question than in any one other interest in our country, should clearly enlist the public sympathies in favor of arboriculture. And this it will do when once all doubt is removed, and the facts are made plain by experimental demonstration. Here is work for practical horticulturists all over the land, and here also is a work for the Nation, the States, and for Municipalities. While the actual facts as to the profitability of tree culture are to be demonstrated by actual trial, the men who are making these practical demonstrations deserve and should have the aid and encouragement of the Nation, the State and the County.

The old philosophers had an axiom which all scientific progress has not disproved that "nature abhors a vacuum." The spot on earth vacuous of organic life is most truly abhorred of nature, wherever such a spot exists, all the forces of nature are perpetually at work to overcome, this abnormal condition, and to produce the conditions favorable for organic existence.

Where man in his ignorance has followed a system of husbandry which has depleted the earth of its stores of plant food, until he is forced to abandon his worn out fields, the lichen, the sedge, the hardy grass, the thistle, burdock and their myriad of despised coadjutors, succeeded by the bramble, the rose, the saffras, the elder, and other shrubs and trees step in, and in their succession of growth and decay, carry on their work of renovation and reconstruction till they have obliterated the sterility forced upon the soil by our wrong doing, our robbery, not culture. This, if atmospheric conditions are favorable, is the circle of organic life often observed; and it proves, what? that the plant is the salvation or the redemption of the soil from the abhorred vacuum of sterility.

The grandest problem of any age remains for us to work out by tree planting upon the so-called Great American Desert. This immense area, sloping from the great central axis of upheaval of our

continent, down almost to the centre of the Mississippi valley is from some cause strangely deficient in timber, and it is very dry and almost sterile in some parts. To just how great an extent artificial tree production will increase the humidity of the atmosphere, and consequently the productiveness of the soil cannot be predicted, but that good effects in that direction will follow arboriculture, there is no reason for doubt. All the evidences which can be obtained, go to show that the grass covered area is getting larger, and the cactus, and artemisia area correspondingly smaller since this region has been known by civilized people. The fire brand of the Indian and the wandering white man has been reducing the groves until at many places the only timber growth left is upon the large river islands where the trees stand literally entrenched behind the flowing waters, but the few outliers which have for centuries withstood the flames on the highlands, prove that wood growth is possible even on the high prairies at many points, and the suggestion which has come to many a mind is that if our national legislature and our gigantic railroad corporations would but support properly organized effort, the most beneficent results to our present and future population could be accomplished upon the great American desert.

In support of the profitability of tree production, so many facts established by actual trial could be cited that any man should be convinced that trees will pay on any bare farm. True, we are too young in forest planting to have proved more than a few years growth, but taking the results of these few years for data and allowing for every contingency, making in all respects a conscientious estimate, the share of profits to the grove-maker are so large as to surprise even the calculator. Mr. Budd, of Shallsburg, Iowa, who has grown the several species of ash to quite a large extent, estimates the net receipts from ten acres of red ash of twelve years growth, at \$3,720. Mr. Scofield, of Elgin, Ills., estimates the value of pine and European larch plantations as more than double these figures, and I have taken known trees for a guide, and after making every deduction for culture, interest on investments, and taxes, I find that the net profit upon ten acres of grove of red maple, honey maple, red elm and hickory, at twelve years old, amounts to \$1,152, or \$9 60 per acre per year, clear profit above all expenses. (See Transactions Ill. Horticultural Society for 1868, page 249.) An objection is raised that these are only estimates, not facts. So everything in the future is an estimate, an expectation, or even a wish; your next year's harvest and your next year's bread are but expectations, and they are reasonable or unreasonable expectations in just so far as they are based upon actual knowledge, and in just so far as they take into consideration all the probable causes likely to effect the production of the expected harvest. If all adverse probabilities have been duly considered, all favorable conditions fairly reduced, our estimates are as deserving as are those of the careful husbandman.

With a view to learn how far our native wood growths could be made to supply our wants, I have made a pretty careful survey of my own county, and the result is a lignarium containing 120 species of woods belonging to 49 genera. First upon the list stands the Acerine or maple family, comprising five species: *Acer rubrum* (red maple), *A. dasycarpum* (silver leaf maple), *Acer saccharinum* (sugar maple), *A. nigrum* (black sugar maple), and *A. negundo* (honey or ash leaf maple). The red maple is useful as a lumber tree, for fuel, and is with all the others a sugar producer. The silver leaf maple with the first, and the ash leaf maple are rapid growers, and worthy of extended cultivation. The so-called sugar maples are worthy of cultivation, but of too slow growth to be generally popular. The last on the list, the honey or ash leaf maple, of all seems the most promising subject of the tree planters' energy; of rapid growth, healthy, a good fuel, and an abundant sugar producer, it doubly pays to plant, pays in sugar, and finally in fuel. To make a sugar orchard it is best to plant upon ground descending from one corner to the other; then first plant 2 ft. by 4, at five years thinning to 4 by 4. At eight or nine years fix ordinary sawed cove-trough stuff along the rows, with a main along the ends of the first troughs. This arrangement brings all the sap (which had better flow through metal spouts) to the reservoir or furnace, doing away with the worst feature of maple sugar manufacturing—the handling the sap. Good sugar, but without the familiar maple flavor, has often been made from this tree, and my experiments show 2 8-11 per cent. as the yield of dry sugar from the crude sap.

Amelanchier Canadensis and *A. Oblongifolia*, the service berries, are worth places in the garden; they are good to eat, as the birds well know; *Amorpha Canescens*, lead plant, unimportant; *Ampelopsis Quinquefolia*, Virginia creeper, is a vigorous climber, with a dense green foliage in summer, becoming crimson in autumn, ornamental.

Celtis Occidentalis (the Hackberry), is a noble tree too much neglected, of as graceful habit as the famous elm; is of rapid growth and hardy, easily transplanted, and furnishing good fuel and lumber for some purposes. *Cephalanthus Occidentalis* (the Button Bush) in the economy of Nature is an important agent in building swamps up into dry ground, but perhaps not worth cultivating. *Celastrus Scandens* (the Staff Tree or False Bitter Sweet) is a clean, neat climber, whose beautiful berries persistent in winter claim for it a place in our shrubberies. *Carya Alba*, *C. Glabra*, and *C. Amara* (the Hickories) grow well from the nut, not transplanted, and every one knows all about the wood. *Corylus Americana* (the Hazel) has been fertilizing millions of acres of Western soil for hundreds of years, and if it was only more rare some one might recognize its beauties and give it a home

in the garden. *Carpinus Americana* (Hop Horubeam), though a small tree, furnishes a unique and beautiful wood. *Ceanothus Americanus* (Red Root), unimportant (except to the man who walks between the handles of a breaking plow). *Cerasus Scrofolina* (the Cabinet Cherry) grows rapidly and is very valuable to the cabinet maker. *C. Virginiana* and *C. Pennsylvanica* are ornamental tree shrubs. The *Crataegus* or Hawthorn family, represented by *C. Tomentosa*, *C. Pyrifolia*, *C. Coccinea*, *C. Crus Galli*, *C. Cordata*, *C. Punctata*, *C. Flava*, *C. Pubescens*, and *C. Mollis*, seems to have but little use if we except *C. Coccinea*, which is used as a stock upon which to graft the pear, and *C. Crus Galli* and *C. Cordata*, which have been used for hedges. The *Cornus* or Dogwood family, represented by *C. Alternifolia*, *C. Stolonifera*, *C. Paniculata*, *C. Sericea* and *C. Asperifolia*, are only ornamental, some of them not even that. *Clematis Virginiana* and *C. Ochroleuca* (Virgin's Bower) are ornamental. *Direa Palustris* (Leather Wood) oddly soft and strong in its fibres. *Diervilla Trifida* (Bush Honeysuckle) unimportant. *Euonymus Atropurpureus* (the Strawberry Tree) is pretty and desirable.

The *Fraxinus* or Ash family of five members, are all useful and valuable; *F. Americana* (White Ash) is a great implement timber and is readily grown; *F. Pubescens* (Red Ash) is so good that it is generally taken for white ash, and grows faster; *F. Viridis* (Green Ash, also mistaken for White Ash), very good, but grows a little slower; *F. Quadrangulata* (Blue Ash) is extremely tough and a very valuable wood. *F. Sambucifolia* (Black Ash), a poor fuel; is useful for all splint work. *Gymnocladus Canadensis* (the Coffee Tree) is an odd looking rather slow growing tree of valuable cabinet wood. *Gleditsia Triacanthus* (the Honey Locust) is more valuable than most people think. It appears that it may take the place of the too tender Osage Orange to make us hedges and the wood is valuable. *Hamamelis Virginica* (Witch Hazel) is peculiar for its winter inflorescence. *Juniperus Virginiana* (Red Cedar) with the most durable timber, is highly ornamental. *Juglans Cinerea* and *J. Nigra* (the Walnuts) are splendid cabinet woods, easily raised. Black Walnut has dethroned the former king of woods, the Tropical Mahogany, and now reigns in his stead. *Lonicera Parviflora* (Woodbine), not strikingly handsome. *Morus Rubra* (the Red Mulberry), though generally barren of fruit, is yet a handsome wood. *Ostrya Virginica* (Iron Wood), erect and lithe. *Ptelea Trifoliata* (Shrub Trefoil, cousin of the *Alnuthus*) is somewhat ornamental. *Prunus Americana* (the Wild Plum) is a fair example of variations in nature running into innumerable varieties; some of them, especially the free stones, worthy of cultivation. *Pyrus Coronaria* (the Crab apple), with a flower of delicious fragrance, is at least ornamental. *Populus Angulata*, *P. Mouillifera*, *P. Tremuloides* and *P. Grandidentata* (the Poplars and Cottonwoods) will grow on the great plains and may there be of great importance. *Quercus Nigra*, *Q. Rubra*, *Q. Tinctoria*, *Q. Coccinea*, *Q. Monticola*, *Q. Castanea*, *Q. Alba*, *Q. Obtusiloba*, *Q. Olivaciformis*, *Q. Macrocarpa*, *Q. Discolor* and *Q. Palustris* (the Oaks) are beyond computation valuable, so valuable that every one knows and recognizes their worth.

Rhus Glabra (Sumac) may be a source of revenue to the country, if properly collected and cured, as a tanning agent. *R. Radicans* and *R. Toxicodendron* (Poison Ivy) not desirable. *Rosa Nitida*, *R. Blanda*, and *R. Setigera* (the Roses), in nature rather plain, have in cultivation sported into beauty. *Rubus Villosus*, Blackberry; *R. Canadensis*, Dewberry; *R. Triflorus*, dwarf Raspberry; *R. Strigosus*, Red Raspberry; *R. Occidentalis*, Black Raspberry, well known. *Ribes Floridum*, Black Currant; *R. Rotundifolium*, *R. Cynasbati*, and *R. Lacustre*, Goosberries well known. *Smilax Rotundifolium* and *S. Hispidium* (Green Briars) sometimes cultivated for ornament. *Staphylea Trifolia*, Bladder Nut, an ornamental shrub. *Sambucus Canadensis*, Elderberry, cultivated for its berries. *Spiraea Opulifolia*, *S. Salicifolia*, and *S. Tomentosa*, the native Spireas, are all beautiful. *Salix Tristis*, *S. Humilis*, *S. Ericocephala*, *S. Sericea*, *S. Petiolaris*, *S. Augustata*, *S. Fragilis*, *S. Nigra*, and *S. Lucida*, the Willows, are a few of them ornamental, and one or two useful in osier work. *Tilia Americana*, Basswood, a fine and healthy ornamental tree.

Taxus Canadensis, American yew, is too much neglected, trailing evergreen, of beautiful foliage and fruit. *Ulmus Americana*, white elm, a noble ornamental tree, and *U. Racemosa* and *U. Fulvia*, the rock and red elms, are well worthy of cultivation, the rock elm especially, for fuel and lumber. *Viburnum Lentago*, *V. Prunifolium*, *V. Pubescens*, *V. Opulus* and *V. Nudum* are all ornamental; some of the *V. Opulus* or cranberry tree and *V. Prunifolium* or tree haw, are really beautiful.

Vitis Cordifolia and *V. Aestivalis*, the grapes, well known; *Xanthoxylum Americana*, prickly ash, ornamental; *Fraxinus*? an ash which seems to be a dwarf, but not yet fully determined. *Pinus Strobus*, the white pine, whose body makes a part of every American house, is, if there be any such a thing, the tree of universal utility. Surely I need not say for what white pine is useful.

For ornament or for use, for show or for profit, we have here a sufficient choice, and it but remains to plant and cultivate.

DR. WARDER'S LECTURE.

It was announced that the Doctor, who had borne the cognomen, "The Great American Pomologist," would lecture on Orchard Culture. He was so much interested in McAfee's lecture, that instead of fruit culture, he took timber culture as his

subject. He spoke of the rapidity with which forest trees grow, as an argument in favor of tree planting. He saw in Kansas this year black walnut eight feet high, three years from the seed. He urged following Nature's teaching by planting close, so that the trees might grow erect, and thus let Nature do her own pruning. Strips or belts of timber were needed on prairie farms, not only evergreen trees, but deciduous trees also. Experience is teaching us that forest trees will pay outside of the protection which they afford. He was glad to see the interest manifested by the Society in the subject of planting forests, and hoped the subject would be agitated by this Society and all local societies, till these vast prairies are encircled by belts of evergreens and deciduous trees.

Judge Knapp gave an address on Climatology. He seemed to be quite at home, and gave his ideas in clear and forcible language. He strongly recommended the study of this science.

At 10 o'clock the motion was made to adjourn. Carried.

THIRD DAY—MORNING SESSION.

The proceedings were opened with prayer by Mr. Smiley Shepherd, of Hemepin.

Fruit lists were taken up. Suel Foster remarked that our fruit lists are too large already, and need cutting down. Twelve varieties were all that could be recommended for Northern Iowa.

Dr. Warder said that varieties of fruit that did well 20 years ago begin to fail now. What is the matter? Kansas exhibits beautiful fruit to-day. So did Illinois 10 years ago. He thinks change of climate is not the cause.

The subject of timber trees was again called up this morning, and took a wide range of discussion.

Mr. McAfee presented his lignarium, consisting of 120 varieties of Stephenson county wood, to Dr. Warder, but Dr. Warder declined to accept it unless he could donate it to the Industrial University in the name of the giver, to which consent was given.

Mr. Edwards said that he considered this donation of more value than any book in the library; and as a trustee, returned thanks in the name of the State.

Mr. Dunlap, another trustee, expressed his pleasure in accepting the gift. Here, from a society like this, will come our botanical and horticultural professors.

AGENCIES OPERATING INJURIOUSLY TO SUCCESSFUL FRUIT GROWING.

Three minute speeches were the order of the day.

This was an interesting topic, and one on which all the speakers could tell something that they knew, hence three minutes was ample time. Mr. Bliss had lost largely by following the light of the East. Messrs. Foster, McWhorter, Ellsworth and others would test all varieties, and hold fast to the few best. Mr. Wier had found a new order of pruning, that he would some day flash upon the world. Dr. Warder stated an immense falling off in the fruit crop of Ohio. The cause is no doubt due to the increase of injurious insects.

Mr. Shepherd, whose head is silvered with the snows of 70 winters, and who, 19 years ago, at this place, assisted in organizing the first horticultural society in the State, spoke on the subject for over half an hour. Something was wanting to better fit the great industrial army to battle with the new condition of things that the West presented. The colleges did not supply it, and after long years of waiting the new school was established, but it had not thus far come up to his ideas of what it should be. He would make no war upon any other institution, for they all filled a place, but this school was intended to give the sons and daughters of the industrial classes such an education as the new condition of things demanded, and out of this grew the university that should teach those branches of learning relating to the great industries of the day. The farmer must know something of chemistry, of the geology of soils of climate, of botany, of forests, and of correlative studies—in short, to make the farmer a better farmer, and the mechanic a better mechanic; to elevate the man whose sun-browed brow and hardy arms lay the foundation of wealth.

He would educate the sons and daughters of toil, to raise them up and enable them to master the situation for our new condition of things, and those that the progress of the age throw in their pathway.

Dr. Warder spoke encouragingly of the prospects of the University. That we must be patient, and success would crown the effort.

President Edwards stated that the latter proposition would please him as a trustee for they needed the counsels of all well-wishers to practical education.

The following motion was passed by a unanimous vote, the members rising.

WHEREAS, The Trustees of the Industrial University have adopted a plan for a plantation of useful forest trees, embracing some thirty species, and to cover some seventy acres, therefore.

RESOLVED, That we trust that the plan be carried out in full, at as early a day as possible, in order to give the farmers of the State practical lessons in tree planting.

Prof. Shaw spoke on the following subject: "Breath of the Ocean upon the Land, or How Plants Grow."

THE BREATH OF THE OCEAN UPON THE LAND.

We give the following brief synopsis of this lecture, presenting some of its leading thoughts, without attempting to follow them into detail or show their close and intimate relations to each other:

The lecturer commenced by remarking that he had on one or two other occasions presented to the horticulturists of Illinois some thoughts on the elements and conditions of tree growth surrounding the roots of the trees, while lecturing upon the Geology of Horticulture or Soils. He then showed them how the struggles of the rain-drop and snow-flake—forces of flowing water and moving glaciers—had produced or ground out the soils and transported, mingled, and mixed them as we now find them over the surface of the country. The dynamical forces acting upon surface geology were shown to be simple, effectual, and grand in their operations. He now proposed to pass over in silence these earth elements round the roots or feet of the tree, and talk for an hour about the elements which surround the top of the tree, and inquire as to the power which man has to control and modify climate and atmospheric influences that affect tree and plant growth. He suggested that man's influence over nature might seem infinitely small; the sunshine and the rain, the heat and the cold, and the force of the straying winds might seem to mock his power; but even over these he could exercise a controlling influence, as the lecturer proposed to show.

Trees and plants, according to vegetable physiologists and agricultural chemists, derive a large large portion of the elements making up their substance from the atmosphere. About nine tenths of the tree are supposed to be thus derived, directly or indirectly, from the air. And when the plant decays the most of it is returned back to the air again. The ligneous or woody fiber; the sugar, starch, carbonic acid gas, and all the other elements which come from the air go back to the air again; and the mineral elements derived from the soil go back to the soil again. Decomposition is but a slow combustion; and the decay of vegetation sends off in gaseous form all that belongs to the

air, and returns in ashes all that belongs to the soil. Rotting is but a slow fire; and the tree is thus honest when it gives back to nature the materials drawn from nature.

The inquiry then becomes interesting as to where the atmosphere obtains the vast amount of air food and air drink necessary to build up the forests and clothe the continents with vegetation. A part of this air food is gathered from the slow combustion or decay of vegetation on the land; but the greater part of this air food of plants comes from the moist breath of the sea forever breathing over the land and carrying to the trees not only their air food but their drink also. The invisible fingers of the atmosphere thus feed the forests and carry to them drink from the sea.

To illustrate the agency of the ocean in the economy of nature and the growth of vegetation, the lecturer described some of its chief characteristics—its great currents, whirls, and ceaseless agitations—its flows, now rising to the surface and now sinking to invisible depths; all controlled by the great laws of heat and cold, and the differences in temperature between Polar and Tropical waters. One of these, the great Gulf Stream, a river in the Sea, was fully described, flowing with vast volume almost round the Atlantic. This gathers up the wood and vegetation constantly borne to the sea by the rivers, and sweeps along the immense amount of algae or sea weed, constantly torn loose from their frail moorings. These gradually center towards the middle of the Atlantic. Mariners call this comparatively still part of the Atlantic Ocean, the Sea of Sargassoa—a sea in the ocean larger than the valley of the Mississippi River. Its surface becomes covered with drift weed, so thick in places that a ship can not sail through it. This vegetation is constantly decaying and throwing off its gaseous elements into the air; and loading the air with the food of plants. All oceans and all seas produce similar phenomena. In this way the ocean becomes the great Laboratory of nature, where the air food of plants is largely eliminated and manufactured. The ocean—never at rest, pulsating and throbbing like the great heart of God round the world—thus purifies itself, and thus gives up by its breath and from its life, a part of its own plant life, to feed the vegetation on the land. This breath of the Ocean then—these breathings of the sea—are the winds. At rest, we call them the atmosphere, in motion we call them the winds; when the spirit of the storm is aroused, we call them the hurricane and tornado; coming from the sea to the land we call them the Breath of the ocean on the land.

The same causes move the winds and give them their currents, which move the waters of the sea, where this breath of the ocean comes fresh to the land from favorable seas forests grow up and vegetation grows and blossoms. The winds are thus the express carriers, agents, and servants of the sea, bearing to the land the food and drink of vegetable growth; and the forests through their leaf lungs, in some mysterious way, breathe in and exhale the elements which minister to their growth. This thought was illustrated by reference to wind charts, precipitation of moisture, and the isothermal lines in North America. Those which come fresh and moist from the ocean to the land confer fertility, and forests spring up; those which become exhausted of their food and moisture make deserts out of fertile plains. The breath of the Pacific builds up great forests in California; the breath of the Atlantic and the Gulf of Mexico makes the Eastern part of the Mississippi valley and North America green and rich. The hot breath of torrid Mexico makes our Western Sahara desert.

The lecturer then spoke of the manner in which the air feeds and waters trees. The millions of hosts of the forest leaves hang trembling in the atmosphere. The leaf performs functions similar to the lungs and stomach. It is full of invisible mouths, which breathe in and exhale the atmosphere; which take in moisture and air food, and throw out poisons and worn out elements, which the plant has already used, and desires to free itself of. The leaf and every inch of surface soil suck in the rains and dews and nutritious gases. Both roots and leaves play important parts in the economy of vegetable growth. The question, somewhat discussed, as to whether plants absorb their air-food directly through their leaf-lungs, or whether it is carried by rain water into the soil and thence absorbed into the general circulation by means of the roots, appertains to the province of vegetable physiology. For the purposes of this lecture it can make no difference. The organic elements of the plant are obtained chiefly from the air, either directly by the leaves or from the soil through the roots.

The lecturer then passed to man's influence over the forces of nature. He showed that the conditions of the atmosphere necessary for tree growth were heat, humidity, and light. He argued that man can and does control climate and atmospheric influences; and illustrated his position by the effect of settlement and civilization on the prairies of the West. Cultivation makes the land dryer; the streams run lower; the springs dry up; the precipitation of moisture is less, and the absorption of moisture is greater. We all know that the Mississippi is growing smaller from this cause, as every average of ten years of the volume of its waters would show. When the whole valley is under cultivation a very marked change in its streams will be noticed.

Another great effect is produced by building up or chopping down forests. The history of civilization in Europe abundantly sustains this proposition. Flourishing provinces have been made waste places, and emporiums of trade and seats of empire rendered uninhabitable by the destruction of the Mediterranean woods. Our own virgin soil will no longer produce its great wheat crops, not so much through exhaustion of the soil, as from causes more directly traceable to the laws of meteorology.

And here the great practical thought of the lecture was fully developed—the planting of forests and surrounding our farms and orchards and gardens with timber and shelter belts, hedges and rows of evergreens, or high protecting walls and double and triple rows of paling fences. To illustrate this, the history of a well known garden at Nahant was given, where the proprietor by high walls and board fences has succeeded in sifting the saltiness from the winds, and compelling them to feed his plants. Outside is sterility and sand; inside is almost a Garden of Eden. Nature has many such spots; and the philosophy of the matter is plain. Winds in motion are drying winds. They neither feed our plants nor moisten their leaves; but, on the contrary, rob the trees of the moisture they are able to draw through the rootlets from the ground. These same winds in the leafy aisles of the forest, where their motion is arrested, feed with invisible fingers the leaves of the trees and distil through a gentle precipitation their moisture over the plants. Trees compel the atmosphere to give up its moisture, and rob the winds of their blighting, blistering, blasting influences. And by growing protecting belts of timber, or erecting barriers to stop the blowing of the air, we shall hold them still long enough, so that the leaves of the plants may eat their invisible food. Plants will endure very great degrees of cold if the wind do not blow upon them. The lecturer had frozen delicate rose bushes into balls of solid ice and kept them at the temperature of ice all winter, and in the spring those rose trees had emerged from their icy bed, bright limbed and ready to bud; whereas, if they had stood bare in the bitter winds, they would have been blackened and killed, as if scorched in a fire. So it was also said that if a tree with its roots frozen in the soil, have its top in a hot-house, it will grow and put forth its leaves.

After thus dwelling upon the philosophy of chaining or tying the winds, by shelter belts and other wind barriers, so as to compel them to give up their plant-food to the hungry and thirsty trees, the lecturer gave a sketch of the experience and legislation of several European nations in regard to timber growth, and rebuked our own Government for its great remissness in failing to take care of its vegetable children, simply because they cannot vote and aid politicians with their ballots. In Europe they do better. In some of the German states a man cannot cut down a tree until he has planted what shall become another in its stead; and in one Prussian state it is said no man can marry until he has planted a grove of walnut trees. The normal condition of the country, as there taught by experience, requires at least twenty per cent. of the country to be covered with trees; and a deplorable result will take place in our own country when we chop down all our pine and other timber producing trees.

The lecturer then reverted to the GROUND CLIMATE of trees and plants; and showed that here man could greatly modify nature, and that CULTIVATION is the very SUBSTITUTE of climate. The conditions of tree-growth, so far as this ground climate is concerned, are heat, humidity, and air, or porosity. Air and heat must find their way to the roots of vegetation, especially air. Exclude the air from a root and that root will die. Exclude it from a seed, and that seed will never germinate. And here we may note a great practical thought in horticulture: that is, prepare the soil so that the air can circulate round the roots of the trees, and so that heat and humidity may be retained. The closest sedimentary soil, where no tree will flourish, if spaded up or subsoil plowed to a great depth, and mixed with gravel or coarse materials, will produce vigorous tree-growth. They understand this in planting vineyards in the North. By thus working at the soil so as to open its pores to the circulation of air and the introduction of a bottom heat, we produce very marked results in horticulture.

The lecturer closed with the thought that our horticultural conventions spent too much time in discussing mere varieties of fruits, modes of grafting, and insect foes; but did not devote sufficient attention to the elements which surround the roots and tops of the tree itself; and hoped that his remarks might stir up thought and turn attention in these directions.

Mr. Shaw was listened to with attention, and the address was one of the most valuable presented during the session.

APPLES FROM NEBRASKA.

Mr. Shearman had just returned from that State, and brought with him samples of Fall Pippins, Ben Davis, Tulpehocken, and Pennock, all large and showy, similar to those grown here 10 years ago before the advent of the codling moth and the scab. The fruit was contributed by Colonel Furness, President of the Nebraska State Horticultural Society. Think of this—a State society of that new State, thus sending greeting to the fruit-growers of Illinois.

Judge Knapp, of Wisconsin, in answer to an inquiry, said that he had been one of

a committee to report upon the effect of cutting away the forest in Wisconsin. His observation was corroborated by Prof. Shaw, that the plains of the territories could never be cultivated or timbered. The extent of country where timber and corn can be grown he thinks does not extend more than 100 miles west of the Missouri river. The question had been asked where we were to get our agricultural and horticultural professors. If he was going to learn Chinese he should not go to England, if he was going to study the wants of this State, he should not go to either England or even to Michigan for men to tell us what was wanted, but should look at home for men competent to instruct us.

Judge Knapp spoke at some length on the isothermal conditions of the Northwest, and was listened to with attention. The climatology of a country was the A of agricultural science, and your Professors don't know anything about it. He had consulted Prof. Henry at the Smithsonian Institution for facts, but they could only give the temperature and the rain-fall. This was the straight side of the letter B, but the crooked side, or the amount of evaporation, no one knew. This was the commencement of the alphabet, and our Professors should study first climatology, and then sources of heat and cold.

A committee of five was appointed to inquire into the manner in which the Industrial University is conducted, consisting of Messrs. S. J. Davis, L. Ellsworth, Smiley Shepherd, J. B. Turner, and Arthur Bryant, Sen.

AFTERNOON SESSION.

SMALL FRUIT—STRAWBERRIES.

T. McWhorter thought we ought to be seeking for some berry to take place of Wilson; this will not endure drouth or unequal temperature, need more care. Thought "McAvoy's extra red" a better one for general cultivation.

Wier—The only objection is, it is a pistillate variety of fruit—with "large early scarlet"—have it nine years, producing large amount of fruit. All others have been run out by grass and weeds, one plant in twenty, to fertilize it.

Dunlap—That the Wilson was the most persistent bearer and durable.

Wier—In all cases has stood its ground against all.

Ellsworth wanted to know if the Wilson was arraigned.

McWhorter again stated his objections. The Wilson was worse killed out than some other varieties.

Ellsworth—Except the winter (always mulch), the Wilson stands better than any other.

Wier offered to send "McAvoy's extra red."

Ellsworth—Have discarded all the McAvoy's.

The Prairie Farmer—Neff's seedling from the Agriculturist, believed to be hybridized by the Wilson, flavor more Wilson than Agriculturist.

Dr. Warder—Buffalo seedling and McAvoy's superior are identical.

Mr. Neff—So superior in quality and prolific.

Nicanor. Wier—Think it the best market berry, season longer, stands drouth better.

Ellsworth—Have had it three years, plants do well, fruit has not answered expectations, fruit small.

Wier—Productive, smallish.

McAfee—Produced this year, found compared with Wilson, bore more berries of about equal size, planted all at same time and soil—loess soil.

Dr. Nieaise—Ellsworth asked for information.

Wier—Have had two years a few large specimens of good quality, consider it worth trial.

McAfee—Coincided with it.

Ellsworth—The same on short trial.

Cramer—Wier finds it a pistillate plant berry small, dark, for table berry far better; to market will not sell, color and size against it; for canning it is superior; firm in flesh.

Budd—In Iowa acts like Russell, when fertilized gives good results, fruit about like Green Prolific.

Edwards—Fruit small, plant hardy, quality good, productive.

Wier—In picking fruit last season found strawberries piled up through the field in small piles equal to $\frac{1}{4}$ the crop.

Napoleon 3d. C. C. Miller—Have thousands of plants with no fruit, will sell at \$1 each to repay me for experiments.

‘‘Peaks Emperor.’’

Colfax—Pistillate, of medium size not very productive.

Van Epps—Thanked the society for holding there session and inviting them to Dixon for future meetings.

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

In behalf of the citizens of Dixon, we feel to return to you our sincere thanks for having held your third annual session in this city, and now at your adjournment we would extend to you a cordial and standing invitation to return to our midst at the return of your annual or other like calls of your body, as may meet your pleasure, believing the seed here sown will bear fruit abundantly. And, if in your wisdom, you should at any time deem this city a suitable place for holding an exhibition of horticulture, we pledge the hospitalities of the citizens, and will hold ourselves in readiness to meet any and all requirements, knowing your members to be a reasonable people.

Wier—Had some seedlings second summer, given the culture through the season in order to find how many fruit buds could be produced at that age—one had fifteen—all were allowed to make one runner.

McAfee—A friend in Freeport kept off runners producing immense heads of plants with numerous fruit buds. The Spring was a beautiful sight had not a single good sized fruit, fully one half of buds producing no fruit; what is the matter. The Wilson goes to work in the Spring and produces runners and then stops, does not make the second growth of runners that many of the newer varieties do. Had severe rains, but other buds, not so treated, fruited well.

Wier—Apples often produce much more bloom than they can perfect, is rare to find over seven fruit buds where the runners are kept off and three where not.

H. J. Dunlap—Stated that any person who would try to cultivate strawberries on the hill will make a failure.

Hathaway—Differ from Dunlap; am an advocate of hill culture; my method is to cultivate 3 or 3½ feet apart, and 2 feet in hill, cultivate with horse.

Hathaway—Have distributed seedlings, wash, mix with sand and sow at once, used a spent hot bed, sowed the seed, wet down, covered the bed, corner up in ten days, kept shaded when necessary, by middle of September had as nice plants as from old beds, last of June or first of July.

Mexican Everbearing Strawberry. Budd—Have eaten the fruit, old red Alpine, watched the habit &c., do not believe that it is a new species, have produced abundantly.

Rice—Have had it in Western New York for over twenty years, grows wild in New York, in swamps and marshes, berry not half the size.

Edwards—Twenty years ago had a strawberry in New York, called mammoth Alpine.

Wier—Had it last Spring, tended it thoroughly, got small fruit, sour.

Lipsey—Had it last week in Indiana in fruit at fair, discarded it.

McAfee—Is evidently the same species (*Fragaria Vesca*) as our wild berries of Wisconsin, fruit small, insipid and small fruitage.

Dr. Warder—Have seen it under favorable circumstances, a variety of *Fragaria Vesca*, distinct remarkable instance.

Bubach—Think we had the same berry twelve or fifteen years ago. Mr. Wilson had bloom, green and ripe fruit.

Hathaway—Referred to the honesty of the disseminators and those who have seen them.

RESOLUTION.

Resolved, That we, the members of the Northern Illinois Horticultural Society, have tested the strawberry known as the Mexican Everbearing, under the most favorable circumstances, and that we find in it nothing new or valuable, and consider it even valueless, other than as a curiosity for the curious amateur; and would recommend that the people let it and its disseminators severely alone, and keep their money in their pockets!

Adopted unanimously.

Raspberries, McAfee—By proper pruning the crop can be doubled, pinch off three or four canes when they are 8 inches high, and the laterals at one foot long—remove berry wood next Spring. The nearer you can get the fruit to the ground the better. In the row three feet apart.

Weir—Agree with last speaker.

Purple Cane F., Philadelphia F., Minnesota Amber F., and M. Doolittle, McCormick, Davison's, Thornless. McAfee—Moved that McCormick and Davison's, Thornless, be added to list, so done.

Canada Black Cap—Lipsey asked for information of this berry, grows more in clusters, a little larger.

Hathaway—The growth of the cane is similar to the wild, have not fruited it.

Blackberry—McAfee moved the list remain as now stands. The Kittatinny the only one.

Rice—Says Barns Bros. considers the Lawton the better berry.

Bryant—Don't wish for a better berry than this when ripe.

Dunlap—With the same treatment as directed by McAfee, on open prairie, has done well without winter killing, while others protected were killed.

Hathaway—Sowed grass among my blackberries, and got plenty of berries; unless covered there is no.

Ellsworth—Lawton has been a failure for want of protection, have discarded it.

Ellisdale Raspberry—Ellsworth—Desires information; here left plants out.

Budd—New blackberry leaf, fruit of Philadelphia shape; will propagate from tops of fruits.

Wier—Fruited three seasons; is larger than purple cane: hardy, strong grower, fruit good; upper fruit from it all among the leaves; one berry at once.

A LITTLE MORE GRAPE.

McAfee described his method of covering, and moved the list stand as adopted now.

Delaware—Ellsworth—Stated that he had not succeeded with it so far as growth is concerned, and enquired for information.

McAfee—Of several hundred vines, all leaf mildewed.

Bliss—Often hear of strong vines; never heard of but one sold by me which grew strongly; this turned out to be a Clinton.

Ellsworth—Have seen thrifty, hardy vines at the East.

Skinner—Have fifty acres at Hammond; fruit of Delaware.

Wier—Eleven years ago; strong layers; frozen roots.

Bubach wants to know if anybody has succeeded on prairie.

Perkins—McAfee says it is a poor sour grape; would place it alongside of Concord.

Budd—The German colony have it, and like it for grape, and speaks of Chrustime as good in quality of fruit and leaf.

McAfee—Would prefer Perkins to Muscadine.

Rice—Have fruited it in western New York; inferior to Muscadine, rots and drops.

Wier—Six or seven years ago recommended the Tokalen; was good every way; never got a perfect berry since.

Rogers' Hybrid—McWhorter—Exhumed all too late; Nos. 1, 4, 9, 15, 19, first year; none got fully ripe, skin tough.

Robson—No. 15 ripens up at Galena; heavy fruit and well ripened.

Judge Knapps—No. 4, 15, 22, at Madison and Boonsboro, ripen well, and much esteemed; superior in flavor to Concord.

H. Shaw says that the flying squirrel is carnivorous.

Striped Squirrel will eat mice, white grub and May bug; destroys rats and large field mice.

TRAINING OR BURYING GRAPEVINES.

Hathaway Concord, Hartford Prolific, Rogers' Hybrid.

Rogers' Hybrid—Was enthusiastic, now am cautious. 1, 5, 4, 5, 15, 19 were fine; No. 3 earliest; would plant No. 5 only; all bore remarkably; second year failure.

THURSDAY EVENING.

Mr. Robson addressed the meeting upon the influences adverse to the progress of horticultural knowledge. The principal reason that our children do not care to learn horticulture, is that the fathers and mothers allow their children to grow up with their eyes blind. They do not observe and know all the thousands of bright truths of nature, and this is the fault of the parents in not drawing out the children's capacities. He contended fervently for the high calling: labor is the highest badge of honor. He described a normal school at Galena, under the charge of Prof. Werin, which is carried on by a working teacher, who has made the school a great success by teaching it to work horticulture, his pupils being adepts in budding, grafting, planting, etc. Called attention to many of our native flora, which, which if brought from a long distance, would attract attention, and bring large prices; urging the adoption of many of them in our gardens.

McWhorter—Endorsed the remarks of Mr R. contrasting the common farmers' home with what might be with better care and attention. We should urge the cultivation of more rural taste to make our homes attractive.

Letter from Mr. Soulard—Has been a nurserymen in the West fifty-five years, thirty-five of this at Galena; the letter accompanied a history of the Soulard apple.

Grafting—McAfee showed a small twig showing a method of grafting cherry and plum.

Neff—Have practiced that and found it successful—Budd, has practiced it, makes a perfect union and rapid, would suggest that crown grafting of cherry is equally good that way, practices the same with plum root grafting.

Pear Grafting—Wier, called attention to his practice of grafting; grafted as apples, planted the scion $\frac{3}{4}$ of the depth in the ground and mulched to nearly the top of the graft, take up in fall, and bury the plant out in spring four or five inches deeper than the previous year.

DOCUMENTS NOT REFERRED TO IN THE REPORT OF THE PROCEEDINGS.

A PASTORAL.

To Samuel Edwards, President of Northern Illinois Horticultural Society, this poem is inscribed by the Author.

BY T. HEMPSTEAD, WINDSOR, BROOME COUNTY, NEW YORK.

It is winter on the prairies, stretching onward far away,
 Blank and dreary in their vastness and the dusk of closing day:
 'Tis as if some angry Presence, from the black vault stooping down,
 Passed, and trailed along the world its robes of cold and sullen brown,
 Banishing the pleasant sunshine, sealing up all tuneful lips
 With the shadow and the sorrow of their stern and dark eclipse;
 Not a flower expands its golden cup in all the lifeless view,
 From the dead grass not a violet turns its eye of tender blue,
 Not an oak in all the landscape lifts its broad and kingly form.
 Rustling in the gales of summer, wrestling with the thunder storm:
 Not a chestnut nor a poplar rears its many twinkling crest,
 Where the jay may find a covert or the eagle build her nest;
 Verdureless expanses, dreary as night without a morn,
 Miles of empty, sullen grassland, broken stalks of earless corn,
 Through whose gray and battered husks with a sad, inconstant moan,
 Rms the wind, a thousand shudders in each deprecating tone:
 Here and there a lonely dwelling, thrust afar from every tree,
 Where a sprightly wren might build, or hum a honey-laden bee:
 Further frowns the dull horizon rising like a wall of lead,
 'Gainst whose face no forest rustles, not a fir tree leans its head—
 Whilst I sit and muse and struggle with the gloom without, within,
 Listening to the rain's dull patter and the northwind's roaring din,
 Thoughts of other days come o'er me, thoughts that lead my feet away,
 Through the long years' deepening shadows to my boyhood's greener day,
 And again I tread the valleys, climb again the rugged hills,
 Vocal with the notes of woodbirds and the headlong dash of rills,
 Pleasant with green nooks of mosses and the trailing of the vines,
 And the dancing feet of breezes in the tops of rocking pines.

O, I sigh, if I could reach them, could I seize them, bring them here,
 In the prairie's heart to flourish and my daily paths to cheer,
 Could I have the pines and spruces I with thoughtless hands have burned,
 Seize the symmetry and greenness I have heeded not or spurned,
 Here in ranks could I behold them, in their undecaying bloom,
 Bringing springtime, shedding glory o'er the prairie's desert gloom,
 I would rather clasp the treasure than a palace in Broadway,
 Piled with plate and drowned in perfumes and with Brussels carpets gay—
 Rather that these sylvan children with their deathless green were mine
 Than to own a baron's castle with its vaults of hoary wine.
 Then I float on glimmering dreams of woven boughs and snowy bloom!
 Sparkles into life around me my ideal Prairie Home—

And instead of dreary pastures swept by roaring winds of March,
 Rise the long dense ranks of maples, groves of walnut, birch and larch;—
 From the mountains of Virginia, from Minnesota's lakes and streams,
 From where St. Lawrence with his thunder shakes the boatman in his dreams,
 And, his forehead wreathed with snow and scarred with lightning, gray Katabahin
 Sees the climbing sun a hundred silver-sanded lakelets gladden,
 From the wild Canadian forests, from Wisconsin's glassy rivers,
 Or where the restless aspen's top beside the Susquehanna quivers,
 From the vales of Colorado and the wilds of Michigan,
 From the fountains of the Ganges and the valleys of Japan,
 From the heights of Scandinavia and the lone wastes of Mongolia,
 From Campania's purple pastures and the slopes of Anatolia;
 From all these my hands should gather treasures living, rare, unknown,
 Tree and shrub and root and scion, polished nut and hooked cone.

Thus I long for what I have not, thus I chase my fair ideal,
 Emerald glories, trailing splendors, would to God that they were real!
 Yet behold my fancied treasures, walk within my airy Eden,
 Soil as deep and rich as ever daintiest plant might ask to feed in;
 Lime and phosphorus and potash, soda, carbon and ammonia,
 Food for fir and rose and lilac, grape or crocus or bignonia;
 Loads of brown leaves from the forest, tempered by the frost and rain,
 Mouldering refuse from the stable, drippings from the kitchen drain,
 These through root and bark and chalice shall ascend, till on my roses,
 Phloxes, dahlias and carnations all the rainbow's glow reposes.

See my cherry trees and apples, plums and mulberries and peaches,
 Apricots and ruddy crab trees stretching by in graceful reaches;
 Not a caterpillar, borer, not an aphid to be found,
 Not a dead branch nor a sucker, not a weed on all the ground;
 Every trunk is smoothly polished, every branch is in its place,
 Bud and leaf and growth and color all declare a vigorous race;
 May suns on their heads pour down a tide of white and purple bloom,
 May winds tripping o'er their branches fan you, heavy with perfume;
 See my wine-saps, bellefleurs, pippins, tempting both to eye and lip,
 In their juices, if he had them, Jupiter his nose would dip;
 Mark my cherries, duke, morrello, kentish, juley bigarreau,
 Early richmond, black tartarian, down their luscious tribute throw;
 All my pear trees drop with nectar, bartlett, buffum, bloodgood, dix,
 I have toiled in mellow borders each with loving care to fix;
 Some with forms of Nature's giving, bend with honied fruitage full,
 And, with branches pointing earthward, some are drooping in quenouille;
 All my peaches are ambrosia, fit for poets, klags or gods,
 Toned with pink and yellow burdens every amber branchlet nods:
 Here my early york invites you, George the fourth awaits you there,
 And my Morris reds are flushing in the golden August air;
 Some, imprisoned on a trellis, shimmer, spreading like a fan,
 And with golden globes are bending, sweet as those of Ispahan—
 Room for shrub and bulb and climber, honeysuckles and altheas,
 Jonquils, amber-throated lilies, and the glory of spireas!
 Walk among my royal willows, hoary oaks and mountain ashes,
 Through whose stems each ruddy cluster like a grosbeak's pinion flashes;
 Lordly elms and feathery larches, where the fire-winged tanagers
 Through the green and braided arches flicker like the beard of Mars;
 Mazes resonant with robins, and the mellow sound that rolls
 In a silver plashing brooklet from the throats of orioles;
 Nestled in the laps of roses, from your sight half hid away,
 Here my sweet-breathed calycanthus freights the throbbing air of May.

Here is food for Juno surely—Hovey's seedling, Wilson, pine,
 McAvoy and Brooklyn scarlet—food for gods should be divine;
 All the rows seem perfumed torches, kindled for some royal pyre,
 And the very ground is quivering with a blaze of odorous fire;

Ebon Concords, Israellas, Clintons swinging from the trellis,
 Sugary Delawares, with pomp of purple-pouting Isabellas,
 Doolittles and rank Miamis, golden cap and nectary Brinkle,
 With their rich and raspy treasures all the bending canes o'er-sprinkle—
 O! the beauty and the richness, the unfathomed rippling sweetness,
 In God's hidden laboratory pushed and rounded to completeness!
 Yet more dear than flower or fruitage, or the sweetest odor shed
 From the bell of hyacinth or lily's milk-white bending head,
 Rise my ranks of evergreens, in radiant order circling all,
 To the blast that sweeps the waste, a dense, Impenetrable wall.
 O! the rich, resplendent verdure that to us is never lost!
 O! primeval bloom and glory! proof against the snow and frost!
 With a love like woman's I have laid my hand upon their brows,
 Through my slumber streams and thunders the great organ of their boughs,
 Like Hyperions mad with wounds across the black air how they sway,
 Writhe and moan and shout and toss their knotted arms with mosses gray,
 While the timid lips of whirlwinds blow the thunder-groan this way;
 And of all the spirits, nectars, soul-intoxicating wines,
 Grandest is the march of winds across the tops of rocking pines;
 When the world from me is passing, I amidst their gloom would die;
 With their bearded boughs around me, I would close my fading eye,
 Feel their slender, brown leaves falling on the grave in which I lie.

'Tis for this that I have sought them, brought them from their homes afar,
 Lands that Arctic frosts have fettered or that Tropic thunders jar;
 'Tis for this that I have taught them here in shining rows to stand;
 Shields to glance the northwind's arrows from the heart of prairie land;
 Round their brows there glows a beauty we are far too poor to miss;
 In their culture lies a duty that may help us on to bliss.
 Not alone by polished words to gaudy congregations spoken,
 Are we roused to deeds of goodness, are the brazen fetters broken.
 Nobly preaches he who plants a tree where not a tree is growing:
 Rightly prays the man who scatters roses where no rose is blowing.
 Triple ranks of pines and spruces all my shrubs and groves surround;
 Lither trunks and fairer branches never rose from any ground.
 Cedars thrive in lengthening hedges, pyramids and shaven cones;
 From their depths the large-eyed thrushes watch me from their grass-built thrones;
 There the cat-bird and the sparrow guard their broods of callow ones;
 There the crested wax-wings linger when November frosts have come,
 Filling with their social chatter all the dim and balmy gloom.

White pines from my native hillsides, green and strong, are waving here;
 Red, loblolly, Scotch and Austrian, robed like kings, are rising near;
 Foreign plains, and nameless forests, distant realms from o'er the sea,
 Make their noble contributions, send their royal gifts to me;
 From the jagged sides of Schreck horn, from the dark blue Appenine,
 And the roots of white St. Gothard, I have brought my Cembra pine.
 Austria sends my grand *sylvestris*, Russian Crimea, my pallas;
 Waved my cluster-coned pinaster in the warm Samarian valleys;
 From where wolves the frosty silence of the Saskatchewan stir,
 Giant, towering among pigmies, comes my kingly Douglas fir.*
 Grandly tower the dark Sierras, fenced around with granite walls,
 Glorious with the hum and silver front of the thundrous waterfalls—
 The sun, in vales that slumber in the mountain's rocky arms,
 Many a nameless seed and seton into life gigantic warms—

*This is a gigantic species of fir found growing in Northwest America between latitude 43 degrees and 52 degrees North. The trunks are from 180 to 200 feet high and attain a diameter of 10 feet. The *Abies grandis*, of California, reaches the height of 200 feet; leaves very long and narrow; cones three to four inches, oblong, erect, slightly curving. The wood is white, soft and inferior. A nobler species of California fir is the *Abies nobilis*, with excellent timber. The *Abies picea* is a native of Europe, growing on dry, stony and exposed places and attains a height of 130 or 150 feet. The gigantic "cedar" of California, known as the *big tree*, is not a fir tree but is nearly related to the cypresses.

There above the slumbrous rivers, higher than the white clouds go,
 Looking out upon the ocean from the silence and the snow,
 While the generations vanish and the haunted moonbeams shine
 Ghastly through the moss-gray branches, waves the stately Lambert pine—
 Here, transferred into my acres, into glorious life they spring,
 Round their stems, through all the winter, feet of little snow-birds cling,
 And the nests of singing robins with the swinging branches swing,
 Standing near, and shooting sunward, till its top seems piercing through
 To the gulfs and central secrets of the heaven's unsounded blue,
 Bathing its enormous foliage in the billows of the sun,
 Towers the peerless Gigantea, stately tree of Washington.

Dazzle, O! august Pantheon! shine, Athenian Parthenon!
 Never nobler piles have slept beneath the kisses of the moon;
 With your gates of bronze, and pomp of flashing dome, and marble column,
 And your every nook with phantoms of departed glory solemn;
 Rise, O! monoliths of Luxor! from your graves of yellow sand,
 And beside the Seine and Tiber tower above a wondering land,
 Yet your domes and pointed columns, glittering shafts of polished stone,
 Are TO THESE but noisy rills beside the rushing Amazon.
 They were green when in the rushes hid and moaned the Hebrew child;
 They were growing when the granite of the pyramids was piled,
 Green when Punic hosts at Canna bound the victor's gory sheaves,
 And the grim and mangled Romans lay around like autumn leaves;
 From their tops the crow was 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.

Sandy plains of Arizona, granite steeps of Colorado,
 Valleys lying cool and dim within the Alleghenies' shadow,
 Hillsides of Nevada, tangled with a web of monstrous vines,
 Treasures more than golden lend me—rarest firs and noblest pines,
 Lend my Table mountain, hooked, glorious Montezuma pines,
 From where winds that blow from Cyprus roll with many a hollow moan
 Round the cliffs and changing gorges of the glittering Lebanon,
 Whence the bronzed slaves of Hiram to the Sacred Mountain bore
 Goodly beams and fragrant timbers, wood for wall and roof and door,
 I have brought my giant cedars with my western pines to stand,
 Glorious with their whispered memories, with the march of victors, grand;
 Grand with worlds of sweet traditions, and with histories sublime,
 Downward borne from trampled cities and the mouldy vaults of Time—

Golden jubilees across the gulf of hungry centuries blown,
 With the trail and purple rattle of the robes of Solomon.

Where the Rio Grande's fountains leap like panthers from the mountains
 To the vales that sleep below, leaning over gulfs enormous,
 The resplendent Strobiformis* waves amidst eternal snow—
 From its rocky throne transplanted, here it drops its giant cones,
 Thrilling all the winds of evening with its grand Æolian tones.

*The strobiformis is the largest pine of New Mexico, growing on the highest mountains and reaching a height of 100 or 120 feet. Its name implies that it strongly resembles the well known white pine or *Pinus strobus*. The cones are ten inches long and abound with resin. The sugar pine is a remarkable species found on the sandy plains westward of the Rocky mountains. A sweet, resinous juice plentifully exudes from the tree, its trunk attains a height of 200 feet and not unfrequently a diameter of 50 feet. Its branches are pendulous and form an open pyramidal head, the leaves from four to five inches long; the cones are pendulous from the extremities of the branches and when mature sixteen inches long. The seeds are large, oval and winged and form quite an important article of food among the Indians. The Montezuma pine grows at the height of 11,000 feet on the mountains of Mexico. The Sabine pine is a noble Californian species, 140 feet high and remarkable for its large heavy cones; the nut is large and edible. Its appearance is peculiar and it is

Thus the wildings of the forest, with their fence of tender gloom,
 And imperishable verdure, glad my heart and guard my bloom.
 He who on the prairie plants and guards them with a loving hand,
 Is, of human benefactors, worthy with the first to stand.

In their green and deathless branches shall his history remain
 When the letters from the marble have been wasted by the rain:
 In their rich and solemn voices shall his memory be sung,
 When the warrior's deeds no longer by the bells of earth are rung.

D. W. SCOTT, *Secretary Northern Illinois Horticultural Society:*

DEAR SIR—With much regret that I cannot participate in the interesting discussions of your annual meeting, I herewith send you all my cordial greeting, and some brief notes of observation upon the following subjects:

MILDEW.—This disease has infested our apples to a degree never before known since the fruiting of our orchards has given opportunity for general observation, and has added another button to the croakers' string of can'ts, and a stumbling block in the way of many who are contemplating the planting of orchards; nor can I forget the ominous shaking of the head of our friend Warder, when pointing out this as one of the much dreaded, and possibly coming scourges of our climate; nor his "happy are you, if you can keep clear of it."

Believing as I do that most, if not all, of the wide-spread, mysterious diseases of our fruit trees are not so much the direct result of the attack of any species of obscure vegetable animalcule, or fungoid, and hence beyond the control of forces within our reach, as that they are the result of a defective circulation, induced by climatic influences, and the presence of fungoids a subsequent, and, possibly, even an economic necessity, for the utilizing of effete matter, to prepare it for the higher forms of organic life; and feeling confirmed in the importance of the propositions I was permitted to present you last year, relative to the effect that "Location in all its aspects has to the health of the tree," I will now briefly state some of the observations of the past season.

1st. An excessive amount of moisture during the growing season, saturating the soil, and depressing the general temperature, giving promise of an unusual formation of young wood. But up to the 10th of July there was not sufficient heat to develop a respectable leaf in the nursery or orchard; many varieties having the appearance of being "bitten by frost and eaten of worms." There was a fair extension, or upward growth, but no power to develop laterals, nor the large leaves necessary to the proper elaboration of the crude sap, to fit it for the development of the young fruit. This state of things continued until the hot days of July, when our trees began to improve in appearance, under thorough and deep culture—in light soils showing the change first, and finally most orchard trees were enabled to make a fair growth of well ripened wood.

Now for the effect upon the fruit. June 1st to 10th we had every prospect of an enormous crop of apples, and, it being the bearing year, there were great anticipations in this direction. But from the middle of June to the middle of July, one-half of this promise fell from the trees, and a large share of the balance became so deformed that it was not merchantable. There was an unusual exemption from the various insect troubles, and but for this blight upon the leaves in early summer, and this mildew upon the fruit which followed, we would have realized the wildest anticipations in the crop of fruit—maybe to the serious exhaustion of our trees.

Now as to the cause. Can we not trace back from the effect, and as before suggested, see the relation which this defective fruit bears to the defective circulation of early summer? What though we discern the presence of numerous fungi here, what analogy or reason can make them a first cause?

Regretting that I cannot pursue this feature of the subject deeper and wider, permit me to rejoice with you in the reflection that, after all our fears and mystifying of these obscure subjects of vegetable and animal life, the number of really aggressive living forms, both animal and vegetable, is

called the white pine of California. A still more remarkable pine grows on the mountains of California, at an elevation of 4,000 feet. It is the great hooked pine, or *Pinus coulteri*. It is a large, strong-growing tree, with large branches and spreading top. The leaves are nine inches long, incurved, somewhat compressed, mucronate, two furrowed above, flatish beneath, and on the margin slightly serrated. The cones are oblong, conical and very large, being a foot or more in length, six inches in diameter, and weighing four pounds. The scales are wedge-shaped, lanceolate, mucronate, incurved and hooked whence its name. The noble pine, *Pinus insignis*, is also a native of California. At least twenty-three species of pines have already been discovered in North America. The red pine is sometimes improperly called the Norway pine; it is a native of North America. The long-leaved pine is a different species from the pitch pine. The loblolly and southern pines are two more distinct species. Pines do not seem to be indigenous to Illinois, but the time will come when they will wave upon the prairies by millions.

not so great as we, in our ignorance, are wont to imagine; but that when we can know and conform to the laws of tree physiology in its adaptation to climate, we shall find the "balance of power" in our favor.

But, as this is only a suggestive article, I will briefly state some of the conditions which seem most favorable to the development of these affections of tree and fruit before named: 1st. All heavy clay soils—and of those the undrained—especially those along the western shore of Lake Michigan. 2d. Those orchards and locations not well cultivated the dry year of 1867, showing want of vitality. 3d. Certain varieties.

But, as under these heads there has not been sufficient inquiry to set forth fully, I will leave the subject for the consideration of your highly esteemed body,

Very truly,

J. C. PLUMB.

RURAL ART.

The population of the rural districts show a deplorable want of artistic taste, in the embellishment of their homes with trees, fruits and flowers. People often make the excuse that want of means prevents them having their homes surrounded with appropriate attractions; but we imagine that, in a majority of cases, it is no lack of means, but a want of taste in rural art, for "where there is a will there is a way," and nowhere on this green earth will it pay better than on the bleak prairies of the northwest: its transforming influence is magical.

The first thing to be considered in constructing a desirable home on the prairies, is to surround it with a suitable wind-break of trees. They may be evergreen, or other trees—or a portion of each, according to your fancy. They may be planted in regular rows, at regular distances; or they could stand irregular, after the manner of our native forests. In ornamenting your grounds, study to attract the attention of the passer-by; let others see your good works, that they may go and do likewise. Hide unsightly objects by evergreens, &c. For that reason, never have your barnyards adjacent to the public highway: it is bad economy, as well as not in harmony with modern taste.

The style of houses most appropriate for prairie homes is one-and-a-half story "farm cottages," half gothic: more costly it is true than plainer styles, but then, all things considered, we think it will pay better. If you wish to sell, a man of means and taste will pay for it. Then it is easier to perform the labor in low houses than high ones; so, if the first cost is considerably more, there is a saving in the wear and tear of muscle. The position that one building sustains to another should be studied. To avoid wholesale destruction in case of fire, do not huddle buildings too much. To maintain harmony in the landscape, the buildings should not be scattered over too much territory. Let them have the appearance of a little village. The appropriate color for the painted buildings of a prairie home, nesting among the green trees in the distant view, is white.

As I am a better worker than writer, I close with an invitation to the Itinerant Committee to visit me, and see if I practice as I preach.

W. WICKS, Mt. Carroll.

FOREST EVERGREENS.

As forest evergreens are being planted quite largely throughout the west, it may be well to consider some of the points in the trade which compose some of the elements of success in this branch of horticulture. The first one of which is very essential is the proper handling in removing them from their native bed and proper care until boxed: secondly a proper selection of plants as regards size, and grown in exposure and in soil to secure good fibrous roots, as for instance the Balsam Fir in some soils will have a plenty of fibrous roots, while in others they will be almost destitute of those small fibers so essential to their success: the same with Arborvite when taken from a low, moist and rich soil, the small roots will be abundant and plants will be much more stocky, while on uplands, in sand, the plants grow fine and spindling and almost worthless for nursery purpose.

The American Spruce also when taken from a proper soil will prove to be one of the most successful in transplanting, but on the other hand if taken from the low swamp they can never become ornamental. One very important thing is to select proper sizes; such as I have succeeded the best with are a class running from six to eight inches, they being small enough by proper culture to become fine and stocky and at the same time stand more exposure than smaller plants, and then we gain a few years' time, an item that is of some consideration in this fast age of progress.

The White Pine and Hemlock are rather more tender to transplant than the others before mentioned, still if taken of proper size and soil to secure the small roots will prove successful. The Red Pine or (Norway) is the most difficult of all the natives to transplant, and at the same time one of the most ornamental of the Pines, and still it seems about the only way to secure this stock, it being very difficult to procure the seed as our friend Douglass and others can testify. While I have spoken of

the proper mode of securing this stock, I will say a word in regard to the handling. Having been shipped to its destination in well ventilated boxes securely packed in moss, as perhaps as much depends upon being well handled here as in forest; my plan is to select a place near by where they are to be planted out and secure from the rays of the sun; take them from the boxes as soon as possible after receiving them on account of the liability of heating, and pack away in moss.

When thus cared for and your ground well prepared by deep spading, well pulverised and raked fine and even, having your beds any convenient width for shading, place a board across to work upon, take one or two bunches of plants, put them in a vessel containing water, take one by one; taking them out of the water only as you want them, carefully press the earth closely around the plants: proceed in this manner without regard to straight lines or even distances apart, planting from one thousand to two thousand on a square rod, as the amount will depend upon the kind, some requiring more space than others: as fast as you proceed with your bed, work in your mulch well around among the plants of some fine material, such as damaged hay, after being run through a straw cutter, well rotted saw dust, old leaves when to be had are also very good. Could we always have such seasons as the past mulch would be entirely unnecessary. Having planted out one hundred in the past season and without any mulch, I succeeded in raising from ninety-five to ninety-eight per cent. of White Pine, Hemlock, Spruce, and Arborvitæ, and nearly that of Balsam.

Shading of some kind is indispensable to success. I usually place the shade about two to three feet above the plants so as to leave a chance for a free circulation of air. Should you be lucky enough to have opportunity of planting them on the north side of evergreen trees tall enough to shade them from the noonday sun, by making the bed well up under them, it would be as good or perhaps better than the ordinary manner of shading.

In regard to the proper season to transplant from forest there is some diversity of opinion: from my own observation and experience. I would say, that about the last of May or first of June, or even up to tenth of June, I have had much better success than earlier, and as a rule when the buds of the Balsam are well swollen is the proper time.

HISTORY OF THE SOULARD APPLE.

The original tree was raised by Mr. Antoine Lessieur, from the seed of the White Calville apple (Calville blanc of the French), in the little French village of Portage des Sioux, in Missouri, on the bank of the Mississippi a short distance above Alton, Illinois. I obtained my scions thrice from Mr. Lessieur, the propagation of the two first lots having been destroyed during my absence from St. Louis. I traveled from that place to Portage des Sioux (distance thirty miles), and back, three times—equal to one hundred and eighty miles—purposely to secure that valuable variety, after seeing the beautiful parent tree and eaten its fruit. Strange to say, the owner only made one graft of the same; which, however, died when in bearing, from very bad usage. I am informed the parent tree died many years since. Hence this valuable variety would have been lost without my exertions. I procured my scions from 1823 to 1827.

Tree—One of the most vigorous growers, in the nursery and in the orchard, and of an erect form and beautiful habit; comes in bearing early; is an abundant and (without disturbing causes) an annual bearer, and propagates easily by graft or bud, and has been perfectly hardy about Galena for some thirty years.

Fruit—Large; form somewhat conical, rather ribbed, with narrow crumpled calyx; basin medium; color whitish green, with broad pale red stripes; skin very thin; flesh snow white, with some reddish streaks. None so tender, none so juicy; subacid, of a sprightly aromatic flavor: without a superior, if it is equalled, for the table, in its season—latter part of September, October and November. It was placed at the head of the list of fall apples, for the knife, by the horticultural society of Jo Daviess county.

Its difficulties are, extreme tenderness long before maturity. The novice presses his thumb, finds it perfectly soft, tastes it, concludes 'tis ripe; exclaims: None so tender and juicy, but too acid! Well, wait friend, until fully ripe, and almost everyone will say, no superior if it has an equal, for its season. Being extremely tender, it is difficult of transportation, and of late years, like many other fine varieties, occasionally has been subject to the apple worm.

Respectfully,
JAMES G. SOULARD.

RESOLUTIONS—PASSES FOR PRESIDENT, &c.

WHEREAS, The President of the Northern Illinois Horticultural Society must of necessity devote much valuable time and money in promoting the society's interests: And, WHEREAS, he cannot do so intelligently and efficiently except by personal examination of all portions of the district

represented by the society, as well as by interchange of courtesies with similar bodies both adjacent and more distant: And, WHEREAS, the receipts of our railroads are greatly increased both by the large attendance upon the society's meetings, and by the great impetus which is given, throughout the whole country, to the production of fruits and fruit, ornamental and timber trees, as a result of the discussions at these meetings:

RESOLVED, That this society respectfully request the different railways in this and adjoining States to grant facilities to the President of this society for passing over the lines of their respective roads free of charge.

We, as a society, would request the Northwestern and Rock Island railroads to grant our State Horticulturist—Dr. Hull—a free pass over their roads, when on horticultural business.

[Offered Wednesday evening, Jan. 25, 1870.]

In view of the rapid consumption of the available timber of this country, and the great importance of encouraging timber planting to supply its future wants, and of the fact that several of the most valuable varieties of timber are derived from plants and seeds obtained, at present at least, from Europe; Therefore, be it

RESOLVED, 1. That our representatives in Congress be urged to use their influence for the admittance, free of duty, of all forest trees and forest tree seeds.

RESOLVED, 2. That the Corresponding Secretary of this society be instructed to place a copy of these resolutions in the hands of each of the representatives in Congress from this State.

Passed unanimously.

REPORT OF FRUIT COMMITTEE.

Your committee, appointed to examine fruit and other articles on exhibition, can only make such an imperfect report as a very hasty examination will permit.

W. H. Hansen exhibited twenty-four varieties of apples, in good state of keeping, correctly named, with a single exception.

Alfred Giddings exhibited a collection of winter crabs in good state of keeping, including one new seedling of good size, but from specimens exhibited would scarcely seem to possess qualities that would make it worthy of special attention.

James Andrews exhibited some samples of his winter crabs, in fine condition.

Mr. Ordway exhibited a seedling that seems worthy of further notice; a green apple, of medium size, fine, tender and juicy; a mild, pleasant, sweet flavor.

Several varieties of apples from Nebraska were exhibited, of fine size, probably from young trees; perfectly free from scabs or blotches, as should be usually expected with fruit from a new country.

Mr. Platt presented some pears and apples produced in California, which are handsome, fair and clear from disease.

Miss Angeline Long exhibited eight samples of jellies, remarkably clear and fine, showing a lively contrast of colors.

A sample of domestic wine was exhibited by Mr. G. W. B. Morgan, too new to have the full characters.

All the fruits except those from Nebraska, and a few specimens from California, exhibited the imperfections peculiar to the past season.

JOHN A. WARDER,
TYLER McWHORTER,

COMMITTEE ON PLUMS.

From the want of practical success in fruiting the plum, your committee do not feel warranted in recommending any one variety for general cultivation except Lombard, for which we have no reason to change our views—believing, like the cherry, we shall have to depend upon a few sorts for our fruit. For trial: Yellow Egg, and Miner.

S. G. MINKLER,
L. ELLSWORTH,
J. G. BUBACH

REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

Mr. President:

Your committee on final resolutions would respectfully report,

1st. That a vote of thanks is due to the citizens of this beautiful city for their generous hospitality to the members of this society in attendance, in providing them with a commodious, pleasant, and comfortable hall in which to hold their sessions. Also in offering a cordial welcome to all the members as guests in private families.

2nd. Our thanks are due to the various hotels who have kindly entertained us at greatly reduced rates.

3rd. That we as a society deeply regret that sickness has deprived us of the presence of our venerable President, J. W. Cochrane of Blue Island, who is hereby assured of our deepest sympathy in his affliction.

4th. Our thanks are due and are hereby tendered to the different railroad companies for returning members free or at greatly reduced rates.

5th. That the thanks of this society are due to all of the officers for the efficient discharge of their respective duties.

6th. That we would praise our very active working members, especially D. Wilmot Scott our secretary; also E. H. Skinner for his noble offer of scions of valuable Russian varieties of apple to all of the members, which cost him much time and labor; and to H. H. McAfee for his valuable essay and Remarks on Forest Trees, and his Illustrations in his Lignarium.

7th. Resolved, that we are ever pleased to see and welcome our highly valued friend Dr. J. A. Warder, and listen to his remarks on any subject pertaining to horticulture.

8th. That we do fully appreciate the labors and counsels in our deliberations of horticulturists from other States to whom we tender our sincere thanks.

Finally, the grateful tribute of our hearts are due the Great Master of Assemblies, for his unclouded smiles during our sessions.

DIXON, January 27, 1870.

D. C. SCOFIELD, Ch.

D. B. WILE.

E. G. MYGATT.

TREASURER'S REPORT.

1869.		PAID OUT AS FOLLOWS:	
March 19, Rec'd of L. Woodward, Treas.	\$ 50 00	To H. D. Emery & Co., for pub. Trans.,	
April 9, " " " " " "	.. 162 50	balance due them for 1868.....	\$ 50 00
1870.		To H. D. Emery & Co., for pub. Trans.	
Jan'y 10, Rec'd of D. F. Kinney, mem- bership.....	2 00	for 1869.....	150 00
Jan'y 10, Rec'd of J. Deere, membership.	2 00	Total.....	\$200 00
Total receipts.....	\$216 50	Balance in my hands.....	\$16 50
Submitted,		E. H. SKINNER, Treasurer.	

STRAWBERRIES AND PEAR SEEDLINGS.

PITTSBURG, PA., January 24, 1870.

J. Cochrane, President Northern Illinois Horticultural Society.

DEAR SIR: I do not think of anything that I have learned experimentally worth noting, except that the Napoleon III strawberry (I have plants to sell), with me, is a rampant grower, a prolific multiplier, a profuse bloomer, and enormously barren. I have thousands of plants, but never had a berry. I will furnish plants to actual members of the society at one dollar each, which is, I think, a little more than I paid for them; but as I have been to the trouble of testing them and have had no berries in return, of course I must get my pay in some way. To any person not a member, I will furnish them at three dollars a thousand. I got my plants of Purdy.

One other point I happen to think of. Last spring I had some pear seedlings transplanted. Part of them were cultivated, and blighted. Part were not touched after they were set out, but left to grow up with weeds. They were in a long row, and wherever the weeds did not grow up about them they blighted; but where the weeds were thick they were entirely healthy.

Yours truly,

C. C. MILLER, Marengo, Ills

TRANSACTIONS CENTRAL ILLINOIS HORTICULTURAL SOCIETY.

HISTORY.

The Onarga Horticultural Society called a meeting for Central Illinois, to convene at Onarga, February 26th and 27th, 1868. A constitution and by-laws were drawn up and adopted, under which the "Grand Prairie Horticultural Society" was organized, with the following officers:

PRESIDENT.—E. Daggy, Tuscola, Douglas county.
 SECRETARY.—J. D. Van Norman, Onarga, Iroquois county.
 TREASURER.—Emery Cobb, Kankakee, Kankakee county.

Twenty-five members were enrolled, and the meeting was regarded as quite a success by those present, and the Executive Committee was instructed to call an annual meeting during the following winter.

The first annual meeting was held at Decatur, February 10th, 11th, and 12th, 1869, at which some excellent essays were read.

The Constitution was amended at this meeting, by striking out "*Grand Prairie*," and changing the name to "*Central Illinois Horticultural Society*."

The following officers were elected:

PRESIDENT.—E. Daggy, Tuscola, Douglas county.
 SECRETARY.—H. J. Dunlap, Champaign, Champaign county.
 TREASURER.—J. B. Clark, Onarga, Iroquois county.

Thirty-eight members were enrolled, and the meeting passed off pleasantly; fixing the place for the next meeting at Mattoon.

LIST OF MEMBERS FOR 1870.

Baker I. L., Pana, Illinois.	McKinstry B. M., East Sunner.
Baron A. B., Sangamon Station.	McNeil C., Tuscola.
Bliss W. F., Champaign.	McNutt C., "
Burton B. H., Arcola.	Melane M. C., Charleston.
Burlingame R. B., Arcola.	Mann W. H., Gilman.
Boatman J. W. & Co., Champaign.	McCoy U. H., Pana.
Clark J. W., Onarga.	Murdoek R. R., Paxton.
Curtis E. S., Paris.	Montgomery T., Mattoon.
Curtis B. O., "	Noyes R., "
Caldwell T., Griggsville.	Noyes F. V., "
Colwell W. B., Paris.	Owens J. W., Onarga.
Dunlap Albert, Champaign.	Phinney Geo. P., Pesotum.
Dunlap M. L., "	Phinney J. B., Champaign.
Dunlap H. J., "	Pope R. F., Kimmunity.
Daggy E., Tuscola.	Parks J. R., Tolono.
Davis John, Decatur.	Platt I. S., Chicago.
Davis H. W., "	Periam J., Chatsworth.
Dummings D. S., Jefferson.	Price Wm., Lowell.
Fraucis L. C., Springfield.	Rice Martin, Camargo.
Fox Dr. D. J., Kimmunity.	Rident H. W., Pesotum.
Garrett Caleb, Tuscola.	Rieve J. B., Moulton.
Hooper John H., Pana.	Robbins E. D., Onarga.
Hammond A. C., Warsaw.	Rudy J. O., Mattoon.
Heim Joseph, Terre Haute, Indiana.	Smith J. A., Tuscola.
Hyner Robert, Mattoon.	Sweet Benj., "
Huggins Jon., Woodburn.	Van Brock H. R., Champaign.
Holcomb T. A. E., South Pass.	Van Pleck M. F., Philo.
Jones R. P., Kimmunity.	Wallace A. S., Tuscola.
Jones W. W., Camargo.	Walker S. B., Charleston.
Kirchgraber John, Mattoon.	Woods T. E., Mattoon.
McCarty E., Pesotum.	

EXECUTIVE COMMITTEE.

The Executive Committee of the Central Illinois Horticultural Society met the Executive Committee of the State Horticultural Society, at the Illinois Industrial University, March 8th, 1870, and made an agreement with them for publishing the proceedings of the last annual meeting, in the volume of State Transactions, for \$65, in pursuance to a resolution authorizing the Executive Committee to make arrangements for publishing proceedings, which was passed at Mattoon February 2nd, 1870.

H. J. DUNLAP, Secretary.

PROCEEDINGS.

The second annual meeting was called to order by the President, E. Daggy, in Doles' Hall, in the city of Mattoon, at 10 o'clock A. M., February 1st, 1870.

Prayer by Rev. Mr. Lapsley, of Mattoon.

Mr. T. E. Woods, of Mattoon, delivered the following address of welcome:

Ladies and Gentlemen of the Central Illinois Horticultural Society:

It is a pleasure to perform the honorable duty assigned me of bidding you welcome to our young city of the Grand Prairie, because I feel that it is good for you to be here. About two years ago, at Onarga, your President, Mr. Daggy, "Rural" Dunlap, and others, organized the Grand Prairie Horticultural Society, and their ever busy and skillful hands planted the seed of this Association. At our sister city to the northwest, Decatur, last year, the second meeting was held, and the Society re-christened the Central Illinois Horticultural Society; and here the germ sprang forth and began to develop. Let us hope that, invigorated by the generous action of its growing membership at this meeting in Mattoon, it may grow stronger, to bloom and produce its goodly fruits through many succeeding beautiful Illinois summers and autumns. This Society embraces in its great scope the body of Illinois which stretches its broad and generous zone from the Logansport and Peoria Railway, on the north, to the borders of lower Egypt, on the Ohio and Mississippi Railroad; an empire teeming with a substantial richness unexcelled in the world; and its bloom-fringed southern border extends almost to that ancient site of horticulture in Illinois where, about the mouth of the Kaskaskia that flows on the western edge of our prairie, the early French adventurers who came by way of the lake chain, from Canada, as early as 1682, planted their orchards around the old town of Kaskaskia, before the "Charter Oak" of the Atlantic colony of Connecticut bore its historic fruit.

Ladies and gentlemen of the Central Illinois Horticultural Society, we greet you as of the most ancient, important and pleasing calling of the earth. The history of the human race begins in a garden—and God was the first garden-maker: "and the Lord God planted a garden eastward in Eden;" and since the father of the race was put in the garden to dress it, and since he and his descendants have been turned loose in the world to subdue it, and Christ prayed in Gethsemane that the "bitter cup" might pass from his suppliant lips, gardens have had an important place in human story. It will be remembered how, when the plains of Shinar had been profligately shorn of their covering of woodland, and the great Babylon was in the zenith of its glory, that Nebuchadnezzar's wife had the great hanging gardens reared on pillar, and column, and arch, terrace on terrace above each other, until the lofty forest trees they bore, alike with the rarest plants and flowers, reared their nodding heads of verdure above the huge walls, three hundred and fifty feet high, and visible from the half hundred fifteen mile streets, to remind her of her native woolly mountains of Media. The ancient Mexican civilization that succeeded the Aztecs on the banks of the lakes, in the great basin on that grandest table land of the world, where was built the city of the Montezumas, between seven and eight thousand feet above the gulf strand, launched floating gardens on the bright bosoms of the numerous sheets of water; and poets have sung of gardens, and nature in her primeval ages spread them on our own fair plains where now you are rearing thousands of orchards and vineyards, "beautiful as apples of gold, in pictures of silver." In the discussions we are to have the benefit of, embracing, perhaps, besides pomology and floriculture, also geology, mineralogy, entomology, ornithology, etc., we shall hope to be instructed in a better practice than that of the ancients of Palestine, and of Castile, and other places in Europe, who rendered barren their once fertile lands by a destruction of their woodlands; and we shall also hope to get out of the rut of our pilgrim forefathers who systematically felled and destroyed the forests of Eastern America in the days of the early settlement as a protection against the lurking savages with whom they waged warfare. We need to plant groves and forests on our prairies instead of destroying the woodlands that fringe them; and how to do this, and how to plant and rear orchards and vineyards in this rich soil and in this variable climate, is to be the fundamental teaching we are to get from this

Society. How to assist nature to continue her wonderful process of ever-renewing productiveness, and how, withal, to add grace and beauty, culture and development to rural life. You are to teach the facts essentially useful about soils, seasons, crops, trees, vines, etc. You may scarcely dare tell us what you think, simply, but you must teach us what you know. Experiment, and give the people the result trimmed and pruned. A generation that regulates its market reports by ocean cable dispatches, and dry land lightning flashes before breakfast, can't wait twenty years to eat the fruit of its pear trees. It must at least have monthly berries, where it feeds its mind with news from three or four editions of daily papers; and it must engraft of all the good things of all the nations, it invites to its vast fields or sees as it travels by steam, with the speed of the wind. A part of the beautiful mission of this Society is to educate our people up to a higher standard of appreciation of the beautiful in nature; for a culture of taste must go hand in hand with utilitarian knowledge. You will teach to combine the beautiful with the useful, as God does in his ever-recurring creations; teach the people to love the ornamental shrub, the tender plant, the happy birds, the lovely flowers—those tender messengers of sentiment, those sweet poems of Heaven, written on the earth by the white hands of angels from the bright land "where the fields are eternally green." Teach us to love these graces of nature because the grace, freshness and beauty of trees, shrubs, song-birds, and flowers, act on the minds, hearts and souls of the people for good, and never for evil. Already have the people of Mattoon felt the good influences of your auxiliary society in this city, with increased interest felt in beautifying our prairie homes; and its humble exhibitions have afforded us some of our most enjoyable occasions. We hope the good work will deepen here, and widen through your Society and sister ones of the State, until it pervades the whole of the noble Garden State.

Then, ladies and gentlemen of the Central Illinois Horticultural Society, as teachers and laborers in this glorious field, we greet you gladly, and welcome you to our young and growing city and our homes, as Mattoon ever greets and delights to welcome a body of intelligent and cultivated ladies and gentlemen.

To the address of welcome, Mr. Daggy made the following response:

Through your representative we have been welcomed to your city and the hospitality of your citizens; and in accepting this compliment, I feel it due to our society to say that we do so in behalf of the cause we represent—the great cause of Horticulture. It is because we appreciate your efforts in this noble, health-giving and refining branch of industry, which is so well adapted to all classes of our people, that we have come among you. That we may have our faith strengthened to nerve us up to the warfare against the discouragements to which we are subject, we need your counsel and experience and encouragement. And from the display I witnessed last June, in this hall, I can confidently promise my fellow-members that much may be gained by an earnest effort to emulate the noble example in the display of taste, skill and energy displayed on that occasion. Especially would I call attention to the very laudable efforts of the ladies on that occasion, as indicating their great interest in this subject: for without their co-operation and assistance in the race of life, we must fail. We thank you most heartily for this most cordial welcome to your city and firesides.

Fellow-members, we have received a formal, cordial welcome to the homes of our horticultural friends of this city; and in accepting this invitation let us each feel that we should make ourselves worthy of their confidence. This, gentlemen, is no ordinary courtesy, and should elevate us in self-respect to correspond with our chosen art of horticulture, in its broadest sense. As we associate for a short time with our friends and their families, let us all endeavor to leave an impression for good, and thus give evidence that we appreciate this hospitality, and be the better prepared to bestow on others such kindness as we have received, when we have returned to our homes.

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen and friends of the Central Illinois Horticultural Society:

By an ever kind and beneficent Providence we have again been permitted to meet and greet each other at the opening of this, our second annual meeting. I assume nothing but what the feelings of my heart fully warrant, in saying that to me these greetings are pleasant beyond description; and, indeed, if I were to allow my feelings to dictate, I might occupy the full time allotted me in attempting to portray my emotions on this occasion. But while we all feel the cultivation of our social faculties to be pleasant, as well as profitable, judgment indicates that our attention should be directed to the transaction of business, as it is for this purpose we have met.

A very brief review of our history as a society may be of sufficient importance to demand a passing notice. Two years ago the Onarga Horticultural Society called a meeting at that place, which convened on the 26th of February, 1868. The result of that meeting was the organization of the

Grand Prairie Horticultural Society—to meet the contemplated re-districting of the State into seven instead of three fruit districts. The first annual meeting, held at Decatur, February 10, '69, amended the constitution by changing the name to "Central Illinois Horticultural Society," so as to embrace the central portion of the State lying between the northern and southern districts.

That meeting also authorized the Secretary to issue a series of questions and send a copy to some suitable person in each county within our boundary, requesting answers to be returned to him so that he could make a consolidated report—which is to be a substitute for an ad interim committee's report at this meeting.

It will be observed at once that we have extended our boundary over quite a diversity of soil, which must necessarily produce a corresponding diversity in the reports from the different sections and localities within our limits.

While our portion of the State is not subject to the extreme cold from which they suffer in the northern counties, and yet not blessed by the balmy breezes that fan our enthusiastic collaborators in the mild climate of Egypt, we can certainly boast of as many changes, or, in the language of another, assert that ours is the most "vicissitudinous climate."

The sudden changes to which we are liable—especially during the autumn and winter—subject the Horticulturist to great care in the selection of varieties, and a vast amount of extra labor in the protection of the more tender trees and plants which are wont to be cultivated in our orchards, lawns and gardens.

But the unparalleled fertility of our soil, and the beautiful surface of our portion of the State, fully counteract any feelings of discontent with our locality. My observation has also induced me to believe that no one locality or section of country possesses many very great advantages over another: but that every locality has good and bad qualities, so that in the aggregate we may be content that we have no more advantage over our neighbors than they have over us. For years past, fruit growers have looked to the southern portion of our State with great interest; but remoteness from market subjects our friends of Egypt to the merciless monopoly of railroad companies for long transportations, which greatly reduce net profits. Experience indicates also that the mildness of the autumn in that locality induces a late, or second growth in many trees, that subjects them to damage by severe freezing before the wood is well ripened.

We have spent another year in experiment, and labor, and toil, and study, and observation, if we have filled our mission as fruit growers and Horticulturists. And now we are assembled to report progress and interchange opinions upon the results. This is a school in which all are pupils and yet all may be instructors if we report the experience of the past, whether it be success or failure.

Our failures or successes with the causes which brought them about are just what we want in Horticultural meetings. Theory is of little value, and the less we have of it without the practice to prove it, the better.

Our theory and experiments should always look to improvement in the way of producing new sorts, or changing the quality and character of old imperfect ones by different modes of propagation and culture.

If we could produce an apple tree of the best vigor, symmetry, hardness, early and annual productiveness, to give us fruit of the best size, shape, color and flavor, embodying all the good qualities of our best sorts, we ought to feel that we had achieved a victory; but such sorts are not known except in humbug advertisements, or the fertile brain of lumbung biped pedestrians.

Great confusion exists in the nomenclature of our fruits. Some well known fruits are known by different names in different sections of the country.

In my own county I have found an apple with a name for each side of the county, and yet I took it twice to the meetings of the State Horticultural Society and found no one to identify it as a known sort. Much of this confusion no doubt is caused by the purchase of trees from ignorant and irresponsible parties, who purchase any kind of rubbish or unknown sorts they can get cheap, and then label the trees to suit the orders of their customers. The carelessness of planters who neglect to plant and make a record of their orchard, even when the trees purchased are labeled correctly—tends to confuse names of fruits, from the fact that when the trees begin to bear they make a guess at the names from the recollection of their purchase, or of fruits they saw many years before. Sometimes such orchardists have kind neighbors who volunteer to assist in this guessing process, in which they display such a knowledge of fruits as Warder, Downing or Thomas might be proud of. Such knowing persons have a name each for red and yellow apples, and apply it almost indiscriminately to each. The name, pippin, is also very convenient, and the adjectives red, yellow, green, striped, fall or winter are very convenient when making a display of their extensive horticultural knowledge. They have not the most remote idea of the length of the list of varieties; but can embrace the entire collection with a dozen names. It is better to let a fruit go without a name than to make a guess at it without some good assurance that it is correct.

Allow me to suggest that a committee might be appointed, who are competent to take charge of the fruit at our meetings, and when the name of an apple is called for discussion, present a specimen

if they have it, so that there can be no mistake about the sort under consideration. In this way I feel that we could soon correct the existing confusion, in the names of our winter fruits at least.

The subject of planting trees, for timber and ornament, is one in which we should take more interest. Trees for shelter, timber and ornament are one of the great wants of this prairie country. We hope this subject will be fully set forth in an essay from one who is much more competent for the task than I am. The vegetable garden is a department to which but little attention has been given in horticultural meetings. This is a legitimate topic for our consideration in these meetings. The same remark will also apply to the ornamental and floral department; the latter of which we hope also to have set forth in an essay.

On the subject of insects I know not what to say—except to exhort you all to greater vigilance in observing their habits, and further experiments for their destruction. At the mention of insects, you doubtless anticipate the mention of one who devoted his life to the study of the habits of the insect creation. At our meeting a year ago his genial voice was heard, and we were charmed with his proficiency in his favorite and useful department of study, as well as enlivened by his wit and humor. But the lamented Walsh has been in our meetings for the last time, and we must look to others for instruction on the subject of entomology. His loss will be felt by all who appreciate his scientific knowledge and high attainments as an entomologist. He was the victim of a railroad casualty while walking on the track near his home, which caused his death last November. This dispensation of an All-wise Providence reminds us that life is passing, and the solemn warning comes to each of us to-day—"Be ye also ready;" and whatever we do must be done quickly, as death will surely call for us, and perhaps when we least expect it.

I must be permitted to refer again to the fact that we should call into our meetings our wives and daughters, so as to make them co-laborers with us in this noble work in which we are engaged. If mother Eve was placed in the garden of Eden for a "help-meet," why not now receive the benefit of the superior skill and taste of woman? She can as well enjoy the shady bower, the luscious fruits of the orchard, the vegetables from the garden, or the fragrant flowers, as we can. Then why not employ her hands, her talents, her taste and skill, in their selection, propagation, arrangement and cultivation? Many departments of the work are eminently adapted to her delicate hand and exquisite taste. If they were not "cumbered with much serving" during our meetings, I think we might safely rely upon them to constitute a large portion of our audiences, and give much interest to our meetings. Some of the strong-minded ones are seeking notoriety in a much more forbidding and un congenial field of labor than this, and one in which we fear much less good will be accomplished. In this department I feel that the refining social influence of woman would not be compromised, as in the political field, where rivalry, animosity and bitterness are the rule of contending aspirants. Time would not permit entering into this subject fully; but I do hope it may be duly considered in all its bearings in this connection.

In conclusion, gentlemen, I must urge you to take some definite step toward the publication of our transactions. I feel that the usefulness, if not the life, of our society depends upon this, as the day has come when we must let the people know what we are doing. We show but little interest in the cause in which we are engaged, if we can afford to meet from year to year and transact business, and not place it in shape for future reference. All our acts go into history, no matter how small, and horticultural history may act as a guideboard to warn others of errors and pitfalls—or indicate the road to success.

I have long felt that in our meetings there is not enough general participation in the discussion. While all feel a desire to receive instruction, it must also be evident that some must impart it. Please bear this in mind, and unburden yourself freely for the benefit of others. Long-spun theories, eloquent addresses, or even finely written essays, should not occupy too much of our time. Practical experience, with attendant results, is what we most need. Let us cultivate that courtesy and mutual friendship which horticulture and home adornment indicate to us, ever remembering that we should not live for ourselves only, but for the good of others also; and especially let us bear in mind the solemn fact, that we will soon be called "from labor to reward."

The Treasurer, Mr. J. B. Clark, reported that he received the past year, from various sources, \$61.00; and paid on orders \$16 10; leaving a balance in his hands of \$44.90.

Report accepted and approved.

The President then appointed the following special committees:

FRUIT—Jno. A. Warder, Cleves, Ohio; H. W. Davis, Decatur, Ills.; and M. C. McLain, Charleston, Ills.

PRESIDENT'S ADDRESS—Tyra Montgomery, J. B. Rieve, J. O. Rudy.

FINAL RESOLUTIONS—L. C. Francis, Parker Earle, W. H. Mann.

Adjourned.

AFTERNOON SESSION—FIRST DAY.

The Secretary presented the following report :

The Secretary has to report, that as soon as the annual election of officers took place at Decatur, last February, he received the books and papers from the then Secretary, Mr. J. D. Van Norman, against his protest. It was doubtless the duty of the old Secretary to finish up all the work pertaining to the annual meeting, before passing the books over to his successor. I make this statement to account for any errors which may have been made in writing up the proceedings of the last annual meeting.

About the first of May circulars were sent to at least one person in every county in the district, to enquire if they were willing to make observations on horticultural subjects and vineyards, in accordance with a resolution passed at our last annual meeting; twenty-three favorable answers to forty-five circulars were received. Where other persons were known to be engaged in horticultural pursuits in those counties from which no reply was received, I sent other circulars, and received some replies.

About the first of September the Executive Committee met at Tuscola and ordered the blanks to be sent to the different persons, and nineteen reports have been received. As it would take some time to read these reports separately, I have taken the liberty to condense them. The questions and answers are in the following form:

Query 1. What kind of soil? has been replied to, either prairie, loam, or clay.

2. Timber or prairie? Both.

3. Is there any kind of fruit grown in your county for market—what kind, where sold? has in only six cases been reported as shipped largely, in four cases shipped some, and in eight counties not enough raised to supply home demand.

4. About what time were orchards first planted, and what were the principal varieties?

The replies vary from ten to fifty years. The principal varieties planted thirty years ago were Winesap, Rawles' Janet (or Jeniton), Ben Davis, Maiden's Blush, Yellow Belleflower, Winter Penneck, Little Romanite, Milam, Fameuse or Snow, Red June, Early Harvest, Rambo, Red Astrachan, Black Gilliflower, Esopus Spitzenburg, and Vandevere Pippin.

Nearly all these varieties are still popular, and most of the apples sent to market are of those varieties, although many of the later varieties have been largely planted. Among these are the Fall Wine, Willow, Rome Beauty, Sops of Wine, Fulton, Domine, Stanard, Golden Sweet, The Russets, Wagoner, White W. Pearmain, White Pippin, Smith's Cider, and others. These varieties have all given satisfaction in some localities, and have been thought worthless in others. But few of them receive commendation from all sources. Those spoken of that have been tested long enough to develop their good and bad qualities, are: Sops of Wine, Keswick Codling, Rambo, Wine Sap, Yellow Belleflower (on clay soil), Ben Davis, Maiden's Blush, Gilpin, Willow, White Pippin, Stanard, and Smith's Cider. This list seems to be as near perfect as one can be made.

5. Is fruit of any kind troubled with insects or disease? Has been answered in the affirmative by nearly every correspondent. The curculio attacks nearly every fruit, except berries. The codling moth infests both apples and pears, the peach-borer in peach trees, and some few reports speak of apple-tree borers. Grapes are troubled with rot, mildew and leaf blight, the latter doubtless caused by the leaf-hopper. Pears are reported as blighting in most counties, and some cracking of the fruit. Apples are reported as having scabbed badly in most localities. Prof. Turner, of Jacksonville, says: "If the Lord knows of any disease or insect that fruit is not troubled with, I am sure I do not." Mr. Huggins, of Maconin county, reports that the apple tree louse (*aphis mali*) has been very numerous. The grape crop has rotted badly in most localities.

6. Are some varieties of fruit less troubled by insects than others? Has been answered in the affirmative in nearly every case. Among apples that do not seem to be so much troubled by the codling moth as others, we find the Sops of Wine, Keswick Codlin, The Russets, some of the Spitzenburgs, Northern Spy, Orange, Maiden's Blush, and Ben Davis. Those varieties reported as being most exempt from scab are: Red Astrachan, Benoni, Trenton Early, Maiden's Blush, Jonathan, Y. Belleflower, (and Willow, in Fulton county). Mr. Robison, of Tazewell county, observes that trees having large, thick, dark colored leaves appear to be the most exempt from scab. Mr. McLain, of Coles county, reports the Janet, Wine Sap, Yellow Belleflower, Little Romanite, Early Harvest, Red June, and Red Astrachan as most exempt from insects and diseases in his locality.

The Northern Spy is reported by Mr. E. A. Hageman, of Edgingham county, thought to be less troubled by the borer than others.

7. What varieties of grapes are mostly planted? is answered by Concord in all cases but one, that being Mr. Hammond of Warsaw; then Delaware, Catawba, Ives, Isabella and Hartford Prolific. The vines are mostly reported as being subject to mildew, and dropping of leaves, and some rot. Stakes and trellis both are used.

8. Have you any pear blight? is answered affirmatively by all but one, it however being worse in different places. Have you any theory as to its origin or cure? is answered in many ways; but few of our correspondents prescribe any cure except to dig up all trees affected and plant new ones in their place. Mr. W. Stewart, of Quincy, says: I think the best preventative is thin, dry, well drained soil, and little cultivation to secure slow growth and early maturity of wood. Mr. Emory, of Fulton county, reports "plenty of theory but no cure." Professor Turner says, "my general theories are published, no change of mind about them." Mr. Huggins, of Macoupin county, says, "when the doctors disagree, what should I know?" Mr. Hammond of Warsaw says, "I have had half a dozen theories and abandoned them all."

9. What varieties of cherries succeed best, and on what stock are they growing? is answered by sixteen giving Early May or Richmond, first; second, common Morello, English Morello and May Duke. What stock are they mostly on? is answered Morello by six, Mohaleb by four, Mazzard by three, own roots by two; while some have reported all kinds as being successful.

10. Do you think that bees injure or benefit the general fruit crop? is answered affirmatively by seven, others are in doubt as to the benefit. Professor Turner of Jacksonville says, "neither particularly, no lack of help here for insects to carry pollen. Plenty of laborers of all sizes, from nothing up to tumble-bugs; all work cheap."

11. Do you know of any person who has used tile drain, who is satisfied with the results? Professor Turner says, "don't know any not satisfied." Mr. Robinson of Tazewell county has used it and is satisfied. Mr. McLain says, "I do, with gratifying results." Nearly all others report "no tile used in this county except for cellar drains."

12. Have you any knowledge of any new variety of tree, plant or vine, planted in your locality, that is worthy of further trial (give name and where obtained)? Mr. Francis reports the Sangamon Red Streak as promising well. Mr. Capps, of Mt. Pulaski, reports Clapp's Favorite pear and Downing's Seedling gooseberry. Prof. Turner, of Jacksonville, reports a "Red raspberry, twenty years old, that I think good, if some one would take hold of it. I have also a seedling pear very early, that is twenty years old, that I think very superior." Mr. D. F. Emory, of Canton, reports: "Have the Mountain cherry described in the Patent Office Report for 1865, page 207; no fruit yet. Mr. Wm. Stewart, of Quincy, has found the Southern Cypress hardy on the prairie since 1853. Mr. Hammond, of Warsaw, reports a new apple called Monte Bello, as having done well in Hancock county for some years."

13. Have any new insects made their appearance during the past season, and have any common insects appeared in unusual numbers? Mr. Stewart, of Quincy—Not unless the scab on the apple is the work of an insect, which is doubted here. Prof. Turner—"Ask Pharaoh how it was once in Egypt. I don't believe that a single fruit of any kind was produced on my place that was not bitten or knotted by something." Mr. Cochran reports "the only real scourge that has appeared the past season has been the free peddler, nine of which have made Havana their headquarters." Mr. Huggins reports the aphid or plant louse in unusual numbers. Mr. Robinson, of Fremont, reports "a caterpillar that eats the leaves of black walnuts." Mr. Hammond reports a new worm on apple trees early in May, that was destructive. The State Entomologist took it in charge, and he will doubtless describe it.

It was found to be impossible to raise sufficient funds to pay for publishing our last report in book form, but it is hoped that the reports of this meeting will be published either by the Society or in connection with the State Society.

The Illinois Central and Indianapolis and St. Louis railroads have kindly consented to return our members at reduced rates, showing that they at least appreciate our efforts to enlarge the production of fruit in Central Illinois, the benefits of which will also assist to materially increase the freight of both these roads. It will be seen by the reports that but little fruit (except berries) is shipped from Central Illinois. It is not all consumed where it is grown, but it is sold on the trees and carried away in wagons a distance of from fifty to one hundred miles, mostly for family use. Enquiries made of those who went to the Wabash counties for apples, the past fall, show that the average price of good winter apples was fifty cents per bushel, on the tree. This, taking into consideration the large crop, is a little singular. Twelve or fourteen years ago apples sold in these same localities at from ten to twenty-five cents per bushel, and were delivered a hundred miles by wagons for half a dollar. Ten years ago our citizens said the apple business will be overdone. Yet with the many hundreds of thousands of trees that have been planted since that time, the price has continued to advance. I for one do not think that the price of apples, pears and cherries will ever fall below the cost of production, which sometimes does happen to the small fruit.

Mr. John Davis, of Decatur, Illinois, then read the following essay on

THE APPLE.

Among cultivated fruits, the apple very justly takes the highest rank. As to hardihood and ease of cultivation, as to its numerous varieties, its keeping qualities, and its varied and important uses, it is justly styled the first of fruits. When the trees are once started they frequently bear good annual crops for a whole generation, without much cultivation, pruning, or other attention. Formerly, the trees were quite free from disease, and the fruit reasonably sound. The size of the fruit, and the broad spreading form of the tree, allows the apple to be easily gathered and conveniently handled. So commonly known are the available and valuable characteristics of this fruit, that the farmer who has not his apple orchard as part of his farm surroundings, is very properly styled thriftless and unenterprising.

In detailing my experience with the apple, I will first state that my location is in Central Illinois, on a rich, black prairie soil, which, in former years, has borne large crops of wheat, oats, rye, corn, and weeds. Has, from time to time, been sown in grass and used as meadow and pasture. Some portions of the ground, in former years, were used for feed lots for stock, and thus have been heavily manured. The land has been in cultivation over thirty years, yet it is richer and better for most crops than at first. My first trees were set in the spring of 1857, other trees were set in the spring of 1862, and still others in the spring of 1864. In the spring of 1867 about four hundred more trees were set, largely Rawles' Janet, with a few Duchess, Wagener, Ben Davis, and English Golden Russet. The Janets and Russets were four years old when they were set. Some of them died (over ten per cent.); others have hardly recovered from the shock of transplanting, at the present time. The other varieties were two-year trees. None died, and all are now fine and thrifty.

The trees on my grounds which have borne most, in proportion to age, are in the order named: Sweet June, Keswick Codling, Winesap, Willow Twig, Red June, Rome Beauty, Limber Twig, Winter Swaar, Rawles' Janet, Roman Stem, Hocking, Trenton Early, English Golden Russet, Sweet Nonsuch, Golden Sweeting, Rambo, Carthouse, Milan, Talman Sweeting, Early Harvest, Fulton, Early Strawberry, and Fulton Strawberry. Some of the oldest and largest trees have scarcely borne at all. The most notable example is the Fulton Strawberry, standing where once was a hog pen, with manure and cobs a foot deep. I believe all the varieties set in 1857 have borne; all set in 1862 have borne, except the Autumn Swaar; all set in 1864 have borne, except Northern Spy, Fall Janet, Summer Queen, and Trenton Early; those set in 1867 have not borne. Most of the trees have been cultivated all the time with some hoed crop. One summer we raised oats, and the following winter the mice, in the stubble and weeds, damaged some of the trees. The trees have usually been healthy, and the fruit sound. The past summer dead patches of bark, several inches in extent, have been observed on the Rawles' Janet. Though the bark seemed dead to the wood, yet if suffered to remain on the tree, a new bark has formed under it, and the wood appears sound. The fruit of the Red June and the Winesap have been much affected with scab the past season.

There are some varieties which I have named as having borne, that, on further planting, I would leave entirely out of the list. The Fulton is very variable; on the same tree some fine apples, but mostly poor specimens, and a poor bearer. The Early Strawberry is too small and unproductive. The joints of the limbs die badly, from some cause. I should not plant largely of Fulton Strawberry, Fall Janet, Autumn Swaar, or Northern Spy. The Trenton Early, Early Harvest, and Golden Sweeting, are not great bearers, but the fruit is large and very fine. The Hocking, with me, is first class in tree and fruit; yet I hear it is not hardy North. The Sweet June is my greatest early bearer, except, perhaps, the Keswick Codling. I would not discard any good standard apple, like Janet or Red June, because of recent disease or temporary imperfection of tree or fruit. It would be wiser to investigate the matter and search for remedies. Were I to set a new orchard, on land similar to that I now occupy, with a view to family supply and the sale of a surplus, I would choose about the following varieties, preferring them in the order named:

Winter—Rawles' Janet, Winesap, Willow Twig, Carthouse, English Golden Russet, Winter Swaar, Rome Beauty, and Roman Stem.

Fall and late summer—Hocking, Rambo, Trenton Early, Keswick Codling, Golden Sweeting, and Sweet Nonsuch.

Summer—Sweet June, Red June, and Early Harvest.

This list is made from the actual performance and appearance of trees on my own grounds, and would, of course, be modified by further experience, and the observation of the experience of others.

Always locate the apple orchard on high land, not quite level; set the trees pretty thickly on the prairies, say about 18x30 feet for the usual varieties, the smaller growers closer. Cultivate the trees well for five or six years. Corn is a good crop for an orchard, if you allow the trees plenty of room.

When the trees are old enough to bear, plow the land into such a shape as to allow the water to

pass off readily. Turn in the pigs and poultry, and let the land go to weeds. Mow the weeds in June and August, with the mower, rake into small piles or windrows and burn, during warm summer evenings when the air is still, to attract and destroy the moths. Burn in the same way all dead brush, and every sort of rubbish about the premises. Late in the fall, with a keen, bright plow, set very shallow, turn over the surface of the soil, and in the spring harrow and roll, ready for the mower. This should be done at least once in two years. Keep a sharp look out for eggs, moths, and insects. Spare the birds to help you, they are your friends. Wash the trees in spring and fall with strong soap-suds, thickened with clay or other material, to form a coating to protect the trunk and larger limbs from the sun, frost and insects; cut away dead limbs, and thin out the tops; beyond this prune but little. Never cease to watch the bugs, borers and caterpillars. Fight them in every way; by fire, by cultivation, and by every known device. Here is the crisis in fruit culture. Remember that we have more to fear from the insect and fungoid enemies which prey upon our orchards, fields and gardens, than from all the guns, swords and diplomacy of the "czar and the infidel;" and unless we wage eternal and determined war against them, we shall be conquered. Of what avail are fruit conventions and fruit lists, if we only raise our finest crops to fatten our enemies? The war is upon us—the armies are in the field—there can be no truce! Shall we, whose fathers drove the British lion from the land; shall we, before whose face the war whoop of the Indian melts into extinction, and the wild beasts of the prairies and forests retire in dismay, cover before the pigny foes of our trees and fruits?

Thus far we have gained a few victories, perhaps, but the bugs have gained many. How their bug generals and beetle captains must laugh, to see us turn pale at sight of a scab on the Winesap, and to hear us talk of giving up cherished fruits, because they have in some way been afflicted. Fellow citizens, such fluid warfare never conquers. Our motto should be, "millions for defence, not a cent for tribute;" and the standing order of the day should be, "Up, guards, and at them!"

REVISION OF FRUIT LIST—APPLES.

It was decided that an expression as to the merits or demerits of a variety was much better than to have a vote, which would not express the sentiments of all the members; therefore no fruit list is recommended by the society. The list of varieties called over is the list adopted by the society at its last meeting, in Decatur.

AMERICAN SUMMER PEARMAN.—Dunlap, Champaign—Of no value for market.

Dr. Hull, Alton—As a family apple has no superior; good for both family and market in some localities.

Holcomb, South Pass—What are we to understand by its being good for family use, and not for market?

Dr. Warder—It is an excellent apple; but people who buy apples are not yet educated up to a point where they are willing to pay a remunerative price for good apples. Hence the distinction. Neither does the public appreciate good fruit.

BEXONI—Dunlap has trees twelve years planted, but they do not bear well. Apple fine, and promises well; would plant sparingly.

RED JUNE.—Huggins, Macoupin Co.—Does not stand high with us, neither does it bear so well as formerly. Scabs very badly; cultivation does not make the fruit perfect.

Dr. Hull—You can get rid of the lice that cause the scab at an expense of two cents per tree. Sprinkle air-slacked lime over the trees, while the leaves are wet, just before or after blooming; it might injure the blossoms if put on while in bloom.

Mr. Dunlap said tree grew very thick, and needed thinning; the fruit should also be thinned out.

DUCHESS OF OLDENBERG.—McLain, Charleston—Gives good satisfaction. Has noticed that the bark sometimes cracks, similar to the Rambo. Has trees four years in bearing, from Ellwanger & Barry; good judges said they were genuine.

Dr. Hull thought the trees could not be genuine, for it is hardy at St. Paul, Minnesota. It prunes itself naturally.

H. W. Davis, Decatur, thinks rupture of bark caused by late growth being arrested by frost. Has seen Transcendent Crab ruptured as badly as Rambo.

EARLY HARVEST.—Huggins—Worthless last year.

R. F. Pope, Kimmundy—Scabs as bad as Red June. Has seen trees well cultivated comparatively free from scab.

McLain—It does not bear profusely, but is early and brings a good price.

Francis, Springfield—Bears well with us: our favorite early apple.

Curtis, Edgar Co.—Trees thirty years old bear well; scabs some lately. Tree badly winter-killed '55-6.

EARLY PENNOCK.—Dunlap—One of the most profitable summer apples for market.

EARLY STRAWBERRY.—Baker, Sangamon Co.—Worthless.

Dunlap—Same opinion.

Dr. Hull—Don't want it.

SOPS OF WINE.—Huggins regards it as the most profitable summer apple. Good for family use. Quite free from scab; skin tough; bears every time. Codlin moth does not trouble it much, and thinks Dr. Hull's *aphis mali* does not injure it.

Dunlap finds it very profitable; very good to eat and to cook.

DYER.—No remarks.

FULTON.—Dr. Morse, of St. Louis, asked for information. Has planted quite a number as substitute for Rambo.

John Davis has trees planted ten years that only bear sparsely. Size very unequal; would not plant many.

Dunlap agrees with Davis. Would not plant another tree.

Mann, Gilman—The original tree in Fulton county never fails to bear. Tree a little tender in nursery.

Warder—Bears enormously on our stiff limestone soils. Has them growing; other varieties scab badly, but Fulton does not.

Pope—Soil clay loam. Bears well.

Daggy has seen trees on edge of prairie bearing fine specimens.

Warder—It gives good satisfaction in Kansas.

FALL WINESAP.—Francis enquired if there was such a variety.

Curtis—Tree originated by his father, in Edgar county, forty years ago. Very productive; fair quality; not quite so good as Maiden's Blush.

FAMEUSE, or SNOW.—Francis—Desirable.

Dunlap—Scabs badly of late. Has several hundred trees.

Pope has trees nine years planted that do not bear.

FALL SWAAR. Dunlap—Good bearer; fine showy apple.

GOLDEN SWEET, HIGHTOP SWEET.—No remarks.

KESWICK CODLIN.—Profitable for market and cooking purposes; good for drying; best early summer cooking apple.

LOWELL.—Daggy, Tuscola—Promises well and bears young.

Dunlap—It is good and profitable.

MAIDEN'S BLUSH.—Very desirable autumn apple, bears well, good for cooking; tree sometimes tender while small; suffered badly from frost the last fall.

PORTER.—Dunlap—One of the most profitable fall apples. It is not generally disseminated; resembles the Belleflower very much.

Dr. Hull—It is one of the kinds that will do to tie to.

Huggins—Thinks highly of it.

RAMBO.—Francis—Good in Sangamon county.

Dr. Hull—Bears well, but there are many better apples.

H. W. Davis—If he could only have one variety, it should be Rambo. McLain, one of my favorites, scabbed bad last year; tree sometimes tender while young; sometimes the fruit will keep till May.

Dunlap—The natural roots of the Rambo are not good; it should be top-grafted; must be picked early.

Francis—Does it not ripen very uneven?

Curtis—Has seen an apple called Winter Rambo, but it is the same thing.

RAMSDELL'S SWEET.—Dr. Hull—One of the best family apples in Madison county.

YELLOW BELLEFLOWER (on clay soil).—Francis—All right.

Huggins—Tree all right, but it don't bear.

McLain—On clay soil it is very healthy and prolific; overbears every alternate year, but on black loam not very desirable.

Dunlap—Has seen trees both top and root-grafted; isolated cases had occurred where it bore heavy crops on the prairie every alternate year.

Bacon, Pana—Bears well on prairie.

Huggins—It is a first-class apple, but of no value for profit.

Earle, South Pass—On our hills it bears well in poor soil; bears early and is profitable.

Mann—Has seen trees on the prairie break down with an excess of fruit.

BEN DAVIS.—Caldwell—Does well in Pike county; has seen trees eight years old produce a barrel a-piece.

Dunlap—This is strictly a commercial apple; its appearance sells it; people buy it with their eyes open; place red and yellow apples before a company and the red ones will go first; an early bearer.

Dr. Hull—Why don't you discard it for the Pennoek, which is just as good, much larger, and sells for \$1 50 more per barrel?

Dunlap—The Pennoek is troubled with bitter rot.

Huggins—Can't say much for its quality, but it has withstood blight, frost and insects, and bears every time.

Dr. Hull—If there were no other apples, what then would become of this?

Huggins—They would still be grown and sought after.

Earle—Thinks the Jonathan can be substituted for this variety.

ENGLISH GOLDEN RUSSET.—Huggins—Very fair.

Pope—Tree seems to be inclined to blight.

GILPIN.—Dr. Hull—Best for cider.

Francis—When kept till there are no others, it is the best in market.

McLain—Keeps well.

Huggins—Blighted badly last year.

HUBBARDSON NONSUCH.—Huggins—Perfectly fair last year.

Francis—Not very profuse bearer.

Dr. Hull—Very productive, but coarse quality.

JONATHAN.—Huggins—It can not be praised too high as a late fall and early winter apple in Macoupin county; was fair past season; best for family.

Dunlap—One of the finest of its season, but not very profitable for market.

LIMBER TWIG.—No remarks.

MILAM.—Rieve—There appears to be two kinds of Milam in Shelby county, a large and a small one.

H. W. Davis—Failed two years ago.

MICHAEL HENRY PIPPIN.—Dunlap—Bears well, but is too sweet.

MOTHER.—McLain—Keeps till February; quality fair; tree not desirable.

PARADISE WINTER SWEET.—No remarks.

PRYOR'S RED.—McLain—Bears well in timber, in Coles county.

H. W. Davis—Bears well on prairie.

RAWLES' JANET.—Francis—It is THE apple.

John Davis—Does well; much sought for; bark blights on south side of tree.

RED CANADA (Steele's Red).—Dunlap—Has trees twelve years planted that do not bear any yet.

Dr. Warder—Good fruit; does not bear very young.

Huggins—It is a favorite; trees planted alongside the Belleflower have borne for years, while the Belleflower does not bear; quite free from scab.

ROME BEAUTY.—Pope—Considers it one of our best winter apples.

Davis—It drops from the tree badly.

SWAAR.—Davis—Good bearer; has poor roots, and often requires to be propped.

WAGENER.—Dunlap—Requires to be top-grafted.

McLain—Has heard no objection to it; bears well; quality good.

Francis—It falls from the tree early.

WESTFIELD SEEK-NO-FURTHER.—Francis—Is good bearer; falls early.

McLain—Very good.

WHITE PIPPIN.—Curtis—Keeps well, and is a good bearer on the prairie.

McLain—It is very popular.

WHITE WINTER PEARMAIN.—Valueless; scabs badly.

WINE SAP.—Scabbed badly last year.

WILLOW.—Dunlap—Perhaps this is one of our most profitable long-keeping varieties.

Pope—It is good but does not appear to keep well South.

STANARD.—Pope—Tree strong; holds up its fruit well; has trees four years old that bear well.

Dunlap—It is the coming apple for Central and Northern Illinois; never fails of a crop.

PECK'S PLEASANT.—Francis—It is No. 1.

McLain—Good bearer and good flavor.

SMITH'S CIDER.—Curtis—One of the most profitable winter apples.

Francis—Thought the tree very subject to blight.

TRANSCENDENT CRAB, HYSLOP CRAB, and YELLOW SIBERIAN.—Recommended for jelly.

MAY OF MYERS.—McLain—Bears well on both timber and prairie soil; quality not first-rate; keeps till May or June.

Pope—Tree very inferior grower.

Dr. Warder—Would nearly answer as a substitute for Osage in making hedges.

GRIMES GOLDEN.—Dr. Warder—Quality first rate; is not a market apple, too tender; does well in S. E. Kansas.

Much complaint was made that those having trees to sell, had asked an exorbitant price for them, and had trimmed off all the growth; many trees had died from sun scald.

LARGE STRIPED PEARMAIN.—Francis—Scabbed badly last year; tree hardy and bears well.

Warder—It is a great favorite in Missouri and Kansas.

LAWYER was inquired for. Earle has seen the apple; thinks none yet in bearing in Illinois; is large, fine, showy, red.

Dr. Hull has tasted the apple two seasons; considers it medium only in quality; can perhaps afford to grow it for market.

TOMPKINS CO. KING.—No remarks.

STARK.—Pope—Has fruited it for two years; kept till strawberry time; thinks it is all the originator claims.

Dr. Warder—The apple is not of sufficient good quality to excite any attention; found it in Kansas under the name of Kansas Keeper.

SWEET JANET.—Dr. Warder—Thinks it preferable to Ladies' Sweeting.

HOOPS.—A good bearer and keeps well. Adjourned.

EVENING SESSION.

Dr. Warder entertained the audience for over an hour with a lecture on 'Variation of plants, and orchards.'

Dr. Hull—We would like to hear from you with regard to how high to head trees.

Dr. Warder—If you want nice symmetrical trees train them boot leg high; *not* half boot leg high as some one has represented me to have said. I have never advocated the branching of trees at the ground. If you keep your trees properly subordinated they will need very little pruning. Low branched trees are liable to another difficulty, if hogs are turned in to eat the fallen fruit, they soon learn to help themselves. To be sure where the curculio catcher has to be used, you can not have very low heads to your trees.

Dr. Hull then explained his system of pruning. His trees are headed four feet from the ground and the limbs extend horizontally, making really a low headed tree, equally balanced, and so spread out as to protect the trunk on all sides. The air under such a tree helps to sustain the fruit; but if you had your tree down to the ground, you exclude the air, thus taking away the resistance, so that your tree does not support itself so well.

Dr. Warder—I can not say how it may be with a high headed tree from experience, but I don't believe such a tree will support itself better than a low headed one.

Dr. Hull gave an account by diagrams of how a tree should be trained, and described the difficulties that low headed trees would have to meet.

Mr. Dunlap took direct issue with the doctor on high heads for the prairies, saying that he that planted a high headed orchard would wait long and often in vain for his fruit.

Adjourned.

SECOND DAY—MORNING SESSION.

Prayer by Rev. Mr. Streeter of Mattoon, Mr. Parker Earle of South Pass read the following essay:

ABOUT PEARS.

Horticulture is very far from being an exact science. There is little that is settled in any department of it. Suppose one should try to find the very best method of pruning and managing grape vines, and thereto should read all that has been written on that question within the last ten years by scientific and practical men (if life were long enough!), what would most likely be his conclusions? So in regard to any other branch of our fruit culture. Our knowledge is lamentably limited and inexact. Our conclusions are curiously divergent.

Pear Culture forms no exception to this painful state of facts; and it must be acknowledged that all the experience of two hemispheres and all the science of this age have failed to tell us how best to grow and manage a pear tree. It is therefore an embarrassing thing for any one to attempt what might seem like instruction. The most that any man can do is to give his latest opinions—which a year's experience may materially change. And no man's opinions mainly based on the narrow experience of a particular locality, can be much relied upon under different conditions of soil and climate. So I stand here to-day, not as a teacher, but as a somewhat enthusiastic student of pear culture, to give you some of my present impressions, which may be worth but little for any place, and that little only for sections whose conditions of climate and soil do not materially vary from those of the hills of Southern Illinois.

The mechanical state of the soil for a pear orchard is, I think, the most important consideration connected with it. It should be in that happy medium condition which gives free natural under-drainage without being leachy. Such a soil will give those temperate conditions of moisture and warmth in which pear roots delight. Our Western soils are generally too heavy for pears, and require very thorough subsoiling and artificial underdrainage. This is somewhat expensive, but indispensable to success in retentive soils. It is said that tile drains are soon obstructed with roots in an orchard. Probably a foot in depth of small cobble stones covered with gravel at the bottom of a four foot ditch will make the best drain for the orchard. As all vegetable substances are derived much more largely from the air and water than from the soil, it seems that the mechanical condition and chemical properties which enable it to absorb and retain the gases supplied by the air and the rain, are more important than mineral constituents. I would plant a few trees on the best soil I could get or make, wherever I was located, as pears are a luxury worth taking great trouble to obtain, but I would not plant largely or for profit, except on soils adapted, by natural constitution or artificial preparation, to the healthy growth and longevity of the trees. Having the right soil, it is important to get good trees to plant. And among trees, as among animals and among men, I believe there are great differences of constitutional vigor. A large majority of the pear trees I have seen come out of the nursery, are deficient in their native vitality; this may come from a feeble stock, or from a weak bud or graft. A young pear seedling inherits the qualities of its parent tree, and only the seeds of perfectly grown pears from healthy and vigorous trees should ever be used in propagation. It is my impression that we suffer greatly from the neglect or ignorance of propagators in this respect. It is wholly impossible to make healthy and long lived trees from puny stocks. Perhaps it is not less important to select buds or grafts from healthy trees, and which have been well developed by full exposure to the sun and air. A vigorous graft on a weak stock may be induced to throw out roots from itself, but a weak graft will never amount to much, whatever the stock. I will venture the opinion here that the best way to make a pear tree, is to sow the seed where the tree is to stand, and put on such tops as you prefer. This cannot be done however in all places. But I have no doubt that the oldest, largest and most regularly productive pear trees in this world have grown from seed where they stand. As most of us must buy out trees from the nursery, and take the chances as to their "noble blood," I would buy only those trees which show a vigorous habit, and a good balance between stock and top; and other things being equal would take year trees in preference to older. Nature is violated less in the removal of a young than an old tree. As to the time of planting, I unhesitatingly say it should be in the Autumn, and the earlier the better, after the leaves have fallen. I also believe in planting closer than is the common practice. The great need of an orchard in our climate is protection against severe winds, and shade to trees both in summer and winter. All these conditions are more easily secured by close planting than in any other way. In those sections where root pruning is essential to the health and life of the trees, four hundred or five hundred trees can be set on an acre, and remain permanently. Or one-half or three-fourths of them may be root pruned at three or four years of age, and brought into early bearing, while the balance are left to grow to their natural size. In time the root-pruned trees, having

amply paid for themselves and the others too, can be removed. If pears are worth growing as a market crop in preference to other fruit, in a given locality, then I know of no other fruit, or crop to grow in the orchard, so profitable or convenient as pears.

Trees such as I have described, planted in a soil such as I have indicated, should therefore be treated as much on natural and as little on artificial principles as possible. Nature does not cultivate by a constant stirring of the soil, but mulches. Nature plants closely, and gives shade in summer and shelter in winter. Nature prunes sparingly, and not by a systematic shortening or cutting back. Nature grows grass and weeds and small brush, to protect her young orchards from all extremes. Can we grow orchards in this way? That is a difficult question to answer, with our present amount of careful experiments and observations. There are scattered instances of complete success in growing pear trees in this way; but I know no one who has attempted to follow nature closely, and on a large scale. Not but that plenty of trees have been planted in a poor way, in soil poorly adapted to their growth, and then left to their own fate. There is an abundance of neglect everywhere—but this is not Nature's way. Nature is particular as to soil and climate. She grows her oaks, her pines, her beeches and her poplars in locations specially adapted to their several wants. Man has not copied her well in this respect. Nature plants the seed where the tree is to grow. Man has not followed her in this particular. It is my impression that her success is far the most triumphant, and that her methods are worthy our attention, study, and a much closer imitation.

The artificial system of culture produces everywhere abnormal results. It gives great growth of wood, but great tenderness. It gives premature fruitfulness, and fruits extravagantly large, and "fit for exhibition," but painfully rare. It brings troops of diseases and early death. The agricultural press of the country is full of a murmur of wailing over the results of this system, and yet the few bold men who have dared advise a radical change in our methods of managing trees, get little gratitude and much abuse. For myself, I am unsettled in opinion as to many of these points. I know this: that I have no knowledge of any pear orchard that has endured the systematic pruning, manuring and cultivation recommended in the books, for a very long term of years; while I do know of many scattered trees which have yielded their annual abundant harvest for a half century of time, and still stand in green and venerable beauty, monuments of something better than the orthodox system of tree management. I do not commit myself to anything beyond this: that the comparative results of Nature's method and man's method are worth our pondering. I do not say that orchards should be seeded to grass, for that is a question of soil and circumstances. Especially, I do not say that they should be left to the protection of weeds, for there is a better way. But it should not be forgotten that Nature abhors the nakedness of the ground, and hastens to clothe every plowed field with her mantle of greenness. I only recommend that we try all these ways, and hold fast to that which gives us the most good pears for the greatest number of years.

Something should be said about "Insects and Diseases" in every well regulated horticultural talk, and, heretic as I am, I will in this respect follow the ritual of our societies. The two insects which damage us most at present, and which threaten the future of "pear growing for profit" the most alarmingly, are the curculio and codling moth. The larvae of the curculio do not often, if ever, mature in the pear, but in neighborhoods where they abound they disfigure the young pears sadly. With orchards of peaches and pears side by side, I have found the latter much the most numerously stung early in the season, while the infant fruits were about the size of peas. The effects of these punctures are not outgrown by most varieties; the development of the fruit is arrested at the point of injury, or goes on slowly, forming a woody texture, and this scarred knotty fruit is not worth half price in the fall.

You are all familiar with the work of the codling moth in the apple, and I need say nothing concerning this insect, only that it is quite as hard on the pears as the apples, and so damaging to both that a dozen years more of neglect of measures for its extermination promises to leave our pear and apple orchards as barren of eatable fruits as are those of many sections of New England and New Jersey, whose proprietors enjoy their abundant supply of these necessities of the table—when they buy them.

Among diseases affecting pear trees I think there is none so damaging as leaf blight—by which I do not mean the sudden blackening of the leaves which we so often see on pear seedlings, but that fall of the leaves in summer which is caused by a slower growing fungus, and sometimes apparently by a premature ripening of the leaves not connected with fungoid disease. This disease affects most varieties in my neighborhood, where the ground is cultivated in the common way. There are a few of our best kinds quite exempt, however, under the most trying circumstances. This fungus attacks only those leaves having a deficient or weakened vitality. Our pear orchards generally stand in a soil which is systematically kept naked during the entire year, and exposed as much as possible to all the severe changes of temperature. Such a soil becomes intensely hot every bright day in summer, and radiates heat rapidly at night—a condition of things precisely contrary to all the requirements of physiology and the teachings of nature. Most of our pear trees can't stand it. The debilitated leaves, which are constantly exposed to the spores of this fungus, become unable to resist it. This is pretty much all theory, of course; but I know that those trees, of varieties most liable to

summer defoliation in our neighborhood, which have been kept in close grass sod or in clover, have held their leaves quite perfectly through the summer.

This leaf blight lays the foundation for wood blight in many, if not in most cases. Those trees which shed their leaves in mid-summer will generally put out leaves again in a few weeks; a new wood growth is commenced, many of the perfected fruit buds will blossom, and the freezes of early winter will find the whole tree unripened and unprepared, and all those new adolescent branches are backward with the frost, and the whole tree must be greatly shocked and more or less permanently diseased. That such trees should yield to the blighting fungus seems in nowise strange. The tree has passed through the feverish vicissitudes of summer, has been often wounded in root and top, and finally has been exposed to severities of winter while in summer clothing, and it is quite to be expected that the abused and weakened thing should yield to the attacks of disease.

Now whatever will keep the leaves on the trees through the season, whether it be high culture, special manuring, root pruning, mulching, or grassing, is better than any other management which is accompanied with leaf blight. Without giving any opinion as to which of these methods is best, I will state two facts: I planted a dozen Flemish Beauty trees nine years ago; have given them moderate annual culture. They are all alive and in apparent health to-day, but they have been badly defoliated for several summers past, and never matured many fruit-buds, and I have never got a barrel of pears from them all. A neighbor of mine planted a few of the same variety out of the same bundle. He set his trees in ground that he seeded down a year or two after, and which has remained in sod ever since, and he says he has never manured them. His trees are as large as mine, and he has had three or four crops, getting over three bushels to the tree in one season, the pears of fine size. I don't know that the grass was good for them, but I shall try what grass will do for mine. Now please don't anybody report me as recommending you to plant trees in grass, for I don't make any recommendation. I think it is only the naturally strong and vigorous trees which will ever amount to anything if planted in grass—or any where else.

I don't wish to speak of varieties, as so much depends upon particular localities and management. It seems unfortunate that so large a share of all our trees ripen their fruit in August and September. We need more early kinds, and many more later ones. Nature designed the pear season to continue as long as that of apples.

I will only say further, that successful pear growing depends upon fitness of soil, climate and varieties, and the largest energy and thoroughness of management. Whatever system of culture is adopted, laziness, slovenliness, and neglect will not win. If I have deprecated the too general violation of nature's plans, I have not meant that all could be left to nature, for

"Ours is an art that doth
Mend nature."

A lengthy discussion arose as to the proper time to set pear trees, but no definite conclusion was arrived at.

The question as to whether the pear threw out roots above the quince stock was also debated.

Mr. McLain said he had never yet been able to find any, while Dr. Hull asserted that no tree ever bore more than one or two successful crops unless such roots existed. One kind of quince is just as good for stocks as another.

About thirty years ago people had come to the conclusion that dwarf pears were a failure, but some genius bought up all the Angers quince in the country, and got it puffed into notoriety, thereby extending the time of dwarf-pears and making a fortune for himself.

Mr. Earle was questioned as to the grass system, but as his essay gives all the necessary information we omit the discussion.

Mr. Dunlap said that he had over a hundred dwarf-pears standing in blue grass and white clover that did not blight. Some varieties bore good crops, others none. The fruit of some also cracked. Has other trees standards both in grass and cultivated, and both blight equally bad.

Dr. Hull said that one acre of root pruned pears was worth fifty in grass, and advised people to keep out of grass.

Mr. Earle said that he should try it—has faith in it.

Adjourned.

AFTERNOON SESSION.

The Secretary read the following essay on

GRAPES.—BY A. C. HAMMOND, OF WARSAW, ILLINOIS.

Every one conversant with ancient history, is aware that vine culture has claimed the attention of every civilized nation from the time the All-Father placed our great progenitor in the garden of Eden until the present day. The Muses have sung of the clusters of purple and gold. The philosopher has moralized on their healing health-giving qualities, and at several periods of the world's history it has been found necessary to regulate vine planting by law, as it was being engaged in so extensively as to cause a scarcity of the bread producing crops.

There is no other fruit that will succeed in such a wide range of latitude or under such a variety of circumstances. In our own favored land, it may be found growing from ocean to ocean and from the lakes to the gulf of Mexico. Nor is there any other fruit that will make such large returns from a few feet of ground. And there is scarcely a dwelling in all the land, unless it be in closely built cities, around which it may not be grown in abundance. But it is my purpose in this paper to discuss grape growing as practised in the vineyard, rather than in the garden or by the amateur.

When the grape mania swept over the country several years ago, many who engaged in the business did so with more zeal than knowledge; supposing that the happy owner of a vineyard was on the sure road to fortune. They therefore planted largely, without much regard to varieties, quality of plants, or congeniality of soil. The result is, what might have been foreseen, disastrous failure in many instances. Yet in the hands of those who possess the requisite skill failures have not occurred more frequently than in any other branch of agriculture or horticulture. And in some instances the result has been very gratifying. The pecuniary success of this branch of Horticulture in Central Illinois may therefore be said to be no longer problematical, and the large amount of capital invested in it makes it a subject of great importance. Yet in common with other branches of business it has its drawbacks. Among them, the rot is more dreaded by the cultivator than all others combined. I will therefore call attention to some of its exciting causes and suggest a remedy.

A wet tenacious soil is by all acknowledged to be a fruitful source of disease. The remedy for this difficulty is apparent—thorough underdrainage in all vineyards not perfectly drained by nature. The experience of the past season has taught us some lessons we shall be slow to forget. The almost continuous rains of the entire season, and the scalding suns of the last of July and first of August, were sufficient in intensity to rot any grape if the location was the least unfavorable, unless it belonged to the genus Salamander.

(Query. Could not some of our enterprising nurserymen furnish us with something of this kind at about five dollars per root?)

The feeble, unhealthy plants sent out by the propagators is another prolific source of evil; and a large proportion of the vines that have been planted in our vineyards should be classed under that head. They are generally grown in a border of rich compost, which causes them to grow with great vigor early in the season, but before they have matured their growth they are often attacked by mildew, and the ripening process is arrested. Such plants will be found to be furnished with a mass of fibrous hair-like roots, very attractive in appearance to the novice, but really of very little value, as such roots are destitute of woody matter, and are killed by a few moments' exposure to the air. Those plants should be selected that are supplied with strong wiry roots, even though they be few in number, as such roots are an evidence of health; and as they very readily throw out an abundance of vigorous spongioles, they make strong healthy plants.

Overbearing may also be mentioned as a cause of many disappointments to the grape grower. If vines are once permitted to overbear, they lose so much vitality that it takes them several years to recover, and if other conditions are favorable they fall an easy prey to disease. The experienced vine grower will promptly apply the remedy, but the novice seldom possesses the courage required to cut half the fruit from his pet vines.

Every cultivator has observed that vines growing near houses or arbors, and permitted to ramble over them at will, are more exempt from disease than those growing in the vineyard. Our native vines, in their normal condition, spread themselves over rocks and shrubs, and climb the highest trees. Do not the laws of vegetable physiology as well as common sense teach us that to confine a plant of such a rambling nature to one or two stakes, and annually cut it back to one or two canes, is to place it in an abnormal state, and provide those conditions most favorable for the attacks of disease. I am inclined to believe that the whole system of training as now practised is radically wrong; and that if we were to plant our vigorous growing varieties with rows ten feet apart, and sixteen feet in the row, and train on high trellises, that the results would be more satisfactory, as

this would admit of a longer system of pruning, permit the air to circulate freely, and give the entire vine the full benefit of the sunshine.

I long ago became disgusted with the whole subject of pruning and training as laid down in the books; for experience has taught me that practically it is impossible to follow any arbitrary system, but that the vine dresser must be governed by the conditions and requirements of the individual vine, and that a little common sense and sound judgment is worth more in the vineyard than all the books on grape culture ever published. Yet I would not discourage the perusal of these books, for we may get many valuable hints from them, but woe to the man who attempts to follow to the letter any of the systems so minutely described and beautifully illustrated. Several years ago I attempted to train a small vineyard according to Dr. Grant's system. After an infinite amount of labor, I succeeded in getting my vines to grow very much like the Doctor's pictures. I got one good crop of fruit, and there the system and fruit both ended. There is as much quackery and malpractice in horticulture as in medicine or surgery; and in no other branch do we find so many false theories advanced, and so many impracticable rules laid down, as in grape culture.

Some of our grape growers have learned a costly lesson in connection with summer pruning the past season—removing a large portion of the leaves in August that the sun might ripen the fruit. As might have been expected, a large portion of it went down before the rot, and what did not rot refused to ripen. After the necessary spring thinning out and pinching back, summer pruning is very injurious.

The mode of training generally practised in the large vineyards in the vicinity of Warsaw, is to train on trellises of three wires, two, four, and six feet from the ground. Two canes are trained nearly perpendicular, until they reach the first wire, when they are trained horizontally, until they meet the corresponding cane from the next vine. Two more are trained to the second and two to the third vine in the same manner. The objection to the spiral system, now so popular in some places, is, that it necessitates too close pruning. It may succeed for a time, but doubtless in a few years it will tell on the health of the vine.

Some of the positions of this paper will probably be severely criticised by the Society; but careful observation in some of the largest vineyards in the State, and a comparison of the different modes of planting and training, and the results attending them, convinces me that they are in the main correct.

Mr. Dunlap said that the writer had fallen into an error with regard to the spiral training. One of its beauties was that it gave perfect freedom of growth to the vine, and free circulation of the air. The *Prairie Farmer Annual* contains cuts that give one a very good idea of the system.

THE THEORY OF MOISTURE. BY J. R. PARKS, OF TOLONO.

Wishing to add my "two mites" to the general store of this great intellectual feast of the experience of practical men, I concluded to offer a few opinions on this trite theme—or which is at least moving the minds of a good many practical men, but which is very imperfectly understood by most men, and among the latter number some very prominent men. This, coming from me, may not be "like one having authority," but "in the midst of council there" may be "wisdom." If I am not correct, my thoughts may prompt some of you to say what is.

We have a phrase very commonly repeated, which is a relic of former science on this subject. It is said, Egypt is watered by the Nile river, the plains of Babylon by the Euphrates, and our own great valley—which will at some future time eclipse the former generations of the earth: not like Babylon, I hope, with her artificial mountain which cost the toils and groans of so many people, for the pleasure of her queen; or like Egypt, with her great monuments of unrequited labor to make a target for the world to gaze at; but a real pyramid of population, each individual of which will enjoy his part of the great column of wisdom. Excuse this prelude.

I am of the opinion that the moisture of the earth, in the dry part of the year, is maintained by condensation of the atmosphere; and not much by capillary attraction, as many have supposed. Were this not the case, a river could not in any sense water the land beyond their bottoms proper. But it is true that the rivers water the entire valley. This watering is effected by evaporation and condensation. These important parts of the economy of nature are aided by the aeration of the soil, which is best effected by underdraining and a thorough comminution of the soil. In casting about for the opinions of others, I found some admirable thoughts in the able essays of Wm. P. Pierson and Parker Earle, on the subject of drainage, read at the horticultural meeting at Bunker Hill. Mr. Pierson says: "There are immense and untold resources in air and earth, which cannot be utilized until a great deal of ditching is done;" and Mr. Earle says: "The air and water both manure the soil." And Prof. Turner, who is always philosophic, said, in the discussion

which followed those essays, that "the man who plows all day provides for a shower at night;" and I will add, that the warmer the soil is when turned under—provided it is thoroughly pulverized—the more copious the shower will be. He says further: "Perhaps one-fifth of all moisture gets into the earth in this way." These are true keynotes to the subject, which will be corroborated by the experience of practical men. Contrary to the generally received opinion, I will say that shade does not, in a dry time, assist to maintain moisture. Mr. ———, of Pennsylvania, in writing on the subject of corn culture, for the Report of the Department of Agriculture for 1867, advised to plant corn thick for a dry season, that the shade might assist in maintaining moisture; but the experience of practical men in agriculture proves that to be a false theory, for the ground is the most moist where the corn is thin and there is most sunshine. By experimenting, I have found that moisture will be maintained longer on the south side of a house than on the north side. I have a sugar maple, on the north side of a lumber room, which nearly died the first season after planting, while some others planted at the same time in open ground did very well. I wish to cite to you the fact that cultivated land will be damper in a dry time, as low down as the ground is stirred, than it is one foot below that: which would not be the fact if moisture was maintained by capillary attraction from the water line. And, further, if the latter was the true theory, underdraining to four or five feet would be deleterious in a dry time, but the contrary is known to be true.

Most of you have noticed the difference in moisture in a well pulverized corn or potato field, and one that has not been plowed. Even the dust of a public road will absorb and maintain more moisture than a meadow or untended field. It is stoutly maintained by some farmers, that it is injurious to plow corn in a very hot and dry time; but it is only when the early preparation, like their early education, has been neglected. I feel very positive, that when a piece of ground has been worked in good condition in the spring, and it should never be worked in any other, spring or summer, a man will be able to prepare a shower for his hortus et agricola—garden and field—every day he stirs the ground. The air is not only laden with hydrogen, which distills at night in dew drops over the sun parched earth, but it carries with it the very essence of manure, which it gathers from wasting heaps of manure and burning straw stacks, wasted sinks, sewerage outlets, and from every form of decaying matter of whatever kind. Certainly, as Mr. Earle has said, the air and water manure the earth, and above all provide food for the plant leaf which—like pure oxygen to a man's lungs—imparts the true vigor of life; and it seems the more air the better, as you will see by noting the deeper green of either tree or plant where there is plenty of air and where there is not enough. Now, to recapitulate this argument, I would say that where damage does result from working (as it is termed) the ground when it is hot and dry, it is only when the ground is turned over and left in blocks or clods, thereby hastening evaporation but preventing the condensation of vapor—or at least retarding it by the diminished amount of surface exposed. Condensation seems to depend on the amount of surface exposed to the air, and as the mere tyro in mathematics knows that there is more surface to a bushel of timothy seed than to a bushel of large round apples, it is plain that an acre or plat of land will present the most surface when it is the most thoroughly comminuted.

A want of the true theory of moisture has led some of our most practical men to give wrong advice. For instance, Mr. Phoenix, one of the best horticulturists, says, in planting trees tramp the earth firmly, to exclude the air: which operation is correct, except to exclude the air, which should only be tramped to prevent any and all large cavities to be filled with air which cannot be condensed. Tramping the ground when wet should never be encouraged, but tramping when dry is a good means of pulverizing the ground.

M. L. Dunlap responded with the following:

I am pleased with the essay, for it recalls to mind what my friend Earle stated to-day, that "ours is an art that doth mend nature." I see how nature is mended in this case by more wind and less water. The genii of the storm, sitting on the highest points of the Ozark range, mustering their forces to flush the great plains with a pluvial douche, spreading their wings over the domain where Pomona holds her court in regal splendor on the grand chain and over the grand prairie, where they have dashed their floods, and where Ceres has vouchsafed us great crops of corn in days past, but now is bedraggled and driven from the field in disorder, wet, cold and disheartened. Give us the new doctrine of more wind and less water, and we may dispense with the Genii of the Ozarks and make new progress in this new field of research.

BEE KEEPING AS CONNECTED WITH HORTICULTURE.—BY L. C. FRANCIS, SPRINGFIELD, ILLINOIS.

That there is a connection, theoretically, between bee keeping and horticulture many will acknowledge. The blossoms with which our trees and bushes are covered in early spring, giving promise of abundant crops, contain a delicious sweet which entices the honey-bee, and as each blossom contains but a minute quantity of the nectar, she must visit many blossoms to obtain her

precious load. By this means a greater certainty of the fertilization of the blossoms is secured, and a delicious luxury laid up for the use of man. But, unfortunately, the cold, raw winds which are generally prevalent during the blossoming of fruit trees, prevent the bees visiting the blossoms, so that, practically, this is of but little account. I shall, in this essay, take up the practical instead of the theoretical, and first name, in the order of blooming, the fruit and shade trees which are visited by the honey-bee. The different kinds of willow furnish the first honey and pollen; the Comewell is a particular favorite, and fairly swarms with them when in blossom; the Silver-leaf Maple soon follows, then the Sugar Maple, while the Gooseberry, Currant, and Raspberry, are fairly alive with bees. The latter is a particular favorite, and furnishes a very delicious honey. The Peach, Plum, and Cherry, soon followed by the Pear and Apple, furnish the bees, in favorable seasons, with large quantities of honey. Strawberry blossoms are generally but little noticed by the bees. The Blackberry finishes up the list of fruit blossoms for the season. Among shade trees, the Tulip, or Poplar, is a great honey-producing tree. The Linden, or Bass wood, yields an abundance of honey of a delicious flavor. I have often wondered why this tree is not planted more extensively as a shade tree, it is certainly deserving of it. Lastly, the common Locust, when in blossom, is a great favorite with the bees. Thus it will be seen that our fruit trees and shrubs furnish two important products—honey and fruit; teaching us that to make the most of what a kind Providence has given us, we should "gather up the fragments" through the agency of the industrious bee. And here I would suggest that if in the choice of trees for shade and timber belts, those were selected whose blossoms are rich in honey, an important and delicious product might be secured, in addition to protection and shade.

CARE AND ATTENTION NECESSARY.

With the movable comb hive (and no other should be used by the intelligent horticulturist) from half a dozen to a dozen hives of bees could be kept without interfering much, if any, with his legitimate business; but it is necessary, to insure the best success, to study Langstroth, Quinby, or some other good works on the honey bee, and go at it intelligently. Where white clover is not abundant, it would be a good plan to seed down orchards to the Alsike or Swedish clover, as this variety is a particular favorite with the bees, and where they have an abundance of this will scarcely notice the common white clover.

ARE BEES INJURIOUS TO FRUIT?

Bees have been complained of as being very injurious to the grape crop. It is possible that in some localities they are, but having never known them to trouble our own grapes, and from the fact that one of our most successful grape growers, Mr. Geo. B. Worthen, of Warsaw, has been keeping bees for several years, and still keeps from fifty to a hundred hives, the injury done by them must be slight. The Lawton Blackberry, when dead ripe, is frequently attacked by bees; so are apples, and, perhaps, pears, after the birds and wasps have made a commencement; but this amounts to but little. Peaches, ripening at the time of early frosts, are apt to be injured by the honey-bee.

Where large quantities of cider are made, it is doubtful whether the horticulturist would succeed with bees, as cider is made late in the fall, after the honey season is over; the bees will swarm about the mill, cider, and pomace, fill themselves so full of the cold juice, that thousands are unable to get back to the hives, and so perish. From my own experience, and that of others, bee keeping and cider making can not be successfully connected. It has always appeared to me that a farm, particularly a fruit farm, was not complete without the industrious bee, in neat painted hives, scattered about the lawn, filling the air in spring, summer, and autumn with their busy hum, gathering their luscious stores for the use of the family, teaching lessons of industry and economy to all, and leading them to adore that wisdom and goodness, that not being content with giving the promise and germ of the fruit in the blossom, gave also a minute quantity of the most delicious sweet in each, and gave the honey-bee to collect and store it for the use of man.

PHYSIOLOGICAL BOTANY. BY JOHN DAVIS.

The subjects of Botany are among the most interesting of created things, and the cultivation and study of plants is the most ancient and honorable of human pursuits.

MAN, fresh from the hands of his Maker, must have an avocation to engage his faculties and powers. The Great Father was his guardian and director. The new man in the new world must be honored, and if possible, kept pure and holy. His pursuits must be improving, purifying, developing, and ennobling. Watch the result.

He was not appointed a place at the head of one of the so-called learned professions, where from pulpit, bar, or rostrum he might propound and discuss figmentary dogmas for the edification of the coming generations. He was not placed in the forest with horn and pack and outriders, nor yet in the saloon, or at the gaming table, that he might drink to the dregs the pleasures of his appetites and

lusts. He was not placed in the halls of State, or on the thrones of cities and empires that he might be honored, obeyed, and worshiped by the coming countless millions of earth.

Contrary to the received notions of a mistaken world, we see the Great Father choosing for His first born son the position of Gardener. In the new, vast, and glorious realms of the new-made earth the first study of Man is to be of plants. "And the Lord God planted a Garden eastward in Eden, and there He put the man whom He had made." Put him in the Garden of Eden "to dress it and to keep it." Thus, not only honoring labor by the judgment and choice of the Creator, but honoring above all other labors and pursuits the cultivation, training, and study of plants.

The science of plants is naturally divided into two departments—Physiological Botany teaches the laws which govern plant growth; Systematic Botany relates to the collection and classification of plants, according to fixed rules of habit and structure. Other members of your committee are better versed in the latter department than myself; I shall, therefore, confine my observations to the former.

Plants are usually stationary in their habits, penetrating the earth with their roots, and pervading the air with their stems, branches, leaves, and flowers. Plants absorb the materials of growth from the earth by means of their roots, and from the air by means of their leaves. The functions of the roots and leaves seem to be reciprocal, and are performed in obedience to certain laws of co-relation and compensation. The health, power, and ability of the one depends upon similar conditions in the other. The leaves and roots are connected, in the living plant, by a circulating fluid called the sap, which permeates the cells of the stems, roots and branches, from the smallest fibre of rootlet to the extremest bud. Earthy nourishment is taken up by the spongioles and rootlets, conveyed by the sap in its upward circulation through the albumen or sapwood, to the leaves, by means of air and sunlight. This sap is modified and elaborated into material fit to add to the growth of the plant, and in its descent it is, in the healthy plant, thus transformed; and thus, from day to day, the plant grows—becomes larger in all its parts. This reciprocal and related action of the leaves and rootlets, makes to the intelligent cultivator a practical suggestion, viz: that there should be maintained in all plants a correspondence of size or force—a balance of power—between the roots and branches; between the rootlets and leaves; and, in view of this suggestion, it would appear contrary to the laws of plant growth, to suddenly and materially disturb this balance of power. Top pruning and root pruning are both violations of the laws of plant growth, when the plant has, in all its previous life, been subject only to normal influences. Yet, among cultivated plants whose characters are largely artificial, we often find pruning a necessary means of restoring the equality of forces. In removing or transplanting a tree, the roots are badly cut, and the rootlets wasted and lost. To restore the balance of power between the top and root, we should lop off branches to correspond. That which, in one case is a violation, becomes in another a necessary process in doctoring a sick patient.

A tree in a state of nature springs from the seed, or other germ of plant life; sends its roots into the soil and top into the air, in natural proportions; and, if the location is a genial one, as to soil and climate, the plant develops itself and performs the functions of its existence, without much need of man's intervention. Trees never disturbed in root, need but little top pruning; and if but little top pruning when young, they are likely to need it less when old. One violation of nature begets and calls for another; and these violations and counter violations have become so common among many of our fruit trees and plants, that they may be considered quite as much artificial as natural productions; and that man who is the best doctor of trees and plants, is the most successful fruit grower. This is especially true, when trees and plants are troubled with insect, fungous, and climatic disturbances, which in thousands of ways, both known and unknown, still further violate the laws of plant life.

Some trees and plants, in a state of nature, though healthy, and, though producing seeds and fruits in quality and quantity quite sufficient for the wants of reproduction, are, when reduced to cultivation, quite unsatisfactory for the requirements of man. We want more fruit, and better fruit; and, in our efforts toward these ends, we have in a thousand ways threatened and endangered the existence of the plants. We have planted, manured, cultivated, transplanted, hybridized, budded, grafted, layered, top-pruned, root-pruned, girdled, dwarfed, and mangled in untold ways; have changed from clime to clime, from valley to hill-top, from marsh to upland, from sandy drought to undrained clay, from the fertile margins of protected streams to sterile gravel, on bleak prairie knolls. All this we have done to obtain the luscious fruits of our gardens and orchards. Quality of fruit and fruitfulness has everywhere been the object. This is sometimes attained temporarily, by threatening the life of the tree. Man, seeing this, acts on the suggestion, and hence has his hands full of sick patients—almost too sick to bear fruit at all.

Take the case of the apple tree: The nurseryman plants the seed to obtain roots. At the end of one or two summers the roots are taken up, trimmed, top and bottom; deprived of all fibres and side roots; then cut into small pieces, whittled and split into shape, and spliced on to scions of strange varieties. At the opening of spring they are set into the earth, in order to produce new homogeneous living plants. That which was bottom in the seedling, is set at the same depth of that which was collar; and that which was a twig in the apex of the tall orchard tree, is now

placed in the soil to be transformed into collar and root, and is expected to become the base of a healthy fruitful stem.

These violations are all the tree can stand. Many of them die in the process. The living ones are now nursed to plethora, that they may soon become nice salable trees. At the end of three or four years, when the poor tree has concluded to "let bygones be bygones," and has become plump and cheerful, from high cultivation; It is astonished, quite out of existence in many cases, by the thrusts of Paddy with the spade, who has been sent to "dig trees." The poor trees are mangled, pruned, bundled, jolted, dried, frozen, watered, and "set out," until one would think every vestige of tree life is extinct. Yet a few of them will grow! And, after enduring the cattle, rabbits, weeds, grains, grasses, blights, insects, bad neglect, and, sometimes, worse cultivation and pruning, actually regain their health and normal balance of forces, producing fair crops of fruit for many years. It is then that we laud the variety. It is hardy. We sing its praises far and near. We call it the Duchess, the Golden, the Transcendent, and pay high prices for it! Whereas, by a little more care, a little more knowledge and attention, finer fruit could be had in equal abundance.

The grape vine is grown from buds, cuttings and layers. The latter would appear the more natural plan; and one can hardly conceive of a surer or better way for the out-door propagations of the vine, than by the proper layering and treatment of good, ripe, old wood. The transplanting of vines is not hazardous, as we usually cut away the top quite as much as the root. But it is the treatment of the vine, in the vineyard, which ignores the laws of plant life. Annually the top is cut away, while the root is left whole. This begets and perpetuates an inequality of forces. For a few years the evil is not large, and a few good crops of grapes are gathered. But the evil is a growing one. The roots become too strong for the diminutive tops. The leaves are not plenty and powerful enough to properly elaborate the sap, sent up by the roots. The plant is fed on crude undigested food. The roots, leaves, fruit and whole plant become diseased. In this weak, unsound condition, the leaves mildew and drop off, under adverse climatic influences. The grapes rot, or fail to ripen. And the wood of the whole plant is unfit for propagating purposes, or for subsequent fruiting. Nor should we be surprised. No other tree or plant would stand such pruning any better than the vine. By removing the tops of growing plants in the season of rest, we always obtain a tender imperfect water shoot, as the result. Water sprouts can not be relied on for fruit. The leaves are spongy and the wood seldom ripens. In apples and pears, we reject the water shoots when cutting scions; yet, in the grape vine, we expect them to bear fruit, and rely on them for propagating purposes almost entirely. Various plans have been proposed to prevent, or remedy this cause of our grape troubles. We are directed to layer the vine, annually, a few feet, in the direction of the row; occasionally cutting it off above the older roots. This keeps the roots weak and maintains the balance of forces between the rootlets and leaves, and produces desirable results.

Another plan is to prune very little, allowing the vines to spread themselves on large trellises, thus allowing more and more top as the roots grow stronger. This plan has been followed in one reported case, until high trellises have been extended thirty-three feet—from vine to vine—and some very large crops of grapes were gathered. But trellises must have a limit, and the vines must, some time, reach that limit; and then the same old trouble begins. We have heavy pruning, followed by sporadic growth: poor leaves, bad fruit and unripe wood, for next season's uses.

Another reported plan is to prune very little during fall and winter; untangle the vines from the trellises in the fall, prune just enough to prevent re-entanglement, and make them more easily handled. Leave them thus until June or July, until after leafing and blooming, and until the fruit is firmly set. By this time the first forces of the roots have been expended on a large number of buds; a sufficient number of leaves have been formed to elaborate and distribute healthy sap to all parts of the plant. And NOW, at this late period, it is contended, the top may be reduced without injury. The vine-dresser, therefore, proceeds to lop off branch after branch, and to thin out cluster after cluster, and to fasten the remaining wood to the supports. There is reason in this process, and one reported case of some years' duration seems to promise valuable results. It preserves the balance of power between the root and top through the first part of the season, when growth is most rampant, and afterwards directs it into the fruit branches and fruit, and does not give so much tender, unripe wood.

From this short view it appears that there is much need of study and experiment in the department of plant life and plant treatment. The "balance of power" in horticulture is of quite as much importance as is the balance of political and military power among the kingdoms of Europe. If they have their Bismarcks and Napoleons, we should also have ours in the fields of botany. Though our victories are peaceful, they are none the less important. A valuable product or process added to the achievements of agriculture or horticulture, is worth far more to the world than is the transfer of provinces and baronies from kingdom to kingdom.

God placed man in the garden of Eden, and designed him to be holy and happy: and so far as we approach the primeval state of purity, in that degree will we value and enjoy the practices and surroundings of horticulture. As time passes on, the names of mere military heroes will fade in the distance, while the heroes of agriculture and horticulture will be more and more appreciated. Every

orchard, and field, and garden, will be the monuments of Van Mons, Landon, Knight, Lindley, Cox, Buel, Downing, and their coworkers; while the names of Xerxes, Alexander, Cyrus, Caesar, Charlemagne and Napoleon, will figure as mere myths of bygone barbarous ages.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The committee to whom was referred the President's annual address, beg leave to report, that the following points require especial attention of the society:

1. Publication of transactions of this Society.
2. Vegetable gardens.
3. Flowers.
4. Interest of ladies in horticulture.
5. Correction of names by presenting fruits during discussions.
6. Timber and ornamental trees.

Motion passed to refer to Executive Committee, with authority to act in regard to publication of transactions in connection with State society, if favorable arrangements can be made; *if not, to publish independently.*

ESSAY ON BIRDS. BY J. HUGGINS.

Birds, under the mission of Providence, like all other creatures, contribute their part toward the harmony of creation. They are not sent into the world for nothing. Birds are ever around us—even at this cold and wintry season of the year, when most species 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 softened breath of heaven wafts from the flowery fields and leafy woods a pleasing fragrance—it is then that we become most familiar with them.

Anxious are we even now to hear the song of the Blue-bird, saying to us that "winter is broken." But we wait patiently, knowing that as sure as the season rolls around that the Blue-bird will come again, followed by the Robin and the Lark, with thousands of lovely comrades fresh from their winter haunts, to cheer us with their welcome presence and music, reminding us that "the time of the singing of birds is come." Then may we be able to recognise in each a familiar friend, who is ever ready to minister to our pleasure, either by cheering our solitary hours with a lively song, or by abstracting our thoughts from this artificial world around us and turning them to the contemplation of the wonderful works of an All-wise Providence.

Comparatively few persons are aware of the pleasure to be derived by the early riser in listening to the song of the birds, during the last months of spring and the summer months. Would you listen to music sweeter far than that of a Jenny Lind? Do you love bird music? Then accept this, my free and cordial invitation to visit "our home" during the month of June next, and you shall have a free ticket to my birds' concert. But bear in mind that my birds hold their concert in the early morning, and if you are not an early riser you will not be dressed and ready. Our bird concert is repeated daily if the weather permits, and the performance invariably commences just as the first ray of light is seen in the east; and if you would be present at the opening you should be in your seats before four o'clock. Listen to the first notes of those birds in the distance—and now others join in, until the whole orchestra is engaged, and the air is full of bird music, soft and sweet, bidding us cast aside our griefs and be as happy as they: saying that the skies are bright and the sun ever shining, notwithstanding clouds may obstruct them from our view.

For me there is great pleasure derived from a morning ramble through my grounds, for the purpose of observing the habits of the birds. There is real enjoyment in watching their incessant activity—the beauty and singular ease of their motions: to trace the gaudy colors in which some are clothed, and the plainer dress of others; to examine the beautiful and delicate structure of their nests, and above all to listen to the sweet and mellow cadences of their many-toned voices. Time thus spent, so it seems to me, can hardly have any other than a happy effect. One of the sweetest as well as the most familiar bird notes is that of the Blue-bird. Soon as the first breath of spring offers him an inducement to remain with us, he is seen cheerily about the farm-house, and along the fence uttering his soft and plaintive warble with a degree of innocence which no sensitive heart could fail to appreciate. For his accommodation I put up boxes through my orchard, where he rears his young, watches carefully over the interests of my orchard and garden, and many a noxious insect is destroyed by him for the benefit of his hungry little ones. Soon after the Blue-bird, to cheer our hearts at the approach of spring, comes the Pewee, Fly-catcher. The song of the Pewee is a sure and reliable prognostic of the coming of that lovely season when the earth clothes herself in green, and the air resounds with nature's sweetest music. We encourage the Pewee to come around our home,

by putting up convenient shelves for them to build their nests on, under sheds and other out buildings. They are great insect destroyers. Among the earliest to show themselves in the spring is the great American Shrike, or Butcher Bird. Its food consist mostly of insects, and the smaller quadrupeds, which he often impales on thorns or other sharp points that may happen to suit his purpose. We believe them useful in destroying mice, locusts, grasshoppers and others of the larger insects, and do not disturb them on our grounds although they do sometimes rob other birds' nests.

The Meadow Lark is also an early spring bird, and merits a prominent place among our song birds for the sweetness and plaintive melody of its few simple notes. We welcome them as among our friends. The Brown Thrush is a favorite with us. Its song is clear and melodious. We welcome it to our grounds on account of its music and insect-eating propensities, and as yet have found it in our heart to forgive him for all the berries he may have taken without leave. The Mocking Bird comes in the spring, soon after the Brown Thrush, and sometimes has remained on our grounds all winter. Who has not listened with delight to this great musician? His voice ever changing, yet ever sweet, and whose music is often heard most of the night. An insect-eating bird, we welcome them, although they do love berries, thereby showing their good taste, but for which I yet have forgiven them. The Cat Bird comes soon after the Mocking Bird, a musician of its kind. It is a great insect destroyer. As yet I have forgiven it when it took our small fruits, or inflicted on us its song, and protected it for the good it has done in destroying our insect enemies. The Baltimore Oriole has never visited us in large numbers, and on my grounds thus far has been a welcome visitant. It is said they will destroy the tent caterpillar, though for this I cannot vouch; but that they prey on the canker worm I have no doubt. The common Robin we would not willingly part with. As I see them carry off my cherries, I recognise the same bird that also, in the earlier part of the season, carried off the grub, locust, and other insects, as the plow turned them up from their winter's home in the ground. For the common Wren we put up boxes through our orchards and grounds. Its food is insects, and while supplying the wants of its young it destroys many hundreds a day, and in searching for its food it leaves no bush or tree unexplored. This ever happy and lively little bird is one of our favorites.

The King Bird we formerly shot because he sometimes showed he had a sweet tooth, by taking the honey bee for a luncheon. We have long since forgiven him for so doing, on account of his good qualities in destroying our insect enemies.

The Black Bird is a welcome visitant at my place, and follower of my plow, as each spring he returns and goes to work with a will, gathering up the army of grubs, worms, and the larvae of myriads of insects. I never yet begrudged them the few hills of corn they destroyed, but on account of their good deeds cheerfully forgive them all. The Blue Jay I do not shoot, but on account of its propensity to rob other birds' nests, sucking the eggs or devouring the young, we do not allow them to rear their young on our grounds. However we welcome them around in the winter season.

With what pleasant and happy recollections is the arrival of the Swallows associated. In the Eastern States, and here in the older settlements, every farmer's child is at home among the Swallows. The appearance of the Barn Swallow, his easy, graceful flight, as he darts over the meadow, his sprightly twittering note, and his nest under the barn roof, are things which we can not forget. The Chimney Swallow is also well known. These Swallows as well as the common Martins are ever welcome on our premises.

The natural food of the common Woodpecker is insects, and the amount of these which he annually destroys will far more than compensate for the fruit with which he varies his diet. Ever on the alert, ever on the watch, the abode of the insect being discovered, with unerring precision he pierces the bark or wood, and with a tongue made for the purpose, draws out the borer in the worm state, or the codling moth in the chrysalis state. Many other insects complain of hard times on presentation of the Woodpecker's bill.

The happiest bird of the spring is the Bobolink. Of all the birds of the groves and meadows of New England, my native land, the Bobolink was the envy of my boyhood. No one I believe brings any charge (except a charge of shot) against the Quail. I can not bring any charge against them. They are emphatically insect eating birds and consequently my friends. I love the birds, and with few exceptions, they are my friends. I love my friends. I love to be with them, and to talk about them. There are other friends I would like to call to remembrance, to speak of their virtues, and draw a veil over their faults in view of their oft repeated good acts, but time forbids.

Insects have not been as troublesome on my grounds, in past years, as on grounds of some of my brother fruit growers a few miles distant. I attribute this fact to a general clean culture, and also to my guardian friends the birds. While I have not for years allowed birds shot on my grounds, yet if they became too troublesome during the fruit season I might be tempted to shoot them, but greatly fear that I would thereby let in a greater evil, our insect enemies. In orchards near the timber we hear complaints of the birds depredating on fruit of all kinds. The raspberries and currants are spirited away, and the grape is bored into. I can not stand it, says the fruit grower, and not having the fear of the fruit-grower's insect enemies before his eyes, he shoots—and that bird will destroy no

more fruit or troublesome insects. The bird dies—the fruit destroying insect lives to propagate its kind in countless numbers.

On account of the great increase of insects injurious to the fruit grower and farmer, much interest has of late years been manifested in the study of Entomology. It seems to me that a knowledge of the nature and habits of birds is of as much importance to the farmer and fruit culturist as is the science of Entomology. The fruit grower and farmer should be able to discern his friends—should be able to know his enemies from his friends, and so govern himself accordingly. With cultivation insects increase. And does not the cultivator of the soil, does not the fruit culturist, need all the assistance possible, that their ravages may be checked? Birds, if fairly dealt with, will come to our aid, especially the most valuable of the insectivorous varieties. Let us then welcome such birds; and if at any time they take too heavy toll, let us use every means to frighten them from our ripe fruit; but if they will not take our well meant hints, and shoot we must, that we may have clothing and food for our bodies, and money in our purse, let it be only as a last resort, and allowed only during the period of the ripening up of our fruit.

May every horticulturist feel the importance of an extended study of the delightful subjects of Ornithology and Entomology, and may our acquaintance with the insect world, and the sweet songsters of the wood, orchards, and field, be a means of tuning our hearts to praise the great Creator of every living thing—"Our Father who is in Heaven."

J. HUGGINS.

ORNITHOLOGY, AND ITS RELATION TO ENTOMOLOGY; OR, BIRDS THE LABORERS OF MAN. BY J. W. ROBSON, GALENA, ILLS.

Mr. President and Gentlemen:

We were requested to write a paper for your meeting at Mattoon. The time being so short, we herewith send you a familiar history of two of the most destructive insects we have at the North, and a short notice of the birds which prey upon them. We have endeavored to write these papers in a popular style, and earnestly trust they will be useful.

THE CANKER WORM.

The family of moths called measurers have larvæ that seem to measure the surface over which they pass. The necessity for this sort of movement results from the fact that they have only ten legs; six true ones under the fore part of the body, and four prop legs at the hind extremity. They are generally smooth-bodied, and when at rest many of them stand on the two hind pairs of legs, with the body extended, and thus may be easily mistaken for a little twig. Often, when disturbed by giving the tree a sudden jar, they let themselves down by a silken thread, and when no danger is apprehended return to the tree again by the same thread by which they descended. The whole family are very injurious to vegetation, abounding upon elms, lindens, and other shade trees, and in the parks and promenades of New York increased to such an extent upon the trees that English sparrows had to be imported to destroy them.

The insect under consideration is one of the worst enemies of the apple tree, destroying its foliage with great rapidity. It is not yet very common here, but in some parts of New England it has become a serious enemy to the fruit grower, stripping whole orchards of their foliage, making them appear as if a fire had passed over them; and in many cases the mischief is done before the presence of the insect is discovered. It is here at the West in sufficient numbers to excite alarm. We discovered it in our orchards in the year 1865, and have seen it in other orchards in this vicinity since then. The male moth only is provided with wings of an ash color, thin and silky, which expand about an inch and a quarter. The female is wingless, and is obliged to perform her journey on foot to the nearest tree, which she crawls up, and is joined by the male, and soon begins to lay her eggs, which she places in rows, forming clusters of a hundred or more, each cluster being the product of a single female. These have a covering of waterproof varnish. The larvæ make their appearance upon the trees about the time the leaves of the apple tree begin to start from the bud. Immediately on hatching they begin their depredations. The leaves are found at first to be pierced with small holes, but as the caterpillars grow they enlarge these holes, and at length little more is left than the midrib and the veins. When not eating, they are stretched out at full length beneath the leaves, enjoying "the luxury of doing nothing." When about four weeks old they reach their full size, and are then about an inch long. They now quit eating, descend to the ground by their silken cord, and, entering to the depth of two to six inches, each makes a cavity by repeated turnings, and soon passes into the chrysalis state, from which it emerges in mild weather during the autumn and winter. They rise in great numbers, however, in the spring. They come out of the ground mainly in the night, and often make their appearance in great numbers, crawl up the tree as before stated and deposit their eggs.

The best preventive that we have seen tried was that used by J. M. Harris, Esq., two years ago, viz.: a broad band of stont paper fastened round the stem of the tree, thickly smeared with tar,

This tarred belt caught and detained all the females on their upward journey. A good plan is to melt India rubber and smear a piece of rope with it, and tie it several times around the trunk. This melted substance is so very sticky that the insects will be captured in all their attempts to pass over it. If those trees which have suffered with the insect have the ground under them dug and turned over, to the depth of five inches, in October, and a good top dressing of lime applied as far as the branches extend, the canker worm will there be almost entirely destroyed.

But our chief dependence for the destruction of this pestilent insect is the never failing vigilance of the feathered tribe. We have investigated this matter thoroughly, and have learned enough to satisfy any one, that birds are one of the links in the chain of creation, just as necessary as any other link for the harmonious working of the whole. The blue bird destroys large numbers, not of larvæ alone, but of full developed moths in the fall, and again in the spring they return just in time to devour the insect as it emerges from the soil. The cedar bird is another enemy. This little bird is a gross feeder, and when the canker worm appears in great numbers as they sometimes do, it will come in large flocks and feed upon them day after day till the pest is subdued. The butcher bird also feeds its young largely upon the larvæ. We well remember it clearing two trees literally covered with this caterpillar, and so well did that pair of shrikes do their work, that these same trees have not been troubled with the insect since.

We call the attention of all horticulturists to this injurious insect, hoping that they will do their part to prevent its spread, and by their untold efforts keep it from becoming to the West what it is in many of the Eastern States, a pestilence and a curse.

THE CODLING MOTH.

If any one who listens to these papers really wishes to know the condition of the fruit crops of our country—especially the apple crop—he will find no better place to gratify his curiosity than the stalls in our markets, and the tables of our fruit dealers; and there trying to select fair and handsome fruit he will be astonished to find so many blemishes. The majority of these are caused by the Codling Moth. This insect, like most other moths and butterflies, increases rapidly. Some deposit several hundred eggs at one time, and the subject of our present sketch deposits two such broods each year; and were it not for the checks which meet it at every stage of its short life, all the apples of this country would soon be appropriated by them. Changes of the weather will prevent their ravages. The larvæ of other insects feed upon them. The ichneumon fly destroys large numbers, by depositing its eggs in the bodies of the young grubs, and the titmouse, bluebird, and the downy woodpecker prevent their increase to a large extent. We have long known that this terrible enemy had its enemies among our birds, and after patient watching have been able to identify these three as being particularly destructive to the progress of the Codling Moth.

It is supposed by Entomologists to have been introduced from Europe with the apple tree. The perfect insect is a very small moth, the forewings gray, crossed by brown, with large lines, and a dark spot on the hinder margin. These moths appear in the greatest numbers in the warm evenings of the first of June, and lay their eggs in the eye or calyx of the young fruit. These eggs hatch in a short time, and the young grub burrows its way to the core, leaving behind it a brownish powder. The fruit ripens prematurely and drops to the ground. Here the full grown worm leaves the fruit and creeps into the crevices of the bark of the tree, there spins its thin paper like cocoon, and in a short time comes forth a full grown moth, ready to perpetuate its species by laying its eggs in the nearly full grown fruit. This worm also spins a cocoon like the first, in which it remains during the winter months. We always find large quantities of cocoons inside of the hoops of apple barrels. Boiling water poured upon the hoops will destroy them.

Now it is apparent that this insect stands nearly first in importance of all the enemies of our fruits, and the question very naturally arises in the mind of every anxious cultivator of the soil, what can be done to rid ourselves of this pest? We will endeavor to answer: First, cultivate thoroughly among the trees, and let no grass grow in the orchard. Second, pick up promptly all fallen wormy fruit and throw them to the hogs, or otherwise destroy them. Third, as cocoons are seen chiefly under the old loose bark, the thorough cultivator will take care—by keeping the trunks of his trees perfectly smooth—to afford them little harbor. This should be done every spring by scraping and washing. Whenever we see trees covered with loose scales of bark, we set down its owner as a careless orchardist, and not deserving of success. Fourth, tie an old rag or piece of cloth around the trunk of the tree, and another piece of cloth or a wisp of soft hay in the crotch of the tree, about the time the fruit begins to fall, and the worms will make them a retiring place. Examine the under part of these cloths once a week, and thousands may be caught and destroyed. Fifth, light small bonfires during the still, warm evenings in the months of June and July in different parts of the orchard. Thus myriads of this and other pestiferous moths will be attracted to the light and destroyed before they have time to deposit their eggs and cause worm-eaten fruit.

Finally encourage birds in your orchard. Note those trees which bore wormy fruit this year: hang up some fat meat or offal in the branches. The titmouse will keep high carnival there this winter, and destroy every cocoon. Put up a bird box in your trees and the blue bird will destroy the moth

and caterpillar during the summer. This bird is exclusively insectivorous, as its beak indicates. It will reward you for shelter afforded. Encourage the visits of the downy woodpecker (*Picus pubescens*) by simply letting him alone. He has wonderful ingenuity in finding the unseen enemy: not by seeing it—that is impossible; not by smell, nor by any motion. It is as quiet as a mummy. No, he finds it by sounding; he taps all scales alike, but stops to make a hole through the one under which the cocoon lies. Unless all orchardists unite in destroying this insect pest by industriously carrying out the above preventives, the amount of wormy fruit will not diminish, but its yearly increase will continue to excite alarm.

Dr. Hull—There are some things in this essay that are new to me: that cedar birds eat the canker worms; does not see what use there is in lighting fires to destroy insects, for if all the directions were carried out there would be no insects left.

Holcomb—Riley said he had never caught a canker moth with light.

Davis J.—Would burn up all rubbish around a place. We can control the burning of fires, but we can not regulate the birds—would use all means to destroy insects. Thinks the birds are rather made too much of.

Huggins—Will not lights or fires attract our friends as well as enemies?

Dr. Hull—Mr. Walsh has said that but few of our insect friends are attracted by light.

ON THE IMPORTANCE OF THE CULTIVATION OF FLOWERS. BY MRS. J. B. RIEVE,
MOULTON, SURELBY COUNTY, ILLINOIS.

As I have been solicited to write an essay on flowers, I will endeavor to try; but it seems to me there need be nothing said to encourage any one in so obvious a duty as the cultivation of flowers—the beautiful flowers! For what would this world be without flowers? And shall we not cultivate them?

“How exquisitely sweet
This rich display of flowers—
This airy wild of fragrance,
So lovely to the eye,
And to the sense so sweet!”

“Flowers! the cultivation of flowers!” some say, “of what use? It gives us neither meat, drink nor clothing.” Well, suppose it does not? Does not the mind require food as well as the body? Shall we always be plodding? Will it always be the inquiry, “what shall we eat, and what shall we drink, and wherewith shall we be clothed?” Must the care of the body engross our whole attention, when the earth, the seas, and the skies are all full of the beauties of God’s wonderful creation? Shall we close our eyes to all this beauty, when an all-wise God has placed it here for our enjoyment? We need not compass sea and land for our gratification: the means for healthful and innocent relaxation are within the reach of every one. Flower gardens were ever highly esteemed by persons of refined taste. The highest personages of earth have been delighted with the expansion of flowers; and even a more highly exalted than any of earth’s sons called the attention of his followers to the beauty of flowers, when he said: “Consider the lilies of the field, how they grow. They toil not, neither do they spin, and yet I say unto you that even Solomon in all his glory was not arrayed like one of these.”

Nature in her gay attire unfolds a great variety that is pleasing to the human mind, and therefore has a tendency to tranquilize the agitated passions, and exhilarate and nerve the imagination, and render all around us delightful. Who that breathes the delicious fragrance of the morning flowers, glittering with dew, but can look up with greater confidence to Him who has strewn with such a bountiful hand and such liberal profusion the evidences of His goodness all around us!

“And the sinuous paths of lawn and moss,
Which led through the garden along and across,
Some opened at once to the sun and the breeze,
Some lost among bowers of blossoming trees,
Were all paved with daisies and delicate bells
As fair as the fabulous asphodels;
And flowerets which drooped as day drooped too
Fell into pavilions, white, purple and blue,
To roof the glow-worm from the evening dew.”

In reply to the question sometimes asked, “What is the use of flowers?” let me ask, What is the use of anything? What do we live for, but to improve our better nature? There are many things pleasing to the eye, some of them expensive and not within the reach of all; but flowers may, with-

out much expense, be possessed by the humblest individual. Their cultivation may be made one source of happiness to the family.

If heads of families would only gather about them every source of innocent amusement and recreation for their children, and endeavor to make their homes attractive, in doors and out, a paradise if possible, they would eventually see the benefit arising from it; and if they did not see it, the world would reap a great and lasting good. A taste for trees, plants, and flowers, is the love an enlightened mind and a tender heart pay to nature; it is a peculiar attribute of woman, exhibiting the purity and gentleness of her sex; and every husband should encourage it in his wife and daughters; for by cultivating a love for such things in them, they will prove wiser, happier, and better, besides saving hundreds of dollars in the shape of doctors' bills: for who ever saw a person who loved to plant and cultivate flowers, and spent a portion of nearly every day among them, that was ever sick much?

What more conducive to health and long life than the cultivation of flowers. The pleasure derived from them is indescribable. There is also a great moral lesson to be obtained from flowers, and this forms another fine characteristic in the cultivation of nature's beauties; for flowers not only please the eye and gratify the most careless observer, but contain a beauty in their structure, in the most minute parts and coloring, to the most accurate and intelligent observer, which conveys a natural lesson, with every thing to please, and nothing to offend.

It has been said by travelers that they could distinguish a pure minded and more intelligent family from the appearance of the house and grounds in this particular; the difference was striking, the houses of the more intelligent were surrounded with flowers, the windows displayed them, vines were twined with care and taste over the dwelling: another presents a different spectacle; the weeds and briars are allowed to hold their dominion; in short, Solomon's description of the garden of the sluggard is exactly verified.

Who that has been blessed with kind parents who gratified their better nature enough to have a flower garden, can forget the many happy innocent hours spent in its cultivation, hours which perhaps then seemed irksome, but now we view them with pleasure as we take a retrospect of the past! Oh! who can forget the vine planted it may be by a parent's own hand, when he or she was a little child: its tendrils are clinging to the topmost branches of a tall tree, perhaps in the front yard; or that beautiful moss rose, or that old lilac, or some other favorite tree, or shrub; and we never revisit the scenes of our childhood, not even in imagination, without calling up some of the holiest emotions of our nature. And there too, clinging and twining about the porch, are the fragrant and coral honey suckle, shading the window with their rich and delicate clusters of flowers; and at every step along the border are the many-hued flowers, planted by the hand of a dear sister, perhaps long since gone where flowers immortal bloom and never fade.

The cultivation of flowers appears better suited to females than to the lords of creation; they resemble them so much in their fragility, beauty, and perishable nature. The Mimosa although a tolerable hardy plant, may be compared to a pure minded and delicate woman, who shrinks even from the breath of contamination, and who, if assailed too rudely by the finger of scorn and reproach, will wither and die from the shock.

Nevertheless there are some men who take great pleasure in their floral pets. How much more ennobling to see a man giving his attention to the examination of the beauties, and delicate structure, and magnificent coloring of flowers, and how to cultivate and care for them, and arrange them in his garden so as to produce the best effect, than to see him playing with his dog, or driving along the road with two or three dogs following, or sitting around the grocery with a wad of tobacco or a pipe in his mouth! Such things indicate the man, as sure as the magnetic needle points to the pole. The one degrading—the other is elevating; inasmuch as there is a secret influence arising from these bright gems of nature, which imperceptibly makes us holier, purer and better; and for this reason we should encourage it in the minds of our children. Let them grow up surrounded with flowers, and be assured that in the garden of their hearts the blossoms will unfold and golden fruit ripen in after years.

The cultivation of flowers is adapted to all—the high and the low, the rich and the poor. We were never placed here on this mundane sphere to rust out in idleness. A degree of exercise is as necessary for the preservation of health, both of body and mind, as food. And what exercise is more fitting for ladies, or children, than the planting of flowers? What more fit for him who is in the decline of life, than that of superintending a flower garden? What more invigorates the feeble frame? Or what is there that would be of so much benefit to our feeble, almost invalid, ladies, as to spend a large portion of their time among the flowers in the garden, instead of at the piano, or in the drawing-room? It would be far better than all the musical attainments, or drawing-room accomplishments, or medical prescriptions that they could possibly have. Besides, a lover of flowers can never be idle: they will always find something to do even in the presence of company, when viewing the flowers. There is always a dead leaf to pick, a weed to pull, a plant to stake, or a vine to train, so that we are always busy, both body and mind, with a pleasing, healthful and useful occupation. Hence, if for no other reason than to avert this first of all evils, and bane of all true happi-

ness, idleness, we should recommend the full development of this love for flowers, as one of the best of graces.

Who ever saw a bad person who loved flowers? It is simply impossible, for, like the Bible, they speak in unmistakable language of the goodness of God to man; and, like that blessed book, the more we study them the more new beauties we shall discover. To those engaged in literary pursuits the flower garden is also very essential. To take a walk among the flowers is a rest from the book, and enables one to return with better conceptions and higher aims, understanding the works of God better and with holier aspirations; for it is almost impossible to go into a flower garden, or examine a flower, without discovering some new truth which we should study and remember.

Who shall number the many joys our garden shall afford? Or who shall estimate the golden return to you and to your children? For be assured that every flowering plant, tree, shrub or vine which you plant enhances the value of your place, when for sale, ten times the cost, in any intelligent man's estimation. Which is a very pleasing and hopeful indication. Hopeful, because it shows that our people are trying to enjoy more of this bright world of ours, by having more to enjoy, in the shape of beautiful flowers; and who knows but we shall eventually rise to new and unheard of bliss in cultivating these gifts of God!

**It is said as on one occasion several angels were seen in a vision to pass by with gilded baskets—

Some as they went the blue-eyed violets strew,
Some spotless lilies in loose order threw,
Some did the way with full-blown roses spread,
Their smell divine, and color strangely red—
Such I believe was the first rose's hue
Which at God's word in beauteous Eden grew,
Queen of the flowers that made that orchard gay,
The morn'ing blushes of the spring's new day."³

The following was offered by J. Davis and unanimously passed:

RESOLVED, That this society thank Mrs. J. B. Rieves for the essay on flowers; and that we invite the women of the land to aid us in our Horticultural labors and studies.

The following resolution was passed:

RESOLVED, That this society request the State Board of Agriculture to appoint some competent horticulturist to take charge of the Horticultural Department of the next State Fair, and that we request our horticultural brethren to come up and assist in making the display in that department worthy of our State.

Dr. Jno. A. Warder was elected an honorary member of the society.

Messrs. T. Montgomery, S. Smith, and J. O. Rudy, were appointed a committee to solicit members from among the citizens of Mattoon.

EVENING SESSION.

Dr. E. S. Hull of Alton addressed the society on Plant Growth.

After a short discussion the meeting adjourned.

MORNING SESSION.—THIRD DAY.

Prayer by L. C. Francis.

The following essay was read by Mr. Jno. Periam of Chatsworth, Illinois.

THE RELATION OF AGRICULTURE TO HORTICULTURE.

The wild man is a brute, the educated one is a God, as pagans understand the term. The first subsists in a precarious manner upon such animals as he may overcome in the chase; but the second harnesses even the elements, and makes them subservient to his will. Both possess bone, sinew, muscle and blood, nerve and brain. The wild man acquires fair physical proportions, but the brain force is latent. The educated one however has fed both his physical and mental nature, and therefore is in the full stature of a man. In rising to a state of barbarism, the savage gathers flocks and herds, cultivates the soil in a rude way, and begins to fix his habitation. Emerging into civilization,

art is developed. Enlightenment ensues. Science is born. Brain force becomes superior to physical power. The printing press stores up the knowledge of foregone generations. The flint and steel of mind upon matter knock out scintillations, illuminating the pathway of mankind, assisting one and another in the study of the material and the spiritual in nature. The savage becomes first the herdsman, then the husbandman; soon the arts of horticulture follow, and lastly come beautiful flowers and landscape adornment. The sum of these is agriculture. Husbandry is the rearing of animals, the cultivation of the cereals and grasses, and their preparation to become fit for food for man and beast; horticulture is the growing of fruit, vegetables, trees and plants, flowers, rural and landscape adornment. The poetry of Agriculture is Horticulture, and beautiful flowers are the religion of Agriculture. A mere husbandman may know nothing about horticulture. A horticulturist may know but little of husbandry, but he must necessarily know a good deal about agriculture. An agriculturist must understand all. The farm destitute of rural adornment looks sorry and cheerless indeed. The villager's house, with its little parterre and vine-clad bower, pleases and cheers the passer-by, while the costly and naked magnificence of the citizen's mansion is scarcely regarded at all. But if, in passing along a country road, you come to a farm where the wealth of the owner has enabled him to beautify and adorn the landscape and rural surroundings, the exclamation at once comes forth—How lovely! How beautiful! The farm after all is the place for effective landscape adornment, and the farmer who is a horticulturist as well may add much, and at comparatively little expense, to the attractiveness and beauty and comfort of his home. He perhaps moves into a new country, poor enough,—his team, household effects, honest hands, and a quarter section of wild prairie, his all. He ploughs, sows, reaps, feeds cattle: this is husbandry. Of timber there is none. He prepares his rows and plants hedges for fencing, nuts for timber; grafts and buds, strikes cuttings, and rears orchards and vineyards. Curves a driveway winding about his buildings and offices; makes a lawn shaded by spreading elms and lindens, with here and there other deciduous and evergreen trees; leads the streamlet into the hollow and forms a lake; builds, with advancing wealth, a green house, a conservatory, an arboretum. This man, and only this, is an agriculturist. There are many farmers in Illinois, who if, as they were growing rich, had devoted some of their money and leisure to these subjects, would not now be lamenting that they had not sooner commenced to be agriculturists instead of mere farmers. The fact is, farmers are too apt to think that there is something mysterious in Horticulture, especially in gardening; that in order to succeed they must hire a professional, who about half of the time are mere botches; that they must send a tree butcher into their orchard with a handsaw, an axe, and a ladder, to destroy trees that were already doing well enough. We only need to remember that the finer the production, the more care should be bestowed upon it. That the delicate fruit or succulent vegetable forced into an abnormal condition by high cultivation, can not be expected to continue to improve or even hold its own without continued high culture and care. We pay high prices for new wheat, rye, barley, oats and corn, from year to year, and yet after a few seasons of cultivation they become as the old sorts. It is because we have not given them the same cultivation that they had previously received to bring them up to the selling and actually to the economical standard. A man plants an orchard, turns in his cattle to trim it, and his hogs to cultivate it; and feeds it, as he does his cattle, on grass. It is not strange if his orchard is unproductive, and he thinks his is not a good fruit country; while, if the facts were known, there are but few farms in the West but what might at least produce what fruit they consumed, that were hardy in their climate; and yet how few farms at the present day in the West produce their own fruit, and at the same time how difficult it is to find any section of the country but that some farms in them produce fruit, and in abundance! It is simply because we do not give enough attention to diversified agriculture; we either run all to stock, or grain, or fruit, or some one of the principal productions of Agricultural art—while more variety in our crops would give greater exercise to the mind, and more varied enjoyment as well. We are doing something in that direction by means of our various societies, but it necessarily works very slowly. We had hoped to have done much through our Agricultural school, and there may, and, I hope, will be a bright prospect for it somewhere in the future. In the far future I fear, if we are to wait for the graduates to go out from there with "a smattering of Agriculture," and, after making fortunes in other pursuits, return to their Alma Mater to assist in elevating into a science the "Empiricism" of Agriculture. Oh! that the farmers of America might wake up to the great possibilities that lie before them; that our rural youth would study those sciences that pertain to Agriculture, the mysteries of vegetable physiology. Why the same air, earth and water produce sound grain or smut, perfect fruits or loathsome corruption. The simple and certain means which nature uses to convert noxious and deleterious matter into plant food. To find the means of attracting to the soil or plant, decomposing and rendering useful at will the latent elements, in air, earth and water. That the earth from becoming more and more barren each year, or relatively, in other words, losing the power of absorption and assimilation, shall grow fatter and fatter, more and more productive, until it shall be again re-instated in its original fertility. If the problem of a higher social existence is solved, it must be solved by applying science, practical science, to industrial pursuits, and must be founded upon the dignity of Labor. We as a nation have been called superficial by some of the

European scholars. It is this so-called superficiality, this knowing something of many things, that has made us the nation that we are. We do not grudge unsuperficial ones their learning. For fortunately learning in our country does not generally unfit a man for "a battle with life." Probably because he is what a mere bookworm would call superficial, he uses books only as a medium for thinking upon—knows enough of them for practical use, and wants also to know something of every-day affairs. Is willing to study Latin and even Greek, because of their value in understanding scientific terms, but likes to read his newspaper as well as the fabled loves of the ancient gods and goddesses; fights the battle of life, and enjoys the fact that modern humanity is superior to the fabled hero gods.

The present generation want to reap some benefit from Agricultural education. How shall this be done? First, by lectures upon practical Agriculture, the management of the farm, orchard and other rural pursuits, rotation of crops, improvement of seeds, stock breeding and rearing. Management of the dairy, and all that pertains to in-door farm life. Surface and under draining, their principles and effects. Mechanical and chemical action upon soils. Cultivation of timber. How climates are changed by the settlement of the country, and what may be done to bring it into a more equable condition. The phenomena of atmospheric and aqueous influences so far as we know them. Upon the propagation, rearing, and pruning of fruit trees, shrubs and vines, their habits and culture, gathering, marketing and use. The forcing cultivation, marketing, and uses of vegetables. The cultivation of ornamental, medicinal and flowering plants. Glass and other structures for forcing, landscape gardening. Rural architecture and ornamentation. Upon the sciences connected with Agriculture, their uses and appropriate places so far as discovered. The mapping out and recording upon experimental farms, gardens and in proper structures, from year to year, of all that is new in Agriculture, Horticulture and Floriculture. Experimenting from year to year upon improved methods of cultivation, and acclimating, instituting comparisons, and reasoning therefrom—the Chemist, the Botanist, the Geologist, the Entomologist, the Veterinarian, and other professions, down to the humble delver in the soil, being actuated by one motive—the advancement of agricultural science—which, disseminated throughout the land by means of the public press, finds its way to every fireside in the country; while at the same time the young men appointed to fill the different classes in our agricultural schools, if they may happily be rescued from the grasp of sectarians, will gradually eliminate the dross of the pure metal, and give us something else besides that obnoxious word "empiricism," which we translate "quackery"—the pretensions of ignorant men to skill. We have happily supposed that agriculture was somewhat scientific; we had supposed that intimately connected as it was with chemistry, botany, and kindred sciences, that it must necessarily partake somewhat of science itself. But, alas! this agriculture, which in itself is really the sum of all science—the science of life—toward which every known science more or less intimately tends. Every fact in nature which is constant is science. Any certain knowledge is science. Bakewell and the Collings were scientific stock breeders. The fruit grower who saves his crop under adverse circumstances, by the application of certain knowledge, is scientific. So of the husbandman. The florist is decidedly scientific who forces plants to bloom in an artificial atmosphere, under artificial conditions; and so also is the landscape gardener, who makes a paradise of a desert—even pure science, as mathematics, must enter here.

I pity the agricultural teacher who is so far behind the age, is so ignorant of what he is teaching, as deliberately to write agriculture as "empiricism."

The annual election for officers resulted as follows:

PRESIDENT—M. C. McLain, Charleston.
 1ST VICE-PRESIDENT—L. C. Francis, Springfield.
 2ND VICE-PRESIDENT—B. O. Curtis, Paris.
 3RD VICE-PRESIDENT—J. B. Clark, Onarga.
 SECRETARY—H. J. Dunlap, Champaign.
 TREASURER—John Davis, Decatur.

The By-Laws were so amended that the President, Secretary and last ex-President form the Executive Committee.

The Committee on Fruits on Exhibition reported as follows:

Your Committee on Fruits report that they find a show of apples possessed of considerable interest, some specimens being extra fine.

E. Daggy, of Tuscola, presents a collection from Douglas county, among which we note Minkler, Willow, Milan (large), Yellow Bellflower (very large), Vandevere Pippin, Michael Henry Pippin (fair), White Winter Pearmain (scabby), Red Canada, Green Newton Pippin, Janet (very large), Pennock, Hoops, and Rhode Island Greening.

R. F. Pope, Kinmundy, Ills.: Stark, smooth and fine.

L. C. Francis, Springfield, Ills.: Jewett's Fine Red.

P. Voris, Mattoon, Ills.: Fallawater (fine), Baldwin (good), Roxbury Russet, Fall Pippin, Peck's Pleasant; also one winter pear.

By S. Edwards, Mendota, Ills.: Specimens of Stark, from Ohio; Minkler and Soulard Crab, from Galena. Mr. Edwards also presented scions of the Stark, Forbiana Willow, and Long-bunched Holland Currant, for distribution.

Mr. Platt, of Chicago: Specimens of Nickajack, and several varieties of Pears, from California.

A. L. Hay, Jacksonville, Ills.: Seedling of 1820, said to be unusually productive; resembles Maiden's Blush; very good and handsome. Recommended.

H. W. Davis, Decatur: Rome Beauty, Pennock, Northern Spy, Vandevere Pippin, Green Pippin, Janet, W. Skaar, E. Spitzenberg, Smith's Cider, Jonathan, Grindstone, English Russet, English Golden Russet, Roman Stem, White Winter Pearmain, Pryor's Red, Limber Twig, Willow, Yellow Bellflower, Gilpin, Perry Russet, Baldwin, Fallawater, Rhode Island Greening, Hays' Wine, Lane Red Streak.

There were other lots, without names of owners or varieties.

J. A. WARDER,	} Committee.
M. C. MCLAIN,	
H. W. DAVIS,	

The President was directed to present the fruit on exhibition to Mr. T. E. Woods, of the Mattoon Journal.

USEFUL AND ORNAMENTAL TREES.

No one subject, of a temporal nature, is of more value to the people of our prairie region than forest planting. Having originally but a limited supply, but a small part of our territory fully developed for cultivation, obtaining a large portion of our timber from sister States—whose thinking men are earnestly endeavoring to arrest the devastation now being made with their forests, which they are satisfied will be gone in twenty-five to fifty years—it behoves us at once to secure legislative action for the encouragement of forest planting. Being recently at Springfield, I found in the Constitutional Convention sixty lawyers, less than a dozen farmers, not one horticulturist.

It seems to be the peculiar mission of our societies to present for consideration of the members some action to make it imperative upon our legislators to pass laws having for their aim aid to this important industry. This was the view taken by the Northern Illinois Society, at their meeting at Dixon last week, full particulars of which will be given by your worthy Secretary, Mr. H. J. Dunlap, whom we were glad to welcome to a part in our deliberations. A committee of seven were appointed, and Mr. Arthur Bryant, Sen., selected as a delegate to present the subject for consideration to the committee on agriculture in the convention, who assured me of favorable action upon anything which the wisdom of our society might suggest.

We need and confidently expect your cordial co-operation in this important work. By addressing a report of the action of your society to Hon. Mr. Wells, chairman of committee on agriculture of constitutional convention at Springfield, it will be a great aid in securing the desired result. Argument, to convince our people of the urgent necessity of immediate attention to this object, seems superfluous.

Your lists of varieties can be made better by your old residents than by one living in a different latitude. White Pine, European Larch, Oaks, Black Walnut and White Willow are leading varieties recommended here. For ornament, evergreens are most largely planted: White and Norway Spruce, Red, White and Austrian Pine, Balsam Fir, Hemlock, Irish and Swedish Juniper, are all desirable. Of the newer or more rare varieties, Cembrian Pine, Picea Nordmanniana, Douglas Spruce (when brought directly from the forests of Colorado), Nootka Sound Cypress, Picea Pichia, are hardy and desirable. For a street tree, the White Elm is taking the lead, where there is plenty of room. Magnolia Acuminata and the Tulip Tree, or Yellow Poplar, are very satisfactory.

A few cuttings of the Forbiana Willow, very valuable for tying corn shocks and any bundle; a few cuttings of Long-bunched Holland Currant, a very late variety; scions of Stark from H. P. McMasters' bearing orchard, at Leonardsburg, Delaware county, Ohio, and a few specimen apples from there, are all I can now send.

Wishing your society a pleasant and profitable meeting, enjoining upon all to work in their temporal and spiritual fields while the day lasts, I remain, in haste,

Very cordially yours,

SAMUEL EDWARDS.

DISCUSSION OF SMALL FRUITS—GRAPES.

CLINTON.—McLain—Many advocate it for fruitfulness, but can't recommend it; never yet able to get it entirely ripe.

Secretary—Rotted bad.

J. Davis—Not a first class grape; wait till frost touches it a little; did not rot at Decatur; it is good enough to keep up a variety.

Platt—What will you do with it—send it to market? Must be sent to market while it shines; if market quality determines its value, should say it is a failure.

Davis—Keeps well.

McLain—Birds won't eat it.

Dunlap—Once thought highly of it; believes in substituting better for poor at any time.

Periam—Thinks will do for family use; is a very good grape; there are several kinds called Clinton.

Parks—A good poor man's grape, and is good if you can't get any other.

Dunlap—Thinks it a poor grape for a poor man.

Daggy—Thinks well of it.

Curtis—Hardy, and does well in Edgar county. After we try the Ives as long as the Clinton it may also fail.

CONCORD—No remarks.

DELAWARE—Dunlap—It has done well. Thinks insects may render it unprofitable. Bore well, but dropped its leaves.

McLain—Is one of my pets. The most delicious we have. Bore well until this season; in June the leaves became diseased and dropped off—consequence, crop a failure. A few on a western exposure ripened well. Don't like to give it up.

HARTFORD PROLIFIC—McLain—Hardy and profitable. Bears well; rotted some in July. Fruit in market brings a good price.

IVES—McLain—Hardy, and much like Hartford Prolific. Fruit not quite as large. No sign of disease in vine or fruit. Not so good as Hartford Prolific.

John Davis—Only a wine grape, said to be very rich in must.

McLain—Thinks it not so good for wine as has been recommended. Don't think the wine equals the Concord.

J. Davis—The taste of a grape is no evidence of its value for wine.

Dunlap—We must bear in mind that the statements of men who put these new varieties on the market must be taken with allowance. It will rot like the Concord. We need not expect it to escape from disease. The berries hold on well. Pure Ives wine is not a good wine, but mixed with Concord is much improved. We want grapes more for table than for wine.

MARTHA—No remarks.

RASPBERRIES.

KIRTLAND'S SEEDLING—Montgomery asked for information.

H. J. Dualap—Said that Mr. E. H. Skinner, of Marengo, regarded it of little value.

BLACKBERRIES.

LAWTON—McLain—Hardy at Charleston. Fruit large; prolific; not very good quality.

Davis—Hardy on the prairie at Decatur.

Francis—Drying up is caused by injury from frost.

Platt—One difficulty, when fit to eat, never fit to sell. Thinks some other berry ought to be provided to take its place.

Dunlap—Is valuable for market.

Francis—For near market. Get a crop every other year.

KITTATINNY—Hardy.

WILSON'S EARLY—McLain—Thinks it abused. Bore well last season. Good in size and quality—knows of no equal to it in quality. Habits similar to dewberry, but more bushy. Will try it further.

Francis—Is the largest berry I ever saw, but the fewest bearer. Failed to perfect its fruit. Very tender; more so than Lawton.

McLain—It is perfectly hardy with me.

Place of next annual meeting referred to the Executive Committee.

Mr. Curtis—There are parties here who wish the opinion of this Society as to the extent of damage done to hedge plants by frost.

McLain—Said this was a matter between purchaser and seller.

Mann—Said that apple trees were injured as well

Platt—The Golden Cap raspberry has been sent to market the past season, but could not be sold on account of its color. People thought it mouldy.

The following letter was read:

CANTON, Ills., Nov. 29th, 1869.

H. J. Dunlap, Champaign, Illinois.

DEAR SIR: Your circular came to hand Saturday, and I have endeavored to answer as well as the small space would allow.

I have resided in Fulton county over thirty-five years. Bought a farm in 1835 with one hundred bearing apple trees on it, with plenty of peaches and cherries in their season. Planted one hundred apple trees in '47—grafted fruit—which suffered severely in the winter of 1855-6, caused by the unusual warm fall of '55, continuing almost summer heat until the 24th Dec., then falling to zero in less than twelve hours, suddenly congealing the sap and rupturing the bark on the wood. In the summer of '57 I commenced to clear an orchard plat of ten acres, and planted in the spring of '60 two hundred and fifty apple trees, one hundred standard pears, two hundred peach trees, and one hundred cherry trees. The apple trees are doing well; also the pears are doing well. Bartletts, Flenish Beauty, and Buffum have borne more fruit than the average of apple trees planted at the same time. The peach trees are all dead, and never paid the expense of planting. Of cherries, I planted Early Richmond, May Duke, Belle D'Choisey, Belle Magnifique, and Reine Hortense, all on Mahaleb stocks, and are over half dead, except Early Richmond—they, almost one-third dead. Original timber on ground, walnut, elm, hickory, &c. In '65 I planted one hundred and sixty apple trees on white oak clay soil, half Willow, balance Early Harvest and Yellow Bellefleur. I gathered this fall a bushel of apples from some of the Bellefleurs, and one and a half bushels from some of the Willow.

In the two hundred and fifty apple trees planted in 1860 are forty varieties. Have received more income from thirty Willows than from the balance of the orchard. Early Pennock, Maiden's Blush, and Wagener will give quicker return for family use to beginners than any other varieties that I am acquainted with. Rawie's Jamet has proven very unsatisfactory. Top-grafted most of them to Ben Davis last spring.

I would like to meet you at your winter meeting at Mattoon, if circumstances would admit; but do not expect to. You have a noble work before you. My hopes are that you may do much to dot those grand and fine prairies of Central Illinois with orchards and groves, and leave monuments for yourselves more noble and enduring than marble or gold.

D. F. EMORY.

The Committee on Fruit presented the following

FRUIT LIST.

Strawberries—Wilson.
 Currants—Red Dutch.
 Gooseberries—Houghton.
 Raspberries—Philadelphia, Miami.
 Blackberries—Lawton, Kittatimby.
 Cherries—Early Richmond (Early May), Late Kentish, Large English Morello.
 Grapes—Concord, Ives, and, in some locations, Delaware.
 Summer Apples—Keswick Codling, Sops of Wine, Lowell, Cooper, Golden Sweet.
 Autumn Apples—Maiden's Blush, Milam, Rambo, Fameuse or Snow, Porter, Standard, Baker's Sweet.
 Winter Apples—Standard, for early winter, Peck's Pleasant, Winesap, Smith's Cider, Rawies' Jannet, Little Romanite, Willow, White Pippin, Jonathan, Minkler, Ben Davis, Rome Beauty, Lyman's Pumpkin Sweet (Pound Sweet).

The report was accepted and filed.

This Society does not make a list of fruits, but simply recommends or calls attention to certain varieties.

The Committee on Final Resolutions report as follows:

Resolved, That the thanks of this Society are due to the citizens of Mattoon for the generous hospitality which they have extended to its members; to the newspapers, who have so kindly noticed the time of holding our meetings, and published the proceedings of our Society; to the Illinois Central and Indianapolis and St. Louis Railroads, for the concessions made to us; and to all who have, by word or deed, encouraged and assisted us in our meeting here.

Resolved, That this Society is under special obligations to Dr. J. A. Warder, of Ohio, and Dr. E. S. Hull, State Horticulturist, for their presence, and for their interesting and instructive lectures during our session; also, to the officers of this Society for the able and impartial manner in which they have discharged their duties.

L. C. FRANCIS.
 PARKER EARLE.
 W. H. MANN.

Report adopted.

No further business offering, the Society adjourned *sine die*.

H. J. DUNLAP, *Secretary*.

ALTON HORTICULTURAL SOCIETY.

Officers for 1869 were JAMES E. STARR, Elsau, President; B. L. KINGSBURY, Alton, Secretary; S. B. JOHNSON, Alton, Treasurer.

The officers elect for 1870 are

PRESIDENT—Jonathan Huggins, Woodburn.
 VICE PRESIDENTS—S. B. Johnson, Alton.
 E. A. Riehl, Alton.
 SECRETARY—D. L. Hall, Alton.
 TREASURER—E. Hollister, Alton.

The meetings of 1869 have been kept up with unabated interest, and are largely attended by both sexes and all ages. This may be largely attributed to the system of "boarding round" which is a good thing for a horticultural society, however it may be with schoolmasters.

The proceedings have been taken, monthly, from the columns of the ALTON TELEGRAPH, and made up into pamphlet form, and three hundred copies struck off of which a good many are mailed to other societies, and to agricultural and horticultural newspapers.

Some specimens of papers read are subjoined :

AN ESSAY UPON APPLE BLOSSOMS.

The subject is sentimental and poetic: but I have been taking notes of the color and relative time of blooming of the flowers on different varieties of apple trees. I submit the following notes, taken May 1st, and would be glad to elicit farther information on the same subject:

1. The following varieties have the blossom white: English Golden Russet: Fulton, bloom sparse; Gravenstein, sparse; large Red Siberian Crab, Newtown Pippin, Red Astrachan, bloom sparse; Sine qua Non, Toceca? 9 Yellow Siberian Crab—3 late, 6 early.

2. The following have the blossoms nearly white: American Summer Pearmain, Benoni, Early Harvest, Henwood, Jersey Sweet, Kirkbridge White, Large Yellow Bough, Summer Rose, Tetoſky? 10 William's favorite—2 late, 8 early.

3. The following have the general appearance of being white rather than red, though it is a little difficult to decide as we approach neutral ground:—Ben. Davis, Brabant Belleflower, Coles' Quince, Dominic, Duchess of Oldenburg, Early Strawberry, Fall Nonsuch, Fall Pippin, Fulton Strawberry, Green Russet, or Winter Sweet: Jonathan, Keswick Codlin, Nickajack, Rambo, Roman Stem, Shockley, Smith's Cider, Sops of Wine, Summer Queen, Sweet June, Tollman's Sweeting, Vandevere, Yellow Belleflower—23, about divided between late and early.

4. In the following, the colors seem to show nearly equally:—Hoop's White Pearmain; 2 Taylor's Garden.

5. In the following, red predominates to such an extent as to give a reddish cast to the color of the blossom. This is the largest class:—American Golden Russet, Autumnal Swaar, Belmont, Bethlehemite, Carolina Red June, Chandler, Cogswell Pearmain, Cooper, Early Pennock, Esopus Spitzenburg, Fallwater, Fall Wine, Gilpin, Hawley, Hocking, Hubbardston Nonsuch, Lady Apple, Limber Twig, Milan, Missouri Pippin, Ortle, Peck's Pleasant, Pomme de Neige, Primate, Red Canada, Soulard Crab, Swaar, Tewkesbury Winter Blush, Trenton Early, Willow Twig, 31 Wine. About two-thirds late apples.

6. The following have a marked shade of red in their bloom:—Common Wild Crab, Hawthornden, Maiden's Blush, Wine Sap—2 late, 2 early.

7. The following seem to be the late bloomers:—(a) The following were hardly opening their blossom buds on the date above mentioned.—Buckingham, on young trees, Common Wild Crab, Drap d'Or, Melon, Northern Spy, Rawles' Janet, Rome Beauty—7 Westfield Seek-no-further? (Trees thought as such but they resemble Rawles' Janet.)

(b) The following seem rather later than most varieties, in blooming:—Bethlemite, Porter, Soulard Crab, Trenton Early.

If it is asked, What does all this come to? I answer, that if correct, these observations go to show:

1. The safest apples to plant in low or otherwise frosty localities. This we well knew before of the Rawles' Janet, Northern Spy and Rome Beauty, but here seems to be a prospect of enlarging the list.

2. It may afford some aid in identifying varieties by furnishing other characteristics.

3. It may aid in tracing the origin of varieties. It will be noticed that the Russian and other varieties of a probable oriental origin, have the blossoms white, or nearly white, as descended from some common, and perhaps, peculiar, species, as has heretofore been suspected from their common peculiarities of foliage.

4. It shows, or tends to show, that varieties with white blossoms are generally early ones.

5. That varieties with red blossoms are mostly late varieties.

6. That the color of the blossoms, in a majority of cases, though the rule has many exceptions, indicates the color of the apple, white apples having white blossoms and red apples red blossoms.

W. C. FLAGG.

ESSAY ON EFFECTS OF ROOT-PRUNING.

MR. PRESIDENT: To be able to treat a subject of so much importance intelligently, we should understand what are roots, and what are their uses. It is an established fact, that the internal structure of roots very nearly resembles the stem: their growth is mostly lengthwise and very slowly in thickness as compared to their extension. Although the older parts of the roots acquire a considerable diameter, the roots, by which the plant feeds, are usually thread-like and slender. The ends of

the roots are their feeders, and when developed are termed spongioles, which are simply elongations of the cells of the roots, which, after having performed their work, decay; and the same process is repeated during the life of the tree.

Mr. Johnson tells us it is a common, but erroneous idea, that absorption from the soil can only take place through these spongioles; but, on the contrary, the extreme tips of the roots cannot take up liquids at all. I must confess that I have been among the number called common, as I had supposed that all food taken up by the tree is in liquid form, and we all know that it has been demonstrated repeatedly that this is the office of the spongioles.

As the intention of this paper is to give some of the results of root pruning for the prevention of pear blight, it must necessarily be brief, as I have not had as much experience in the matter, nor investigated it as thoroughly, as Dr. Hull, who is the author and champion of root pruning to prevent blight. In my own case the effects have been highly satisfactory; I believe, in every single instance, it has been a success exceeding my own expectations; and, in some two or three instances that I am conversant with, off from my own place where tried, is equally satisfactory. Dr. Haskell, of Alton, has informed me of his success in every instance; and Mr. Plimney also of Alton, informed me not long since of his experience; he says some time ago the blight attacked his pear trees and he root pruned, and he did it severely so that the trees actually leaned over and he thought they would die, but they came out all right and there is no appearance of the pest.

There seems to be a want of nerve, or some doubt and hesitation, in accepting this remedy for this disease. There may be a want of confidence, or fear, by some—to relate my experience may induce some to try it. Cases have come under my observation where trees have borne good crops year after year, and their owners have considered themselves fortunate in their locations, but have had to stand by and witness the destruction of all their hopes in one or two short weeks. Some object to its practice on the ground that it will shorten the lives of their trees. To this class I say "hope on." My experience is, that in nine cases out of ten, the blight will shorten them quicker and at less expense; and with regard to the profit of two ways of shortening the life of the tree, there certainly is a great choice. That it will dwarf the trees, to a certain extent, all admit; but I consider this no serious objection, as I prefer a healthy dwarf to a sickly standard. By this I do not mean to recommend dwarfing on the quince for commercial orcharding. Dr. Hull has given us so many times his rule and plans for performing root pruning, that I leave this part of the subject by simply saying that I have done it very severely on some trees and they, to-day, are healthy and make as good a growth as trees not disturbed.

As every one has a reason why he does anything in all kind of business, I will try and give my reasons for commencing root pruning. In the first place, if done properly, (and every one must judge for himself about this,) it is a first-rate cultivation, by furnishing fresh soil and food near the tree; but the principal reason was the loss of three hundred trees in one year by the blight. I did not stop to see if they would all die, but argued that if Dr. Hull practiced root pruning and did not lose ten or fifteen per cent. of his trees, I might do the same and save a part of mine. I commenced immediately, (this was about the first of August, 1867)—the result, to my mind was satisfactory. Some may ask, how I could tell, as perhaps the trees root pruned would not have blighted? Well it might have been so, but as I consider it too expensive to continue the old experiment of waiting and watching, and then let the blight help me out of my difficulty, I must refer the solution of the question to some one more willing to sacrifice their pear trees for the benefit of horticulture. The trees then root pruned, that had no blight in, are healthy and growing finely. As to the proper time to do it, I give the preference to early spring, as the ground is soft and it is easier; and it is a time when we are more at leisure than any other time of the season. As to how often it is necessary to be done, my rule is, when you discover a tree making more than six to ten inches of growth, mark it and root prune as soon as possible. Do it thoroughly. Make a note of your experience and report. In this way we can help each other over some of the difficult places in horticultural knowledge and gain reliable information, which is the study of us all.

As our society has a committee appointed on root pruning, I should like to see it continued, with leave to bring in a report at any time when they have reliable data to form such a report from, that will prove interesting to us all. None of us are so self-sacrificing as to wish to build up false theories or doctrines at our own expense; but when a new idea comes up, give it a careful investigation and report on its merits honestly. There have been some reports in regard to this theory that I presume would not bear investigation; for instance, if people will wait until the blight has appeared severely in their trees, and then root prune with the expectation of restoring their trees, they will find themselves mistaken. It has not been put forth as a cure nor as a positive preventive, but as the best means of controlling our trees; of having the terminal bud form early; thus giving plenty of time for thorough ripening of wood, so necessary to the prevention of attacks from fungus, which I am almost persuaded to say is the cause of the pear blight.

H. J. HYDE.

ESSAY ON THE TOMATO—ITS CULTIVATION AND VARIETIES.

The cultivation of the tomato, in this vicinity, for shipment to Chicago and other northern markets has rapidly increased during the past few years, not less than one hundred and thirty acres having been devoted to it during the present season, requiring a large amount of capital and labor, extending over a period of more than six months from sowing the seed in February until the final marketing the crop in the latter part of August.

It is the field culture of the tomato for marketing purposes that we propose briefly to consider in this paper, giving only what appear to be the most essential points in its cultivation, and the main causes of success or failure. Sow the seed in hotbeds about the 10th of February, being governed more by the weather than any exact date, as seed sown in bright, moderately warm weather, during the latter part of the month, will make better plants, than if sown three weeks sooner, if in such extreme cold that but little light and air can be given. Sow thinly in drills, and when about two inches high transplant to a new bed 3 to 4 inches apart, in rich, loose, soil, so as to induce a vigorous root growth, very essential at this time. When the plants cover the surface of the bed, transplant again from 8 to 10 inches apart, this time a cold bed or frame will answer, the sides of the frame being sufficiently high to allow a growth of 15 to 18 inches. By May 1st, full grown plants will have attained this height, be half an inch through at the ground, and should be well furnished with side branches. During all those operations plenty of light and air must be allowed the plants and for the last ten days, no covering should be allowed unless in danger of frost at night. Transplanted into the field as soon as the ground is warm and danger of frost over, usually from May 5th to 10th.

The ground for tomatoes should be deeply plowed and otherwise well prepared. Set the plants from 4 to 5 feet apart each way, and cultivate thoroughly until so large that the plow or cultivator cannot be run without touching them, then stop, for further working will do more harm than good. For the tomato, level culture is decidedly the best, any hilling or ridging to the plant, having a tendency to produce a new root growth, and we think, thereby retard the growth, and maturity of the fruit, and in case of drouth the vines on hills or ridges will be first to suffer. In a favorable season, and with ordinary success, the first tomatoes will ripen about July 1st, the quantity gradually increasing until August 1st, when the vines should be in full bearing, and unless in extremely dry weather, continue to yield largely during the entire month.

A fair yield per acre, is one hundred bushels of marketable tomatoes, that is ripened in time to be profitable for market; much larger results than this have been obtained, but this is a full average. The tomato for distant market should be picked as soon as well colored, carefully packed in one-third bushel boxes, filled so as to prevent the fruit moving in the least after the cover is nailed on, thus packed they will remain in good condition for 48 to 60 hours. In common with most other horticultural products, the tomato has numerous insect enemies, the most destructive is the Cutworm, (*Agrotis telifera*) which severs the young plants when first set out, at or near the surface of the ground. Various remedies have been suggested such as putting salt, lime, stiff paper around the plants, but the only effectual one, in our experience, is daily hand picking and crushing so long as cool or wet weather continues. The Stalk Borer (*Gortyna Nitela*) is another pest, boring into the stalk, and some times eating into the green tomato. Last in appearance is the potato or tomato worm (*Spherix 5 Maculata*) a large green caterpillar, eating the foliage, and if not checked completely striping the vine of leaves. For both these, hand picking is the best remedy.

VARIETIES.

In selecting a variety of tomatoes for market purpose we require, earliness, good size and color, productiveness, and firmness of flesh and skin sufficient to endure transportation without injury. Of the varieties cultivated in this vicinity: The Tilden is the best for shipping purposes; early, good size and color, handsome and productive, its only fault is lack of quality, and proneness to rot. Large Smooth Red; five to ten days later than Tilden, handsome, good quality and productive, one of the best. Extra Early Red; very early, medium size, and productive for a short time, but will not stand dry weather. Lester's Perfected, large, quality best, enormously productive, but too late, and does not stand transportation. Maupey, large, productive, good quality, worthy of further trial. Keye's Early, Alger, Orangefield, Eureka and Cedar Hill, all nearly worthless for market. Of the newer varieties, Brimson, Bluster and General Grant, are productive, and of good quality, but deficient in size and too soft. New York Market, large size, firm, of good quality, and we think will prove valuable.

And now finally, the question, will it pay to grow tomatoes? We answer, that those whose experience and knowledge of the business united to a favorable location, will enable them to be always

among the first in market, may, in most seasons, make tomatoes pay, but that even then there are but few crops that pay so small an interest on the time and capital invested. That the business has been overdone for the past year or two, is certainly true, but the principle reason of failure to pay lies in the want of an outlet for the bulk of our crop; that which matures too late for profitable shipping purposes. This can be supplied by a good canning establishment; and as the want is not confined to the tomato, but extends to all of our small fruits and most vegetables, we are confident that success from the start will attend the first enterprise of this kind, which may be established in Alton or vicinity.

CENTRALIA FRUIT-GROWERS' ASSOCIATION.

BIRDS.

The time of the meeting was pretty much occupied by Messrs. Reeder and Hooton in a further discussion of the bird question; these gentlemen, by general consent, fighting it out good-naturedly, each on his own line. They both came well prepared with ammunition, and the controversy was animated, interesting, and instructive.

Mr. Reeder hoped that by this time his friend, Dr. Hooton, was prepared to discuss the subject of birds in a cool and impartial manner; that he would take a broader and more comprehensive position, and acknowledge the subject has two sides—that one bird does not make a summer. As the Doctor seemed so bitter against the wood-pecker, the speaker would endeavor to show that that bird has some friends as good as the best. Mr. Reeder then proceeded at some length, giving quotations from various well-known writers, showing the great amount of good accomplished for fruit-growers and farmers by the wood-pecker. The testimony in favor of the bird was very strong and highly interesting. The speaker mentioned a few other birds that were useful aids to the fruit-grower and to the general economy of animal and vegetable life. The prairie warbler, says one author, is a small bird that creeps and flits among the grass and foliage with a quick and jerking movement; its nest is partially made of caterpillars' silk. Swallows are noted for feeding on insects, and they touch no fruit. The same may be said of the whippoorwill. The house wren should be protected for a similar reason. The English sparrow has lately been introduced into the East in hopes that he would be of much service in destroying insects. They are now in the New York city parks. A speaker in the Farmers' Club, New York, in answer to an interrogatory, says these little fellows (the sparrows) may be seen any pleasant morning in summer chasing down white millers and yellow millers, and consuming them. Great relief has been found from their advent. A general improvement in this respect will be found when our birds, especially the blue jay, robins and cat-birds are never molested and shot. Michelet, a celebrated French author of a great work on birds, says: "A man could not live without the birds, which alone could save him from the insect and the reptile; but the *birds* had lived without man." It is authenticated that one female moth produces 16,000,000 caterpillars in one year. Dr. Hitchcock enumerates 25,000 species of insects in Massachusetts alone. Bradley says a pair of sparrows will destroy 3,360 insects for a week's supplies. Wilson says

a black bird will destroy fifty grubs a day. Even in winter its food consists of chrysolides and spiders. A family of plovers will destroy myriads of grasshoppers. Quails, in immense flocks, have been shot immediately after foraging a planted field. Upon examination, no grain was discovered in them, but plenty of cut-worms and other insects. Mr. Reeder continued to speak in favor of the birds, quoting from numerous works to show their great benefits to farming and agricultural interests. Before closing, he desired to say a word in regard to bird laws. Most of the States have those laws. Illinois has a game law, but no bird law. Michigan has a law that fixes the penalty at \$5 each for killing small birds. In Ohio the penalty is \$10 for each offense. The birds protected in Ohio are the sparrow, robin, blue bird, martin, thrush, mocking bird, swallow, meadowlark, pewee, wren, cuckoos, indigo bird, nut hatch, creeper, flicker, finch, oriole, red bird, and cat bird. A similar law, with modifications, obtains in other States. Why should not this society make a move to have a similar law passed in this State?

Dr. Hooton followed with a perfect shower of shell—some of them right hot—which he poured in remorselessly, apparently without regard to cost, fear of getting out of ammunition, or flutter of feathers. He did not declare a war of extermination against the birds; should protect some and destroy others; was opposed to a law protecting birds. Alluded to Longfellow's jingling rhymes, but did not believe that he or Audubon ever raised a peach. The Doctor showed, inadvertently, probably, that he possessed a dash of sentiment as well as other members, by relating in a touching manner the story of the "Babes in the Woods," which he had read as a boy, and caused him to cherish the robin as nearly sacred for many years. But he had got bravely over that. His observation and experience taught him that the fewer birds the more fruit. To show that he was not lonesome or singular in his conclusions, he produced a well-loaded scrap-book, from which he discharged round after round of the concentrated wisdom of the Alton fruit-growers, Benj. D. Walsh, our State Entomologist, Dr. Spaulding, Dr. Tice, and eminent horticulturists all over the country, all of which went to prove that raising fruit and birds does not work well together.

Brunton thought thorough cultivation a more certain remedy against insects than birds. If we plant plenty of the best varieties of grapes we may be able to gather the poorer kinds for our own use.

Crosby had always been a friend to the birds, but he must confess that his convictions of the benefits conferred by them had become somewhat shattered by the Doctor's extracts.

Webster thought the more English sparrows we have the worse it would be for the farmers. In England boys were employed to watch the fields and scare off the birds. Would not exterminate all birds. We have fruit exposed to their ravages but a small portion of the year, while we have birds all the time.

Eldridge was satisfied that some varieties of birds do damage while some others may not. It will not require many years for a man with sharp eyes to learn which are beneficial. In alluding to the sap-sucker, he said that if he wanted holes made in his trees he would prefer to make them himself, according to his own judgment. Admitted that birds would eat bugs if you would plow them up for them. Related his experience in Du Page county thirty years ago. It was nearly impossible to save either oats or corn. Stated an incident that occurred with a neighbor holding family worship,

who was so annoyed by an immense flock of birds, suddenly swooping into a field, that the man abruptly broke off his prayers in the middle, without even an amen, and went to shooting.

Mitchell suggested that each member should make careful observation during the coming season, and report at a future meeting. In this way we may arrive at safer conclusions.

Pullen had been a friend to the birds, but agreed with Dr. Tice, that raising fruit would soon knock the sentiment out of any one on birds. Some varieties of birds it would do to protect, and others must be destroyed to preserve the fruit. It was a question of birds or fruit. Continued cultivation would do more to destroy insect enemies than birds.

CULTIVATION.

The subject for discussion being now in order—

RESOLVED, That it is profitable to thoroughly cultivate the soil for all kinds of fruits during the natural period of growth—

Dr. Hooton remarked that it was easier to make suggestions than to come to correct conclusions. From his experience, had decided that it was good policy to lengthen the period of natural growth as much as possible—or rather not to allow trees to stop growing in mid-summer by reason of dry weather. Thought this might be done by constant or continued cultivation during the season—say into September. Trees have a season of growth and a season of rest. The natural season for rest is during the fall and winter, but with us it frequently occurs in the late summer, when we generally have a protracted drouth which is followed by warm rains and pleasant weather. Then the trees renew their growth, buds will swell, and there are signs of new growth, which, being tender and premature, are more easily killed by frost, cold winds, or severe weather. By thorough cultivation the trees are less liable to receive injury from drouth, and will grow until as late as October. Another reason for continuous cultivation is a protection against injurious insects. It is well known that a mass of weeds and grass furnish a shelter and harbor for vermin and insects, a moist warm bed for the germ of destructive enemies, where they are comparatively safe from attack. Our seasons are so long there is more danger of this premature growth in the fall after a long dry spell than farther north.

Webster considered the question under discussion an important one, and we should be careful not to recommend either extreme. There was little if any doubt of the wisdom of keeping the ground clean and loose till the first of August. Whether it was profitable to continue cultivation a month later was somewhat doubtful in his mind, as in the latter case the growth would be tender and consequently more liable to injury from frost or severe weather. Especially for peaches, was in favor of no cultivation after the first of August. Deep plowing between trees would have a tendency to disturb and break roots, which he thought would be an injury rather than a benefit. Was of the opinion that a tree did not produce too many roots. Shallow plowing would do no harm to the roots; would destroy the weeds and keep the ground loose. Recommended plowing in such a manner as to facilitate drainage.

Capt. Taylor felt a diffidence in expressing his views upon fruit growing before men whose experience was so much greater than his own, which was counted by months only, while many had had years of practical observation. However, he had studied

the manner of cultivation, and coincided with the views expressed by Dr. Hooton. Continued cultivation from early spring to late fall, as practiced by himself the last season, had produced the most favorable results. He gave a detailed description of the formation of buds, branches, leaves and fruit. The necessary elements were gathered and stored in the tree for the production of fruit the coming season. In favorable seasons but little artificial help was needed; but in case of a drouth the growth of a tree would be suspended, and a season of rest follow. Then when the rains came a premature growth would not be in a condition to bear much exposure. But keeping the ground loose and free from weeds, the growth of the tree could be continued through a drouth, unless it was unusually severe, until October, when the natural time for rest would commence and the tree would possess a vigorous vitality to withstand the dangers of the winter. Was aware that practical experience makes sad havoc with many fine spun theories. However, his own experience and reflection had induced him to believe implicitly in the good old fashioned adage, that "by the sweat of thy face shalt thou eat bread," and thought it would apply quite as pertinently to peaches. The captain came very near being eloquent in his glowing description of the size and vigor of our peach trees: had seen fruit trees of this variety in New Jersey, in Michigan, in the South, and other localities, but for large, thrifty, vigorous trees, he had never seen any to equal those in our own vicinity, and attributed the fact to our peculiarly favorable soil and climate.

Brunton said that deep tillage effectually root prunes, insures good drainage and destroys large numbers of injurious insects. There might be danger that the cultivator would take too much from the soil in the shape of fruit or vegetables, or both, without replacing it, but not necessarily so. For large peaches it was necessary to have a large growth of wood. Thought it probable that root pruned trees would be short lived, as the roots do not penetrate the hard pan. Was convinced that tile drainage will not make our hard pan porous.

Eldridge considered it very important that the ground should be placed in good condition before planting the trees, by thorough plowing, sub-soiling, and throwing the land into ridges to secure drainage.

President Pullen was in favor of cultivation through the season. Alluded to the results in Mr. Tunnichif's orchard for two seasons just past, as being a case in point and affording strong evidence for thorough cultivation. His orchard is on both sides of his house, the rows next to his house on each side are in sod; that the fruit on these rows was very inferior to those adjoining which were cultivated and were of the same variety. The trees were filled about alike, but the fruit on the cultivated trees was so much larger that the yield was nearly double. The relative value was three or four to one: for while he sold the good fruit at a fair price, he had to send the other to the dry-house to realize anything from it.

Pullen claimed for thorough cultivation over the let alone system, the following results:

- 1st. A longer lease of life by from one-fourth to one-third.
- 2d. An increased amount of fruit, in bulk.
- 3d. Superior quality of fruit.
- 4th. Greatly increased returns in money as the result of the above.
- 5th. It is one of the best general remedies known as an insect destroyer, whether of the class that destroys the fruit or that which attacks the body, limbs or foliage.

FARINA AGRICULTURAL AND HORTICULTURAL SOCIETY.

In accordance with the general invitation for horticultural and agricultural societies to report to the State Society, the Society at Farina reports as follows:

Date of organization, November 21st, 1868. Meetings held twice a month. Officers elected semi-annually. The members are nearly all farmers and fruit-growers, and the discussions embrace both subjects. Meetings well attended, and considerable interest manifested. Many orchards are being planted out, and small fruits increasing rapidly.

LIST OF OFFICERS.

PRESIDENT—O. B. Irish.

VICE PRESIDENT—Jas. Greenman.

RECORDING SECRETARY—Wm. B. Irish.

CORRESPONDING SECRETARY—E. W. Irish.

TREASURER—Jas. Clawson.

DIRECTORS—L. Dunham, A. S. Coon, D. P. Marsh,

E. W. IRISH.

MACOUPIN COUNTY HORTICULTURAL SOCIETY.

This Society was organized March, 1869.

OFFICERS.

PRESIDENT—Geo. H. Holliday, Carlville.

VICE PRESIDENT—Henry W. Burton, Carlville.

SECRETARY—George Hunter, Carlville.

TREASURER—Milo Graham, Carlville.

MORGAN COUNTY HORTICULTURAL SOCIETY.

The Society was founded and held its first exhibition on Independence Day, July 5th, 1869. There was an excellent display of fruits, flowers, and vegetables, and all visitors were well pleased. It was held in Music Hall, free, and no premiums were given.

Since then the Society held its fall exhibition, September 10th and 11th, in the new court-house, which was pronounced the "finest horticultural display ever witnessed in Morgan county." It was largely attended by visitors, who were highly pleased, and quite a snug amount of cash was taken at the door, besides about one hundred membership tickets which have been sold, leaving a nice balance in the Treasurer's hands. At this exhibition premiums were given in cash, pruning shears and knives, hyacinth glasses, hanging baskets, and similar articles.

Since the Society's organization, besides shows, it has held monthly meetings at the members' houses, where questions of crops and culture have been discussed (by the ladies as well as the men), which have proven a source of pleasure and instruction—a sort of social gathering of parties interested in horticulture.

It is proposed to hold two exhibitions next spring—one for early flowers and vegetables, and one for strawberries, &c., at both of which large premiums will be given.

H. W. MILLIGAN.

EBENEZER MASON, *Secretary*.

OFFICERS FOR 1869.

PRESIDENT—E. Lambert.

SECRETARY—E. Mason.

TREASURER—Mrs. M. D. Wolcott.

REPORT OF THE ONARGA HORTICULTURAL SOCIETY.

For the year ending December 6, 1869.

Our Society has not, during the past six months, exhibited its usual zeal in pursuit of knowledge. A rainy season has somewhat *dampened* our ardor, and the collapsed condition of our purses exhibits with unerring certainty the amount of our crops. However we will not despair.

The members of our Society do not intend to go backward, or cease to labor.

EXTRACTS FROM THE JOURNAL.

January 22, 1869. The following question was asked, "How shall we obtain pure seed?"

The following resolution was introduced and adopted at the next meeting:

RESOLVED—That the Legislature of our State should pass a law, prohibiting the sale of old or impure garden seeds.

Our Strawberry festival on June 12th, was a success. At a meeting of the Society, June 19th, the following was unanimously adopted.

RESOLVED—That this Society having for the last three years watched the Strawberry known as Owen's Onarga Seedling, without hesitation can recommend it as the best table berry in this vicinity, and one worthy of confidence.

At a regular meeting of the Society, September 22nd, the following resolution was adopted.

RESOLVED—That the Onarga, Horticultural Society, recommend that no Society should award any premium for fruit that is not properly named.

After numerous windy arguments on Microscope, the Society at its last meetings instructed the corresponding Secretary to obtain the popular Microscope.

At the same meeting the society passed on Harper's seedling, a splendid apple. It

was christened Onarga. (See report of the same in *Western Rural*.) Also elected the following officers for the year:

PRESIDENT—J. B. Clark.
 VICE PRESIDENT—E. D. Robbins.
 TREASURER—H. Pinney.

REC. SECRETARY—E. C. Hall.
 CORRES. SECRETARY—L. Pike.
 LIBRARIAN—J. W. Owen.

To sum up: we have had poor crops of vegetables, good crops of Strawberries, Raspberries, Blackberries, Gooseberries, Currants, Cherries, and Pears. Apples slim crop. Grapes almost entire failure either in fruit or plants. We have had many interesting and some important discussions.

We have had our share of rot, and blight in grapes, rotten potatoes, &c. With the farmer it is no better; but we have about done looking at black clouds and are now busy, hunting the silver lining.

The nursery of W. H. Mann, Esq., is about three and a half miles from Onarga, and said to be the largest nursery in the world.

LYMAN PIKE, Corresponding Secretary.

RICHVIEW HORTICULTURAL SOCIETY.

It was in the years 1863-4 that fruit-growing commenced in the eastern part of Washington county with a view to profit. It is true that some had planted apple and other fruit trees before that time for family and market, but it was not with any view of making it a business. The growers commenced with but little experience, and with what they could learn from agricultural papers and some of the early works on fruit-growing.

The orchards, as well as the number of growers, kept increasing until 1866, when those engaged in the business began to think they could learn by hearing and comparing each other's experience. A call was therefore issued by J. M. Hunter, at that time a vice president of the Illinois Horticultural Society, for a meeting to be held in Ashley, on the 6th of January, 1866. At that time the Washington County Horticultural Society was organized by eleven fruit-growers of the county. G. Wilgus, of Richview, was its first President. The second meeting was held in Richview on the second of the next month, and the number of members was increased to twenty. Thus monthly meetings were held alternately at Richview and Ashley for most of the year. Two-thirds of all the members were citizens of Richview and vicinity. In the beginning of the year 1867, Dr. Geo. Vasey was made President. But few meetings were held this year; the last one was in April.

In February, 1868, several of the members met to see what could be done towards reviving the Society. It was found that the time for electing officers, as required by the constitution, had passed, and hence the Society had expired by limitation. It was at once resolved to organize a local society. A committee was appointed to draft a constitution, which reported at the next meeting in march, and the Richview Horticultural Society was organized, with Dr. John Hyde as President.

But few meetings were held during the year of its organization. In 1869 regular meetings were held—although somewhat thinly attended—every month, with the

exception of the busy summer months. The Society has a small library, which is constantly increasing.

OFFICERS FOR 1869.

PRESIDENT—Dr. John Hyde.

VICE PRESIDENT—Joseph Houstons.

SECRETARY AND TREASURER—O. C. Barber.

LIBRARIAN—M. D. Blackman.

The Society has not as yet adopted a fruit list for this locality, but will, perhaps, during the coming year. Its meetings are held on the first Saturday afternoon of each month.

O. C. BARBER, *Secretary*.

RICHVIEW, December 8, 1869.

REPORT OF THE STATISTICAL COMMITTEE.

Read before the Richview Horticultural Society at its regular monthly meeting, held on October 2d, 1869:

MR. PRESIDENT: In the performance of the duty devolving upon us as a statistical committee, we shall beg indulgence, but hope the shortness of the time given in which to make our report will exempt us from severe criticism.

It was impossible to see every one engaged in horticultural operations, and in cases of recent commencement in such pursuits, also in some others where these engagements were of quite a limited extent, we were obliged to rely on such information as could be gathered from neighbors.

Where your committee fail in exact statement, it is our endeavor to under rather than over estimate the extent of operations. With this explanation we state that our report closely approximates correctness—the more so, as our most extensive growers have furnished us with statements so exact in detail as to leave no room for doubt.

We will state from the first settlement of the country, apples and seedling peaches have been part of the farmer's productions. Prior to 1859 scarcely a budded peach could be found. Horticultural pursuits may in reality be said to date back no farther than 1864. The slight efforts put forth previous to that time partake more of a spasmodic than systematic character. In that year, four men commenced the business of fruit-growing somewhat extensively, and with an eye to its profit.

Subsequent to the above date, so many have turned their attention in that direction as to enable us to present the following statement evidencing the extent of our orchards and vineyards:

In this immediate vicinity we find there are planted—Peach trees, 95,000; apple trees, 20,000; pear, 7,500; cherry, 2,500; quince, 3,000; grape, 16,500; gooseberry, 1,800; currant, 2,000; blackberry, 10,000; raspberry, 20,000; acres of strawberries, 21.

Of the above numbers of trees and plants, the great majority is not yet in bearing condition. The number of peach trees which actually bore the crop this season, is about six thousand. Four thousand produced three-fourths of a crop.

With slight exception, the high ground has yielded the most. The varieties which have been the most productive this year are the Hale's Early, Serrate Early York, (both rotting badly), Tillotson Galbraith Seedling, George the Fourth, Kensington, Yellow Rareripe, Portermixon, Oldmixon, Orange Free, Red-cheek Melocotoon, Heath Free, Ward's Late, Scott's Nonpareil, Smock Free, Heath (Cling, and a nameless variety by Mr. Wilgus. But few Troths or Crawfords could be found.

The peaches have been remarkably free from *enroulo*, and have brought prices for most of the season in advance of quotations.

The apple trees which are in bearing condition are productive, this year's crop being mostly on the trees. Cherries were good. Grapes have rotted badly. Currants and gooseberries have produced a good crop. The strawberries were very productive. In one case 250 bushels were grown from one and one-third acres.

We find upon inquiry that sales of peaches have reached 30,000 boxes; apples, 1,000 barrels; pears, 1,000 boxes; cherries, 500 cases; strawberries, 22,000 quarts; tomatoes, 10,000 boxes. There have also been put up about 500 dozen commercial cans, and 500 1-gallon cans of peaches, by Mr. Wilgus, our largest orchardist. In addition to the above enumerated articles, there has been shipped large quantities of melons, squashes, cucumbers, and other garden productions.

Wine has not been produced in our immediate vicinity, but at our county seat, [Nashville, some 8,000 or 10,000 gallons have been made previous to this year.

We may in justice to the place be permitted to state that the above amounts do not comprise the whole which should naturally find egress from this station. From the orchards both east and west of us, much of the crop has been taken to Centralia from the fact of lower rates of freight.

Upon a review of these facts we regard the season for peaches, in great part, a failure in quantity, but congratulate ourselves that for eight years but one entire failure has occurred—that of 1864—our high and rolling country securing us partial crops when other districts have failed. With our limited crop this year, we yet challenge competition when the number of bearing trees is taken into consideration.

Some of our want of success is attributable to the unpropitious season, much to careless management. But our people are encouraged to persevere, trusting in the blessings of a kind Providence upon their efforts, and hoping to be cheered in their labors by future visitations of Ad Interim Committees.

JOSEPH BARBER,
WM. E. THOMAS,
CHAS. H. SMITH,
ED. LESTER,
P. C. BLACKMAN.

ROCKFORD HORTICULTURAL SOCIETY.

The fruit and flower growers of Rockford assembled *en masse*, last Saturday, in Agricultural Hall, and after an earnest and interesting conference upon the expediency of reorganizing, the resolution passed that steps be taken immediately to put the Institution in working order. Whereupon, Capt. Asa Weldon was appointed Chairman, and H. P. Kimball Secretary *pro tem*. The meeting proceeded forthwith to ballot for President for the ensuing year.

Hon. Anson S. Miller received 266 votes, and was unanimously elected.

The following gentlemen were chosen Vice Presidents:

G. A. Sanford, T. D. Robertson, D. S. Penfield, C. C. Briggs, Orlando Clark, J. S. Shearman, J. B. Agard.

The vote for Recording Secretary stood 139 for Alexander Strachan, and 127 for E. L. Abell. Mr. Strachan was accordingly elected.

The vote for Treasurer stood 266 for David Dawson, who was unanimously elected.

The meeting proceeded to elect a Corresponding Secretary and Librarian, whereupon H. P. Kimball received 266 ballots, being the entire vote.

The following gentlemen, elected from the various Wards, constitute the Executive Board for the year:

John Gray, William Simpson, 1st Ward.

G. W. Twiss, James Steele, 2d Ward.

David Castner, John Lake, 3d Ward.

Samuel Somers, E. L. Abell, 4th Ward.

Orlando Clark, Capt. Asa Weldon, 5th Ward.

The new organization have determined to hold a grand Horticultural Exhibition and Festival sometime in June next, when the roses are in full flower, and the strawberries are in their prime, similar to the one that afforded such public gratification and entertainment several years ago.

The Society intend to hold weekly meetings, that all the benefits of each member's study, observation and experience upon particular branches of horticulture may become the possession of all.

The spring will soon loosen the fetters of the frost, and the lover of beautiful homes will desire to know "What grapes do the best? and how shall they be managed? What pears are hardy, and what varieties have succeeded best? What kinds of apples

shall we plant, that we may have bearing orchards? What are the most profitable varieties of cherries, raspberries, strawberries? What are the best climbing roses, June roses, Hybrid Perpetuals, Bourbons and Norsette roses? What twelve dahlias are the freest and most perfect bloomers? What twelve annuals afford the best and most constant bloom? What perennials are most desirable? What shall we plant to transplant?"

All persons who love fruit and flowers, young and old, are invited to be present. The ladies, especially, who take so much delight in having home and its surroundings attractive and beautiful, are invited to lend the inspiration of their presence and approval to a pursuit that embodies as much of taste, culture and refinement as any other branch of the fine arts. The right kind of spirit, energy and enthusiasm is manifested in the reorganization of the Society. Now let every member work with a strong will and muscle, and let us all crown the memory of the summer of 1870 with the finest floral exhibition that Rockford ever saw.

K.

WARSAW HORTICULTURAL SOCIETY.

OFFICERS FOR 1869.

PRESIDENT—Asaph C. Hammond.

VICE PRESIDENT—Charles C. Hoppe.

SECRETARY AND TREASURER—Thomas Gregg.

OFFICE OF SECRETARY, Hamilton, Ill., January 15, 1870.

O. B. GALUSHA, ESQ., *Secretary Ill. State Horticultural Society*:

DEAR SIR: I proceed to make my Annual Report of the proceedings of this Society. I do so under a sense of discouragement at the little positive progress that seems to have been made in the four years during which the Society has had an existence. We, in common with other horticulturists, have theorized and discussed, have read and re-read, have practiced and experimented, and yet it would seem that but little actual, positive knowledge has been acquired. To-day there seems to be as many open questions in horticulture, or nearly so, as at any time within the past four years. Doubt seems to hang upon every question—many of them the most important ones that can engage our attention. I will not undertake here to inquire into the reason of this, but leave its discussion to minds of deeper penetration than mine.

And yet, it will not do to say that no progress has been made. If we are not progressing—if we are all at a stand-still—not reaching any higher mark in the scale of horticultural improvement, then we had better cease our efforts. Our time, our money, our energies, will have been thrown away. There is positive improvement, in this one thing at least. We are daily learning to know and to realize that theory is nothing—that patient, careful investigation is everything; that speculation is folly; that demonstration is wisdom.

Our associations are slowly doing their work. They are directing the public mind to the subject of horticulture. They are creating a spirit of inquiry among the

people, that must be productive of good results. And, above all, they are educating the people to a knowledge, that to adorn and beautify our homes—to plant orchards and eat the fruit thereof; to cultivate gardens and vineyards, and enjoy the rich health-giving blessings they yield, is not only life and happiness, but religion too.

At the December meeting, 1868, President Hammond delivered his Annual Address on

THE YEAR AND ITS LESSONS.

“The Year and its Lessons” has been assigned me by this society as the subject of an address to-day. Let us, therefore, very briefly consider the successes and failures that have occurred during the year now so nearly numbered with the past, as well as the useful lessons they teach us.

The Spring opened with great promise of an abundant fruit crop. Trees of all kinds being well supplied with fruit buds, which were generally in a healthy condition; but the warm weather of March brought them forward too rapidly; and when, on the fourth of April, the mercury sank twelve degrees below the freezing point, almost the entire crop of apples pears and cherries, was destroyed, and all the small fruits seriously injured—leaving only the grapes and peaches—and even these did not entirely escape.

Our insect enemies have also come upon us like the plagues of Egypt. First the Locusts seriously injured our fruit trees in some localities. Next the Grasshoppers stripped many of them of their foliage. Then a worm (which Mr. Walsh says he has never seen before,) made its appearance upon the leaves of young orchards and nursery trees, and about finished the work of defoliation. The Curculio has not only destroyed the entire crop of plums in this vicinity, but has this season for the first time, attacked our peaches and cherries. The birds have also been very numerous, appropriating most of the cherries, berries, and early apples that survived the frost, and in some instances, destroying almost the entire product of a vineyard in a few days.

Truly a chapter of disasters! but shall we yield to discouragements and abandon our business, because diseases, insects and birds increase? The man who would become a fruit-grower, and has not sufficient energy to boldly meet and finally overcome, all these obstacles, has mistaken his calling, and had better turn his attention to some other pursuit.

He who would succeed as a horticulturist, must be in love with his profession; he must adopt it as his business, and identify it with his life. He must be a close observer; possess an indomitable will and a large amount of patience and perseverance. He must be a man who has learned to labor and to wait. Not to labor for a season;—to plant an orchard or vineyard, and then sit down and wait with folded hands, expecting without further effort, to gain Pomona's fairest treasures. But to labor constantly and earnestly, in season and out of season, firmly believing that the reward will surely come. He should also understand something of the nature of the soil, its relations and conditions; something of Geology, Entomology, Agricultural Chemistry, and Vegetable Physiology. In a word,—something of the science of Horticulture.

In the present age science is called to the aid of every profession and made to do the bidding of man. Commerce once crept cautiously along the shore, or navigated the inland seas. Science gave her the compass and taught her to spread her wings and sail from shore to shore. Ere long she brought to her aid the mysterious power of fire and water, and now she defies the mighty force of wind and wave, and goes boldly forth to every sea and every clime, to civilize and enrich the earth. Great has been her triumph on the sea, but greater on the land. The locomotive flies along the shore faster than the ship across the deep; and now the echo of its shrill whistle and the clatter of its iron hoofs, are heard not only amid the haunts of civilized men, but on the mystical plains of the great American desert, and amid the solitude of the Rocky Mountains.

Though science has done so much for the commercial world, how little, comparatively, has it done for the farmer or horticulturist? True, it has given us much valuable machinery, and taught us the importance of a better system of culture. But how little do we know of the mysterious chemical influences that are ever at work in the great laboratory of nature to produce the luscious fruits we pluck and eat with so little thought; or of the peculiar structure of the trees and plants with which we daily come in contact; or the subtle influence of the soil on their growth and development.

Who has yet discovered a sure preventive for the pear blight or peach and grape rot? Or a way to circumvent the hosts of insects that prey upon our fruits? or prevent the depredations of those sweet singers of the grove, who sing to us their morning song, and delight us with their beautiful presence as they flit from tree to tree, and then in perfect wantonness destroy great quantities of our choicest fruit? Surely, we have many important lessons yet to learn.

It is a very prevalent idea that it is the easiest thing in the world to manage a farm or fruit plantation; while it really requires more brains to become a first-class farmer or horticulturist than to

become a successful merchant, banker, or artizan. An ignorant, blundering man, may occasionally produce a crop of corn or wheat; but in these days of innumerable insects and diseases, he cannot succeed in profitable fruit-growing. I venture the assertion, that the day is not far distant when, from these causes, the entire business will have to be given up to the professional horticulturist.

Perhaps a word in regard to the profits of fruit-culture may not be out of place at this time. Will it pay? is a question often put to the practical fruit-grower. Can I enjoy the poetry and pleasure the business affords, and at the same time make it pecuniarily profitable? We answer, Yes. Still, it is our duty to warn the novice of the difficulties he may expect to encounter, for, in common with other avocations, it has its perplexities. A few years ago a grape mania swept over the country, and hundreds of vineyards were planted in our own county. What is the result? Some were planted on un-congenial soil; others with tender or unhealthy varieties, while others have suffered from mismanagement, so that all have not proved a success; yet most of them are yielding their owners a fair profit.

A year or two later everybody was planting pears, and many of our fruit-growers predicted that the market would soon be glutted, and prices ruinously low. But we have seen that three-fourths of the trees planted have failed entirely, and one-half of the remaining fourth are in an unhealthy condition. In view of these facts, is pear culture profitable? Most certainly, to those that possess the requisite skill to make it a success.

Our commercial orchards are also very rapidly increasing, and now occupy thousands of acres in Hancock county. Will they all prove remunerative? We think not; because many of them are planted with unproductive varieties, and others will suffer from neglect and bad management. But with the constantly increasing demand for fruit, we have no reason to suppose that those that are in the hands of skillful cultivators will not prove profitable.

With peaches, plums, cherries, and all the small fruits, the majority will fail disastrously, while the few will make it enormously profitable.

A large majority of those who engage in the business of fruit-growing do so with more enthusiasm than wisdom. They do not stop to consider what varieties or species are adapted to their soil or location; but plant largely of whatever they know or suppose to be of good quality, or that some friend may happen to recommend, without any regard to vigor, hardiness, or bearing qualities.

No one would expect to succeed in any other business under similar management. Then why should they expect to be successful in fruit-growing? I believe it to be just as safe as any other business; but those who engage in it expecting to reap a golden harvest without an earnest persistent effort, will be sadly disappointed.

How shall we perpetuate our Society and add to its influence and increase its usefulness? are questions that should at this time come before us for consideration. First, the members should be prompt in their attendance at its monthly meetings, and be willing at all times to perform every duty required of them—such as preparing essays and reports, and bringing to our meetings such specimens of fruits, flowers, wines, and vegetables as may be worthy of notice.

It would also add much to the interest of our meetings if the attendance and co-operation of the ladies could be secured. As there is a strong probability that they will soon be admitted to all the privileges of the Industrial University, we need have no fears of being in advance of public sentiment if we invite them to be co-workers with us. Horticulture is a legitimate employment for women. Her superior skill and correct taste are needed in the more delicate parts of fruit and plant culture, while in the floral department, she must ever be the presiding genius.

The holding of a fruit and floral festival sometime during the year would, perhaps, be the means of creating an interest in our Society; and at the proper time I think it would be advisable to take the matter in serious consideration.

I think we can, as a society, safely say that we have accomplished something; yet a work of great magnitude is before us. Nowhere on the face of the earth has nature done so much to aid in beautifying and adorning as on the prairies of the West, yet, as has often been remarked, nowhere has she left so much for man to do in this direction. How apparent, then, the necessity for the work we are attempting to accomplish. And if we fully discharge our duty, and properly use the guiding power intrusted to us, the homes of our people will ere long be surrounded with trees and flowers, and sheltered with evergreens, and our prairies dotted with orchards and vineyards, groves and belts of trees, and our country become beautiful beyond comparison, and fruitful as the fabled orchard of Hesperides.

FEBRUARY MEETING.

On motion, the members were severally called upon for Lists of Apples, as required by resolution passed at last meeting, when reports were made as follows, some verbally and some in writing, viz:

B. G. GROVER'S LIST.

Best in orchard of several hundred trees on the high bluff, south of and opposite Keokuk—

Summer—Early Harvest, Red June, American Summer Pearmain.

Fall—Maiden's Blush, Red Milan, Rambo.

Winter—Rawle's Janet, Winesap, Green Winter Pippin, and Paradise Winter Sweet—10 in all.

GEORGE B. WORTHEN'S LIST.

For an orchard of 100 trees, I would plant about in the following proportion, viz: Early Harvest, 5; American Summer Pearmain, 5; Keswick Codling, 5; Rambo, 10; Rawles' Janet, 20; Ladies' Sweeting, 10; Little Romanite, 10; Ben Davis, 10; Winesap, 20; White Belleflower, 5. Total, 100.

Mr. Worthen's place, "Golden Bluff Vineyards," is situated two miles below Warsaw, and about one mile from the Mississippi river.

C. F. DARNELL'S LIST.

Summer—5 Early Harvest, 3 Red June, 3 Red Astrachan.

Fall—5 Rambo, 4 Detroit Red or Maiden's Blush.

Winter—35 Ben Davis, 20 Winesap, 10 American Golden Russet, 10 Rome Beauty, 10 Jonathan, 10 Domine, and 5 Grimes' Golden Pippin—100.

Mr. Darnell's place is at Riverside, in Monte Bello township, immediately overlooking the river; and, although a beginner, he has been a close observer of the orchards in the neighborhood.

J. F. SPITZE'S LIST.

Mr. Spitze stated that in making out his list of varieties, he availed himself of the advice of John Peyton, Esq., an experienced fruit-grower in Wilcox township.

Red June, Early Harvest, Maiden's Blush, Rambo, Red Pippin, (Ben Davis), Winesap, Rawles' Janet, Rome Beauty, Red Belleflower, Red Winter Sweet.

HENRY CROUSE'S LIST.

Mr. Crouse's location is at Goldens Point, in Sonora township; and though only a few years in this county, has devoted his attention entirely to the propagation and planting of fruits.

Ben Davis, Rambo, Grimes' Golden Pippin, Red Astrachan, Red June Maiden's Blush, Jonathan, Willow Twig.

SECRETARY'S LIST.

For making money, believe the Ben Davis is *the* apple; but for market and for home use, would want to plant about 100 as follows: 15 varieties, viz:

Summer—4 sorts—Red June, 10; Early Harvest, 4; Red Astrachan, 3; Sweet June, 3.—20.

Fall—3 sorts—Fall Wine, 4; Rambo, 3; Maiden's Blush, 3.—10.

Winter—8 Sorts—Ben Davis, 40; Winesap, 10; Rawles' Janet, 10; Jonathan, 3; Willow Twig, 2; Westfield Seek-no-Further, 2; Danver's Winter Sweet, 2; Ladies' Sweeting, 1.—70.

For an orchard not convenient to a good market, a less proportion of summer sorts would be advisable; but good early apples near a market will be found generally profitable.

Dr. CHARLES HAY read an interesting report in regard to the vineyard of Mr. GABRIEL MARLOT, in Bear Creek township—written in his native French, and translated for the Society by Col. JOHN HAY.

REPORT OF MR. MARLOT.

My vineyard is situated twelve miles East of Warsaw, and at the same distance from Keokuk, Iowa. Bear Creek flows at its feet. It stands upon a hillside, sloping gently to the South. The soil is composed of alluvium, of ferruginous deposits, of sandy clay and gravel. The subsoil is of clay.

At the time of planting, a part of this land was in timber and the rest in cultivation. I have planted successively for 8 years upon this slope, where the air circulated freely, about fifteen acres of vines, comprising at least 30 varieties, several of which were planted merely as experiments.

The principal varieties in Concord, Clinton, Catawba, Norton's Virginia, Delaware, Diana, Herbe-mont, Ives' Seedling, Iona, etc. Ten acres were planted in trenches running down the slope, from North to South. Five acres broken with the plough and planted in the same direction. The vines are trimmed in the same proportion to trellises and stakes.

I have only covered a few delicate varieties for the two last winters. Several varieties, which have been thus tested, have not suffered by exposure. My last vintage produced 2,040 gallons of wine. These are the methods which I employed in producing the three specimens of wine which I presented in January last to the Committee of Agriculture:

VINIFICATION OF RED WINES.

Sound and ripe grapes should be gathered in fair weathers, and after the dew is off; they should be examined with care before being crushed: the green, dry, or spoiled berries should be separated. The berries should not be stemmed, the grapes, crushed by hand, should be gradually thrown into the vat so as to fill it, the same day of the vintage. My fermenting vats are of oak, and of ordinary form. I place them as far as possible protected from wind, from cold and heat. The generally favorable temperature of our autumns in this region, ordinarily sets the must promptly in fermentation, without necessitating those auxiliaries which are indispensable in Europe. The only care I have taken for, and during the fermentation, has been to cover the vats with a woolen cloth. In case of a sudden lowering of the temperature, fermentation should be aided by a current of steam, obtained by a distilling boiler, or by warming a portion of the must. If the fermentation should, on the contrary, become too violent, it would be necessary to bring it back to a normal state by application of ice or cold water.

The fermentation in the vat is the most important operation of vinification. It is that which decides as to the quality of the wine. The vat should be of oak, which contains a small quantity of tannin—a natural element of wine. The vat should have the form of a truncated cone, so as to concentrate the alcoholic set free by the must. It should not be entirely full. A space of ten or twelve inches remains free in the upper portion. It is destined for the expansion of the ferment, and also for the condensation of carbonic acid heavier than air, and which forms therefore a layer of gas, partially intercepting the evaporation of the alcoholic vapor, and thus prevent the must from losing that which gives strength and richness to the wine. I let my wine remain in the open vat, as is customary for the fine wines of Burgundy and Medoc. The closed cask has also its partisans for the commoner wines. It has of late years gained over the majority of wine-makers in France. It is

altogether used for wines of distillation. Improved apparatus for this object—presses, crushers and stemmers—were properly appreciated at the late Paris exposition of 1867. I have designs of them in my hands.

The object of the crushing is to tear the pulp of the berries, and to so mix up the parts composing them, as to submit them all to a uniform action of fermentation. Repeated pressure augments the richness of coloring of the wine. It has also the effect of preserving in the best condition the scum or net work to which adhere all the solid particles expelled by fermentation from the must. I have therefore re-pressed the must three times a day, as soon as sufficient fermentation has been produced to saturate to solid scum, by covering it with liquid. I have renewed this operation for four or five days by means of a wooden rod, armed at the extremity with transverse teeth. I have ceased the pressure when the tumultuous fermentation was over. The duration of the fermentation varies according to temperature and circumstances. I have avoided pressing the wine twelve hours before drawing it off, so as to preserve its clearness. The wine is next deposited in the cellar, in large casks, where it continues the second fermentation. The bung is placed lightly over the opening so as to let the gas escape during the last fermentation—when this is finished the head of the casks are hermetically sealed. I kept separate the wine derived by pressing, as of inferior quality.

Red wines should remain upon the lees up to February or March. The firmness of the wine, certain elements and aromas which are only slowly derived from the lees, render this necessary. Do not neglect to fill often, during the winter following the vintage, the space left in the casks by latent fermentation and evaporation. Draw off in cold weather before the heat of summer. The wine may be used a fortnight after drawing off. It would, however, be better to wait for several years, and draw off once before drinking or bottling the wine.

For red wine, the grape should be gathered neither too green nor too ripe. Overripe grapes contain too much sugar; consequently produce too much alcohol, and too much alcohol destroys the bouquet. Excess of alcohol endangers also the preservation of the wine.

The Concord wine was made without mixture of other sorts. My Clinton I treated differently, adding about a fifth of Norton, Delaware, Diana, and Herbenont grapes. These grapes fermented at the same time and in the same vat. My intention in mixing these varieties was to give to the whole color, softness, aroma, and vigor. This is done in Burgundy, especially in Clos-bouquet.

WHITE WINE.

The white wine which I made in 1867 was treated as follows: The same care was used in the selection of the grapes, but they were pressed and placed in the cask the very day of the gathering. The vinous fermentation, instead of taking place in the vat, was produced in the cask. I drew the wine off when the active fermentation had been quieted, and repeated the operation twice during the winter. The perfect transparency of white wine, its delicacy and vigor, required for the reunion of these essential qualities not only that it should not remain upon the lees, but also that it should be freed from that yellowish and muddy froth which escapes by the bung. To obtain this result, take care to fill the cask gradually as the froth escapes—brought to the surface by the action of gases and fermentation. For white wine the grape should be suffered to ripen fully.

In closing, I must say one word in regard to the abuse of sugar, alcohol and water. This deplorable abuse seems, unfortunately, to be becoming general in the manufacture of wine in this country. The addition of sugar and alcohol is only to be advocated as a palliative in bad years, when the grapes have not ripened. It is not inopportune to refer to the condemnation of those mixtures by science and experience in a country where viticulture, still in its infancy, as yet hardly permitted more than gropings. These first efforts have not been barren; they have fully demonstrated that the vine generally succeeds in the United States, and that it promises a success equal to that obtained elsewhere in similar conditions. Confiding in these first fruits, let us plant vines—let us make wine! That it may be healthful and salutary, make it pure. Let us prefer quality to quantity.

Only on this condition can our wines rise from their inferiority, and accept comparisons and competition with foreign brands. It is, therefore, outside of our private interest, a question of national interest, which we have to solve. It is worthy of our most earnest efforts.

JULY MEETING.

This meeting was held at the residence of Mr. Louis Stracke, in Warsaw.

The chief object of attention was Mr. Stracke's grounds. His place consists of 10 acres—the well known former residence of Col. J. G. Fonda. The mansion is admirably situated in a natural grove, chiefly of oak, of a very regular and handsome

growth. One-fourth, perhaps, of the land is occupied by the house, lawn and grove, and a small orchard and vineyard, planted by the former proprietor.

The whole of this tract of 10 acres is underdrained with tile, from the manufactory at Whitehall, Illinois. The depth of the drain is four feet, distance apart an average of 40 feet; size of pipe two inches for the minor drains, three inches for the main one.

The heavy rains of Sunday had so filled the soil with water, that the main drain was discharging at the rate of probably three or four gallons per minute, while the surface had been dry enough to work ever since Tuesday morning. Similar land, not underdrained, would not have been as fit for the plow in less than a week.

One portion of this tract is planted with a pear orchard of 1300 trees—standard and dwarf, obtained from Elwanger & Barry, Rochester, N. Y., spring of 1867. The distance is 10 feet each way, in squares, every other tree in each alternate row being a standard, thus throwing the standards 20 feet apart. Mr. Stracke thinks that if, in time, the dwarfs should fail, the standards will be at a proper distance to occupy the ground.

The varieties are well selected, being as follows:

Bartletts, 225; B. d'Anjou, 125; Belle Luerative, 130; Buffum, 75; Howell, 50; Seckels, 95; Duchesse, 100; Bon de Jersey, 130; Flemish Beauty, 50; and some eight or ten other sorts.

This pear orchard seems to be quite a pet with its proprietor, and receives from him considerable care and attention; and well it may. We seldom see so fine a prospect for a healthy and productive pear orchard. Every tree is kept properly pinched back, and its branches trained to the requisite shape.

Mr. Stracke's grapes are young, planted one year ago last fall. They number 2400 vines, divided as follows: Delawares, 1000; Ionas, 750; Ives' Seedling, 350; the remainder principally Concords and Norton's Virginia. The Ives presented the most healthy appearance, the growth being fine, and the foliage remarkably healthy and green. The Ionas and Delawares had made good growth, but the foliage did not look so well, that of the latter showing considerable mildew.

This vineyard, besides the underdraining previously mentioned, was trenched with the spade all over to the depth of two feet, at a cost of near \$200 per acre.

Returning to the house, some discussion was had on Mr. Stracke's mode of culture.

Dr. Warner inquired—I wish to ascertain Mr. Stracke's reason for pinching the pear trees as he does.

Mr. Stracke—I do it for several reasons. First, to induce fruit-bearing; second, to improve the shape of the tree; third, to harden and mature the wood; and fourth, to prevent blight!

Members generally concur in the opinion that pinching back is a good preventive of blight; and it was suggested that to the good drainage of the land, the remarkable freedom of these trees from blight and all other diseases, is in a great degree to be attributed.

[Queries by the Secretary—Is it desirable to stimulate fruit-bearing in trees yet so young? and is it not too early in the season (last of July) to pinch for hardening and ripening the wood?]

All members present concurred in saying that Mr. Stracke's grapes are very superior and of better growth than others of the same age and varieties in the neighborhood.

AUGUST MEETING.

The meeting for August was held by agreement at the residence of Ezekiel McCune, in Wythe township. Mr. McCune is proprietor of the farm and orchard formerly owned by Dr. Griswold—an orchard once numbering in all 2400 apple trees, now reduced to about 1700.

Many of these trees are large, being more than a foot in diameter; one we measured being full 42 inches in circumference. We take it that this large orchard has been somewhat neglected of late years; though, from the quantity of brush-wood over the ground, would judge that there has been a good deal of trimming done this season.

A few of these trees are old, for this country, being 22 or 23 years old. There were 200 in the year 1848; in 1849 there were 1200 more planted; in 1850, 500; in 1851, 200; and in 1855, 300 more. Probably not more than two-thirds of the trees are bearing this year, while perhaps 500 trees have an average of five bushels each—a small yield for so great an orchard.

We did not have an opportunity to post ourselves as to the best bearers, since it came into the hands of the present owner; but Dr. Griswold named the following as having given the best results up to 1862, viz: Winesaps, Rawles' Janets, Yellow Belleflowers, Ortleys, (White Belleflowers) Fall Wines, Rambos, Fulton Strawberries, Early Harvests, and Red Junes—the Winesaps much more productive than most others. The orchard contains—or did at one time—about 50 varieties; but the following largely predominate, viz:

Of summer sorts, Early Harvest, Red June, and Early Sweet Bough.

Autumn—Fall Wine, Rambo, Porter, Fulton Strawberry.

Winter—Winesap, Rawles' Janet, Ortley, Yellow Belleflower, Esopus Spitzenburg, Newtown Spitzenburg, Pryor's Red, Ladies' Sweeting, Baldwin, Belmont, Newtown Pippin.

In 1862 we published a statement concerning this orchard, from which the following paragraph is extracted:

“Some peculiarities of culture may be mentioned here. About half the orchard was well cultivated for four or five years after planting, and then sown down to grass, principally timothy. The other half was cultivated for nine or ten years, and is now also put to timothy and clover. Those trees which were first put down to grass have generally done the best—have grown as well, look as thrifty and healthy, are as free from pests of all kinds, and have borne better than those which were cultivated longer. This seems to be contrary to theory and the teachings of the books; and we leave to others the task of reconciling theory with practice in the present instance.”

Want of time prevented us from taking as full notes of this orchard as we desired.

Returning from the orchard, President Hammond took the chair, and called the meeting to order. The Chair presented a specimen of the body of an apple tree, which had died from an unknown disease, and asked the opinion of members. The disease seems to be in the bark, which turns dry and black in different sections, and is fatal to the tree.

Dr. Hay said he had not observed it in his orchard, or those of Messrs. Grover, on the bluff.

Mr. Darnell—Had observed it at Riverside; it is found mostly among the Rawles' Janets, but some others are affected.

Other members had noticed it in a few instances; but no one knew its cause or could suggest a remedy.

THE LESSON OF THE SEASON.

[Essay read before the Warsaw Horticultural Society, August 24, 1869.]

Every season may be said to teach a new lesson to the cultivator of the soil—fruit-grower as well as farmer. Let us consider what is the lesson taught by the season of 1839; and, first, in what way has it been remarkable? Throughout the West it has been one of the wettest ever known. Rain—rain, from early spring to midsummer, with but short intermission, has been the rule, until the soil has been soaked full, and surface-washed to a degree seldom known before. It is needless to say that cultivation and the proper care of crops has been simply impossible. If crops have grown at all, in many cases it has been in conflict with weeds which could not be destroyed.

Then what is the lesson taught us by this experience? It is written so that those who run may read—**DRAINAGE**.

I think no one will differ with me in this statement. It is a thing which we partially realized before, but which the year 1839 has doubly demonstrated. I will briefly allude to a few of the reasons for drainage.

1. It renders the subsoil porous, and allows the water to pass through it, leaving it in a tillable condition long before lands undrained can be tilled at all.

2. It presents to a large degree all surface washings.

3. It prevents baking and hardening on exposure to sun after rains.

Other valid reasons might be given, but these will suffice. To the question, What lands need underdraining? I would reply, all, or nearly so; boggy soils need it to be rendered tillable at all. Flat lands need it, in order that the superabundant water may pass off. Our bluff limestone lands need it to give mellowness and moisture, and to prevent wasting away. I conceive of no soil that would not be benefited by draining except those sandy or gravelly subsoils sometimes found in our river bottoms.

What would be called good drainage may vary as to the character of the soil. Some requires more, some less. Our bluff lands in Hancock county can scarcely be drained too much; our flat prairie farms will not soon be drained half enough.

I have thus briefly hinted at what I conceive to be the lesson of 1839. I will add, that I believe a dry season will teach the same lesson. Drainage is a panacea for excessive moisture; draining is a panacea for drought. Complete and sufficient drainage will doubtless double the crops of many farmers in Hancock county.

But the cost. Aye, there's the rub! It is a formidable item, whether we contemplate using tile and doing the work in the most thorough manner, or whether we only design to cut ditches. One thing is certain, it is in the power of every one to begin. The owner of a flat prairie farm can this year open a ditch through it; next year he can do more. The owner of a village acre can lay one drain through it, next year add another, and so on. I shall inform myself about cost, and give result.

SEPTEMBER 20, 1869.

The *Ad Interim* Committee of the Illinois State Horticultural Society, consisting of Dr. Hull, of Alton; Samuel Edwards, of Lamoille, Bureau county; and Mr. Cochran, of Cook county, made a visit to Warsaw to-day.

President Hammond and other members took them in charge, on a tour of inspection and observation to the orchards of Mr. Hammond, Ezekiel McCune, and others, and the vineyards about the city. In the evening, by agreement, they met most of our members at the residence of Dr. Hay, in town. President Hammond called the meeting to order, and stated that the meeting was gotten up for the purpose of having a talk from our distinguished visitors of the committee.

Mr. Cochran responded in a somewhat discouraging account of the prospects of fruit culture in the several sections of the State and in Missouri, which they have visited. He thinks that in view of the increase of the insect tribes, and the diseases

incident to the fruit trees, the business of fruit-growing will in future be attended with increased difficulties. Yet he would not give up, but rather urged renewed activity in fighting the enemies, and renewed zeal in our investigations.

He was followed by Mr. Edwards, who gave an interesting discourse on Evergreens. Mr. E. is the propagator of perhaps the most extensive evergreen nurseries in the State, and seems to be quite at home in discussing them. He urged their planting largely for belts and screens, and protection to orchards, as well as for shade and ornament. He gave an interesting account of the habits and characteristics of the several varieties.

Dr. Hull closed with an account of the structure and growth of the plant, the nature and character of the several diseases, the uses of root and top pruning, the cause and prevention of pear blight, the value of draining, etc., etc. The doctor's remarks were listened to with marked attention, and many inquiries made for the explanation, by our members. Some of his theories are new, and some will doubtless be freely criticized; but he is an earnest and pains-taking investigator of long experience, and has not arrived at his conclusion without a close and critical examination of the subject.

After a hearty vote of thanks to the members of the committee for their presence among us, and the happy manner in which they had entertained us in their discourses, the meeting adjourned.

On Tuesday the committee visited several other places in the vicinity, and then left for Quincy.

OCTOBER MEETING.

NEW APPLE—THE MONTE BELLO.

President Hammond brought to the notice of the Society, and presented specimens of a seedling apple from the orchard of Dr. Ero Chandler. It is a most magnificent red apple, of highest quality, and is certainly a great acquisition. The following is its

HISTORY.

Planted from seed on the place of Mathew Gray, Esq., at Riverside, in Monte Bello township, and hence named the "Monte Bello Seedling." This was in 1833. It lived about 20 years, and was then destroyed, being on the line of the Warsaw and Rockford railroad. A few trees had been propagated from it previously; but up to the date of this meeting, that in the orchard of Dr. Chandler, and two others on the place of John Wright, Esq., in Monte Bello, are all that are known to exist.

DESCRIPTION.

Tree rather upright, moderately vigorous and healthy, very hardy, early, and constant bearer, and very productive; shoots grayish brown, leaves medium.

Fruit large, oblate, very handsome; surface smooth; color yellow-striped and splashed with deep red, with which it is almost completely covered; dots large and scattering. Basin wide, regular or wavy; eye medium, closed; cavity wide, regular, brown; stem short and slender; core medium, regular, meeting the eye; seeds small, pointed. Flesh white, tender, fine grained, delicate, juicy; red streaks from the core

towards the surface. Flavor mild, sub-acid, sprightly, vinous. Quality very best. Season, September to December.

President Hammond then read an Essay on "Varieties of Grapes and Apples," which, on motion of the Secretary, was ordered published with the proceedings.

VARIETIES OF GRAPES AND APPLES.

[An Essay read before the Warsaw Horticultural Society, at the Oct. meeting. By A. C. Hammond.]

It perhaps appears to some of you, that, as a Society, we have gained a position, where the discussion of varieties is no longer necessary. But as many of our old varieties, hitherto considered reliable, are apparently failing and as some of our vineyards are to be replanted, it may perhaps be profitable to enter upon the discussion of the subject to-day. And in attempting to comply with your request, to prepare a paper on the subject, I shall ignore the long lists that appear on Nurserymen's Catalogues, and only speak of those most generally known.

GRAPES.

Catawba.—This grape has been more extensively planted in this county than any other variety, and until the last three years has been considered reliable. But during that time it has suffered so severely from rot, mildew, and frost, that some of our vine growers are preparing to replant their vineyard with other varieties.

Isabella—Is now seldom planted by any one. It is almost as tender as the Catawba, subject to the same diseases, and greatly inferior in quality.

Concord—Possesses more of the requisites of a popular grape than any other variety now growing, being extremely vigorous, and healthy in both leaf and fruit, and remarkably productive. As it will adapt itself to almost any soil and location, and flourish, under any treatment, and is of large size, attractive appearance, and fair quality, it may be said to be pre-eminently the grape for the million. In my own vineyard it has this season, where planted close, suffered severely from rot. But where planted wide and trained in such a manner as to permit the air to circulate freely, it has been almost exempt.

Clinton—Is also a grape of great hardiness and vigor, and will bear abuse as well as the Concord. It is such a rampant grower that it is difficult to keep within bounds, unless planted on poor soil. It begins to color about the middle of August, and is often gathered by the inexperienced, who suppose it to be ripe. By this means it has gained the reputation of being of poor quality. But if allowed to remain on the vines until fully ripe, which will be from the first to the middle of October, they will be found superior to many of the new and much lauded varieties. As a wine grape it is rapidly growing in favor with our vinegrowers.

Creveling—Is one of the most promising of the new varieties. It was the first grape to ripen on my grounds the present season. The bunches are very large and make a fine appearance. It is superior in quality to the Hartford and will become a more popular market grape.

Hartford—Is grown, in some localities, quite extensively for market. Its only recommendations are its earliness and productiveness, being scarcely possible in quality. It will be superseded by better sorts.

Ives' Seedling—Is a grape of great vigor and productiveness, and generally supposed to be one of the most healthy; but it has, the present season, shown as much rot as the Concord, to which it is greatly inferior in quality. It can never be profitably grown for market.

Delaware—Is generally considered the most delicate of all our native grapes. While young, the vine is a slow grower, and rather tender, but as it grows old it becomes a good grower and quite hardy. It is the only variety in my vineyard this season that is entirely exempt from rot. It is a grape that suits almost every one, and is much sought for in market. The only drawback to its successful cultivation, is the liability of the leaves to mildew, which often prevents its ripening.

Norton's Virginia—Is not considered profitable, as it requires careful winter protection, and is not very productive. Iona, Anna, Maxatawney, Rebecca, and some of Rogers' Hybrids, are valuable for the amateur, but cannot be profitably grown in the vineyard.

APPLES.

The question of varieties is perhaps more difficult to decide in regard to apples than any other fruit. A year or two ago we supposed it definitely settled, but the experience of the present year has, in many instances, reversed that of former seasons; some of our most reliable varieties failing, and others that have been generally discarded, producing abundantly. Out of more than a hundred varieties on my own grounds, there is scarcely a dozen that I would plant in a commercial orchard. We have not a single early apple that has proved entirely satisfactory.

Red June—Has been more largely planted than any other early apple; but it has been scabbed so badly of late years as to make it almost worthless.

Early Harvest—Unproductive while young, and subject to the same objection as the Red June.

Benoni—An apple of the best quality. In my orchard it has done well, bearing moderate annual crops. I think it will prove valuable.

Early Pennock—Is a large showy apple, and considered profitable market variety. I have not fruited it.

Sops of Wine—There is much confusion concerning this apple, if we have it true, it is very inferior in quality. The tree is a rapid grower and good bearer, the fruit large and showy, and sells well.

Red Astrachan—A hardy rapid growing tree—the fruit being large and of a brilliant red color, always finds a ready market. Root grafted trees do not bear until they are twelve or fifteen years old; top grafted trees bear much earlier.

Maiden Blush—Is only fall apple that has been found profitable. At this season of the year the market is well supplied with peaches, pears, and grapes, and apples are but little sought for.

Rambo—Is one of the most profitable early winter apples that we have. If gathered early, say about the middle of September, it will keep and retain its flavor until February. The tree is too upright a grower, and not quite hardy.

Yellow Bellefleur—This is one of the most unsatisfactory apples for the cultivator in the whole list, and more sought for in market than any other. It succeeds best top-grafted on a slow growing stock. I would plant sparingly of it.

Hubbardson's Nonsuch—An annual bearer of large showy fruit. It should be gathered early, Ripens with the Rambo.

Peck's Pleasant—One of the very best apples. The tree is a vigorous grower and a moderate annual bearer. It is worthy of more general cultivation.

Red Canada—There is much confusion respecting this variety among our orchardists. It was first introduced under the name of Newton Spitzenberg, and is yet often sold under that name. After the tree attains the age of about fifteen years it is very productive. It has this season produced more satisfactorily than any other variety.

Winesap—Has heretofore been considered one of our most reliable market varieties, but has this season scabbed so badly as to make it worthless for market purposes. It has, however, too many good qualities to be given up for any temporary cause.

Rawle's Janet—A few years ago this was the most popular Western variety, but it now appears to be falling into disrepute. It bears so heavily every other year that the fruit is of but little value, and alternate years produces nothing. It will hereafter find few planters.

Ben Davis—This variety possesses all the requisites of a popular apple but one—that of quality. But as long as our city friends prefer beauty to quality (the brilliant red of the Ben Davis to the homely russet of the Pryor's Red, and Westfield Seek-no-further), we should grow this apple for them. I have made more money from it than any other variety.

Willow Twig—This is an apple that has been too much neglected by the commercial orchardist. It is a good bearer, long keeper, and valuable for shipping a long distance. Quality a little better than Ben Davis, but not so popular in market on account of its unattractive appearance.

Pryor's Red—Is a shy bearer while young, but as it grows older it bears satisfactorily. It is a fine fruit and should be more largely planted.

Grimes' Golden—I have not yet fruited this variety, but I am favorably impressed with the appearance and growth of the tree, and the specimens of fruit I have seen: it is probably the coming apple.

The **Rome Beauty**, **White Winter Pearmain**, **White Bellefleur**, and **Newton Pippin**, have scabbed so badly this season that they are scarcely worth gathering for cider.

The **Summer Rose**, **Golden Sweet**, **American Summer Pearmain**, **Fall Pippin**, **Fall Wine**, **Bailey Sweet**, **King of Tompkins County**, **Jonathan**, **Westfield Seek-no-further**, **Wagner**, **Ladies' Choice**, **Esopus Spitzenberg**, and **Golden Russet**, are all valuable for the small cultivator, but I would plant none of them for market.

Taking the experience of the past fifteen years as a guide, for market I should plant about as follows:

GRAPES.—Concord, Clinton, Creveling, and, perhaps sparingly, of Ives, Delaware, and Norton's Virginia.

APPLES.—Red Astrachan, Sops of Wine, Maiden's Blush, Rambo, Red Canada, Peck's Pleasant, Willow Twig, Winesap, Ben Davis, Pryor's Red, and Grimes' Golden.

Discussion being invited, Dr. Hay remarked that his ideas coincided generally with those expressed in the Essay—especially on grapes—with apples he did not profess to be so well posted. Thinks the Concord and Clinton are the grapes for this section: Delawares may be planted with a fair prospect of success.

Chittenden—Concord with me is fine, while Catawbas are doing badly.

Barnes—As to apples, with me the Rawles Janet is the most profitable so far; always a good cooker. The greatest objection to it is, it bears too full, and the fruit is apt to be small. If confined to one tree, I would choose the Jenetting.

Chittenden—My 26 year old trees of this variety are not doing well. When young they did better. I think they need very severe pruning.

Worthen—My experience is with two trees 18 years old. Have from them this year 45 bushels of fruit.

Darnell—The Janet bears well with me, but the fruit is too small. I would not plant it any more; but would plant such as would bring far more money, say Ben Davis, Winesap, Willow Twig, Domine, and others.

The Secretary claimed for the Ben Davis that it is far the most profitable apple to plant to make money; but believes it will some day be superseded by those of superior quality. Thinks the Janet is next profitable, if care be taken to prevent overbearing. Perfection is far from being reached yet; and while we seek diligently for better sorts, we should encourage the planting of those that will produce the best results now.

DECEMBER MEETING.

Mr. Hammond submitted and read a letter from Charles Downing, of Newburgh, N. Y., acknowledging the receipt of the Monte Bello seedling apple, in which he pronounces it "a first-class fruit." Also, one from Mark Miller, publisher of the *Pomologist*, at Des Moines, Iowa, highly praising the fruit, and asking for scions; also promising to make an engraving of it for his publication.

President Hammond read his annual address, which was ordered published with the proceedings.

ADDRESS.

Another year, with its vicissitudes and varied incidents, its realizations and disappointments, has passed, and we are permitted with unbroken ranks to inaugurate our fourth annual re-union. It is appropriate on these occasions for us to take a retrospective view of the operations of the year, compare our success and failures, and carefully ponder the result.

It has been the habit of many horticultural writers to loudly herald their successes, to tell of the wonderful crops of strawberries, grapes or pears they have grown, and the fabulous price they have obtained for them, but to carefully keep in the background their failures and disappointments. This course may at least be said to be of doubtful propriety, for by it the novice is often led astray; is made to erroneously believe that the paths of horticulture are paths of peace and lead to sure success. As the careful mariner often consults his chart, that he may avoid the shoals and hidden rocks on which others wrecked, so should the horticultural beginner be able to consult the record of our disappointments and losses, and thus be able to avoid the mistakes into which we have fallen. It is not pleasant to speak of our mistakes, therefore few horticulturists tell their own or know all their neighbors'. Yet there can be no failure without a cause. Therefore, if we have failed to realize our expectations—as we in common with other horticultural communities undoubtedly have—let us carefully search for the cause.

Perhaps one of the most common sources of disappointment is the great number of unprofitable varieties that crowd our orchards and vineyards. When our first planting was done we did not know by actual experience what varieties would be successful, and, therefore, made many mistakes. Again, some of us were led into error by the confusion of our nomenclature, often getting something very different from what we were seeking. To illustrate, I will cite an instance of this kind. In the commercial orchard planted by Dr. Griswold twenty years ago and now owned by Mr. E. McCune, are a number of trees which he received for (and supposed to be) Newtown Spitzenberg, but which are really Red Canada. These trees have proved to be very hardy and productive, annually producing good crops of handsome fruit of the best quality. The result has been that many who have seen them in bearing have planted largely of Newtown Spitzenberg. When these trees come into bearing their owners will find they have a variety that is entirely worthless. Probably one-half of the trees planted in commercial orchards in this county were of those varieties that may be called unprofitable. Nor are the conditions of our vineyards any more favorable.

Another mistake we have made (at least some of us), is in planting too largely, forgetting that the enemies of fruit-culture are increasing at an alarming rate, and that every tree and vine planted increases the conditions of failure. Twenty, forty or sixty acres of orchard or vineyard require such a constant oversight, and large amount of labor, that we are apt to neglect some important point either in cultivation, pruning, destroying insects or gathering fruit, and thus suffer loss. The time has been in the history of this Western country when we had but to plant the trees and gather the fruits, and we fondly hoped that this condition of affairs would always continue; but a change has come over the spirit of our dreams, and we are beginning to realize the fact that horticulture is rapidly assuming a new phase, and that hereafter eternal vigilance will be the price not only of liberty but of fruit. I am inclined to believe that if the same number of apple trees usually planted on forty acres (say sixteen hundred) were planted on ten acres, and the same amount of labor usually given to the forty applied to the ten in a judicious system of cultivation, and root and top-pruning, that the net proceeds would be the greatest from the smallest amount.

Another difficulty that confronts us is the apparent deterioration of varieties. I am aware that there is much diversity of opinion in regard to this matter, some of our best authorities taking the ground that varieties never do deteriorate or run out. Says Dr. Warder, in American Pomology, any portion of a tree grafted on another stock, or planted immediately in the ground itself and established upon its own roots, will produce a new tree like the first. Being furnished with supplies of nourishment it may grow indefinitely, while retaining all the qualities of the parent stock. Indeed, new life and vigor often seems to be imparted by a congenial thrifty stock and fertile soil. So there does not appear to be any reason why a variety should ever run out or disappear.

On the other hand, Col. Wilder says, however we may theorize in regard to this matter, it must be admitted from a practical point of view, that some varieties have so declined as to render it absolutely necessary to replace them with new varieties. This it appears to me is the correct view of the case, although we may not be able to sustain it by any of the well understood principles of vegetable Physiology. Among apples that are apparently failing, the Newtown Pippin, Belmont, Cooper, and Geniton stand prominent. Some of the old Eastern varieties that seemed to be exhausted on their native soil, appear for a time to take a new lease of life in the west, but soon begin to show signs of failure. The White Doyenne and Benrre Die Pears may be cited to illustrate this point. We all know that ten years ago we could rely on a crop of Catawba Grapes with as much certainty as a crop of corn or potatoes. Their failure cannot be attributed to the age of the vines for old and young alike fail. Nor to the climate, for it was as fitful then as now. Nor to the cultivation or system of pruning, for it was the same ten years ago as to-day. Nor to the exhaustion of any of the specific elements of the soil, for on all soils they are exceedingly fickle. What then is the difficulty? To my mind it is evident that the variety is exhausted, that it has had its day and will soon be numbered with the things of the past.

Another mistake that Agriculturists and Horticulturists make, is in neglecting to make themselves acquainted with the operations of others engaged in the same business. We should spend more time in visiting our neighbors' grounds and witnessing their operations, and conversing with them under their own vine and fig tree, and especially should we as fruit growers, make it a point to attend the meetings of our State, District, and local Horticultural Societies. We should use every means in our power to inform ourselves, if we would become skillful, and successful Horticulturists.

Each succeeding generation should be wiser than their fathers. Standing upon their experience and accumulated wisdom and thus sweeping a wider field of vision, the child may comprehend at a glance that which cost his father years of patient toil. The great want of the rural districts is intelligent, skillful, cultured, men. Men who recognize the fact that the world is progressive, and fully understand that the farmer is no longer the servant of all, and that if they would occupy their legitimate position in Society they must prepare themselves for it. The time has been in the history of the world, when, like the children of Issacher, the esentcheons of the Agriculturists, should have been an ass couching down between two burdens. But in these latter days this idea is passing away as the blessing of Judah is supposed by many to have fallen upon him. Binding his foal to the vine and his ass's colt to the choice vine, he shall wash his garments in wine and his clothes in the blood of grapes. Or of Asher of whom it was said his bread shall be fat and he shall yield royal dainties. Yet many of them are very slow to appreciate and enjoy their blessings, but tenaciously cling to that rotten old conservatism which has caused them to fall a generation behind other men in the race for position, wealth and honor.

Some of the tillers of the soil are so very conservative that they consider a new idea a temptation of the devil, and earnestly strive to banish it from their minds. May we not rather believe that the new thoughts that originate in the careful student of nature are given him by the creator to direct him in the path of usefulness and duty, and if acted upon will often lead to grand results.

Rural pursuits are yearly becoming more attractive and honorable. The old idea that any fool could make a farmer, and that to educate a man was to spoil him for that very useful but somewhat degrading occupation, is about exploded, and it is now conceded that intelligence is one of the most important requisites for the successful tiller of the soil.

Although gardening was the first occupation in which man engaged and has claimed the attention of cultivated men in every age of the world, yet it must be admitted, that as yet we know very little of the principles of vegetable growth, or of the mysterious process of decay, or of the numerous diseases that attack our trees and plants. Yet that active progressive spirit which is characteristic of the universal Yankee Nation, and only laughs at difficulties, is earnest in penetrating these mysteries, and the result of these labors and experiments must be valuable.

Finally, that which should stimulate us to constant action, is the good we hope to accomplish in redeeming the multitude from that semi-barbarism in which they live and labor, and educating them up to that point where trees and fruits, and flowers will be a necessary appendage to every humble, as it now is to every aristocratic, home.

OFFICERS ELECT FOR 1870

PRESIDENT—A. C. Hammond, Warsaw.

VICE PRESIDENT—Dr. Charles Hay, Warsaw.

SECRETARY and TREASURER—Thomas Gregg, Hamilton.

Meetings held monthly at the homes of members alternately, the last Wednesday in each month, at 10 o'clock, A. M. Membership fee, \$1.00.

TH. GREGG, *Secretary*.

TABLES OF FRUITS, FLOWERS, TREES, ETC.,

RECOMMENDED BY THE

ILLINOIS STATE HORTICULTURAL SOCIETY

AT THE

ANNUAL MEETING AT OTTAWA, DECEMBER, 1869.

N—Northern, C—Central, and S—Southern Illinois. Numerals—The number of Horticultural Districts. 1 and 2—Northern; 3 and 4—Central; 5, 6 and 7—Southern Illinois.

Recommendations of Fruit made by the Society are: m—market; f—family use; c—cider; b—baking, and *trial*. a—denotes for special localities.

Recommendations of Fruit made by individuals are denoted by a star (*).

Recommendations of Trees, etc., made by the Society are marked with a double star (**). Those made by individuals with one star (*).

The arrangement is in the botanical order according to Gray's Forest, Field and Garden Botany.

No.	NAMES.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
		N.		S.							Class, Etc.	Height or Shape
		1	2	3	4	5	6	7				
	CROWFOOT FAMILY.											
	CLEMATIS.											
	<i>Patens</i>							Asia, etc.	orn	climber		
	<i>Corulea (Blue)</i>		*	*				Japan	orn	climber		
	<i>Grandiflora (Large Fl.)</i>				*	*	*	Japan	orn	climber		
	<i>Virginiana (Common Wild)</i>	*	*	*	*	*	*	America	orn	climber	20 feet	
	ANEMONE (Wind Flower).											
	<i>Hortensis</i>	*	*	*	*	*	*	S. Europe	orn	erect herbs		
	<i>Coronaria</i>	*	*	*	*	*	*	S. Europe	orn	tuberous		
	DELPHINIUM (Larkspur).	*	*	*	*	*	*					
	P. EONIA (P. EONY).											
	<i>Officinalis (Common)</i>	*	*	*	*	*	*	Old World	orn	herbs, etc.		
	<i>Peregrina</i>							Europe	orn	herb	3 feet	
	<i>Abiflora (Chinese)</i>				*	*	*	China	orn	herb	3 feet	
	<i>Montan (China)</i>	*	*	*				China	orn	shrubby	3 feet	
	MAGNOLIA FAMILY.											
	LIRIODENDRON.											
	<i>Tulipifera (Tulip Tree)</i>	*	*	*	*	*	*	America	or. tim.	tree	100 feet	
	MAGNOLIA.											
	<i>Grandiflora (Great Flowered)</i>				*	*	*	South America	orn	tree	80 feet	
	<i>Glauca (Sweet Bay)</i>	*	*	*	*	*	*	America	orn	shrub	15 feet	
	<i>Acuminata (Cucumber)</i>	*	*	*	*	*	*	America	orn	tree	80 feet	
	<i>Macrophylla (Great Leaved)</i>				*	*	*	America	orn	small tree	15-30 feet	
	<i>Umbrella</i>			*	*	*	*	America	orn	tree	30 feet	
	<i>Conspicua (Yulan)</i>			*	*	*	*	China	orn	small tree	15-20 feet	
	<i>Purpurea (Purple)</i>			*	*	*	*	Japan	orn	shrub		
	CUSTARD APPLE FAMILY.											
	ASIMINA.											
	<i>Triloba (Papaw)</i>	*	*	*	*	*	*	America	or. fruit	small tree	15-20 feet	
	BARBERRY FAMILY.											
	BERBERIS.											
	<i>Tulgaris (Common)</i>	*	*	*	*	*	*	Europe	or. fruit	shrub		
	<i>Aquifolium (Mahonia)</i>		*	*	*	*	*	Oregon	orn	shrub	3-4 feet	
	WATER LILY FAMILY.											
	NYMPHEA.											
	<i>Odorata (Sweet Scented)</i>				*	*	*	East	orn	herb		
	FUMITORY FAMILY.											
	DICENTRA.											
	<i>Spectabilis (Bleeding Heart)</i>	*	*	*	*	*	*	N. China	orn	perennial		
	MUSTARD FAMILY.											
	BRASSICA.											
	<i>Oleracea (Cabbage)</i>							Europe	sal. etc.	herbs		
1	Early Flat Dutch.....	*	*	*	*	*	*			an. & bien.		
2	Early York.....	*	*	*	*	*	*	Flanders				
3	Early Wimmingstadt.....	*	*	*	*	*	*					
4	Jersey Wakefield.....	*	*	*	*	*	*	N. J.				
5	American Drumhead.....	*	*	*	*	*	*					
6	Drumhead. Savoy.....	*	*	*	*	*	*					
7	Mason.....	*	*	*	*	*	*	Mass				
8	Premium Flat Dutch (Cauliflower).....	*	*	*	*	*	*					
1	Early Erfurt.....	*	*	*	*	*	*					
2	Early Paris.....	*	*	*	*	*	*					
3	Half Early.....	*	*	*	*	*	*					
	Cumpestris (Turnip).											
1	Flat Strap Leaved.....	*	*	*	*	*	*					
2	Purple Top Strap Leaved.....	*	*	*	*	*	*					
3	White Dutch.....	*	*	*	*	*	*					
4	Yellow Aberdeen.....	*	*	*	*	*	*					
	NASTURTIUM FAMILY.											
	NASTURTIUM.											
	<i>Arnoracia (Horse Radish)</i>	*	*	*	*	*	*	Europe	cond	perennial		
	RAPHANUS.											
	<i>Sativus (Radish)</i>	*	*	*	*	*	*	Europe	cond			
1	Chinese Rose.....	*	*	*	*	*	*		cond			
2	Late.....	*	*	*	*	*	*		cond			
3	Long Scarlet Short Top.....	*	*	*	*	*	*		cond			
4	Scarlet Turnip.....	*	*	*	*	*	*		cond			
	VIOLET FAMILY.											
	VIOLA.											
	<i>Olorata (Sweet Violet)</i>			*	*	*	*	Europe	orn	herb		
	<i>Tricolor (Pansy)</i>			*	*	*	*	Europe	orn	herb		
	PINK FAMILY.											
	DIANTHUS.											
	<i>Chinensis (China Pink)</i>	*	*	*	*	*	*		orn			
	PURSLANE FAMILY.											
	PORTULACA.											
	<i>Grandiflora</i>	*	*	*	*	*	*	S. Amer	orn	annual		
	MALLOW FAMILY.											
	ALTHEA.											
	<i>Rosea (Hollyhock)</i>	*	*	*	*	*	*	Syria	orn	herb		

OF PLANT, ETC.		PECULIARITIES OF FRUIT, ETC.					Season.
Hardin's Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.	
hardy	in threes	3'-7'					
hardy	in threes	blue					
hardy	in threes	white					
hardy	3-cut-tooth						
not hard		very large					
not hard	finely cut						
hardy	large	red etc.					
hardy	glaucous	rose red					
	bright green	scarlet					
	pale large	very large					
hardy	rich green	yellow					
half hard	evergreen	white					
hardy	glaucous	white					
hardy	thin	yel. green					
	very large	immense					
half hard	large	white					
hardy	dark green	showy					
half hard		dull purple	3'-6'	bean	yel. green	sweet	Sep. Oct.
hardy		yellow	product	small	oblong	red	sour
half hard	evergreen					blue-black	
hardy		white					
hardy		pink-red					
hardy	very large	yellow	product	large	round		medium
				small	roundish	ash-green	good
				large	pyramidal		early
				large	pyramidal	glaucous	medium
hardy				large	round	sea-green	good
				large	round		late
				large	hemisph'l		best
hardy			product	large	flat	blu'n-gr'n	sweet
	large			large			late
	large			large		white	best
							early
							medium
hardy	few		prolific	medium	flat	purple	mild
						white	best
hardy	deep green				globular	purple etc	sugary
							late
hardy	large						
				large		pink	sharp
							late
	very short				very long		v. early
	large			small	spherical	scarlet	best
							early
hardy	heart-shap'd	violet, etc.					
hardy		various					
hardy	lanceolate	various					
		various					
hardy	heart-shap'd	various					

No.	NAME.	DISTRICTS.						Origin.	Use.	PECULIARITIES	
		N.		C.		S.				Class, Etc.	Hei't or Shape
		1	2	3	4	5	6					7
	HIBISCUS.										
	<i>Syrtaeus (Althea)</i>		*	*	*	*	Levant	orn	shrub	8 feet	
	<i>Esculentus (Okra)</i>				*	*	East India		herb		
	LINDEA FAMILY.										
	LILIA.										
	<i>Americana (Basswood)</i>	**	**	**	**	**	America	or. tim.	tree	100 feet	
	RUE FAMILY.										
	ZANTHOXYLUM.										
	<i>Americanum (Prickly Ash)</i>	*	*		*	*		or. med.	small tree	25 feet	
	QUASSIA FAMILY.										
	AILANTHUS.										
	<i>Glandulosus (Tree of Heaven)</i> ..			*	*	*	China	or. tim.	tree	60 feet	
	VINE FAMILY.										
	VITIS.										
	<i>Labrusca (Fox Grape)</i>										
1	Adirondac				*	*	N. Y.	fruit	wine	vigorous	
2	Catawba		m	m	m	m	N. C.	fruit		vigorous	
3	Concord	m	m	m	m	m	Mass	fruit		strong	
4	Creveling?	trial	f	f	f	f	Penn.	fruit		vigorous	
5	Delaware?	f	f	m	m	f	Ohio	fruit		weak	
6	Diana	m	m	f	f	f	Mass	fruit		vigorous	
7	Hartford Prolific	m	m	m	m	m	Conn	fruit		strong	
8	Iona		*	*			N. Y.	fruit		weak	
9	Ives' Seedling	trial	trial	trial	trial	trial	Ohio	fruit		strong	
10	Martha			*	*		Penn	fruit		vigorous	
11	Maxatawney		*	*			Penn	fruit		vigorous	
12	Northern Muscadine	*	*				N. Y.	fruit		strong	
13	Rebecca?	*	*				N. Y.	fruit		weak	
14	Rogers No. 1, Gæthe?		f	f	trial		Mass	fruit		vigorous	
15	" No. 3, Massasoit?	*	*	*			Mass	fruit		vigorous	
16	" No. 4, Wilder?	*	*	f	f		Mass	fruit		vigorous	
17	" No. 7, ?	*	*	*	*		Mass	fruit		vigorous	
18	" No. 15, Agawam?	*	*	f	f		Mass	fruit		vigorous	
19	" No. 22, Salem?	*	*	*	*		Mass	fruit		vigorous	
	<i>Estivalis (Summer Grape)</i>										
20	Herbemont				f	f	S. C.?	fruit		strong	
21	Norton's Virginia		wine	wine			Va	fruit		vigorous	
22	Bulander?	*	*	*	f	f		fruit		vigorous	
	<i>Cordifolia (Water Grape)</i>										
23	Clinton	m	m	m	w	w	N. Y.	fruit		strong	
	AMPELOPIS.										
	<i>Quinquefolia (Va. Creeper)</i> ...	*	*	*	*	*	America	orn	climber	50 feet	
	STAFF TREE FAMILY.										
	CELASTRUS.										
	<i>Scudens (Bitter Sweet)</i>		*	*	*	*	America	orn	climber	15 feet	
	ECONYMI.										
	<i>Americanus (Strawberry Tree)</i> ..		*	*			America	orn	shrub		
	SOAPBERRY FAMILY.										
	ESCULUS.										
	<i>Hippocastanum (H. Ches.)</i>	*	*		*	*	Asia	orn	tree	50-60 feet	
	ACER (MAPLE).										
	<i>Platanoides (Norway)</i>				*	*	Europe	orn	tree	60-70 feet	
	<i>Saccharinum (Sugar)</i>	**	**	**	**	**	America	or. tim.	tree	70 feet	
	<i>Nigrum (Black Sugar)</i>	*	*				America	or. tim.	tree	70 feet	
	<i>Dasycarpum (White)</i>	**	**	**	**	**	America	or. tim.	tree	50 feet	
	NEGUNDO.										
	<i>Aceroides (Box Elder)</i>	**	**	**	**	**	America	or. tim.	tree	20-40 feet	
	PULSE FAMILY.										
	LABURNUM.										
	<i>Vulgare (Common Laburnum)</i>			*	*	*	Europe	orn	small tree		
	ROBINIA.										
	<i>Pseudacacia (Common Lucust)</i> ..	**	**	**	**	**	America	timber	tree	50-75 feet	
	<i>Hispida (Rose Acacia)</i>	**	**	*	*	*	America	orn	shrub		
	WISTARIA.										
	<i>Fentescens (American Wistaria)</i> ..	*	*	*	*	*	America	orn	climber	20 feet	
	<i>Sinensis (Chinese Wistaria)</i>	*	*	*	*	*	China	orn	climber		
	PILASEOLUS.										
	<i>Vulgaris (Bean)</i>			*	*		Europe?	table	bush	16 inches	
1	Early Valentine		*	*						18-20 inches	
2	Fejee		*	*	*	*				6 feet	
3	London Horticultural	*	*	*	*	*	England	table	annual		
4	Red Speckled Valentine	*	*	*	*	*		table	annual		
5	Speckled Cranberry	*	*	*	*	*		table	annual		
6	Speckled Crowder	*	*	*	*	*		table	annual		
7	White Dwarf	*	*	*	*	*		table	annual		
	<i>Lunatus (Lima Bean)</i>										
	LIMA										
	<i>Lima</i>	*	*	*	*	*	S. A	table	perennial	10 feet	
	<i>Silva</i>	*	*	*	*	*	Mass	table	perennial	10-12 feet	
	DOLICHOS.										
	<i>Sinensis (China Bean)</i>	*	*	*	*	*		table		15 inches	

OF PLANTS, ETC.				PECULIARITIES OF FRUIT, ETC.				Season.	No.
Hard'n's	Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
half hard	three-lobed	various							
hardy	heart shap'd	cream color							
hardy ?	pennate	ill-scented							
hardy	large			medium	round	black	sweet	early	1
hardy	mildew			medium	round	red	sweet	late	2
hardy	coarse		product.	large	round	black	sweet	early	3
hardy	large			medium	round	black	sweet	early	4
hardy	mildew			small	round	red	v. sweet	early	5
hardy	mildew			small	round	red	v. sweet	medium	6
hardy	coarse		product.	large	round	black	harsh	v. early	7
hardy	mildew			medium	oval	red	v. sweet	early	8
hardy	coarse		product.	medium	round	black		v. early	9
hardy				large	round	green, yel.	sweet	early	10
hardy				medium	round oval	green, wh.	v. sweet	late	11
hardy	coarse			medium	round	red	foxy	early	12
not hard	mildew		product.	medium	oval	amber	v. sweet	late	13
hardy				v. large	oval	yel. green	sweet	late	14
hardy				large	round	red	sweet	early	15
hardy				large	round	black	sweet	early	16
hardy				large	round	red	sweet	early	17
hardy				large	round	maroon	foxy	medium	18
hardy				large	round	red	sweet	early	19
half hard	smooth			small	round	black	sweet	late	20
hardy	smooth			small	round	black	sweet	late	21
half hard	round			small	round	black	v. sweet	medium	22
hardest	smooth		product.	small	round	black	harsh	medium	23
hardy									
		green white							
					three-lob.	crimson			
		large white.							
hardy	bright green								
hardy									
hardy									
hardy	light green.								
v. hardy		small, gr'ish							
half hard		gold, yellow							
	small.	white rose							
		blue purple.							
v. hardy	deep green.	white purple	product. prolific		kidney $\frac{1}{2}$ in. l'g. egg.	pink drab flesh white	sweet best	early	1 2 3
									4
									5
									6
									7
tender	lo'g, smooth	green, yel			broad kid	dull white		late	
	lo'g, smooth	green, yel			broad kid	dull white			
hardy	yel. green.	white	product			white			

No.	NAME.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
		N.		C.			S.				Class, etc.	Hei't or Shape
		1	2	3	4	5	6	7				
	PISUM (PEA).											
1	<i>Sativum</i> (Common Pea).											
2	Daniel O'Rourke.....				*	*	*	*	table			
3	Extra Early.....	*	*	*	*	*	*		table			
4	May.....	*	*	*	*	*	*		table			
5	McLean's Advancer...	*	*	*	*	*	*		table		9 inches.	
6	Tom Thumb.....	*	*	*	*	*	*		table		5-6 feet.	
7	Champion of England.	*	*	*	*	*	*		table		3-4 feet.	
	Missouri Marrowfat...	*	*	*	*	*	*	America.	table			
	CERCIS.											
	<i>Canadensis</i> (Red Bud).....	*	*	*	*	*	*	America.	orn.	tree	30 feet.	
	GYMNOCLADUS.											
	<i>Canadensis</i> (Ky. Coffee Tree)...	*	*	*	*	*	*	America.	orn.	tree	60 feet.	
	GLEDITSCHIA.											
	<i>Triacanthos</i> (Honey Locust)...	**	**	**	**	**	**	America.	or.hedge	tree	50-75 feet.	
	ROSE FAMILY.											
	PRUNUS.											
	(<i>Amygdalus</i>) <i>Nana</i> .											
	Flowering Almond.....	*	*	*	*	*	*	Asia.	orn.	shrub	2-3 feet.	
	White Flower'g Almond	*	*	*	*	*	*	Asia.	orn.	shrub	2-3 feet.	
	(<i>Amygdalus</i>) <i>Communis</i> .											
	Hard Shell Almond.....		*	*	*	*	*	Asia.	nuts	tree		
	(<i>Amygdalus</i>) <i>Persica</i>							Asia.	fruit.	tree		
1	Bergen's Yellow.....				*	*	*	N. Y.	amateur			
2	Cole's Early Red.....			*	*	*	*	Ame.ica.	market			
3	Columbia.....		*	*	mf	mf	mf	N. J.	am. can.			
4	Coolidge's Favorite.....		*	*	mf	mf	mf	Mass.				
5	Crawford's Early.....		mf	mf	mf	mf	mf	N. J.	market.			
6	Crawford's Late.....		mf	mf	mf	mf	mf	N. J.	mar. can			
7	Delaware White?.....		*	*	*	*	*		market.			
8	Druid Hill.....		*	*	*	*	*	Maryland.			vigorous	
9	Early Tillotson.....		*	*	*	*	*	N. Y.			mildews	
10	Early York (serrate).....		*	*	*	*	*					
11	Galbrath.....		*	*	*	*	*	Illinois.	market.			
12	George the Fourth.....		mf	mf	mf	mf	mf	N. Y.	amatenr		vigorous	
13	Grosse Mignonne.....		*	*	*	*	*	France.			vigorous	
14	Hale's Early.....		mf	mf	mf	mf	mf	Ohio	mar. etc			
15	Heath Cling.....		*	*	*	*	*	Maryland	mar. etc.		vigorous	
16	Honest John (yellow).....		*	*	mf	mf	mf		mar. etc.			
17	Jacques' Rareripe.....		*	*	*	*	*	Mass.				
18	Kenrick's Heath.....		*	*	*	*	*	N. E.	market.		vigorous	
19	La Grange.....		*	*	*	*	*	N. J.	can. etc.		vigorous	
20	Large Early York.....		mf	mf	mf	mf	mf	N. Y.	mar. etc.		vigorous	
21	Late Amirable.....		*	*	*	*	*	France.	can. etc.		vigorous	
22	Lemon Cling.....		*	*	*	*	*	S. C.	can. etc.		vigorous	
23	Morris White.....		f	f	*	*	*		can. etc.		vigorous	
24	Mountain Rose.....		*	*	*	*	*					
25	Oldmixon Cling.....		*	*	*	*	*		family			
26	Oldmixon Free.....		mf	mf	mf	mf	mf		market			
27	President.....		*	*	*	*	*	L. I.	family			
28	Pullen's Seedling.....		*	*	*	*	*					
29	Red Cheek Melocoton...		*	*	*	*	*	America.	market.			
30	Reeves' Favorite.....		*	*	*	*	*	N. J.	market.			
31	Smock.....		mf	mf	mf	mf	mf	N. J.	market.			
32	Snow.....		*	*	*	*	*	America.	family			
33	Stump the World.....		*	*	*	*	*	N. J.	market.			
34	Susquehanna.....		*	*	*	*	*	Penn.				
35	Switzerland.....		*	*	mf	mf	mf		mar. etc.			
36	Troth's Early Red.....		mf	mf	mf	mf	mf	N. J.	market.			
37	Walker's Early.....		*	*	*	*	*		market.			
38	Ward's Late Free.....		*	*	mf	mf	mf	America.	market.			
39	White Imperial.....		*	*	*	*	*	N. Y.	family			
40	Yellow Alberge.....		mf	mf	*	*	*	France.				
41	Yellow Rareripe.....		*	*	*	*	*	America.	mar. etc.			
	<i>Var. laevis</i> (Nectarine).											
1	Boston.....		*	*	*	*	*	Mass.				
2	Downton.....		*	*	*	*	*	England				
3	Early Violet.....		*	*	*	*	*	France.				
4	Elruge.....		*	*	mf	mf	mf	England				
5	Pitmaston's Orange.....		*	*	mf	mf	mf	England			vigorous	
	<i>Armenica</i> (Apricot).											
1	Breda.....		*	*	mf	mf	mf	Africa?				
2	Early Golden.....		*	*	*	*	*	N. Y.			vigorous	
3	Henskirke.....		*	*	mf	mf	mf	England				
4	Large Early.....		*	*	mf	mf	mf	France.			vigorous	
5	Moerpark.....		*	*	mf	mf	mf	England				
6	Peach.....		*	*	*	*	*	Piedmont				
	<i>Spinosa Incitina</i> , or <i>Domestica</i> (Garden Plum)											
1	Coe's Golden Drop.....		*	*	mf	mf	mf	England			branches	
2	Coe's Late Red.....		*	*	mf	mf	mf				downy	

OF PLANTS, Etc.,				PECULIARITIES OF FRUIT. Etc.				Season.	No.
HardIn's	Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
hardy			prolific		round	cream		v. early.	1
								v. early.	2
				large	roundish			v. good	3
			prolific			cream		medium	4
			product.	large	flattened	white		v. early.	5
							good		6
		pink							7
		white							
hardy	narrow	rose.							
hardy	narrow	white							
halfhard									
buds ten	reniform	small	moderate	large	roundish	yellow	best	Aug.	1
hardy	globose	small	fruitful	medium	roundish	red	v. good	Jul. Aug.	2
buds ten	reniform	small	moderate	large	globular	brown	best	Sept.	3
hardy	globose	small	fruitful	large	roundish	red&white	v. good	Aug.	4
buds ten	globose	small	fruitful	v. large	oblong	yellow	good	Aug.	5
buds ten	globose	small	fruitful	medium	roundish	yellow	good	Sept.	6
hardy	globose	small	fruitful	large	roundish	red. white	v. good	Sept.	7
not heal	serrate	small	moderate	medium	roundish	red	v. good	Jul. Aug.	8
buds h'y	serrate	large	product.	medium	roundish	red&white	v. good	Jul. Aug.	9
hardy	globose	small	moderate	medium	roundish	red&white	v. good	Jul. Aug.	10
buds h'y	globose	large	product.	medium	roundish	red&white	v. good	Jul. Aug.	11
hardy	globose	small	moderate	large	roundish	red	v. good	Aug.	12
buds h'y	globose	large	product.	medium	roundish	red	v. good	Aug.	13
hardy	reniform	small	moderate	v. large	oblong	white	best	Sept. Oct.	14
	reniform	small	product.	large	roundish	yellow	good	Sept.	15
	reniform	small	product.	v. large	oblong	white	good	Sept.	16
hardy	reniform	small	product.	v. large	oblong	white	best	Sept. Oct.	17
hardy	globose	small	product.	large	roundish	red&white	v. good	Aug.	18
hardy	globose	small	product.	v. large	oval	white&red	best	Sept.	19
hardy	reniform	small	product.	v. large	oblong	yellow	good	Sept. Oct.	20
buds ten	reniform	small	product	large	oval	white	v. good	Sept.	21
	globose	small	product.	large	ro'nd-ov'l	white-red	best	Aug. Sep.	22
	globose	small	product.	large	roundish	red	v. good	Aug. Sep.	23
	globose	small	product.	large	ro'nd-ov'l	green	v. good	Sept.	24
buds ten	globose	small	product.	large	ro'nd-ov'l	yellow	good	Aug. Sep.	25
hardy	globose	small	product.	large	roundish	yellow	good	Sept.	26
buds ten	reniform	small	product.	large	oval	yellow	good	Sept. Oct.	27
	reniform	small white.	product.	large	globular	white	v. good	Aug. Sep.	28
	globose	small	product.	large	roundish	white-red	v. good	Sept.	29
				large	globular	yellow	v. good	Sept.	30
	globose	small	product.	medium	roundish	red	v. good	Jul. Aug.	31
	globose	small	product.	large	roundish	white-red	v. good	Aug.	32
	globose	small	product.	large	roundish	white-red	v. good	Sept.	33
	globose	small	product.	large	roundish	white	best	Aug.	34
	globose	small	product.	medium	roundish	yellow	good	Aug.	35
buds ten	globose	small	moderate	large	roundish	yel. red.	v. good	Aug.	36
hardy	globose	small	product.	large	roundish	yel. red.	good	Aug.	37
	reniform	small	product.	large	ro'nd-ov'l	green-red	v. good	Aug.	38
	reniform	small	product.	large	ro'nd-ov'l	green-red	v. good	Aug.	39
	reniform	small	product.	medium	ro'nd-ov'l	green-red	v. good	Aug.	40
	globose	large	product.	large	roundish	or. yellow	best	Aug.	41
		buds red.	product.	small	roundish	orange	best	Jul. Aug.	42
			product.	small	roundish	orange	v. good	July.	1
			product.	medium	roundish	yellow	best	July.	2
			product.	large	roundish	orange	v. good	July.	3
			product.	large	roundish	orange	v. good	July.	4
			product.	v. large	roundish	orange	best	Jul. Aug.	5
			product.	v. large	oval	yellow	v. good	Sept.	6
			v. prod.	medium	round	purp. red	v. good	Oct.	7

No.	NAME.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
		N.		C.			S.				Class, etc.	Hei't or Shape
		1	2	3	4	5	6	7				
3	Columbia							mfmfmf	N. Y.			slender, etc.
4	Damson			*	*			mfmfmf	N. Y.	cook, etc.		long, smooth.
5	Domine Dull							* * * *	N. Y.			very downy
6	Duane's Purple	mfmf	mfmf	*	*			* * * *	N. Y.			smooth
7	German Prune	mfmf	mfmf	*	*	*	*	* * * *	Ger., etc.	dry, etc.		short jointed.
8	Green Gage	*	*					mfmfmf	France.			dark, downy
9	Imperial Gage	mfmf	mfmf	*	*			* * * *	N. Y.			downy
10	Jefferson							* * * *	N. Y.			smooth
11	Large Green Drying	*	*						England			smooth
12	Lawrence's Favorite							mfmfmf	N. Y.			smooth
13	Lombard	mfmf	mfmf	*	*			* * * *	N. Y.			purple, glossy
14	McLaughlin							mfmfmf	Maine.			smooth
15	Prince's Yellow Gage			*	*				N. Y.			smooth
16	Red Diaper			*	*				France.			smooth
17	Reine Claude de Bayay			*	*				France.			smooth
18	Smith's Orleans							mfmfmf	N. Y.			glossy, purple
19	Washington							mfmfmf	N. Y.			downy
	<i>Chicasaw (Chickasaw).</i>											
20	Chickasaw	*	*	*	*	*	*	* * * *	America.			
21	Miner	*	*	*	*	*	*	* * * *	La.			sm'th, d'k red
22	Wild Goose							* * * *	Tenn.			
	<i>Cerasus (Garden Red Cherry).</i>											
1	Kentish or Early Rich 'nd	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	Belgium.			spreading
2	Late Kentish	*	*	*	*	*	*	* * * *				spreading
3	Morello, Common	*	*	*	*	*	*	* * * *				spreading
4	Morello, English	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf				
	<i>Avium (Bird Cherry).</i>											
5	Belle de Choisey			*	*	*	*		France.			upright
6	Belle Magnifique	*	*	*	*	*	*					
7	Bigarreau or Yel. Spanish			*	*	*	*			market		spreading
8	Black Eagle					*	*	*	England			
9	Black Tartarian					*	*	*	Russia	market		upright
10	Cleveland					*	*	*	Ohio			
11	Early Purple Gage					*	*	*				spreading
12	Early White Heart					*	*	*				r. upright
13	Elton					*	*	*	England			
14	Governor Wood	*	*	*	*	*	*	*	Ohio			round
15	Gridley	*	*	*	*	*	*	*		market		
16	Late Duke	*	*	*	*	*	*	*				fastigate
17	May Duke	*	*	*	*	*	*	*				
18	Napoleon Bigarreau	*	*	*	*	*	*	*		market		
19	Reine Hortense	*	*	*	*	*	*	*				
20	Tradesman's Black Heart	*	*	*	*	*	*	*	Europe	market		
	V. Mahaleb.	*	*	*	*	*	*	*		st'ks or wood or orn.		vigorous
	<i>Serotina (Wild Black).</i>											
	<i>Padus (Bird Cherry)</i>											
	<i>SPINEA (MEADOW SWEET).</i>											
	<i>Opulifolia (Nine Bark)</i>			*	*				America.	orn	shrub	
	<i>Douglasii</i>			*	*				Oreg., etc.	orn	shrub	
	<i>Collosa</i>	*	*	*	*				Japan	orn	shrub	3-6 feet
	<i>Lanceolata, or Reevesiana.</i>	*	*	*	*				China	orn	shrub	
	<i>Prunifolia.</i>	*	*	*	*	*	*	*	Japan	orn	shrub	slender
	FRAGARIA (STRAWBERRY).									fruit	run. herbs.	
1	Agriculturist	*	*	*	*	*	*	*	N. J.			strong
2	Austin	*	*	*	*	*	*	*	N. Y.			vigorous
3	Downer's Prolific	*	*	*	*	*	*	*	Kentucky	nr. mar.		
4	Fillmore	*	*	*	*	*	*	*	Maryland.			moderate
5	French's Seedling							f f f f	N. J.			vigorous
6	Green Prolific	tr tr	tr tr	tr tr	tr tr	tr tr	tr tr	tr tr	N. J.			vigorous
7	Hovey's Seedling	*	*	*	*	*	*	*	Mass.	market		vigorous
8	Jenny Lind	*	*	*	*	*	*	*	Mass.	market		small
9	La Constante							*				
10	Large Early Scarlet							f f f				vigorous
11	Longworth's Prolific	f f	f f	f f	f f	f f	f f	f f	Ohio			
12	McAvoy's Extra Red	trial	trial	trial	trial	trial	trial	trial	Ohio			vigorous
13	McAvoy's Superior	*	*	f f	f f				Ohio			vigorous
14	Monitor	*	*						N. Y.			vigorous
15	Neckel Pine	f f	f f	f f	f f	f f	f f	f f	America.			
16	Russell's Prolific	*	*	*	*	*	*	*	N. Y.			strong
17	Triomphe de Gand	*	*	*	*	*	*	*	Belgium			vigorous
18	Wilson's Albany	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	N. Y.			vigorous
	RUBUS (RASPBERRY).											
	<i>Occidentalis (Black Raspberry)</i>										per. herbs	curv. canes.
1	American Black	*	*	*	*	*	*	*	America	cook, etc.		long
2	American White	*	*	*	*	*	*	*	America.			branching
3	Doolittle	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	N. Y.	market		
4	McCormick, or Miami	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	mfmfmf	Ohio	market		
5	Ohio Everbearing	f f	f f	f f	f f	f f	f f	f f	Ohio			
6	Purple Cane	f f	f f	f f	f f	f f	f f	f f	America.	family		erect canes.
	<i>Idaeus (Red Raspberry)</i>											tall
7	Catawissa	*	*	*	*	*	*	*	Penn.			everbearing

OF PLANTS, ETC.			PECULIARITIES OF FRUIT, ETC.				Season.	Z	
Hardin's Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor			
vigorous		product.	v. large.	globular	purple	good	Aug.	3	
		product.	small.	oval	purple	good	Aug. Sep.	4	
		product.	medium	long, oval.	purple	good	Ag. Sep.	5	
			v. large.		purple	good	Aug.	6	
		product.	large.	long, oval	blue	v. good.	Sept.	7	
		product.	small.	round.	green	best	Aug.	8	
		product.	large.	oval	green	best	Aug.	9	
		moderate			yellow	best	Aug.	10	
			large.	round	gr. yellow	good	Sept.	11	
vigorous		product.	large.	roundish	yel. green	best	Aug.	12	
thrifty		v. prod.	medium	ro'd. oval	red	good	Aug.	13	
hardy		product.	large.	round.	yellow	best	Aug.	14	
hardy		product.	large.	oval	yellow	v. good	July, etc	15	
slow		product.	large.	obovate.	purple	v. good.	Aug.	16	
vigorous		product.	large.	roundish	gr. yellow	best	Sept.	17	
vigorous		v. prod.	large.	oval	purple	v. good.	Aug.	18	
hardy			large.	ro'd. oval	yellow	v. good.	Aug.	19	
								20	
			medium	oblong	pur. red.		Sept.	21	
vigorous			small		purple		July	22	
								23	
hardy		v. prod.	medium	round	red	acid v. g'd	June	1	
hardy		product.	medium	round	red	v. good.	July	2	
hardy		product.	medium	round.	black.	v. good.	July	3	
			large.	heart-sh'd	black.	good	July	4	
								5	
hardy		moderate		round	amber	best	June	5	
hardy		product.	large.	roundish	red.	sub-acid	July	6	
			v. large.	ob. h't sh.	yellow	rich	June	7	
		moderate	large.	ob. h't sh.	d. purple.	rich	June	8	
	large		large.	heart-sh'd	black.	v. rich.	June	9	
			medium	r'd h't sh.	red.	v. good.	June	10	
hardy	log petioles	good.	medium	r'd h't sh.	purple	v. good.	May, etc	11	
			small.	h't-shape.	yellow	good	May, J'e	12	
	red foot stks		large.	p'k h't sh.	yellow	v. rich.	June	13	
		v. prod.	large.	h't-shape.	yellow	best.	June	14	
		product.	large.	h't-shape.	black.	good	J'e, July	15	
			large.	ob. h't sh.	red.	sub-acid	July	16	
		product.	medium	ob. h't sh.	red.	rich	May, J'e	17	
		product.	v. large.	h't-shape.	yel. red	good	J'e, July	18	
								19	
			large.	h't-shape.	black.	good	J'e, July	20	
								21	
			small		black.			22	
			small		red.			23	
hardy	heart-sha'd	white						24	
	lance-obl'g.	pink						25	
	lance-obl'g.	pink						26	
	oblong	wh'c showy						27	
	small	double wh'c						28	
		white					May, J'e	29	
hardy	large, dark.		v. large	conical	crimson	v. good.		1	
hardy			large	roundish	b. scarlet	good	early	2	
hardy			medium	roundish	scarlet	good	early	3	
	large, rough	pistillate	moderate	ob. con	d. crimson	v. good.		4	
hardy	medium		product.	conical	d. scarlet.	good	early	5	
	large, thick		product.	v. large.	round.	scarlet.	good	early	6
hardy		pistillate.	product.	v. large.	conical.	crimson	good	7	
			product.	large.	conical.	b. scarlet.	v. good.	May, J'e	8
not hard	burn		product.	large.	conical.	red.	best	Aug.	9
				medium	oval	b. scarlet.	v. good.	v. early.	10
				large.	roundish	b. crimson	good	May, J'e	11
					roundish	scarlet	good		12
		pistillate	v. prod.	large.	roundish	scarlet	good		13
		pistillate	product.	large.	irregular	crimson	good		14
			moderate	large.	round con	b. scarlet.	good		15
		pistillate.	product.	large.	conical.	scarlet.	good	early.	16
	large		Product	v. large.	round, con	d. crimson	good		17
				v. large.	con'l, etc	b. crimson	v. good.		18
hardy			product.	large.	irreg. con.	d. crimson	good	early	19
								20	
hardy	threes.	white					J'e, July	21	
				small	flat	black.	acid	early	1
				small	flat	white		2	
			v. prod.	large	flat	black.	acid	3	
			product.	large	flat	black.	sweet	late	4
					flat	black		5	
				medium	oblate	pur. mar'n	sweet	early	6
tender	thick	white					J. Ju, etc	7	
tender			product.	medium	flat	d. crimson	rath. acid.		8

No.	NAMES.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
		N.		C.							Class, Etc.	Hel't or Shape
		1	2	3	4	5	6	7				
8	Clarke	trial							Conn.....	market.	upright	v. strong
9	Hudson River Antwerp.					*	*	*	France.	market.	canes green	short.....
10	Imperial	*	*	*	*	*	*	*	Penn.	amateur		
11	Orange	mf	mf	*	*	*	*	*	Penn.	market.		
12	Philadelphia					*	*	*				
13	Red Antwerp					*	*	*			erect	1-6 feet.
	<i>Villosa (Blackberry)</i>											slender
1	Crystal White					*	*	*	Illinois	amateur		
2	Dorchester	*	*						Mass			
3	Kittatumy	*	*	trial	*	*	*	*	N. J.	market.		
4	New Rochelle or Lawton			mf	mf	mf	mf	mf	N. Y.	market.		
5	Wilson's Early	*	*						N. J.			
	ROSA (ROSE).											
	<i>Setigera (Prairie)</i>								America.			
1	Balthuore Belle	*	*	*	*	*	*	*	America.	climber.		
2	President	*	*	*	*	*	*	*	America.	climber.		
3	Queen of the Prairies	*	*	*	*	*	*	*	America.	climber.		vigorous
	<i>Rubiginosa (Sweet Briar)</i>	*	*	*	*	*	*	*	Europe			
4	Common Sweet Brier	*	*	*	*	*	*	*				
	<i>Sempervivens (Evergreen)</i>					*	*	*				
5	Bennett's Seedling	*	*									
6	Duodec Raubler	*	*									
7	<i>Multiflora</i> .											
	Seven Sisters	*	*	*	*	*	*	*				
	<i>Indica (China, etc.)</i>											
8	Coup d' Hebe	*	*	*	*						hybrid Chi.	
9	George IV.	*	*	*	*						hybrid Chi.	
10	Madame Plantier	*	*	*	*	*	*	*				
11	Aurora	*	*	*	*	*	*	*			tea-scented	
12	Bougere	*	*	*	*	*	*	*			tea-scented	
13	Caroline	*	*	*	*	*	*	*			tea-scented	
14	Devoniensis	*	*	*	*	*	*	*			tea-scented	
15	Gloire de Dijon	*	*	*	*	*	*	*			tea-scented	
16	Homer	*	*	*	*	*	*	*			tea-scented	
17	Appoline	*	*	*	*	*	*	*			Bourbon	
18	George Peabody	*	*	*	*	*	*	*			Bourbon	
19	Hermosa	*	*	*	*	*	*	*			Bourbon	
20	Joseph Gourdon	*	*	*	*	*	*	*			Bourbon	
21	Mrs. Bosanquet	*	*	*	*	*	*	*			Bourbon	
22	Paul Joseph	*	*	*	*	*	*	*			Bourbon	
23	Queen of the Bourbons	*	*	*	*	*	*	*			Bourbon	
24	Sir Joseph Paxton	*	*	*	*	*	*	*			Bourbon	strong grower
25	Souvenir de la Malmaison	*	*	*	*	*	*	*			Bourbon	
26	Imperatrice Eugenie	*	*	*	*	*	*	*			Chi. or Beng.	
	<i>Moschata Hybrid</i> .											
27	America	*	*						D. C.		Noisette	very strong..
28	Celine Forestier	*	*								Noisette	
29	Lamarque	*	*								Noisette	
30	Solfaterre	*	*	*	*	*	*	*			Noisette	
	<i>Centifolia (Provence)</i> .											
31	Common Moss	*	*	*	*						moss	vigorous
32	Common Provence	*	*	*	*						Provence.	
33	Dwarf Burgundy	*	*	*	*	*	*	*			Provence.	
34	Luxembourg	*	*	*	*	*	*	*			moss	luxuriant
35	White Bath	*	*	*	*	*	*	*			moss	
	<i>Damascena (Damasc)</i> .											
36	Madame Hardy	*	*	*	*	*	*	*				
	<i>Lutea?</i>											
37	Harrison's Yellow	*	*	*	*	*	*	*				
38	Persian Yellow	*	*	*	*	*	*	*				
	<i>Not referable?</i>											
39	Arthur de Sansal	*	*	*	*							vigorous
40	Baronne Prevost	*	*	*	*	*	*	*				vigorous
41	Caroline de Sansal	*	*	*	*							vigorous
42	Dr. Arual	*	*	*	*							
43	Dr. Arnold	*	*	*	*	*	*	*				
44	Gen. Jacqueminot	*	*	*	*	*	*	*				dwarf
45	Giant des Batailles	*	*	*	*	*	*	*				
46	Gen. Washington	*	*	*	*	*	*	*				
47	L'Entant du Mont Carmel	*	*	*	*	*	*	*				vigorous
48	La Reine	*	*	*	*	*	*	*				
49	Lord Raglan	*	*	*	*	*	*	*				
50	Lion des Combats	*	*	*	*	*	*	*				
51	Madame Laffay	*	*	*	*	*	*	*				
52	Madame Rivers	*	*	*	*	*	*	*				vigorous
53	Madame Charles Wood	*	*	*	*	*	*	*				
54	Mrs. Elliott	*	*	*	*	*	*	*				good grower.
55	Paeonie	*	*									
56	Portland Blauche	*	*			*	*	*			hy. per	
57	Pius IX.	*	*			*	*	*				

OF PLANT, ETC.				PECULIARITIES OF FRUIT, ETC.				Season.	No.
Hard'n's	Follage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
hardy ?	large		product.	large	conical	br't crim.	sweet	8	
			product.	large	conical	dull red.	pleasant	9	
			v. prod.	large	roundish	bright red	excellent	10	
hardy			product.	large	conical	orange	rich	11	
			product.	large	roundish	pur. red.	v. good	12	
			product.	large	globular	dark red.	vinous	13	
not hard	3-5		not prod	medium	oval	cream wh.	sweet	Jul. Aug	
hardy			product.	large	ob. con	deep black	high	1	
hardy			product.	large	round. con	black	sweet	2	
hardy			product.	v. large	oval	black	sweet	3	
hardy			product.	large	ob. oval	black	sweet	4	
								early	
tender ?		clusters.				blush wh.		summer	
						blush		summer	
hardy				large	globular	rosy red		summer	
		single.				pink		4	
						pure wh.		summer	
								6	
		clusters l'ge				bl'h to eri.		summer	
				large	beautiful	br't pink.		summer	
		bright.		v. large		dark crim.		summer	
		in clusters.				pure wh.		summer	
				large		yel. rose		summer	
				large		deep blush	fine	12	
				large		rosy flesh.		perpet'l	
				large		cream wh.		perpet'l	
				large	full	yellow		perpet'l	
		free blmr			fine form.	rosy pink.		perpet'l	
					double	light pink.		perpet'l	
		bl'ms pro		large	double	dark crim		perpet'l	
				large	double	light blush		perpet'l	
				large	double	rosy flesh.		perpet'l	
				large	double	pale flesh.		perpet'l	
						violet pur.		22	
		pro blmr				fawn		perpet'l	
		free blmr				deep rose.		perpet'l	
						pale flesh.		perpet'l	
				v. large.		clear rose	v sweet.	perpet'l	
		free blmr				cream yel.		perpet'l	
		free blmr				pale yel.		perpet'l	
				v. large.		pale lemon		perpet'l	
						saf. yel.	fragrant	perpet'l	
		bl'ms pro		large	full	rose	v. sweet	summer	
				large	double			summer	
		free blmr				pur. crim.		summer	
						pure wh.		summer	
delicate				large	double	white		summer	
						double	yellow	summer	
						double	gold. yel	summer	
								38	
		abu. blmr		v. large.	full	deep rose	best	perpet'l	
				large	double	clear flesh.	best	perpet'l	
		free blmr				br't crim.	best	perpet'l	
								43	
		free blmr				crim. scar.		perpet'l	
		free blmr				fiery crim.		perpet'l	
		free blmr		v. large.		rosy ear.		perpet'l	
		free blmr		v. large.	full	pur. red.		perpet'l	
		free blmr		v. large.	double	rosy lilac.	sweet	perpet'l	
				large		fiery crim.		perpet'l	
						red. scar.		perpet'l	
		free blmr		large	full	rosy crim.		perpet'l	
						pale flesh.		perpet'l	
						brill. red.		perpet'l	
		abu. blmr		v. large.		rosy pur		51	
		free blmr				cherry red		55	
						pure wh.		perpet'l	
		pro. blmr		v. large.		pur. red.	best	perpet'l	

No.	NAME.	DISTRICTS.						Origin.	Use.	PECULIARITIES	
		N.		C.		S.				Class, Etc.	Hei't or Shape
		1	2	3	4	5	6					7
58	Prince Albert	*	*	*	*	*	*				
59	Sylvonie	*	*	*	*	*	*				
	AMELANCHIER.										
	<i>Canadensis</i> (June Berry.)			*	*	*	*	America.	or. etc.	shrub or tr.	10—30 feet....
	Commonis (Pear.)							Europe	table	tree	
1	Bartlett.	m	f	m	f	m	f	England	mar. etc.	shoots y. br.	upright
2	Belle Lucrative	m	f	m	f	m	f	Belgium	des. etc.	yl. brown.	spreading
3	Beurre Bose	*	*	m	f	m	f	Belgium	des. etc.	br. olive	
4	Beurre Clairgeau				*	*	*	France	market.	reddish	vigorous
5	Beurre d' Aijou	m	f	m	f	m	f	France	mar. etc.	yl. brown	spreading
6	Beurre Diel	*	*	*	*	*	*	Belgium	mar. etc.	vigorous	
7	Beurre Easter			m	f	m	f	Belgium	des. etc.	red. yellow	vigorous
8	Beurre Giffard			m	f	m	f	France	mar. etc.	yl. brown.	moderate
9	Beurre Langeller			*	*	*	*	Jersey		yl. brown.	vigorous
10	Bloodgood			m	f	m	f	N. Y.	table etc	red. brown.	moderate
11	Buffum	m	f	m	f	m	f	R. Island	tab. & m.	reddish	vig. upright.
12	Chamumontel	*	*	*	*	*	*	France		slender	
13	Clapp's Favorite					trial		Mass	market.	red. brown.	vig. upright.
14	Dearborn's Seedling	*	*	*	m	f	m	Mass	table	red. brown.	
15	Doyenne Boussock			f	f	f	f	Belgium	tab. & m.	red. brown.	up. spreading
16	Doyenne d' Ete	m	f	m	f	m	m	Belgium	tab. & m.	red. yellow	upright
17	Doyenne White	m	f	m	f	m	f	France	table	light brown	upright
18	Duchesse d'Angouleme.	m	f	m	f	m	f	France	mar. etc.	yl. brown.	sirong
19	Flemish Beauty	m	f	m	f	m	f	Belgium	mar. etc.	olive brown	luxuriant.
20	Gloû Morceau			f	f	f	f	Belgium	desert	dark olive	spreading
21	Howell	m	f	m	f	m	f	Conn.	mar. etc.	red. yellow	upright
22	Kirtland	*	*	*	*	*	*	Ohio	amateur	olive brown	moderate
23	Lawrence	m	f	m	f	m	f	L. Island	mar. & d.	yl. brown	moderate
24	Louise Bonne de Jersey	m	f	m	f	m	f	France	mar. etc.	olive brown	upright
25	Onondaga	m	f	m	f	m	f	Conn.	mar. etc.	olive brown	vigorous
26	Oshand's Summer	m	f	m	f	m	f	N. Y.	mar. etc.	yl. brown.	
27	Rosttizer	m	f	m	f	m	f		amateur	olive brown	straggling
28	Seckel	m	f	m	f	m	f	Penn.	des. etc.	olive brown	symmetrical
29	Sheldon	*	*	*	*	*	*	N. Y.	mar. etc.	yl. brown	erect
30	Stevens' Genesee	*	*	*	*	*	*	N. Y.	amateur	dark gray	
31	Tyson	m	f	m	f	m	f	Penn.	des. etc.	ol. yel. br.	upright
32	Urbanist					m	f	Belgium		yel. brown.	mod. vig.
33	Vicar of Winkfield	m	f	m	f	m	m	France	mar. etc.	dark ol. br.	thrifty
34	Waterloo?					m	m	amateur	ol. br. gray	vigorous	
35	Winter Neils	m	f	m	f	m	f	Belgium	des. etc.	straggling	straggling
	<i>Malus</i> (Apple.)							Asia	fruit.	tree	20—50 feet.
1	American Gold, Russet.					m	f	America.	des. etc.	red. gray br	upright.
2	American Sun. Pear.	*	*	f	f	m	f	America.	desert.	slender	slow, large.
3	Autumnal Strawberry	m	m	m	f	m	f	N. Y.			upright.
4	Baccolimus	*	*	*	*	*	*				thrifty
5	Bailey Sweet.	*	*	*	*	*	*	N. Y.		dark	vigorous
6	Baldwin	*	*	*	*	*	*	Mass		red brown	spreading
7	Belmont	*	*	*	*	*	*	Va.	table	light olive.	spreading
8	Ben Davis	m	m	m	m	*	*	Ky		yellowish	large, up't.
9	Benoni	m	f	m	f	f	f	Mass	table	slender br.	small, up't.
10	Broadwell	f	f	*	*	f	f	Ohio		red. brown	spreading
11	Buckingham					m	f	Va.		red. dark	upright
12	Carbage	*	*								
13	Carolina Red June.	m	f	m	f	m	f	N. C.	table	sten. dark.	upright
14	Cole's Quince	*	*	*	*	*	*	Mass?		red. brown.	spreading
15	Cooper	*	*	*	*	*	*		table	red. slender	spreading
16	Crain's Spice				*	*	*				
17	Cullasaga				*	*	*	N. C.			
18	Danver's Win. Sweet.					f		Mass		gray brown.	rapid growth.
19	Davidge				*	*	*	Illinois?			
20	Domine	m	f	m	f	m	f	N. Y.		reddish	symmetrical
21	Duchess of Oldenburg	m	f	m	f	m	f	Russia?	cooking.	stout, erect.	small
22	Dyer	f	f	f	f	f	f	France	table	dark, erect.	spreading
23	Early Harvest	f	f	f	f	m	f	N. Y.	tab. cook	red. brown	spread. small
24	Early Pennock	m	f	m	f	m	f		cooking.	erect, dark.	upright
25	Early Strawberry					m	m	N. Y.		sten. olive	upright, large
26	English Golden Russet.	m	m	f	*	*	*			sten. olive.	spreading
27	Esopus Spitzenburg	*	*	*	*	m	f	N. Y.		slender	drooping
28	Fallowater	*	*	*	*	*	*	Penn.		stout, dark.	rapid spread.
29	Fall Janneting	*	*	*	*	*	*	Conn.		stout, dark.	vigorous
30	Fall Orange	m	f	m	f	m	f	Mass	cooking.	red. diverg.	strong, erect.
31	Fall Pippin	*	*	*	*	*	*	America.		stout, brown	spreading
32	Fall Wine	f	f	f	f	f	f			stout, dark.	slender, med.
33	Fall Winesap	m	f	m	f	m	f	Illinois		stout, dark	drooping
34	Fall Swaar of the West.	*	*	f	f					stout, dark	
35	Fameuse	m	f	m	f	m	f			red. brown.	drooping
36	Father Abraham, of Ill.	*	*	*	*	*	*	Va.			large
37	Fink	*	*	*	*	*	*	Ohio			upright
38	Fulton	m	f	m	f	m	f	Illinois		sten. red. br.	large, up't

OF PLANTS, Etc.			PECULIARITIES OF FRUIT, Etc.				Season.	No.
Hardin's Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
hardy	white	product	ber. like		purplish	sweet		
hardy?	ovate	product	large	tap. to s'k	green, etc	high	Sum. &c	
blights	folded	v. prod	large	ob. pyr.	yellow	vinous	An. Sep.	
		product	medium	variable	green	sweet	Sept.	
		product	large	pyriform	russlet	sweet	Oct?	
		product	large	pyriform	blushed	sweet	Oct. Nov	
		product	large	ob. pyr.	greenish	vinous	Sept. Oct	
blights.	leaf blights.	product	large	pyriform	yellow	sweet	Sept. Dec	
		product	large	pyriform	green	sweet	Jan. Mar	
		product	medium	pyriform	yellow	vinous	Aug.	
		product	medium	pyriform	yellow	vinous	Nov. Jan	
		regular	medium	turbinate	yel. rus.	aromatic	July	
		regular	medium	ob. obov.	yellow		An. Sep.	
		regular	large	pyriform	yellow	sweet	No. Dec.	
		v. prod	large	ob. pyr.	lem. yel.	sweet	Aug.	
		v. prod	small	round, pyr.	light yel.	sweet	Aug.	
		product	large	obovate	deep yel.	sweet	Sept.	
		product	small	round, ob.	yellow	sweet	Jul. Aug	
		product	medium	obovate	pale yel.	high	Sept. Oct	
		v. large	obovate	obovate	green yel.	sweet	Sept. Oct	
blights.		product	large	obovate	pale yel.	sweet	Sept.	
		product	large	variable	green yel.	sweet	Dec. Feb	
	early	product	large	r'nd. pyr.	light yel.	vinous	Sept. Oct	
		product	medium	obovate	russlet	sweet	An. Sep.	
hardy		product	medium	ob. pyr.	lem. yel.	sweet	No. Dec	
		product	large	ob. pyr.	blushed	rich	Sept. Oct	
		product	large	ob. pyr.	yellow	vinous	Sept. Oct	
healthy		prolific	small	obov. pyr.	yellow	sweet	Jul. Aug	
hardy		prolific	small	obl. pyr.	blushed	sweet	An. Sep.	
hardy		prolific	small	obovate	blushed	sweet	An. Sep.	
hardy		g. bearer	medium	r'nd. obo.	russlet	sweet	Sept. Oct	
		product	large	roundish	yellow	sweet	An. Sep.	
		product	medium	ae. pyr.	blushed	sweet	An. Sep.	
hardy		product	large	ob. pyr.	pale yel.	rich	Sept. Oct	
		product	large	long pyr.	pale yel.	good	Oct. Jan	
hardy		product	large	ob. pyr.	blushed	vinous	Sept. Oct	
hardy		regular	medium	r'nd. obo.	russlet	sweet	Nov. Jan	
tender	serrate	product	small	conical	russlet	sub-acid	Nov. Dec	
hardy	white	product	medium	round	striped	sub-acid	An. Sep.	
		product	medium	r'd obl.	blushed	sub-acid	An. Sep.	
		product	small	round	striped	sub-acid	Dec. Mh	
		product	large	round	striped	sweet	Oct.	
tender	large	product	large	flat	striped	sub-acid	Oct. Jan	
tender	crenate	product	large	oblong	blushed	sub-acid	Oct. Dec	
hardy	large	product	large	oblong	striped	sub-acid	Dec. Jan	
	thin, long	product	small	round	striped	sub-acid	Jul. Aug	
		product	large	round	blushed	sweet	Dec.	
	narrow	product	large	conical	striped	sub-acid	Oct. Dec	
hardy	dark	reddish	medium	r'nd. con.	yellow	sweet	Sept. Oct	
		whitish	medium	oblong	blushed	sub-acid	In. July	
cankers.	reddish	product	large	round	yellow	sub-acid	Aug.	
		product	large	flat	striped	sub-acid	Sept. Oct	
		v. prod	small	flat	dull red	spicy	Mar. Jne	
		product	large	round	striped	sweet	Jan. Apl	
		product	large	round	green	sweet	Dec. Jan	
		product	large	conical	striped	sweet	Mar. My	
		product	large	flat	striped	acid	Oct. Dec	
not hard	narrow	reddish	medium	flat	striped	acid	Jul. Aug	
short liv		product	medium	round	yellow	sub-acid	Sept. Oct	
		not prod	medium	flat	white	sub-acid	June. Jy	
		product	large	conical	striped	acid	Jul. Aug	
	crenate	whitish	medium	conical	striped	acid	Jul. Aug	
		late bear	medium	round	russlet	sub-acid	Jan. Feb	
tender	crenate	white	medium	round	russlet	sub-acid	Jan. Feb	
short liv	large	product	medium	conical	striped	acid	Dec. Feb	
		product	large	round	green	sweet?	Nov. D'r	
hardy		product	large	round	blushed	acid	Oct. No?	
short liv	serrate	whitish	large	round	yellow	acid	Sept. Dec	
not hard		reddish	medium	flat	striped	sub-acid	Sept. Oct	
hardy		product	medium	round	blushed	acid	Sept.	
		product	large	roundish	rus. yel.	sub-acid	Sept. Oct	
		product	medium	round	striped	sub-acid	Oct. Dec	
		not prod.	medium	flat	striped	sub-acid	M'y. Jul.	
		product	small	flat	wh. yel.	sub-acid	Nov. Jan	
		not prod.	large	flat	blushed	sub-acid	Nov. D'r	

No	NAME.	DISTRICTS.						Origin.	Use.	PECULIARITIES	
		N.		C.		S.				Class, Etc.	Hei't or Shape
		1	2	3	4	5	6					7
39	Gilpin	e	e	m	m	m	m	Va.	shoots dark.	slender med.	
40	Golden Sweeting	m	f	m	f	m	f	Conn.	erect, stout	spreading	
41	Gravenstein	*	*	*	*	*	*	Holstein	red, brown	spreading	
42	Grimes' Golden	trial	*	*	*	*	*	Va.	stout, dark	large	
43	Harrison	*	*	*	*	*	*	N. J.	stout, olive,	large, spread.	
44	Hawley	*	*	*	*	*	*	N. Y.	round, ugly	round, ugly	
45	Hawthorned	*	*	*	*	*	*	Scotland.	red, brown	small, droop.	
46	Hewes' Virginia Crab	f	f	f	f	f	f	Va.	spare	large, spread.	
47	High-Top Sweeting	*	*	*	*	*	*	Mass.	light red, br.	upright	
48	Hocking	*	*	*	*	*	*	Mass.	light red, br.	spreading	
49	Horse	f	f	m	f	f	f	N. C.	c k. dry.	vigorous	
50	Hubbardston Nonsuch	f	f	m	f	f	f	Mass.	gray brown	drooping	
51	Hurlbut	*	*	*	*	*	*	Conn.	stout	spreading	
52	Jerrall	*	*	*	*	*	*	Conn.	small	spreading	
53	Jersey Black	*	*	*	*	*	*	des. etc.	strong	spreading	
54	Jersey Sweeting	*	*	*	*	*	*	N. H.	mar. etc.	spreading	
55	Jewett's Fine Red	m	f	m	f	m	f	N. Y.	mar. etc.	spreading	
56	Jonathan	m	f	m	f	m	f	Kentucky	mar. etc.	vigorous	
57	Kentucky	m	f	m	f	m	f	England	mar. etc.	vigorous	
58	Keswick Codlin	trial	*	*	*	*	*	N. J.	strong	small	
59	King of Tompkins	*	*	*	*	*	*	desert.	des. etc.	large	
60	Kirkbridge White	*	*	*	*	*	*	France?	v. dark	large	
61	Ladies Sweeting	*	*	*	*	*	*	Kentucky	light green	compact	
62	Lady Apple	*	*	*	*	*	*	N. C.?	slender	round head	
63	Large Striped Pearmain	n	m	m	f	m	f	N. J.	mar. etc.	spreading	
64	Large Yellow Bough	m	f	m	f	m	f	N. J.	market	spreading	
65	Lumber Twig	m	f	m	f	m	f	N. J.	market	spreading	
66	Lowell	m	f	m	f	m	f	N. J.	market	spreading	
67	Maiden's Blush	trial	*	*	*	*	*	N. Y.	dark	spreading	
68	May of Myers	*	*	*	*	*	*	N. J.	reddish	small	
69	Melon	m	f	m	f	m	f	N. Y.	market	round head	
70	Michael Henry	*	*	*	*	*	*	N. J.	market	round head	
71	Milam	m	f	m	f	m	f	Illinois?	dark	spreading	
72	Minkler	f	f	f	f	f	f	Mass.	table	reddish	
73	Mother	*	*	*	*	*	*	N. Y.	tab. etc.	dark green	
74	Newtown Pippin	a	n	f	a	m	f	N. Y.	tab. etc.	reddish	
75	Northern Spy	a	n	f	a	m	f	N. Y.	tab. etc.	reddish	
76	Northern Sweet	*	*	*	*	*	*	Vermont	eating	stout, red	
77	Nickajack	*	*	*	*	*	*	Georgia	market	stout	
78	Ortley	*	*	*	*	*	*	N. J.	eating	dark	
79	Paradise Wh. Sweet	*	*	*	*	*	*	Penn.	eating	dark	
80	Peck's Pleasant	*	*	*	*	*	*	R. I.	eating	dark	
81	Pennock	*	*	*	*	*	*	Penn.	market	large	
82	Perry Russet	*	*	*	*	*	*	Penn.	market	large	
83	Pomme Grise	*	*	*	*	*	*	Mass.	market	large	
84	Porter	m	f	m	f	m	f	Mass.	mar. etc.	slender	
85	Primate	*	*	*	*	*	*	Mass.	eat. etc.	slender	
86	Pryor's Red	m	f	m	f	m	f	Va.	eat. etc.	reddish	
87	Rambo	m	f	m	f	m	f	Penn.	eat. etc.	reddish	
88	Ramsdell's Sweet	m	f	m	f	m	f	Conn.	eat. etc.	reddish	
89	Rawles' Janet	m	f	m	f	m	f	Va.	eat. etc.	reddish	
90	Red Astrachan	*	*	*	*	*	*	Russia?	mar. etc.	brownish	
91	Red Canada	*	*	*	*	*	*	Russia?	mar. etc.	brownish	
92	Red Russet	*	*	*	*	*	*	N. H.	mar. etc.	dark	
93	Rhode Island Greening	*	*	*	*	*	*	N. H.	mar. etc.	dark	
94	Richards' Gratt	*	*	*	*	*	*	N. Y.	stout, dark	small	
95	Roman Stem	m	f	m	f	m	f	N. J.	eating	small	
96	Rome Beauty	*	*	*	*	*	*	Ohio	market	slender, red	
97	Roxbury Russet	*	*	*	*	*	*	Mass.	market	slender, red	
98	Sangamon Red Streak	*	*	*	*	*	*	Illinois?	market	slender, red	
99	Sine Qua Non	*	*	*	*	*	*	N. Y.	eating	light green	
100	Smith's Cider	*	*	*	*	*	*	Penn.	market	slender	
101	Smoke House	m	f	m	f	m	f	Penn.	market	slender	
102	Sops of Wine	m	f	m	f	m	f	Penn.	market	slender	
103	Sparks' Late	m	f	m	f	m	f	N. Y.	mar. etc.	large	
104	Stannard	m	f	m	f	m	f	N. Y.	mar. etc.	large	
105	Stark	trial	trial	trial	trial	trial	trial	N. Y.	long	brown, red.	
106	Str'd or Scoll'd Gilliv'r	m	n	m	n	m	n	N. Y.	long	brown, red.	
107	Striped Pippin	*	*	*	*	*	*	N. Y.	market	slender	
108	Summer Queen	*	*	*	*	*	*	N. J.	eating	stout, dark	
109	Summer Rose	*	*	*	*	*	*	N. Y.	eating	stout, dark	
110	Swaar	f	f	f	f	f	f	N. Y.	eating	stout, dark	
111	Sweet Vandevere	m	f	m	f	m	f	N. Y.	stout	slender	
112	Tart Bough	*	*	*	*	*	*	N. J.	eating	slender	
113	Tewksbury Wm. Blush	*	*	*	*	*	*	R. I.	reed, etc.	slender	
114	Tolman's Sweeting	m	f	m	f	m	f	R. I.	reed, etc.	slender	
115	Transcendent Crab	m	f	m	f	m	f	R. I.	reed, etc.	slender	
116	Twenty Ounce Apple	*	*	*	*	*	*	Conn.	stout	round head	
117	Vandevere Pippin	*	*	*	*	*	*	Penn?	stout	spreading	
118	Wagener	m	f	m	f	m	f	N. Y.	eating	stout	
119	Westfield's Seek no Fur	m	f	m	f	m	f	Conn.	tab. etc.	spreading	

OF PLANT, ETC.

PECTLIARITIES OF FRUIT, ETC.

Hardn.	Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.	Season.	$\frac{c}{N}$	
short liv		reddish	product	small	round	striped	sweet	Apr. May	39	
		white	product	large	round	yellow	sweet	Aug.	40	
hardy			late bear.	large	flat	striped	acid	Aug. Sep.	41	
			product	medium	flat	yellow	sub-acid.	Dec. Mar.	42	
		reddish	car. bear.	large	flat	yellow	sub-acid.	April	43	
		red	car. bear.	large	flat	striped	sub-acid.	Aug. Sep.	44	
hardy		whitish	product	small	round	striped	acid	Jul. Aug.	45	
		reddish	product	medium	round	yellow	sweet	Nov. Jan.	46	
			product	large	flat	striped	sub-acid.	June July	47	
		reddish	product	large	round	yellow	sub-acid.	Aug. Sep.	48	
			product	large	round	striped	sub-acid.	Oct. Dec.	50	
			product	medium	flat	striped	acid	Dec ?	51	
			product	medium	flat	striped	sub-acid.	Dec	52	
		whitish	product	medium	conical	striped	sweet	Aug. Sep.	54	
			product	medium	flat	striped	acid	Dec	55	
	sparse	whitish	product	medium	oblong	striped	sub-acid.	Nov. Jan.	56	
			product	large					57	
hardy		whitish	product	medium	oblong	yellow	acid	June Aug.	58	
hardy			product	large	flat	striped	sub-acid.	Nov. Jan.	59	
hardy		whitish	product	medium	oblong	yellow	sub-acid.	Jul. Aug.	60	
thrifty	toothed		product	large	round	striped	sweet	Dec	61	
	dark	reddish	product	small	flat	blushed	sub-acid.	Dec. Mar.	62	
			product	large	conical	yellow	striped		63	
	crenate	whitish	not prod.	large	small	conical	striped	sub-acid.	Jan. Aug.	64
thrifty		reddish	not prod.	small	conical	striped	sub-acid.	Mar. Apr.	65	
hardy ?		red	product	large	round	blushed	acid	Aug. Sep.	66	
			product	medium	flat	yellow	sweet	Sep. Oct.	67	
			product	large	round	striped	sub-acid.	M. Y. Jun.	68	
			product	medium	conical	yellow	sweet	Nov. Jan.	69	
hardy	dark	reddish	product	small	conical	striped	sub-acid.	Dec. Jan.	70	
hardy			product	large	flat	striped	sub-acid.	Dec. Jan.	71	
			product	large	oblong	striped	sweet	Mar. M. Y.	72	
			product	medium	round	yellow	acid	Oct. Jan.	73	
	dark	white	moderate	medium	round	yellow	acid	Dec. Mar.	74	
		v. late	product	large	conical	striped	acid	Dec. M. Y.	75	
			product	large	round	yellow	sweet	Sept.	76	
		whitish	product	large	flat	striped	sub-acid.	Mar. M. Y.	77	
tender		reddish	product	large	oblong	yellow	acid	Nov. Jan.	78	
			product	large	round	white	sweet	Dec. Mar.	79	
hardy		reddish	product	large	round	yellow	sub-acid.	Dec. Jan.	80	
	sharp		product	large	flat	striped	sub-acid.	Dec. Feb.	81	
hardy	large		product	medium	flat	russet	acid	Dec. Jan.	82	
hardy			product	small	flat	russet	sub-acid.	Jan. Mar.	83	
hardy		reddish	product	large	oblong	yellow	acid	Aug. Oct.	84	
			product	medium	round	yellow	sub-acid.	Jul. Aug.	85	
hardy	scattering		product	large	round	russet	sub-acid.	Dec. Feb.	86	
tender	light green.	whitish	product	medium	flat	striped	sub-acid.	Oct. Dec.	87	
	whitish		product	medium	oblong	striped	sweet	Sep. Dec.	88	
tender			product	medium	conical	striped	sub-acid.	Feb. Mar.	89	
hardy	large	white	shy?	large	flat	striped	acid	July	90	
hardy	wavy	reddish	product	medium	conical	striped	sub-acid.	Dec. Feb.	91	
			product	large	round	russet	sub-acid.	Jan. Apr.	92	
tender	dark		product	large	flat	green	sub-acid.	Oct. Dec.	93	
		whitish	product	medium	flat	striped	sub-acid.	Sep. Oct.	94	
			product	medium	round	yellow	sub-acid.	Dec. Jan.	95	
hardy		late	product	large	flat	striped	sub-acid.	Dec. Feb.	96	
tender	gray		product	large	flat	russet	acid	Nov. Jan.	97	
			product	large	conical	striped	sub-acid.	Nov. ?	98	
		white	product	medium	conical	white	sub-acid.	Jul. Aug.	99	
hardy		whitish	product	medium	round	striped	sub-acid.	Dec. Jan.	100	
			product	large	flat	striped	sub-acid.	Oct. Nov.	101	
hardy		whitish	product	medium	round	striped	sub-acid.	Jul. Sep.	102	
			product	medium	oblong	yellow	sub-acid.	Dec. Jan.	103	
hardy			product	large	roundish	striped	sub-acid.	Nov. Feb.	104	
			product	large	roundish	striped	sub-acid.	Dec. My.	105	
			product	large	oblong	striped	sub-acid.	Sept.	106	
			product	large	oblong	striped	sub-acid.		107	
hardy ?	crenate	whitish	product?	large	conical	striped	sub-acid.	Jul. Aug.	108	
hardy	glaucous		product	small	round	striped	sub-acid.	Jan. Aug.	109	
	large	reddish	product	large	round	yellow	sub-acid.	Dec. Jan.	110	
			product	large	flat	striped	sweet	Dec. Jan.	111	
			product	small	flat	white	acid		112	
hardy	waved	whitish	product	medium	round	yellow	sweet	Mar. Apr.	113	
hardy			product	small	oblong	blushed	sub-acid.	Sep. Jan.	114	
	large		car. bear.	large	conical	striped	acid	Aug. Sep.	115	
			product	large	flat	striped	acid	Oct. Dec.	116	
			product	large	flat	striped	sub-acid.	Dec.	117	
hardy	serrate		product	medium	conical	striped	sub-acid.	Nov. Dec.	118	
			product	medium	conical	striped	sub-acid.	Dec.	119	

No.	NAMES.	DISTRICTS.						Origin.	Use.	PECULIARITIES	
		N.		C.		S.				Class, Etc.	Hei't or Shape
		1	2	3	4	5	6					7
120	White Pippin.....	mfmf	mf	mf				mar.etc.	skoots dark.	upright	
121	White Winter Pearmain.....		f	f	mfmfmf				dark	spreading	
122	Winesap.....	mfmf	mf	mf	mfmfmf		N. J.	tab. etc.		spreading	
123	Willow Twig.....	mfmf	m	m	m m m m		Virginia	mar.etc.	slender	spreading	
124	William's Favorite.....		m	m	m m m		Mass.			spreading	
125	Wine Ap. Hays' or Pa. R. S.		*	*	* * * *			cook. etc.	slender	upright	
126	Yellow Bellefleur.....	f	f	*	mfmfmf		N. J.	eat .etc.	yellowish	drooping	
127	Yellow Ingeric.....						England				
128	Yellow Siberian Crab.....	mfmf	mf	mf	mfmfmf						
	<i>Spectabilis</i> (Chinese Flow. Crab)		*	*	* * * *		China	orn.			
	<i>Prunifolia</i> (Siberian Crab)							orn. etc.			
	<i>Baccata</i> (Berry Crab)				* * * *			orn.			
	<i>Coronaria</i> (American Crab)				* * * *		America	orn.		small tree	
	<i>Americana</i> (Mountain Ash)	*	*	*	* * * *		America	orn.		small tree	
	<i>Aucuparia</i> (European Ash)	*	*	*	* * * *		Europe	orn.		medium tree.	
	CYDONIA (QUINCE).									low trees. etc.	
	<i>Vulgaris</i> (Common Quince)						Levant				
	Orange.....	mfmf	mf	mf	mfmfmf						
	Portugal.....										
	<i>(Japonica</i> (Japan Quince).	*	*	*	* * * *		Japan				
	Blush.....										
	Crimson.....										
	CALYCANTHUS FAMILY.										
	<i>FLORIDUS.</i>		*	*	* * * *		America	orn.		shrub	
	SAXIFRAGE.										
	RIBES (CURRANT, ETC.)							fruit. or.			
	<i>Grossularis</i> (Eng. Gooseberry).						Europe				
1	Woodward's Whitesmith	*	*				England?	fruit.	erect		
	<i>Hirtellum?</i>										
1	Downing's Seedling.....	*	*	*	*		N. Y.	family	slender	upright	
2	Houghton's Seedling.....	mfmf	mf	mf	mfmfmf		Mass.		slender	spreading	
3	Mountain Seedling.....	*	*	*	*		N. Y.		strong	straggling	
4	Pale Red.....	*	*	*	* * * *				slender	upright	
	(<i>Rubrum</i> (Red Currant).										
1	Cherry.....	mfmf	*	*	mfmfmf		Italy	market	stout		
2	Gondouin White.....	*	*	*	*		France		strong		
3	La Versailles.....	*	*	*	*		France				
4	Long Bunched Red.....										
5	Red Dutch.....	mfmf	mf	mf	mfmfmf			fam. etc.	erect		
6	Victoria.....	f	f	f	f f f f				slender	spreading	
7	White Dutch.....	mfmf	mf	mf	mfmfmf						
8	White Grape.....	f	f	mf	mfmfmf			amateur	slender	spreading	
	<i>Nigrum</i> (Black Currant)						Europe				
	Black Naples.....	mfmf	*	*	*					coarse	
	<i>Aureum</i> (Missouri)	*	*	*	*		America				
	Large Fruited Missouri.	*	*	*	*			fruit, etc			
	<i>Sanguineum</i>		*	*	*		Oreg. etc.	orn.			
	PHILADELPHUS SYRINGA.										
	<i>Coronatus</i> (Mock Orange)	*	*	*	* * * *		Japan?	orn.	erect	shrub	
	DEUTZIA.	*	*	*	* * * *		Japan, etc			shrub	
	<i>Gracilis.</i>	*	*	*	* * * *					2 feet.	
	<i>Crenata.</i>	*	*	*	* * * *						
	<i>Scabra.</i>	*	*	*	* * * *					5 feet.	
	WITCH HAZEL.										
	LIQUIDAMBAR.										
	<i>Styraciflua</i> (Sweet Gum)		*	*	* * *		America	orn.	tree	130 feet.	
	GOURD.								annual		
	CUCURBITA (PUMP. & SQUA.)										
	<i>Pepo.</i> (Pumpkin).										
1	Cashew.....	*	*	*	*						
2	Cheese.....	*	*	*	*						
3	Yellow Field.....	*	*	*	*			stock		12 feet.	
	<i>Ferrucosa, etc.</i>										
1	Bush Sum. Wart Cr. Neck	*	*	*	* * * *			cooking.		2 1-2 feet.	
2	Early Yel. Bush Scollo'd	*	*	*	* * * *			cooking.		2 1-2 feet.	
3	Autumnal Marrow.....	*	*	*	* * * *					12 feet.	
4	Hubbard.....	*	*	*	* * * *					12 feet.	
5	Turban.....	*	*	*	* * * *					12 feet.	
6	Vegetable Marrow.....	*	*	*	* * * *					12 feet.	
	CITRULLUS (WATERMELON)										
	<i>Vulgaris.</i>										
1	Black Spanish.....	*	*								
2	Ice Cream.....	*	*	*	* * * *						
3	Long Island.....	*	*	*	* * * *						
4	Mountain Sprout.....	*	*	*	* * * *			market			
	CUCUMIS (M'K MELON. & C.)										
	<i>Melo</i>										
1	Alton Nutmeg.....							market			
2	Green Citron.....	*	*	*	*			mar. etc.			
3	Nutmeg.....	*	*	*	* * * *						

OF PLANTS, ETC.			PECULIARITIES OF FRUIT, ETC.					Season.	No.
Hardin's	Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
	large		product.	medium	round.	white	acid.	Dec. Jan.	120
			product.	medium	conical.	yellow	sub-acid.	Dec. Mh.	121
hardy		red	product.	medium	conical.	bluish.	acid.	Jan. Mh.	122
		reddish	product.	large	round.	striped	sub-acid.	Dec. Apl.	123
				medium	round.	striped	sub-acid.	Jul. Aug.	124
tender	small		product	large	flat	striped	acid.	Oct. Dec.	125
		whitish	shy ?	large	conical.	yellow	acid.	Oct. Jan.	126
				small	round	yellow	acid.	Sep. Oct.	127
	large	white	product.	small	oblong	yellow	acid.	Aug. Sep.	128
	smooth	rose, etc.				yellowish.			
		white							
	ovate	reddish				green			
	pointed	white				scarlet			
	oblong	white				scarlet			
	oval	white		large	round	yellow		Sep. Oct.	
	large	white	shy	v. large.	ob. ovate.	yellowish.	mild		
	oval	blush		small		green	uneatable.		
	oval	crimson		small		green			
		dull red							
mildews			product.	large	roundish	white	best		1
vigorous			v. prod.	medium	roundish	whitish	v. good	J'c. Jul.	1
vigorous			v. prod.	medium	roundish	pale red	v. good.	J'c. Jul.	2
vigorous			product.	large	oval	brown red	good	J'c. Jul.	3
vigorous			v. prod.	small	oval	pale red	v. good.	J'c. Jul.	4
	thick		product ?	v. large.	round.	deep red	acid	J'c. Jul.	1
			product.	large	round.	yellow	sweet	J'c. Jul.	2
	large		product.	v. large.	round.	dark red	acid	J'c. Jul.	3
			v. prod.	large	round	deep red		J'c. Jul.	4
			v. prod.	large	round	deep red	rich acid.	J'c. Jul.	5
			v. prod.	large	round.	light red.	acid	late	6
			product ?	large	round.	yel. white	sweetish.	early	7
			product ?	v. large.	round	white yel.	sweet	early	8
			product.	v. large.		black.	sweet		
		yellow							
		rose red		v. large		black.			
	ovate.	cream white						late sp'g	
	ovate	snow white						late sp'g	
	ovate	dull white						summer	
		white						late	
		ant. pur. red	greenish						
	large		v. prod.	large	flat	red or	sweet		1
				large	roundish	or, yellow	coarse		2
			product.	medium	oblong	yellow	v. good.	early	1
	large			small	hemisph'l	yellow	good	early	2
				medium	ovoid	cr. yel	best	late	3
				medium	oval	cl. bl. ol. gr	best	late	4
				medium	turban	brick red	best	late	5
	medium			small	oblong	pale yel		late	6
hardy			product.	large	roundish	d. green	best		1
hardy			prolific	large	round.	pale green		early	2
									3
			v. prod.	large	long oval.	striped	best		1
			product.	large	roundish		v. good.		1
			product.	medium	round.	green	v. good.		2
				medium		pale green	best		3

No.	NAME.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
		N.			S.						Class, etc.	Hei't or Shape
		1	2	3	4	5	6	7				
4	Persian		*			*						
5	White Japan		*			*						
6	Ward's Nectar		*			*						
7	Yellow Cantaloupe		*			*						
	<i>Satirus (Cacahuer)</i>		*			*		East India	catting			
1	Early Cluster		*			*						
2	Early Frame		*			*					6-10 feet	
3	Early Russian		*			*						
4	Long Green Turkey		*			*						
	PARSLEY.											
	DAUCUS (CARROT).							Europe, etc.		bien. herb.		
	(<i>Cocota Common Carrot</i>).											
1	Early Horn		*			*			catting		6 inches	
2	Long Orange		*			*			st'k. etc		15 inches	
	APIUM (CELERY, ETC.)							Europe				
	<i>Graculus (Garden Celery)</i>		*			*				bien. herb.		
1	White Solid		*			*				strong grow	tall	
	CARUM (CARRAWAY, ETC.)											
	<i>Petroselinum (Parsley)</i>					*		Europe	cooking.	bien. herb.		
	PASTINACA (PARSNIP).							Europe		bien. herb.		
	<i>Sativa (Common Parsnip)</i>											
1	Guernsey		*			*		Guernsey	cook. etc		3 feet	
2	Large Hollow Crown		*			*					18 inches	
3	Sugar		*			*						
	DOGWOOD.											
	CORNUS.											
	<i>Florida (Flowering Dogwood)</i>		*			*		America	orn		12-30 feet	
	<i>Sanguinea (Red Twig Dogw'd)</i>		*			*		Europe	orn			
	HONEY-SUCKLE.											
	LONGERA.											
	<i>Sepapervitris (Trumpet Flow.)</i>		*			*		America		climber		
1	Scarlet Trumpet		*			*		Japan?	orn	climber		
	<i>Japonica (Chinese)</i>		*			*				climber		
	<i>Tartarica (Tartarian)</i>		*			*				shrub	5-8 feet	
1	Red Tartarian		*			*						
2	Upright White		*			*			orn			
3	Upright Yellow		*			*			orn			
	VIBURNUM.											
	<i>Opulus</i>											
1	Cranberry Tree		*			*		America	fruit, etc			
2	Snowball		*			*		Europe	orn			
	COMPOSITE.											
	CALLISTEPHUS.											
	<i>Chinensis (China Aster)</i>		*			*		China	orn			
	DAILIA.											
	<i>Variabilis</i>							Mexico	orn	per. herb.		
1	Augustus Bougler					*						
2	Aurora					*						
3	Banmaid		*			*						
4	Clio					*						
5	Dandy		*			*						
6	Dr. Bozes		*			*						
7	Duke of Wellington		*			*						
8	Emperor de Maroc		*			*						
9	Frank Smith		*			*						
10	Jessie		*			*						
11	John Keynes		*			*						
12	Marc Antony					*						
13	Mauve		*			*						
14	Mt. Blanc		*			*						
15	Puffin					*						
16	Queen Mab		*			*						
17	Queen of Bea		*			*						
18	Rembrandt		*			*						
19	Richard Cobden		*			*						
20	William Dodd		*			*						
	HEATH.											
	GAYLUSSACIA (HUCKLEB'Y)							America	fruit			
	<i>Resinosa (Com. or Black H.)</i>								cat. etc.	shrub	1-3 feet	
	VACCINIUM.								fruit			
	<i>Corymbosina (Com. S. Blue'y)</i>									shrub	3-10 feet	
	<i>Pungentiaricum (Dwarf Blue'y)</i>									shrub	6-15 inches	
	<i>Maceropon (Cacaherry)</i>									shrub	1-3 feet	
	EBOMY.											
	DIOSPYROS (PERSIMMON).											
	<i>Virginiana (Common)</i>		*			*		America	fruit, etc	tree	20-60 feet	
	BIGNONIA.											
	TECOMA (TRUMPET FLOW.)											
	<i>Radicus (Trumpet Creeper)</i>		*			*		America	orn	climber		
	CATALPA.											
	<i>Bignonioides</i>		*			*		America	orn etc.	tree	30-90 feet	

OF PLANTS, ETC.			PECULIARITIES OF FRUIT, ETC.				Season.	No.
Hardin's Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
			large	oblong		best	4	
		product.	medium	roundish	cr. white.	v. good	5	
							6	
							7	
hardy			small	oblong	green	good	1	
		v. prod.	small	oblong	d'p green.	good	2	
hardy		v. prod.	small	oblong		good	3	
		v. prod.	large	long	d'p green.	v. good	4	
			small	eylind'cal	orange	v. good	1	
			large		red or	good	2	
hardy	large						1	
	strong						1	
	short						2	
							3	
	ovate	in. white yel			dark			
	ovate							
	evergreen							
	scarlet, etc.				red		1	
	heart-shap.				red			
	red						1	
	white						2	
	yellow						3	
	white		small	oblong	bright red	acid	1	
	white						2	
	various							
	pinmate							
							1	
	scarlet, etc.						2	
							3	
	blu. eri. etc.						4	
	bright scar.						5	
	or. scar.						6	
	yel. & white						7	
	scarlet						8	
	scarlet, etc.						9	
	rose & buff.						10	
							11	
	mauve						12	
	pure white.						13	
							14	
							15	
							16	
							17	
	scar. & white						18	
	dark						19	
	yellow						20	
hardy	oval	white	small	round	black	sweet		
	oval		small	round	black	sweet		
	shining		small	obl'g, etc.	black	sweet		
			small	round, etc.	red	acid	late	
			smal. etc.	roundish	yellow	v. sweet	Sep. Dec	
		yellow, etc.						
tender	large	white						

No.	NAME.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
		N.		C.		S.					Class, etc.	Height or Shape
		1	2	3	4	5	6	7				
	VERVAIN.								America..	orn.....	herbs .....	.....
	VERBENA.	**	**	*	*	*	*	*				
	PALEMONIUM.											
	PILOX.											
	<i>Drummandii.</i>	**	**	*	*	*	*	*	Texas....	orn.....	annual.....	herb
	CONVOLVULUS.											
	IPOMEA (MORN. GLORY).											
	<i>Butatus (Sweet Potato).</i>								E.&W.Ind	tuberous	per. herb...	.....
1	Brazilian			*	*	*	*	*	S. Amer.?	market.		.....
2	Nausemond	*	*	*	*	*	*	*	Virginia..	eat....etc.		.....
	NIGHTSHADE.											
	LYCOPERSICON (TOMATO).											
	<i>Esculentum.</i>								S. Amer ..		an. herb....	.....
1	Cook's Favorite.....			*	*	*	*	*	N. J.			.....
2	Fejee .....		*	*	*	*	*	*				.....
3	Keyes' Early Prolific.....		*	*	*	*	*	*				.....
4	Large Red .....		*	*	*	*	*	*				.....
5	Large Round Smooth.....	*	*	*	*	*	*	*				.....
6	Large Yellow .....	*	*	*	*	*	*	*				.....
7	Tilden .....	*	*	*	*	*	*	*				.....
	SOLANUM (NIGHTSHADE).											
	<i>Melangena (Egg Plant).</i>								Africa, etc	cooking	an. herb	.....
1	Long Purple.....		*	*	*	*	*	*				2-3 feet.
	<i>Tuberosum (Potato).</i>											
1	Buckeye	*	*	*	*	*	*	*	West.....			vigorous.....
2	Early Dykeman.....	*	*	*	*	*	*	*				medium
3	Early Goodrich.....	*	*	*	*	*	*	*				
4	Early Rose	*	*	*	*	*	*	*				
5	Early White Sprout.....	*	*	*	*	*	*	*				
6	Early York	*	*	*	*	*	*	*				
7	English Flake.....	*	*	*	*	*	*	*				
8	Gleason	*	*	*	*	*	*	*				
9	Neshannock.....	*	*	*	*	*	*	*				
10	Peach Blow.....	*	*	*	*	*	*	*				
11	Prince Albert.....	*	*	*	*	*	*	*				
12	Shaker Russet.....	*	*	*	*	*	*	*				
	PETUNIA.											
	<i>Violacea (Petunias).</i>	**	**	*	*	*	*	*	S. Amer ..	orn.....	an. herb....	.....
	DOGBANE.											
	VINCA (PERIWINKLE).	**	**	*	*	*	*	*	Europe?..	orn.....	perennial...	trailing herb.
	OLIVE.											
	FORSYTHIA.											
	<i>Viridissima.</i>	*	*	*	*	*	*	*	China, etc	orn.....	shrub	vigorous.....
	SYRINGA.											
	<i>Tulyaris (Common).</i>	*	*	*	*	*	*	*	Persia?..	orn.....	shrub	8-15 feet.....
	<i>Persica (Persian).</i>	*	*	*	*	*	*	*	Persia....	oru.....	shrub .....	.....
	CHIONANTHUS.											
	<i>Virginica (Fringe Tree).</i>	tend.	*	*	*	*	*	*	America..	orn.....	shrub .....	.....
	FRAXINUS (ASH).											
	<i>Excelsior (English Ash).</i>		*	*	*	*	*	*	Europe ..	orn.....	tree	80-90 feet.....
	<i>Pendula.</i>		*	*	*	*	*	*	Europe ..	orn.....	tree .....	.....
	<i>Americana (White).</i>	**	**	*	*	*	*	*	America..	tim. etc.	tree	100 feet.....
	<i>Sambucifolia (Black).</i>	**	**	*	*	*	*	*	America..	h'ps, etc	small tree...	.....
	<i>Quadrangulata (Blue).</i>	**	**	*	*	*	*	*	America..	tim. etc.	tree	70 feet.....
	GOOSEFOOT.											
	BETA (BEET).											
	<i>Vulgaris (Common Beet).</i>								S. Europe.	food.....	bien, herb..	.....
1	Bassano	*	*	*	*	*	*	*	Italy.....			.....
2	Blood Turnip .....	*	*	*	*	*	*	*				.....
3	Long Smooth Blood.....	*	*	*	*	*	*	*				18 inches
4	White Sugar	*	*	*	*	*	*	*				16 inches
	BUCKWHEAT FAMILY.											
	RHEUM (RHUBARB).											
	<i>Rheonicum.</i>								Asia?	food, etc	per. herb...	.....
1	Linnaeus .....	*	*	*	*	*	*	*				.....
2	Victoria .....	*	*	*	*	*	*	*				.....
	LAUREL FAMILY.											
	<i>Sassafras.</i>											20-70 feet.....
	<i>Officinale.</i>	*	*	*	*	*	*	*	America..	orn. etc.	tree .....	.....
	SPURGE.											
	BUXUS.											
	<i>Sempervirens (Box).</i>	*	*	*	*	*	*	*	Mediterr'n	orn.bor.		.....
	NETTLE.											
	ULMUS (ELM).											
	<i>Fulva (Slippery).</i>	**	**	*	*	*	*	*	America..	orn.....	tree	40-50 feet.....
	<i>Canadensis (English).</i>	**	**	*	*	*	*	*	European.	orn.....	tree	60-70 feet.....
	<i>Americana (White).</i>	**	**	*	*	*	*	*	America..	orn. etc.	tree	100 feet.....
	<i>Alata (Winged).</i>	**	**	*	*	*	*	*	America..	orn.....	tree .....	.....
	MORUS (MULBERRY.)											
	<i>Rubra (Red).</i>	*	*	*	*	*	*	*	America..	tim. etc.	low tree....	15-25 feet.....

OF PLANTS, ETC.				PECULIARITIES OF FRUIT, ETC.				Season.	No.
Hardin's	Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
		various.							
		various.							
				large					1
				large		yellow	sweet	early	2
hardy	light green.		prolific	medium	oval	deep red			1
				large		red	good		2
								v. early	3
				large	flat	red	good	late	4
hardy			prolific	large	round	br. red		late	5
				large	flat	yellow	sweet		6
			prolific	large	oval	scarlet	good	early	7
		purple			oblong	purple			1
			product.	large	round	white	v. good	v. early	1
			product.	large	roundish	white	variable	early	2
				large		white	v. good	v. early	3
									4
									5
									6
									7
									8
			product?	large	roundish	pink red			9
									10
									11
		purple, etc.							12
		blue, etc.							
	oblong	yellow							
	ovate	pale vio. etc lilac pur. etc							
		white							
hardy	bright green				flat, ob.				
hardy									
hardy									
hardy									
	num. erect			small	flat	rose red	good	v. early	1
	erect scanty			medium	turbinate	pur. red	v. good	early	2
	green			v. large		black pur.	v. good	late	3
				large	furiform	white	sugary	late	4
	small		product				high flavor	early	1
	large		v. prod				acid	early	2
	dp gr. aut. rd	yellow		small	oblong	purple		late	
tender		rose red							
	aut. yellow								
	aut. yellow								
	aut. yellow								
	large			small	cyli'drical	purple	sweet	early	

No.	NAME.	DISTRICTS.							Origin.	Use.	PECULIARITIES	
											Class, etc.	Hei't or Shape
		N.	C.	S.								
		1	2	3	4	5	6	7				
	<i>Alba</i>					*	*	*	China	leav. etc	small tree	
	Downing's Everbearing. MELIA					*	*	*	N. Y.	fruit		
	<i>Avantiaca</i> (<i>Osage Orange</i>).....	**	**	*	*	**	**	**	Ark.	etc. hed. etc.	low tree	25-50 feet.
	PLANE TREE FAMILY PLATANUS											
	<i>Occidentalis</i> (<i>Sycamore</i>).....	*	*			*	*	*	America	orn.	tree	125 feet
	WALNUT FAMILY JUGLANS (WALNUT.)											
	<i>Ciavrea</i> (<i>Butternut</i>).....	**	**	*	*	**	**	**	America	tim. etc.	tree	20-50 feet.
	<i>Nigra</i> (<i>Black Walnut</i>).....	**	**	*	*	**	**	**	America	tim. etc.	tree	110 feet.
	<i>Regia</i> (<i>English Walnut</i>).....					*	*	*	Asia	nuts. etc	tree	
	CARYA (HICKORY.)											
	<i>Oliviformis</i> (<i>Pecan</i>).....					*	*	*	Ill., etc.	nuts. etc		130 feet
	<i>Alba</i> (<i>Shellbark</i>).....	**	**	*	*	**	**	**	America	tim. etc.		60-80 feet.
	<i>Sulcata</i> (<i>West. Shellbark</i>).....	*	*			*	*	*	America	nuts. etc		60-80 feet.
	<i>Amara</i> (<i>Bitternut</i>).....	*	*	*	*				America	timber		60 feet.
	OAK FAMILY. QUERCUS.											
	<i>Alba</i> (<i>White Oak</i>).....	**	**	*	*	**	**	**	America	tim. etc.		70-100 feet.
	<i>Macrocarpa</i> (<i>Overcup</i>).....	**	**	*	*	**	**	**	America	tim. etc.		125 feet.
	<i>Priaus</i> (<i>Chestnut</i>).....	*	*			*	*	*	America	tim. etc.		90 feet.
	<i>Corocina</i> (<i>Scarlet</i>).....					*	*	*	America	tim. etc.		
	<i>Tinctoria</i> (<i>Black</i>).....	*	*			*	*	*	America	tim. etc.		80-90 feet.
	<i>Rubra</i> (<i>Red</i>).....	**	**	*	*	**	**	**	America	tim. etc.		60-90 feet.
	<i>Palastris</i> (<i>Scamp, Spanish</i>).....					*	*	*	America	orn. etc.		60-80 feet.
	CASTANEA (CHESTNUT)											
	<i>Vesca</i> (<i>European</i>).....								Europe			
	(<i>Americana</i>).....	**	**	*	*	**	**	**	America	fruit. etc		60-80 feet.
	FAGUS (BEECH.)											
	<i>Ferruginea</i> (<i>American</i>).....					*	*	*	America	orn. etc.		100 feet.
	<i>Sylvatica</i> (<i>European</i>).....					*	*	*	Europe	orn. etc.		
	<i>Enpurea</i>					*	*	*				
	CORYLUS.											
	<i>Acellana</i> (<i>Filbert</i>).....	*	*			*	*	*	Europe	nuts.		5-10 feet
	<i>Americana</i> (<i>Hazel</i>).....	*	*			*	*	*	America			4-6 feet.
	OSTREA.											
	<i>Virginica</i> (<i>Bay Horsebean</i>).....	*	*	*	*				America			30-50 feet.
	BIRCH FAMILY BETULA (BIRCH.)											
	<i>Lenta</i> (<i>Sweet</i>).....	*	*	*	*				America	timber.		30-60 feet.
	<i>Alba</i> (<i>White</i>).....	*	*	*	*	*	*	*		timber.		20-25 feet.
	<i>Populifolia</i>	*	*	*	*				America	orn.		20-25 feet.
	<i>Nigra</i> (<i>Red</i>).....	*	*	*	*				America	orn.		40-70 feet.
	WILLOW FAMILY. SALIX (WILLOW.)											
	<i>Purpurea</i> (<i>Purple</i>).....					*	*	*	Europe	baskets.		
	<i>Viminalis</i> (<i>Basket</i>).....	*	*			*	*	*	Europe	baskets.		
	<i>Babylonica</i> (<i>Weeping</i>).....	*	*			*	*	*	Orient	orn.		30-50 feet.
	<i>Alba</i> (<i>White</i>).....	**	**	*	*	**	**	**	Europe	tim. etc.		30-60 feet.
	<i>Vitellina</i> (<i>Golden</i>).....	*	*	*	*	*	*	*	Europe	os'rs. etc		30-50 feet.
	<i>Caprea</i> (<i>Goat W.</i>).....	*	*			*	*	*	England	orn.		30-50 feet.
	<i>Forbyana</i> (<i>Forbes W.</i>).....	*	*			*	*	*	England	bask. etc		
	POPULUS (POPLAR.)											
	<i>Alba</i> (<i>Able</i>).....	*	*	*	*				Europe	orn.	spreading	30-60 feet.
	<i>Dilatata</i> (<i>Lombardy</i>).....	**	**	*	*	**	**	**	Europe	orn.	fastigate	60-80 feet.
	<i>Monilifera</i> (<i>Cottonwood</i>).....	**	**	*	*	**	**	**	America	tim. etc.	spreading	130 feet.
	<i>Balsamifera</i> (<i>Balsam</i>).....	*	*	*	*				America	medic' l	round head.	80 feet.
	PINE FAMILY. PINUS (PINE.)											
	<i>Ponderosa</i> (<i>Heavy Wooded</i>).....	**	**	*	*	**	**	**	California	timber.		100 feet.
	<i>Sylvestris</i> (<i>Scotch</i>).....	**	**	*	*	**	**	**	Europe	timber.		80 feet.
	<i>Austriaca</i> (<i>Austrian</i>).....	**	**	*	*	**	**	**	Austria	timber.		
	<i>Resinosa</i> (<i>Red</i>).....	*	*	*	*				America	timber.		
	<i>Strobilis</i> (<i>White</i>).....	**	**	*	*	**	**	**	America	tim. etc.		100-200 feet.
	ABIES (SPRUCE FIR.)											
	<i>Everata</i> (<i>Noisy</i>).....	**	**	*	*	**	**	**	Europe	orn. etc.		120-150 feet.
	<i>Nigra</i> (<i>Black</i>).....	*	*	*	*				America	orn.		75 feet.
	<i>Alba</i> (<i>White</i>).....	**	**	*	*	**	**	**	America	orn.		25-50 feet.
	<i>Canadensis</i> (<i>Hemlock</i>).....	*	*	*	*	*	*	*	America	orn.		70-80 feet.
	<i>Balsamea</i> (<i>Balsam</i>).....	*	*	*	*	*	*	*	America	orn.		30-40 feet.
	<i>Pectinata</i> (<i>Silv' Fir</i>).....	tend.	*	*	*	*	*	*	Europe	orn.		100-180 feet.
	LARIX (LARCH.)											
	<i>Europaea</i> (<i>European</i>).....	*	*	*	*				Europe	tim. etc.		80-100 feet.
	<i>Americana</i> (<i>American</i>).....	*	*	*	*				N. Amer.	tim. etc.		
	TAXODIUM (CYPRESS.)											
	<i>Distichum</i> (<i>American</i>).....					*	*	*	America	tim. etc.		120 feet.
	TIUJA (ARBOR VIT.E.)											
	<i>Occidentalis</i> (<i>American</i>).....	**	**	*	*	**	**	**	America	orn.		20-25 feet.
	Var. <i>Siberian</i>	**	**	*	*	**	**	**	England?	orn.		

No.	NAMES.	DISTRICTS.						Origin.	Use.	PECULIARITIES	
		N.		C.		S.				Class, Etc.	Height or Shape
		1	2	3	4	5	6					7
	JUNIPERUS (JUNIPER.)										
	<i>Virginiana (Red Cedar)</i>	**	*	*	*	*	*	America	tim. etc.		30-40 feet.....
	<i>Sabina (Savin)</i>	*	*	*	*	*	*	Europe			
	SALISBURIA.										
	<i>Adiantifolia (Ginkgo Tree)</i> ...							Japan			40-80 feet.....
	AMARYLLIS.										
	NARCISSUS.	**	*	*	*	*	*			per. herb.	
	POLIANTHES (TUBE ROSE.)	**	*	*	*	*	*			per. herb.	
	<i>Tuberosa</i>	**	*	*	*	*	*	Mexico	orn.	per. herb.	
	IRIS FAMILY.										
	IRIS (FLOWER DE LUCE).	**	*	*	*	*	*			per. herb.	
	<i>Germanica (Common)</i>	**	*	*	*	*	*	Europe	orn.	per. herb.	
	LILY FAMILY.										
	LILIUM.									per. herb.	
	<i>Tigrinum (Tiger)</i>	*	*	*	*	*	*	China	orn.		4-5 feet.....
	<i>Carolinum (Carolina)</i>	*	*	*	*	*	*	America	orn.		2-3 feet.....
	<i>Spectosum</i>	*	*	*	*	*	*	Japan	orn.		1-3 feet.....
	<i>Auratum (Golden)</i>	*	*	*	*	*	*	Japan	orn.		1-3 feet.....
	<i>Japonicum (Japan)</i>	*	*	*	*	*	*	Japan	orn.		2 feet.....
	<i>Candidum</i>	*	*	*	*	*	*	Persia, etc	orn.		
	<i>Longiflorum</i>	*	*	*	*	*	*	Japan	orn.		1 foot.....
	TULIPA (TULIP).										
	<i>Gesneriana (Common)</i>							Asia Min.	orn.	per. herb.	
	ALLIUM (ONION, ETC.)										
	<i>Cepa (Onion)</i>							Europe	eat. etc.	per. herb.	
1	Clove.....	*	*	*	*	*	*				
2	Top.....	*	*	*	*	*	*				
3	Wethersfield Large Red.....	*	*	*	*	*	*	Conn.	mar. etc.		
4	Yellow Danvers.....	*	*	*	*	*	*	Mass.			
	HYACINTHUS.										
	<i>Orientalis</i>	**	*	*	*	*	*	Levant	orn.	per. herb.	
	YUCCA.										
	<i>Filamentosa</i>	**	*	*	*	*	*		orn.		3-6 feet.....
	GRASS FAMILY.										
	ZEA.										
	<i>Maize (Indian Corn)</i>							America	grain	an. herb.	8-11 feet.....
1	Adams' Early.....	*	*	*	*	*	*		mar. etc.		
2	Bates' Early.....	*	*	*	*	*	*				
3	Forty Days.....	*	*	*	*	*	*				
4	Mammoth Sugar.....	*	*	*	*	*	*				
5	Stowell's Evergreen.....	*	*	*	*	*	*				6-7 feet.....
6	Tuscarora.....	*	*	*	*	*	*				5-6 feet.....

OF PLANT, ETC.			PECULIARITIES OF FRUIT, ETC.				Season.	No.
Hardin's Foliage, etc.	Flowers.	Product.	Size.	Shape.	Color.	Flavor.		
..... small	.....	.....	small	.....	.....	.....	.....
.....	white	.....	.....	.....	.....	.....	.....
.....	white, etc.	.....	.....	.....	.....	.....	.....
.....	deep violet.	.....	.....	.....	.....	.....	.....
.....	or red	.....	.....	.....	.....	.....	.....
.....	or red	.....	.....	.....	.....	.....	.....
.....	white, etc.	.....	.....	.....	.....	.....	.....
.....	white, etc.	.....	.....	.....	.....	.....	.....
.....	white	.....	.....	.....	.....	.....	.....
.....	white	.....	.....	.....	.....	.....	.....
.....	various	.....	.....	.....	.....	.....	.....
..... hollow	white	.....	.....	.....	.....	.....	.....
.....	.....	.....	large	roundish	.....	coarse	1
.....	.....	product	large	roundish	red	.....	2
.....	.....	product	large	globular	yellow	mild	3
.....	various	.....	.....	.....	.....	.....	4
.....	white	.....	.....	.....	.....	.....	.....
.....	.....	.....	large	cyli'drical	white, etc.	.....	.....
.....	.....	.....	7-8 in.	.....	white	not sweet	early ... 1
.....	.....	.....	.....	.....	.....	.....	..... 2
.....	.....	.....	.....	.....	.....	.....	..... 3
.....	.....	.....	.....	.....	.....	.....	..... 4
.....	product	6-7 in.	conical	yel white	sweet	late ... 5	
.....	12 in	white	not sweet	medium 6	

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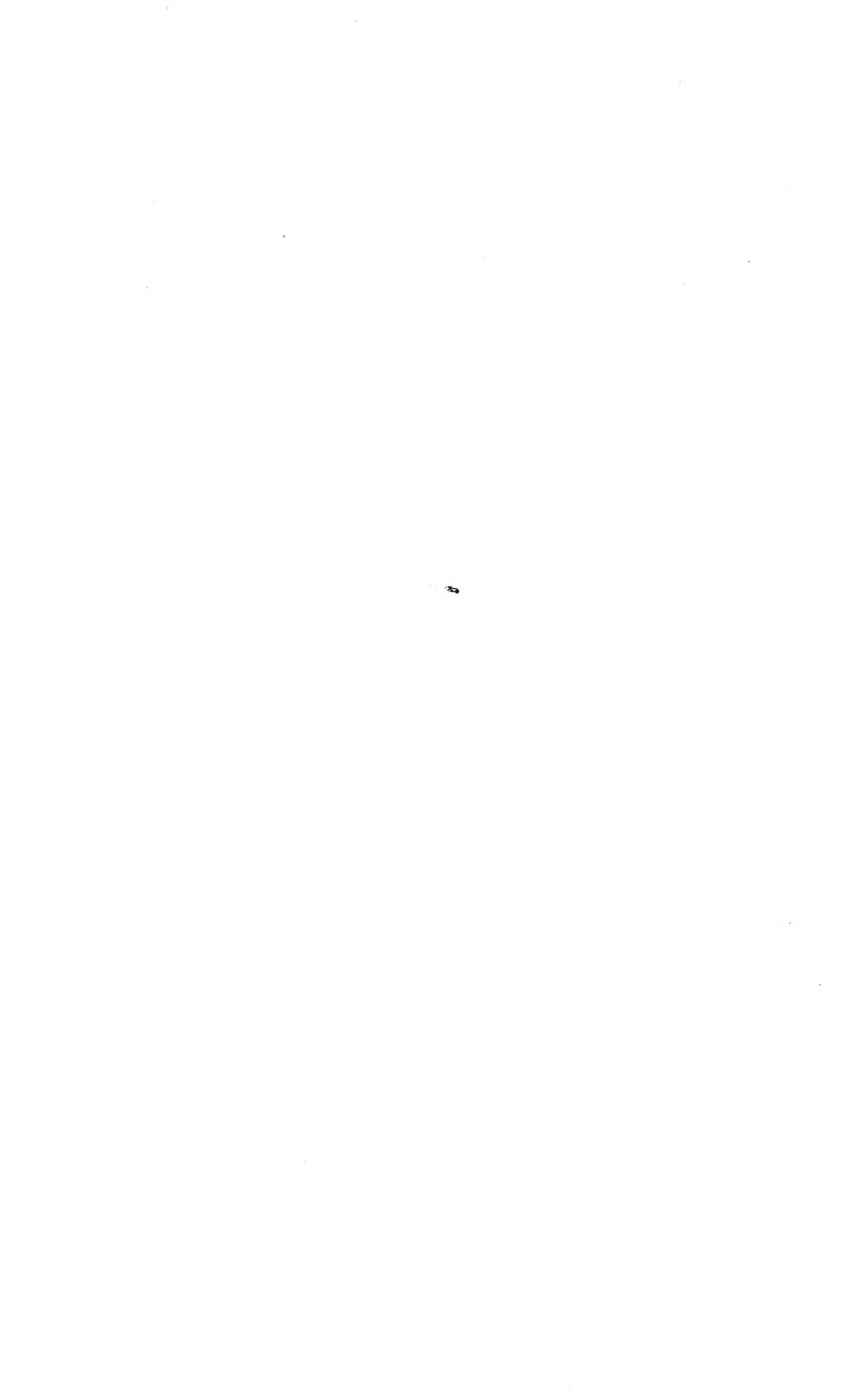
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