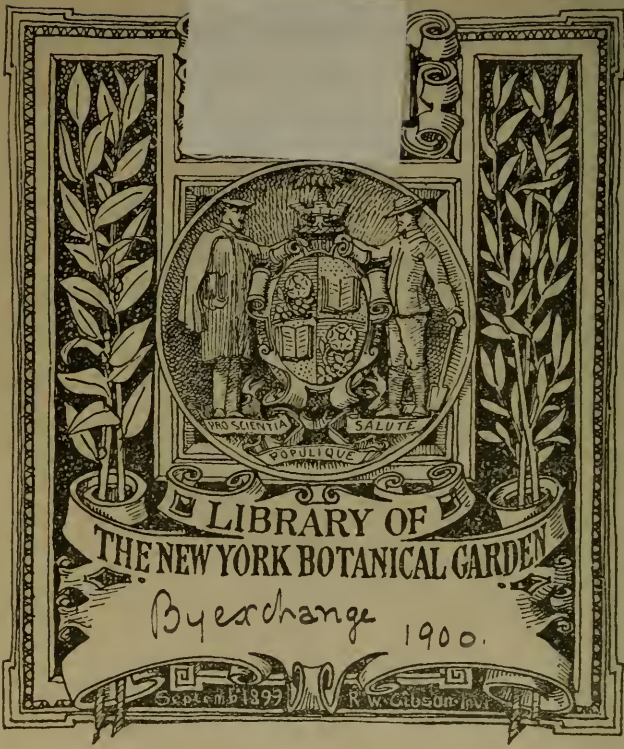


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TRANSACTIONS
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY.

PROCEEDINGS, ESSAYS AND REPORTS

AT THE

ANNUAL WINTER MEETING,

Held at Minneapolis, January 20-23, 1874,

AND

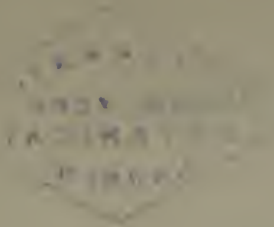
CORRESPONDENCE AND REPORTS UPON THE EFFECTS
OF THE WINTER OF 1872-3 ON FRUIT
TREES IN MINNESOTA.

Prepared by JOHN S. HARRIS, Secretary.

SAINT PAUL:
OFFICE OF ST. PAUL PRESS CO.
1874.



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LIST OF OFFICERS—1874.

PRESIDENT :

TRUMAN M. SMITH. St. Paul.

VICE-PRESIDENTS :

E. H. S. DARTT Owatonna.

LEVI NUTTING..... Faribault.

G. W. FULLER..... Litchfield.

SECRETARY :

L. M. FORD St. Paul.

TREASURER :

AMASA STEWART..... Minneapolis.

STANDING COMMITTEES.

EXECUTIVE :

J. S. HARRIS..... La Crescent.

J. C. FLEISCHER..... St. Paul.

P. A. JEWELL..... Lake City.

O. F. BRAND..... Faribault.

J. T. GRIMES..... Minneapolis.

GENERAL FRUIT COMMITTEE :

WYMAN ELLIOT, H. J. BRAINARD, O. F. BRAND, E. H. S. DARTT,
THOMAS RAMSDEN, BARRETT TAYLOR, P. A. JEWELL,
ROBERT GOODYEAR, JOHN S. HARRIS, A. C. HAMIL-
TON, A. W. SIAS, LEVI HILLIGOSS,
F. G. GOULD.

LIST OF MEMBERS.

Abernethy, W. J.	Minneapolis.
Buckendorf, William.....	Minneapolis.
Brackett, George A.....	Minneapolis.
Booth, J. E.	Minneapolis.
Bowerman, J. H.	Faribault.
Brand, O. F.	Faribault.
Carter, T. G.	St. Peter.
Clark, C. H.	Minneapolis.
Chowen, George W.	Minneapolis.
Cannon, William.....	Minneapolis.
Day, Ditus.	Farmington.
Dartt, E. H. S.	Owatonna.
Foster, A. D.	Minneapolis.
Fuller, G. W.	Litchfield.
Fowler, William.....	Newport.
Fleischer, J. C.	St. Paul.
Ford, L. M.	St. Paul.
Grimes, J. T.	Minneapolis.
Gibbs, H. R.	Minneapolis.
Gould, T. G.	Excelsior.
Humphrey, Otis M.	Minneapolis.
Hilligoss, Levi	Blooming Prairie.
Herrick, H. N.	Minneapolis.
Howe, G. H.	Minneapolis.
Hoffman, James.	Minneapolis.
Higgins, S. B.	Baxter, Iowa.
Harris, John S.	La Crescent.
Jewell, P. A.	Lake City.
Kilpatrick, Charles.....	Minneapolis.
Kramer, J. C.	La Crescent.
Latham, A. W.	Excelsior.
Loring, B. M.	Minneapolis.
Moulton, Thomas.	Minneapolis.
Meyer, Ernest.....	St. Peter.
Nutting, Levi	Faribault.
Prescott, C. A.	West St. Paul.
Ramaley, D.	St. Paul.
Shaw, J. N.	Minneapolis.
Stevens, John H.	Minneapolis.
Smith, Truman M.	St. Paul.
Stratton, L. W.	Excelsior.
Stubbs, N. J.	Long Lake.
Stewart, A.	Richfield.
Tyler, Alexander	Minneapolis.
Wilcox, E.	Trempealeau, Wis.

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LOCAL AND COUNTY HORTICULTURAL SOCIETIES.

OLMSTED COUNTY HORTICULTURAL SOCIETY,

ORGANIZED MARCH 3D, 1873.

Secretary.....S. D. HILLMAN, Eyota.

HENNEPIN COUNTY HORTICULTURAL SOCIETY.

[The list of officers and reports of this society have failed to come to hand.]

HONORARY MEMBERS.

- GEO. PEFFER..... Pewaukee, Wisconsin.
- A. G. TUTTLE Baraboo, Wis.
- O. S. WILLEY Madison, Wis.
- HON. WM. W. FOLWELL..... Minneapolis, Minn.

P R E F A C E .

The second annual volume of the Minnesota State Horticultural Society is herewith submitted to the friends of horticulture and rural adornment, and all who are interested in the welfare and happiness of the people of our noble State, and with its publication the official connection of the writer with the society ceases. From the time it sprang into existence the writer has been a member of the society, and has attended every meeting held with the exception of two, and during most of the time has occupied an official position, and it is with pleasure that he surrenders the responsibility of an officer, not to retire to private life, but to enter the ranks and join in the battle until the victory is complete.

Of the value of this volume it may not be proper for me to speak. It speaks for itself to tell you that the society is steadily growing in numbers, influence and power for good. This volume contains a number of addresses and essays of great value, and the correspondence and reports are in my opinion one of its best features. The lists of fruits adopted for cultivation are very complete, and fully equal—quality and hardiness to rule—to the lists recommended by our neighbors of the Wisconsin Society.

The last (1872 and '73) winter had severely tried many varieties of fruit, and we expected that many of our friends would be discouraged, and inclined to raise the old cry of "no fruit country," but were happily disappointed, as the contents of this volume will show.

It will be noticed that the men who have taken part in the discussions and contributed papers are with few exceptions the pioneers of fruit growing in this State, and many of them have had large experience in testing varieties in various localities.

We for the first time present a list of Siberians for general planting. No doubt some of the varieties will be discarded in future years and their places filled with other and better, for this class of fruit is showing a capacity for improvement, but

there is very little risk incurred in planting them freely, as most of the varieties come early into bearing and fruit very abundantly.

For the deference shown me by the society I am very grateful, and feel that to one and all my heartfelt thanks are due.

JOHN S. HARRIS.

LA CRESCENT, Minn., 1873-4.

NURSERYMEN, FLORISTS AND GARDENERS OF MINNESOTA.

- Bunnell, M. C., fruit trees and shrubbery, Money Creek.
Brand, O. F. & Co., general nursery stock of fruit, evergreen and ornamental trees, Faribault.
Bates & Northrop, general nursery, Stockton.
Bowerman, J. H., general nursery, Faribault.
Brimhall, William E., fruit and ornamental trees and garden vegetables, St. Paul.
Brown, James, vegetable garden, La Crescent.
Buckendorf, William E., florist, Minneapolis.
Booth, J. E., florist, Minneapolis.
Cook, C. P. & Co., hardy trees, shrubs and vines, Garden City.
Dartt, E. H. S., hardy apple trees, Owatonna.
Dean, J. H., nurseryman, Blue Earth.
Elliot, Wyman, nurseryman and gardener, hardy fruit and ornamental trees, Minneapolis.
Evans, E. P., nurseryman and dealer, Brownsville.
Ford, L. M., nurseryman and florist, St. Paul.
Fuller, G. W., nurseryman, Litchfield.
Fleischer, J. C., florist, St. Paul.
Goodyear, Robert, nurseryman, Mankato.
Grimes, J. T., small fruits, hardy apple and ornamental trees, Minneapolis.
Gould, F. G., nurseryman, Excelsior.
Gillmore, J. F. nurseryman, Faribault.
Harris, John S., fruit gardener and florist, La Crescent.
Hoffman, James, nursery and shade trees, Minneapolis.
Hermanson, J. A., nurseryman, Otisco.
Jewell, P. A., general nursery, Lake City.
Jordon, E. B., nursery, Rochester.
James, A. T., nurseryman, Smithfield.
Kramer, J. C., general gardener, La Crescent.
Latham, A. W., nurseryman, Excelsior.
Moulton & Co., hardy apples, Minnesota seedlings and Siberians, Minneapolis.
Martin, Lewis, nurseryman, Anoka.
Prentis, D. W. C., nurseryman and dealer, St. Peter.
Stewart, A., nurseryman, Richfield.
Sias Brothers, nurserymen, Rochester.
Slee, John W., nurseryman and florist, Dundas.
Smith, Truman M., small fruits and grape vines, St. Paul.
Waller, G. B., nurseryman, Litchfield.
Wadsworth, H. S., nurseryman, Litchfield.

INCORPORATION OF THE SOCIETY.

ARTICLES OF INCORPORATION OF THE MINNESOTA STATE
HORTICULTURAL SOCIETY.

Know all men by these presents, that we, the undersigned, John S. Harris, of La Crescent, Houston county, John H. Stevens, of Hennepin county, Wyman Elliot, Charles Hoag, J. T. Grimes, A. Stewart, R. J. Mendenhall, Peter M. Gideon and Charles H. Clark, all of Hennepin county, D. A. J. Baker, Truman M. Smith, D. A. Robertson, William E. Brimhall, H. J. Brainard, L. M. Ford and Wm. Paist, all of Ramsey county, and Thomas Ramsden of Washington county, O. F. Brand, A. W. McKinstry and Levi Nutting, all of Rice county, and P. A. Jewell, of Wabasha, E. H. S. Dartt, of Owatonna, Steele county, all of the State of Minnesota, do hereby associate ourselves together for the purpose of becoming incorporated under the name, and for the purposes hereinafter stated, pursuant to the provisions of title and chapter 34 of the General Statutes of said State of Minnesota, so far as the same may be applicable, and do now adopt the following Articles:

ARTICLE 1. This corporation shall be known as the Minnesota State Horticultural Society.

ARTICLE 2. The object of the society shall be to collect, condense and collate information relative to all varieties of fruits, flowers, and other horticultural productions, and dispense the same among the people.

ARTICLE 3. Any person interested may become a member of the society by paying to the Treasurer or Secretary, the annual fee of one dollar, and signing the constitution and by-laws.

ARTICLE 4. The amount of capital stock of this corporation shall be twenty-five thousand dollars (\$25,000), with privilege to increase it to \$100,000, to be held in shares of twenty-five dollars each.

ARTICLE 5. The officers of this society shall be as follows : President, one Vice President to reside in each Congressional District of this State, Secretary, Treasurer, and an Executive Committee of three or more members, all of whom shall be elected at the annual meetings of this society, which shall be held on the 3d Tuesday in January.

ARTICLE 6. The principal place of business shall be wherever the majority of the society may hereinafter designate.

BY-LAWS

ADOPTED AT THE ANNUAL MEETING HELD JANUARY 20-23, 1874.

DUTIES OF OFFICERS.

1. It shall be the duty of the President to preside at all meetings of the society, when present, and to deliver an address at the annual meeting of the same. In the absence of the President, one of the Vice Presidents shall preside in his place.

2. The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the society; establish and maintain correspondence with all local, county, district and State horticultural societies, and secure by exchange their transactions, as far as possible; to aid the President as an executive officer, in the dispatch of business relating to meetings of the society, and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which shall become part of the transactions for the current year, and shall be prepared by him for the public printer.

3. The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the Secretary countersigned by the President.

4. An Executive Committee of five shall be chosen annually, who shall, in connection with the President and Secretary, (who shall be members ex-officio) have in charge all matters pertaining to the interests of the society; shall revise all matter coming into the hands of the Secretary, and pass upon the same their approval before its submission to the annual meeting

5. The Executive Committee may call a meeting of the society at any time and place they may deem advisable for the interests of the society, giving at least thirty days' notice through the public press, and shall in no case incur any ex-

pense exceeding fifty dollars except by authority of the vote of the society at its annual meeting, when the specific object and the amount so appropriated shall be designated.

6. The President, at each annual meeting of the society, or as soon thereafter as practicable, shall appoint a General Fruit Committee, consisting of one member from each Senatorial District in the State, and it shall be the duty of each member to report upon the fruit crop in his respective district annually; also a limited list of fruits best adapted to general cultivation in the district which such member represents.

7. That committees on vegetables and market gardens; flowers and floriculture; trees for the forest and forest culture, and entomology, be appointed each year, whose duties it shall be to report on their several topics to this society at the annual meeting.

TRANSACTIONS
OF THE
MINNESOTA STATE HORTICULTURAL
SOCIETY.

ANNUAL MEETING HELD AT MINNEAPOLIS, JANUARY 20, 21, 22 AND 23, 1874.

Pursuant to notice given through the Farmer's Union of Minneapolis, and the principal periodicals throughout the State, and in accordance with provisions of the Constitution, the members and friends of the State Horticultural Society met in the Council Chambers of the City Hall, at Minneapolis, at 10 A. M., January 20.

There was quite a large attendance, and an unusual interest shown in the cause of horticulture, and a strong desire to learn how to avoid a repetition of the disasters of last winter (1872 and 1873.)

A table was set up in the hall upon which was spread collections of fruits, flowering plants, seeds for distribution, and samples of wines, jellies and preserved fruits, &c. But the display, though better than we expected, was much inferior to that shown at the annual meeting in this city two years since, and told plainly that misfortunes had overtaken us and dashed many bright hopes to the earth, but like truth, which, "crushed to earth, will rise again," so is horticulture destined to become a grand success in our noble State. Severe winters may visit us, and corrupt and ignorant Legislators may defraud us of our rights, and rings may cripple us for a time, but the fruit-growers of Minnesota are "iron-hearted men," and they are searching for "iron-clad" trees. They have nailed the flag to the mast, and their battle cry is: "Fruit for ourselves; fruit for the millions that will soon people our State; fruit to load our railroad cars and steamboats and send to other lands. We will have fruit or perish in the attempt."

The meeting was called to order by the President, Truman M. Smith, of St. Paul; and the Secretary, J. S. Harris, of La

Crescent, being out of health, C. H. Clark, of Minneapolis, was chosen Assistant Secretary.

ADDRESS OF WELCOME.

Col. J. H. Stevens, on behalf of Mayor Brackett, extended to the society the following address of welcome :

Mr. President and Gentlemen of the State Horticultural Society :

I am directed by Mayor Brackett, who is unavoidably absent, to extend to each one of you the hospitalities of the city. The citizens of Minneapolis feel honored that the society, in its wisdom, selected this place for the purpose of holding the annual meeting. They have ever taken a deep interest in the glorious cause of horticulture, and they will endeavor to make your sojourn with us pleasant. They doubt not that your deliberations will be attended with much benefit to the State. You have their best wishes and sympathy in all that appertains to your noble calling. They bid you God speed in your undertaking, fully believing that the day is not far distant when the apple, through your efforts, will be to the manor born, while the rose and kindred flowers will be household treasures appreciated by all who are fond of the beautiful.

PRESIDENT SMITH'S REPLY.

Mr. Smith, in his reply to the above, remarked that the society had selected Minneapolis as their place of meeting feeling its great interest in horticulture as evinced by the choice fruits in their markets, and by the ornamental trees, and numerous and well-filled green houses and conservatories and beautiful flower gardens that beautify your many pleasant homes in your young and growing city.

He also thanked the citizens in behalf of the society for their proffered hospitality and kindness.

COMMITTEE ON ARRANGEMENTS.

As the Executive Committee had been unable to prepare a programme for the meeting, a motion was made and carried that a committee of three be appointed to present topics for discussion, and prepare an order of business for the meeting; committee to report at 2 P. M.

A. T. Stewart, of Hennepin, P. A. Jewell, of Wabasha, and Theodore Bost, of Carver county, were appointed.

The Secretary read a communication from G. E. Morrow, Secretary of the Wisconsin Horticultural Society, offering to

exchange fifty copies of their Transactions for 1873, for fifty of ours for the same year. The communication was accepted and a resolution passed instructing the Secretary to exchange fifty copies of the Minnesota State Horticultural Society Reports for fifty copies of the reports of the Horticultural Society of Wisconsin.

On motion of Mr. Ford, of St. Paul, a committee was appointed and instructed to proceed to the State capitol and secure all the State Horticultural Reports not in use there, and bring them before the society on Thursday morning.

A short time was spent in free conversation, and the society adjourned to 2 P. M.

AFTERNOON SESSION.

The meeting was called to order by Vice President E. H. S. Dartt, of Owatonna, when the following report from the Committee on Topics for Discussion, and Order of Business, was presented by P. A. Jewell :

1. What tests are necessary to fully establish the perfect adaptation of any variety of apples to the peculiar and trying climate of our State.
2. Best sorts for cultivation.
3. Transplanting.
4. Cultivation and protection.
5. Time and manner of pruning.
6. Diseases to which apples trees are liable, and their treatment.
7. Insects injurious to trees and fruits, and the most economical and efficient means of destroying them.
8. Pear culture.
9. Plums.
10. Cherries.
11. Grapes.
12. Currants.
13. Gooseberries.
14. Blackberries.
15. Raspberries.
16. Strawberries.
17. Cultivation of forest trees for timber protection.
18. Deciduous, shade and ornamental trees.
19. Evergreens.
20. Ornamental shrubs and plants.
21. What soils are best adapted to the various kinds of fruits, and what manures promote the most healthy growth.
22. What new kinds of fruit appear worthy of cultivation.
23. Suggestions relative to the granting of premiums at State Fairs.

The report was accepted, and the society proceeded to the discussion of the subjects in the order named.

PLANTING APPLE TREES.

Considerable discussion followed on the first subject as to the best locality for planting apple trees, and the time necessary to test their hardiness. It was asserted as an established fact that many varieties of trees would grow and produce apples on or near the borders of our lakes and rivers when they would not flourish on the high prairies.

The severity of the last winter on fruit trees had made the question one of great importance as to which kind of fruit trees should be recommended and what tests should be applied. Mr. P. A. Jewell stated that his experience proved that many varieties, such as the Ben Davis, which have come into extensive use, had failed to stand the test of Minnesota climate; that all the samples of fruit we have is but the growth of a remnant of hundreds of fruit trees that we have planted. Because one or two trees out of a dozen different varieties stood the test, it should not be taken as proof of their worth. It is impossible to test any kind of trees with one, five or ten years' growth.

Messrs. Hoffman, Stevens, Stubbs, Dartt, Clark, Bost, Fuller and others spoke at length, and Mr. Clark said he thought that although the last winter was an exceptionably severe one, it was quite safe to assert that any tree that had stood the test of this climate, planted in different parts and in different soils, was sufficient to establish its hardiness. He accordingly presented the following resolution:

Resolved, That this society will not recommend for trial in this State any variety of apple tree that has not stood a test of at least five years in different locations and soils throughout the State.

Mr. Jewell said that he would not object to trying any tree five years, but he would not recommend it for planting in five years—not less than ten years. It was necessary for trees to have a test of that length of time, or at least till they had a test such as only last winter could give.

Mr. James Hoffman thought that dwarf varieties would have to be resorted to yet, since the standard had failed.

Rev. Mr. Fuller thought that last winter was a sufficient test for any tree.

Mr. Bost said that in his vicinity the old trees had been killed and not the younger varieties.

Mr. Jewell offered the following in amendment to Mr. Clark's resolution:

That we do not recommend for general planting in large quantities any variety that has not stood a test of ten years in a variety of soils and situations, and shall have passed through at least one winter of great severity.

Another warm discussion arose on Mr. Jewell's amendment.

The Secretary, J. S. Harris, offered the following resolution for the amendment:

Resolved, That a test of five or more years in ten or more different localities, and endurance of such a winter as the last without injury, should be a sufficient test of hardship to warrant this society in recommending for general cultivation.

Mr. C. H. Clark thought it was unjust to those who planted trees, to impose such a length of time on any variety of trees before they could be recommended for general use.

The resolution offered by Mr. Jewell was adopted.

Variety of apples next taken up.

BEST SORTS FOR CULTIVATION.

The next subject was the best sorts for cultivation.

It was moved by Mr. Dartt and seconded by Mr. Gould, of Excelsior, that the Duchess of Oldenburg be counted first on the list.

Carried.

It was moved that a committee be appointed to present a list of trees to be regarded the best.

The President appointed Messrs. Jewell, Dartt and Hoffman as such committee.

TRANSPLANTING.

Transplanting was the next theme of discussion. Col. Stevens introduced Dr. O. M. Humphreys, of this city, to the meeting.

The Doctor had not been long in this State, but always had a deep interest in fruit and tree culture. His experience had always favored his preference for fall planting. He always planted immediately after coming from the nursery, and with as many roots as possible. His spring transplanting had not been so successful. The Duchess tree, from his observation, has proved the best. The crabs in sandy soil and in different parts of the State, had proved a failure, although in heavier soil it may do better. His grape vines, of twenty varieties, he always plants deep, and they passed through last winter safely.

Mr. Hoffman had been in the State twenty-six years; sixteen years he had planted forest trees, and five or six fruit trees. He always plants forest trees in fall, and lifts or heals in his fruit trees in fall and plants them in the spring. Duchess he favors best, Haas next, Ben Davis not at all.

Mr. Jewell thought if fruit trees were lifted in the fall they would survive the winter, but all fruit trees should be

planted in the spring. They should be dug up early in the fall and carefully laid away till spring, when they suffer but little injury in transplanting. It is not safe to take even the hardiest varieties from a nursery and transplant them.

Mr. Gould indorsed Mr. Jewell's opinion of transplanting, but he objected to the manner of burying trees in winter. He recommended a dry place, not putting the body of the tree in earth at all,—by digging a trench on the north side of a hill, and leaning the trees at an angle of 45 degrees, so that the water will not rot the bark.

Mr. Jewell preferred a high and dry location, burying about two feet, digging a deep trench which will take in the trees entirely below the surface. After placing the trees in these trenches he places rafters or ties across the top, covering with a board, then he covers over all with dirt; after a freezing he covers with straw or litter.

Mr. Harris gave his system and experience, which conformed nearly or quite to that of others.

He had transplanted apple trees in the autumn with good success, if it was done early and the soil was not too dry, but preferred to receive trees in the fall and plant as early in the spring as the season would permit. Said his plan for wintering the trees was to select a dry, sheltered place and dig a trench eighteen inches deep and about the same in width and long enough to receive what trees he had.

Then open the bundles and take one tree at a time and remove with a sharp knife all bruises from the roots, cut back the tops to correspond with root and place in the trench, standing at an angle of about 45 deg., and put the earth back over the roots one tree at a time, being sure to leave the work when completed so that water will run from it. By this process had kept his trees for spring planting for many years and never had one injured. If the trees are received from the nursery in very cold weather, the pruning and making ready should be done in the barn or cellar, to prevent their being long exposed to frost.

CULTIVATION AND PROTECTION.

This subject being next taken up, was opened by Mr. Grimes. He believed in deep ploughing with proper pruning, while for protection mulching was necessary, and he would recommend a growth of something like raspberries in parallel rows to trees, as incidental to the same.

Mr. Dartt favored thorough cultivation.

Mr. Jewell believed in thorough cultivation, particularly during the first three or four years. In order to get trees

well established would commence as early as possible. He warned the society against late cultivation as tending to late growth, thereby jeopardizing the safe passage of the trees through the winter. He would mulch in the fall of the year. There is nothing better than straw, which would hold the snow, taking due caution against injury from mice.

Mr. Dartt had had most satisfactory experience in mulching with earth, sowing oats, and as they grew working them into the soil.

Mr. Hoffman approved of cultivation. Said it kept the soil in condition to receive and retain moisture.

The Secretary said that his experience had favored cultivation up to the last winter, but during that winter his losses had been most severe where the ground was cultivated. Believed liberal mulching would have saved most of his orchard. Had trees of Northern Spy and Perry Russet in grass not materially injured.

Presented the following report from S. B. Klough, Winona county:

"I have an orchard of 65 trees four years planted on high ridge land; soil clay loam. Trees of those varieties nurserymen call hardy, just commencing to fruit. Land seeded to clover last fall. I hauled wheat straw and put it about a foot deep around the trees, and out as far as the roots would reach. Lost one tree, a Dominic, the rest all right. The tree that died had never done well."

PRUNING AND TIME TO PRUNE.

In consideration of this subject, Mr. Dartt would only prune to please the eye. He thought little pruning should be done, and would prune about three feet up.

Mr. Jewell thought that three feet was high enough.

Mr. Grimes thinks the less pruning trees have the better; it should only be done when limbs grow in improper places.

Mr. Howe thought that trees could be shaped in any way desired. If scions are to be cut they should be cut from the tops of the tree. We want the roots to run deep so that we can plow near them, and the tree should be trimmed high up.

Mr. Gould thought that one should use judgment in trimming trees. It was not safe to cut large limbs.

J. S. Harris thought we should not cut off the Transcendent too early; he found budding on Transcendents a failure.

Mr. Jewell thought the trouble with Mr. Harris' failure in budding on Transcendents was in not cutting away the top early enough, which caused bleeding.

A motion was made and carried to adjourn till evening.

EVENING SESSION.

The President in the chair called the meeting to order at 7 P. M. The Secretary being absent, Mr. Latham was appointed Secretary *pro tem*.

The President then announced the topic for discussion.

THE DISEASES TO WHICH APPLE TREES ARE LIABLE AND THEIR TREATMENT.

The discussion was opened by Mr. Dartt. He considered that the blight affected fruit trees, as disease does the human family. The Transcendent and seedling crab are most liable to blight; the Duchess of Oldenburg and Soulard crab the least. The Tetofsky is not so free from it as the Duchess. The Saxton and Golden Russet also suffered severely from it. He preferred the severity of winters, like the last, to the blight.

Col. Stevens could not agree with Mr. Dartt. He had never heard of any successful remedy for it, but believed that the frosts of winter were worse than blight. It was not generally considered dangerous to fruit trees, as it does not affect them oftener than once in twenty or thirty years. It has been a number of years since the blight made its appearance in Minneapolis. I have heard that a few years since it prevailed to such an extent in Southern Illinois as to threaten the total destruction of the orchards, but has since disappeared.

Mr. Smith had lost two Soularés by the cause of blight—esteems the fruit very highly. Said that until lately Mr. Harris had thought the blight caused by electricity; believed that Mr. Elliot considered it the result of a certain fungus in the atmosphere, but he did not think either supposition entirely correct, as the electricity, according to that theory, would destroy the trees every year. He thought the blight was contagious, and could only be regarded as a disease.

Mr. Gould also thought it was contagious, and was the result of fungus matter in the atmosphere, and there was no remedy found for it yet. He had examined the trees affected with it with a powerful microscope, but could not detect the cause. Stated that his Transcendents were the first to blight.

Dr. Humphreys asked what should be done with a tree in a garden of a hundred others, that had blighted for two or three years?

Answered by Col. Stevens—"Dig it up."

Dr. Humphreys then asked if wood ashes had been used, and further stated that all diseases were self-propagating, and that if the cause of the blight is parasites, a preventive ought

to be found in disinfectants. We might approximately decide as to this cause by their use. He intended to try on his own grounds a solution of potash or strong lye. Carbolic acid and other similar disinfectants might be tried with probably good effect.

Mr. Stewart has trees with wood ashes thrown around them, and they have suffered as much as others.

Mr. Gould advised cutting off all diseased branches and burning them.

Mr. Jewell does not profess to know the cause of the blight, although he has suffered much from it. His experience with it was more in nursery than orchard. Thought the more rapid the growth of the tree, the more liable to blight; that the disease was transmitted through the atmosphere, and wherever there was a rupture in the bark of the tree there it lodged. The blight attacked some Transcendents 4 or 5 years old, and spread rapidly through his nursery. Would keep Transcendents and Hyslops from the near proximity of a growing nursery, as they are more subject to blight. He also notices that trees not pruned suffered less than those closely pruned. Had used a tree plow to cut the roots of nursery row trees which were badly affected with good success in arresting the disease. He inferred that from arresting the growth of the tree in this way worked the favorable result.

The Transcendents and crabs as a class were most subject to blight, and in the selection of varieties to plant care should be taken as to their kind. Would not recommend setting Transcendents, and other varieties subject to blight, in same orchard with others, as they would be liable to cause it to spread among the others. Had top grafted a Hyslop. The blight killed the body and the tree is now dead. This liability to blight is an objection to using crabs to top work upon, and if used for this purpose all sprouts should be kept away. The Montreal Beauty blights worse than any other.

INSECTS INJURIOUS TO TREES AND FRUITS, AND THE MOST ECONOMIC AND EFFICIENT MEANS OF DESTROYING THEM,

Was the next topic taken up.

Mr. Brand considered the best way to destroy the aphid was to watch them carefully as they appeared upon the top leaves, and destroy by rubbing between the hands. If left two weeks they will spread rapidly. He suffered much the past season from the borer. By close examination he had been able to detect their first appearance by the incisions made by the perfect insect in depositing the eggs, and the best way to destroy them was to crush the eggs by a pressure on the bark.

Mr. Stevens had had strong soap suds recommended for the louse, to be applied to the leaves; had tried it and found two applications to work an effectual cure.

Mr. Jewell had tried solution of ammonia and decoction of tobacco, the latter of which he found the best, and would further say that it was the only use for which it was fit.

Mr. Cannon said tobacco water (the leaves to be immersed in it or apply with syringe) is the best remedy I know of.

Mr. Howe suggested evening bonfires, or that a pan of burning tar be placed among the trees as an economical way of catching and destroying insects.

Mr. Dartt regarded the apple worm as the most destructive to the apple in Minnesota and throughout the north-west. Thinks this worm was brought here in barrels of apples shipped from below. Described Weir's trap for catching them.

Dr. Humphreys inquired if the fact of a leaf-louse depositing its eggs on a tree one season would render it more liable to its ravages another year.

Mr. Gould thought it would, from his own observation.

Mr. Stewart said that a tree that was once attacked by leaf-louse is more liable to be attacked by them the next year, as their eggs are left on the branches and are not injured in the winter.

Mr. Dartt inquired if the aphid or louse did not become a fly.

Mr. Gould said they were green when young, but when fully developed they became a black fly not much larger than a louse.

Mr. Stewart had discovered a white grub among his strawberry vines that destroyed them by eating off the roots, and was unable to account for it.

The President thought it was the larvæ (*Lachnosterna*) of the May beetle, and that soap-suds was the best remedy.

Mr. Jewell said his nursery had suffered considerable from the beetle. The ground that was formerly covered with poplar trees was infested the least. He thought the best remedy was to go through the orchard every day, and catch and destroy them.

At this stage of the discussion Col. Stevens offered the following resolution, which was adopted without discussion :

Resolved, That a committee be appointed by the President to prepare a memorial to the Legislature, requesting provisions to be made for the appointment of a State Entomologist.

Col. Stevens, and Messrs. Dartt and Jewell were appointed such committee.

Discussions resumed.

Mr. Dartt asked if ants are injurious to trees.

Mr. Cannon considered them the best preservative of the trees.

Mr. Bost thought the ants only infested the trees for a honey substance that the aphid drops when worried, and that this bothering of them might compel them to drain more sap from the tree.

Mr. Jewell moved to consider to what causes are to be ascribed the wholesale destruction of fruit trees the past winter or spring.

Carried.

Mr. Stewart ascribes this loss to the immaturity of the wood and severe freezing.

Mr. Dartt considers the severe freezing alone the cause.

Mr. Stubbs—Caused by severe freezing. Animal life can endure only a certain degree of cold, and the tree, too, has its limit.

Mr. Carter, of St. Peter, thinks the sun somewhat to blame.

Mr. Gould believes the extreme cold did the damage. Saw scions of Flemish Beauty pear last January that were entirely dead, and this before the season had become warm. Grape vines were also killed down in Ohio, eight miles below the lake shore; vines that had never been affected before.

Mr. Brand does not consider the cold altogether the cause, but the dry weather and dry soil were fully as much to blame. On the grounds of Mr. Drew, where he had seen the hardier varieties dead, it was dry soil throughout. He had seen the Ben Davis killed by cold weather, but not the Duchess of Oldenburg or Fameuse.

Dr. Humphreys questioned whether the drouth of the preceding summer and fall had not impaired the vitality of the trees and rendered them easily overcome by the cold.

Mr. Jewell believes the extreme cold weather the cause of this loss. In his locality it was quite wet in the fall, and trees could not have been killed by dryness of soil. Thinks the roots of unmulched trees were killed by excessive cold, and not by lack or excess of moisture. Thinks there is a certain lowness of temperature at which any variety would be killed. Trees ripen up and stand the winter better if the ground is dry.

Mr. Dartt knew of hardy varieties like Transcendents to have root killed while the tender ones had not. The plum he had introduced from Wisconsin stood the winter, while the Illinois variety succumbed to it.

Mr. Brand stated that J. O. Milne had not lost a single tree of Ben Davis; and this, he considered, was due to the fact that in that part of the State (Sauk Centre) there were heavy

rains in the fall, and the same was true of all trees in wet places.

The President said that the experience throughout New England during the last winter was that trees the best protected by snow suffered the most. In his own orchard the Minor plum, that had winter killed three or four years ago, came through the last winter all right. Those trees that he cultivated latest in the season suffered most. Trees are injured by sudden changing. Immature wood, and the early and severe frost was the cause of his loss.

Dr. Humphreys apprehended a severe winter and protected some tender varieties with wrappings, and they came out all right.

Mr. Bowerman never knew trees covered with snow to survive cold weather any better than those entirely exposed.

Mr. Jewell thought the drouth had nothing to do with winter killing.

Meeting adjourned to 9 A. M. to-morrow.

WEDNESDAY, JANUARY 21ST.

Society met at 9 A. M. President Smith in the chair.

The discussion was resumed on the cause of the destruction of fruit trees last winter, and was opened by Mr. Harris of La Crescent. He had lost a great many fruit trees last winter. Some varieties were almost entirely killed, apparently root killed, as they did not sprout again from the roots. Among those that suffered the most was Northern Spy. Lost one Transcendent; some others made but feeble growth because a portion of the roots were injured. The Duchess stood the winter well. Lost one or two Red Astrachan and Tallman Sweet trees. His opinion was that the wholesale destruction of trees last winter was from exceeding dryness of soil the previous fall, and the severe cold the winter following. He had trees of Perry Russett, Northern Spy and Early Harvest that had been exposed to dripping water and the shade of sheltering buildings that escaped injury. Some trees that had grass or weeds around them came through very well.

When he discovered that the winter had been so unfavorable for trees, he had caused the following circular to be published in the Farmers' Union, asking for information, the replies to which will be published under the head of Reports.

CIRCULAR.

LA CRESCENT, May 22d, 1873.

To the Fruit Growers of Minnesota :

We have just passed through the hardest winter known to the oldest citizens of this State, and there were peculiar circumstances attending it that will make it a test winter for many years, if not for all time. The winter set in early and dry, and frost penetrated to a great depth before any considerable snow fell. Many losses have occurred to our fruit growers by the destruction of trees and plants. We desire to profit by the severe test by collecting such facts from the people as will enable us to place before them a list of fruit trees that are *iron-clad* under all circumstances, and therefore solicit from you answers to the following questions as soon as possible :

1st. What varieties of apples have you planted in this State?

2d. What varieties have come through the last winter without receiving any injury in root, trunk or branches?

3d. What varieties have received no injury to fruit buds?

4th. What is the nature of your soil? What is the exposure? What cultivation and protection do you give?

5th. Are you raising any seedlings that are perfectly hardy, and are any of them good enough to take the place of Russets, Seek-no-Furtherers, and other varieties that we are obliged to discard?

6th. Are you raising pears, and have you any variety that stood the test of last winter without injury?

7th. What is the hardiest and best strawberry for your locality?

8th. What two varieties of grapes are the best with you?

Notes upon plums, cherries and other fruits will be acceptable.

You are further informed that this society intends to be represented in the meeting of the American Pomological Society, to be held in Boston next September, and you are requested to furnish the delegates with specimens of your fruit for the exhibition. Please correspond with the officers of this society, and they will make known to you the time and manner of sending them.

JOHN S. HARRIS,

Secretary of Minn. State Horticultural Society.

Mr. Latham—The cause of this universal loss must be some one common to the whole State. In some localities the soil was dry, in others wet; in some the ground was frozen deeply, and in some the snow fell deeply before freezing. The only common cause was the severe and long-continued cold, which he thinks must be the grand destructive cause.

Mr. Hoffman does not consider cold the only cause of this loss. Has noticed that where his soil has been dry, the roots have been easily killed. Has lost shade trees from this cause. As a preventive for this cause of loss, cultivate thoroughly and keep the ground moist.

Col. Stevens asked if his, Mr. Hoffman's, experience was not that for many years all the tops and branches died off, and sprouts came again from the roots.

Mr. Hoffman replied that he had thoroughly tested with fruit and shade trees, and found if mulching was plenty there was no danger of root killing. He had sometimes sustained

injury to trees in severe winters by top killing, and they sprouted again from the root. He lost only two trees last winter. His soil is sandy, and cultivated, and slopes east.

Mr. Ford related his experience, which is very interesting but unfortunate, and would leave the impression that his was a very unfavorable locality for fruit trees.

His loss last winter was from root killing. He had a Transcendent on one side of a walk and two Tetofskys on the other. The Tetofskys are dead, and the Transcendent is alive and bore full last year. He wants to know what made the difference between the two sides of the walk if the crab is not the hardiest.

Mr. Hoffman answered: Because there is a pond of water near the walk where the Transcendent stands.

Mr. Fuller, of Litchfield, said his nursery was on soil of light sandy loam, in a most exposed place on open prairie. Wherever snow covered the trees they were preserved, and where most exposed they perished; the same was true of White Elm, Mountain Ash, &c. It was the hard and repeated freezing of the sandy soil that killed them.

Mr. G. P. Peffer, of Pewaukee, Wis., was introduced as a delegate from the Wisconsin Horticultural Society, and afterward elected an honorary member, and invited to participate in the debates.

He said it is always well to consider the soil and situation in which trees were planted. Cold affects a tree very much the same as heat, and will in like manner evaporate the sap; and a root being exposed to a certain degree of cold is certain to perish. He had ascertained by actual measurement before and in time of a hard freeze that the root and trunk of a tree will shrink nearly one-third by freezing; probably by the evaporation of the sap. Related his experience with ashes. The soil in his nursery was clay loam, and very stiff. He applied ashes liberally to a block for trees and incorporated them with the soil by plowing and harrowing till the soil became loose, pliable, and would not retain water. The trees on this ground grew well and looked better than any others he had; but last winter they root-killed, while those on land not prepared with ashes were not so injured. The varieties killed were the hardiest he had.

Mr. Harris thought the application of ashes on clay soils made them more porous, and in the absence of fall rains it was in a condition to invite deep freezings, which extracts the sap from the roots; there being no moisture in the ground when they thaw out, death must ensue. The roots freeze harder when encased in a dry substance than a wet. A bucket of water would freeze over in a cellar before vegetables would receive injury.

Mr. Bost said it is thought in his locality that one principal reason why the losses were so great was because the soil was so wet.

Mr. Bowerman, of Pioneer Nurseries, Faribault, said that part of his nursery was on high and dry ground, and some parts of it on low grounds; on high grounds lost less by root killing than on low. Lost but few young trees by killing of root, but lost heavily by tops dying.

Mr. Howe, of Hennepin county, said some think the loss is from dryness, some from wet, and some from cold. He thought the cause was the extreme changes of the weather; the extreme cold of January, and the mildness of March, followed by sudden freezing and thawing rapidly.

Mr. A. Stewart, Hennepin county, says the sole cause is because the root is not hardy enough. Has experimented on this subject fifteen years. Roots must be perfectly hardy or thoroughly protected.

Mr. Ford offered the following resolution, which was adopted:

Resolved, That names of places of different speakers be given in the report.

Mr. Stewart said his experience was mostly confined to Hennepin and Le Sueur counties.

The Secretary moved that we suspend the regular discussion of topics, as he had some reports to present. Seconded by Mr. Ford.

The Secretary read a report from the Olmsted county Horticultural Society. The Society was organized on the 3d of March, 1873, with the following officers:

President—Wm. Somerville, Eyota.

Vice President—J. B. Clark, Rochester.

Secretary—S. D. Hillman, Eyota.

Asst. Secretary—J. W. Mason, Rochester.

Treasurer—J. M. Westfield, Rochester.

The regular meetings are held the third Saturday in each quarter. Have already discussed apples, grapes, small fruits, &c.

On motion, the report was adopted, and ordered to be placed on the minutes.

The Secretary read the following extract from a letter received from Mr. D. W. Prentis, of St. Peter:

“I wish to say that there is a man here from Finland, where the thermometer goes down to 56 degrees below zero. He says high up in the mountains, or at quite an elevation, where there is no rain all winter, they raise fine apples, and winter apples at that, and also nice pears. I thought that such varieties would stand our climate. I learn that twenty-

five Finland emigrants are at the Reception House in West Brainerd. Have written to the postmaster to have him obtain an interview with them and see if these statements were confirmed. I also wished to learn if some one could not bring out some scions.

"Would it not be proper to have the statements investigated, and if wise, ask the Legislature to appropriate a sum sufficient to obtain such fruits as are hardy in that extremely cold climate?"

Moved that the communication be received and placed on file to be embodied in the proceedings.

The Secretary then read his annual report to the society.

ADDRESS OF THE SECRETARY OF THE STATE HORTICULTURAL SOCIETY.

Mr. President and Gentlemen of the Minnesota Horticultural Society:

The official position in which I am placed by your favor makes it my duty and privilege to address you at this time, reporting to you the progress we have made during the past year and the hopes and prospects of the future.

THE LAST WINTER.

The winter of 1872-73, for long continued and extreme cold storms and fierce winds, stands without a parallel in the history of our State. During the autumn preceding, the rainfall was very light, and was followed with but light falls of snow and hard freezing, that continued over most of the State until the 7th of January, when we experienced the most fearful snow and wind storm known within the memory of the oldest inhabitants, which continued for three days, and carried mourning and sorrow into many homes, and caused great loss and suffering to stock in the new and sparsely settled parts of the State. Previous to this storm the ground was frozen dry to the depth of three to five feet. The winter had set in earlier than usual, and but few farmers and gardeners had given proper mulching or protection to their trees and plants. The whole winter ranged extremely cold and the spring was rather backward, and a long drouth prevailed in some sections of the State.

What do we witness as the result of these unfavorable influences all combined in one year's experience? Many orchards of great promise were ruined, and many others were seriously injured, while a very few were comparatively unharmed.

With the view of drawing out as many facts as possible, to ascertain the extent of the injury, and the varieties of apples

that were not injured, or that were injured the least, I caused a circular letter to be published in the Farmers' Union of May 24th, 1873. In reply a number of communications were received from different parts of the State, and many others have reported through the columns of the Union. From this correspondence I am enabled to report that the Duchess of Oldenburg and Tetofsky are damaged the least.

The Red Astrachan, Haas, Fameuse, Tallman Sweet and St. Lawrence, rank next best among those varieties which are in general cultivation, and they stand for hardiness about in the order they are named. The Siberian crabs and a number of the hybrids or seedlings of the Siberian have generally proved to be perfectly hardy. I also find that some other varieties have come through all right where they had been grafted upon crab stocks. I have heard of a few instances where the Early Harvest, Northern Spy and Perry Russet did not show any injury.

The fire blight has prevailed quite extensively, and is doing serious damage to the varieties of Siberian crab. The losses of last winter to the apple and the blight which is affecting both the crab and apple trees to a certain extent have had a tendency to discourage a few of our farmers, but the professional horticulturists and many of the amateur fruit growers appear to be hopeful, and freely express the opinion that in spite of losses and failures we are gaining ground, and that our efforts will eventually be crowned with success. Doubtless we shall learn lessons from the past year's experience that will prove of great advantage to us in the future. I received but two reports of orchards that did not sustain any serious injury from the winter. One in Winona county, which is on a high ridge of land, seeded down to clover, and with trees mulched around with wheat straw to the depth of one foot, contained sixty-five trees, in varieties nurserymen term hardy, and lost but one tree, a Dominie. The other was in Fillmore county, on high prairie land cultivated in corn. The stocks left standing over winter came through splendidly. Orchards have generally fared best that were not cleanly cultivated. As the greatest losses arose from root-killing, (and much of that could have been prevented by mulching) this meeting should take a positive stand and prompt action upon the matter, and propose some method by which hardy roots and stocks for grafting and budding upon may be raised by our nurserymen, and in quantities sufficient to meet our present requirements.

SUMMER MEETINGS.

The officers of the society did not deem it to be expedient

to call you together for meetings of exhibition or discussion during the last summer, but a call was made for a meeting to be held in St. Paul, upon the evening of the second day of the State Fair, which, from causes beyond our control, was very near a failure. No business was transacted except the appointment of examining committees and determining where the annual meeting should be held.

THE AMERICAN POMOLOGICAL SOCIETY.

The American Pomological Society held their last biennial session in September last, at Boston, Mass. Our society was represented in the meetings by but one delegate, Wyman Elliot, of Minneapolis, from whom we expect a report. Owing to the earliness of the meeting and the unfavorable condition of the fruit crop, we could not make an exhibition that would convey any correct idea of the advance we have made in horticulture, and therefore did not consider it expedient to attempt to show our fruits. The next meeting is appointed to be held in Chicago, in 1875.

FALL EXHIBITION.

The exhibition of fruits, flowers and vegetables, at the State Fair, held in St. Paul in September last, was a fine success; in most particulars far surpassing our most sanguine expectations. I think this was the result, in the first place, of a determination on the part of our fruit growers to show that all was not lost, and they would fight it out on that line, *i. e.* the hardy stock that is left, and in the second place, from the liberal additions that have been made to the premium lists since the influence of the State Horticultural Society has been brought to bear upon the State Agricultural Society in giving the management of the horticultural department over to our direction.

The premium lists in the floral and vegetable departments should be thoroughly revised, and the result would be an increased number of exhibitors, a lively competition and an improvement in the culture of the articles exhibited for premiums.

Some additions ought to be made in the fruit department. In the past, the Siberian crab has shown a capacity for great improvement, and we now have some of its seedlings and hybrids that are perfectly hardy.

The fruit is received with favor for home consumption, and is fast coming into general use for pickles and sauces, and will probably soon have a commercial value next to the common

apples. I think they ought to be placed upon the premium lists in a separate class and advanced to the position which they merit. Some varieties are reported to be long keepers and others superior for eating from the hand.

MEETINGS FOR DISCUSSION.

One meeting per year is not sufficient to do justice to the questions which are demanding our attention, but it has been found difficult to get the members out to more. I do not believe this is the result of a want of interest on their part. Our State is large, the summers are short, and the fruit growers and farmers are crowded with work, and considerable time would be consumed in going to and returning from a summer meeting, while the traveling expenses incurred by those living in remote parts of the State is an item of considerable importance. Perhaps a practical remedy for this would be the division of the State into districts, and holding summer meetings alternately in the several districts. I think this hardly practicable at present, but it can be brought about in time.

SEEDLINGS AND NEW FRUITS.

Nothing in the line of seedlings or from the new varieties has come up for our notice since the last annual meeting, and from the few varieties of seedling apples exhibited at the last State Fair, it is evident that some of the competitors for favor will never again be heard from. The Wealthy of Excelsior still maintains its reputation for hardiness, and doubtless could with safety be placed upon the list for general cultivation. Experiments with seedlings are being made by individuals in various parts of the State, and some parties are conducting them upon a system that cannot fail to make our future in apple growing equal to, if not in advance of, any State in the Northwest. (I would refer you to a communication from Peter M. Gideon, of Excelsior, published in the December number of vol. for 1873 of the Horticulturist, p. 369.)

The Wealthy originated with and was brought to notice by Mr. Gideon. He has now under cultivation several hundred seedlings that bear marks of being a cross between the Crab and Wealthy Duchess, Blue Pearman and other superior varieties that endured the severity of last winter without injury. If any improvement can be made it must be by hybridizing our best varieties of apples with the crabs or the variations which come about through cultivation, or the planting only of home-grown seeds of the hardiest varieties. Necessity is called the mother of invention. May not our necessity prove

a blessing in developing for us and our posterity a better class of fruits?

COUNTY HORTICULTURAL SOCIETIES.

We are not in correspondence with or in receipt of reports from any local or county horticultural societies except the Olmsted County Horticultural Society, which was organized last March, and is prospering. I believe there are some other such societies in the State, and there ought to be more, and if abstracts of their transactions could be secured and published in our annual volume they would add to its interest and usefulness, and by complying with the requirements and provisions of the acts of the Legislature of last winter, providing for the printing and distribution of the transactions of the State society; would be entitled to receive copies of the same.

Another plan would be for the State society to assume the position of a parent society, and have auxiliary societies organized in every favorable locality, these societies to be required to hold summer meetings for exhibition and discussions, and to send delegates and full reports to each annual meeting of the State society.

After the adjournment of the last annual meeting the State Legislature passed an act to provide for the printing and distribution of our society reports. Under this act the State printer has published the history and an abstract of its proceedings from its organization, Oct. 3, 1866, to the annual meeting, inclusive, in January, 1873, in a neat and closely printed volume of two hundred and eight pages. Aside from the aid granted, we have incurred a debt of \$225 in collecting material and preparing it for the printer. In order to liquidate this debt and defray the expense of sending one or more delegates to the winter meeting of societies in adjoining States, and to procure seeds, plants, cuttings and trees for experimenting with, I recommend that we adopt a resolution of thanks to the last Legislature for the aid and encouragement they have extended to us, and memorialize the present Legislature, now in session at St. Paul, and ask them to grant us an additional annual appropriation of \$300.

Insects injurious to vegetation are rapidly on the increase, and a State entomologist is loudly called for. We can do no less than to ask the Legislature to provide for one.

Cranberry culture is awakening a lively interest in some of the States. There is no State so well adapted for it as Minnesota. Shall we encourage its growth, or let our swamps and marshes remain unsightly and unprofitable wastes. It is unnecessary to remind you of the importance of planting

shade and ornamental trees and wind-breaks. The people have aroused themselves and are inquiring what they shall plant. In conclusion, I recommend that this meeting take the necessary steps to secure for the next annual meeting a full report of the forestry of Minnesota, to include the evergreen and deciduous timber and ornamental trees that are found flourishing in the State, the places where they are found, and the soils most natural for their perfect development.

I would also recommend the appointment of a committee of three or more practical horticulturists, to co-operate with a like committee from the State Agricultural Society to revise, correct and amend the premium lists in the Horticultural department of the State Fair.

Respectfully submitted,

J. S. HARRIS, Secretary.

On motion of Col. Stevens, the report was accepted and adopted.

The report of the Committee on Varieties being called for, Mr. Jewell, (the chairman being absent), presented the following lists, but declined to make a full report, as the attention of the public had been called to many varieties he had recommended at previous meetings, some of which had failed.

FIRST LIST.

Apples for General Cultivation.

- | | |
|--------------------------|---------------------|
| 1. Duchess of Oldenburg. | 3. Wealthy. |
| 2. Tetofsky. | 4. Stewart's Sweet. |

SECOND LIST.

Apples for planting in most favorable localities.

- | | |
|------------------------------|-------------------|
| 1. Haas. | 5. St. Lawrence. |
| 2. Fameuse. | 6. Red Astrachan. |
| 3. Plumb's Cider. | 7. Saxton. |
| 4. Walbridge. | 8. Price's Sweet. |
| 9. Perry and Golden Russets. | |

On motion, the report was received.

The Secretary thought the committee should present a list of Siberians.

Mr. Jewell said he was supposed to be interested in crabs, seedlings and hybrids, and he did not think it well to introduce them personally.

Moved by Mr. Gould and seconded by Mr. Ford, that a committee of three be appointed to prepare a list of Siberian crabs and seedlings for general cultivation, to be presented this afternoon.

Carried.

The chair appointed on this committee, Thos. Moulton, P. A. Jewell and Mr. Harris.

Mr. Jewell did not feel disposed to act on this committee for reasons before stated.

The President said as they had buried the crabs at a previous meeting, and Mr. Jewell had been the first to start them, he ought now to be among the first to resurrect them.

Mr. Harris said that he had officiated at the burial, but had found that the things were prematurely buried, before dead, and would cheerfully help dig them out.

Moved and seconded that the report on apples be taken up, one variety at a time, for adoption.

Carried.

THE DUCHESS OF OLDENBURG.

Mr. Fuller In Meeker county this apple has been killed very badly, and he hardly knows of any trees of this variety now in healthy existence.

Mr. Grimes has lost no Duchess since he grafted on hardy roots.

Moved and seconded that the Duchess be adopted for general cultivation.

Dr. Humphreys asked Mr. Fuller if his trees root-killed.

Mr. Fuller said they did.

Mr. Ford stated that with him the Duchess had killed, while the Transcendent, only eight feet distant, lived, and he intended to dig up and destroy the Duchess.

Mr. Ditus Day, of Dakota county, had 20 or 30 Duchess that did not winter-kill; did not know of but one tree in his locality that had been injured.

Mr. Fuller stated that the Duchess being slow in starting may be the cause of its killing with him. In reply to question by Dr. Humphreys, he said some of his trees were planted in loam, and some in sandy soil.

Mr. Jewell (Lake City) does not consider that in his part of the State there is any danger of this variety being injured except by root-killing; had seen them top-killed in this locality and at Mankato. In the southern part of the State the Duchess is free from root and top killing, but in the northern some have top-killed. In the extreme northern part of New York they were more successful in growing apples than in the southern part of the State.

Mr. Peffer, of Pewaukee, Wis., said that as he came up to this meeting he stopped at Sparta, Wisconsin, and he thought that the winter had been more destructive to trees there than

in Minnesota. In the whole place there was but one bearing tree left, and that was a Duchess.

Mr. Hoffman said that on digging some Duchess that looked feeble he found that the roots they were grafted on were dead, and their life was supported simply by roots that sprouted from the scion.

Mr. Carter, of St. Peter, said a neighbor lost several Duchess, ten years, while the younger trees were not hurt. Mr. Knight's fine Red Ash are dead.

Mr. Ford, St. Paul, said he dug along the rows of Transcendents and found them good, while the Duchess near by were dead.

Mr. Stubbs, Long Lake, said in his locality there was scarcely an old Duchess that passed through the winter without injury and most of them were destroyed. He planted ten trees ten years ago that were bearing, and every one is now dead or nearly so, but he believed the trouble was from root killing.

Col. Stevens suggested mulching as the best preventive of root killing.

Mr. Morrison said that Mr. Ford had set out twenty Duchess trees for him and warranted them to be hardy, but they had all died after bearing a little. So had some green gage plum trees all killed.

Mr. Gould, Excelsior, thought this variety should be placed first on the list. Any tree that passed through last winter, with branches above the snow uninjured, had had a sufficient test. He could show any one 1,000 trees on south shore of Lake Minnetonka, seven and eight years old, in good condition for a crop of fruit next year.

Thomas Moulton, of St. Anthony, had 250 trees, four to seven years old. They stood on ground not cultivated, both sand and clay; 75 of them bore last year. Had 1,000 three years old, and those that suffered most were where the snow was from three to four feet deep. Had seen Transcendents top and bottom killed.

Mr. Hoffman said it looked very much as if two varieties of Duchess had been planted out; one died, the other lived.

The President said he had had the Duchess planted since 1861, and had never lost but one tree.

Moved by Mr. Ford and seconded by Mr. Jewell—"That 'in favorable localities' be added to the resolution to adopt."

Motion lost.

The original motion was carried, Mr. Ford voting No.

TETOFSKY.

Mr. Ford said his experience with the large apples was that they had better be dug up and destroyed.

Moved by the Secretary that the Tetofsky be recommended for cultivation in village and city gardens. He said it was peculiarly adapted for such places, as it was hardy enough, and a small and compact tree and early bearer, but on account of its diminutive size it does not make a very good appearance where planted promiscuously in the orchard with standard apples. Thought the fruit too perishable for shipping long distances to market.

Mr. Stevens, of Minneapolis, favored the Tetofsky. He was very much attached to it, as the first apple he had raised was of this variety. Hoped the motion of Mr. Harris would not prevail, because the tree was equally valuable for the farm as the city garden.

Mr. Jewell, Lake City, said his experience with it was very much the same as with the Duchess. Had 7,000 two-year old trees, and they came out all right, as did others in his part of the State. Believed when they died it was from root killing, and if they had been mulched they would have survived.

Mr. Bowerman, of Faribault, said he did not lose any in the nursery. They were not mulched, but weeds were allowed to grow to protect them.

Mr. Fuller said he felt more favorable to this variety than the Duchess. In his experience, seventy-eight miles west, on the St. Paul and Pacific railroad, he had but few trees that were not affected in his nursery. Some tree roots, as the Haas, were all killed, while others were not much hurt, and Tetofsky looked best of all.

Mr. Grimes hoped the society would not confine Tetofsky to towns, as the country wished some. His Tetofsky had proved all right, has never had one killed back a bud; was one of four varieties that bore last year.

Mr. Howe, of Minneapolis, and Mr. Ford, of St. Paul, suggested that the society recommend what location to plant this tree in as favorable to success.

The question being called for on the Secretary's motion, it was lost, and a motion to recommend it for general cultivation was carried.

WEALTHY.

Moved and seconded that the Wealthy be recommended for general cultivation.

Mr. Peffer being called upon for his experience, said that P. M. Gideon, of Excelsior, left him some of the Wealthy to propagate; also some of the Molly, which latter is proving to be worthless. Said that they had got somewhat mixed in sending out, and that some had probably received the latter

under the name of the Wealthy, and it would certainly injure under so severe a test as the last winter, but he had been able to get the two varieties separate, and the trees had made a good growth last year, a proof that they were not much injured. The tree grew thorny but the fruit is of good flavor.

Mr. Thos. Moulton bought a lot of scions of Mr. Gideon, cut the 8th of last March, after the severe winter, and they succeeded better than crab scions cut at same time. Lost very few.

Mr. Gould, of Excelsior, said he lives 1 1-2 miles from the original tree; had examined it several times every season, and was satisfied that the tree was hardy enough for this climate. The old tree bore last year. He thought it was inclined to blight badly. It is an average grower with much vigor, more than the Duchess, and the best variety to graft into the top of other trees he knew of. Has no blight on his own, but Mr. Gideon's are badly injured, but several hundred of his two-year olds escaped last season. It made growth last year from its extreme terminal bud, evidencing its hardiness. The fruit was above medium size, and presented the best appearance of any he had seen. Its form is perfect, its color good, and is second rate in quality. Season about same as Fameuse, November and December. Owing to a mistake in labelling scions of this and the Molly—which is a worthless variety—a little confusion had arisen, but the last winter had pretty effectually used up the Molly, and those acquainted with the two could easily distinguish the true Wealthy from the other.

Question. Is it not generally considered a crab or a hybrid?

Ans. It is not.

Col. Stevens considered the Wealthy of great merit as a market apple on account of its beautiful form, color and appearance. He had five trees and they had never injured on his grounds either by blight or winter killing. It is evidently the coming apple of the Northwest.

Mr. N. J. Stubbs, Long Lake, has a very favorable opinion of it. It is the hardiest seedling in his knowledge. Some trees grown on their own roots have stood as well as any crab.

Mr. Latham, Excelsior, has observed that a large growth of this variety from a bud has passed through this winter, and grown from the tip, while other varieties considered as hardy have been more or less injured.

Mr. C. H. Clark had planted 150 yearling trees and he lost all of them, and that, too, alongside of the Duchess and Tetofsky. He observed that Gideon's own old trees were nearly used up, although the young trees looked well, and thought all varieties of trees should be renewed often in this climate.

Mr. Gould remarked that the old tree was nearly used up by blight the year before, and the present appearance of the tree is ascribable to that cause, and that probably Mr. Clark's 150 trees were the Molly.

Mr. Harris said he thought that the vitality of new varieties of trees was impaired by the excessive cutting of scions, and they were in a condition favorable to taking the blight. The condition of the old tree was a natural consequence, after being robbed of so many scions, and did not argue anything against its value. Although the facts stated in the discussion proved nothing derogatory to the planting, he would move to amend the motion by making it read "recommended for further trial. His motion was afterward withdrawn."

Mr. Ford personally had had no experience with the Wealthy, but on Mr. Slate's grounds on the St. Paul and Pacific Railroad, he found it badly diseased. Mr. Martin's, at Anoka, were also killed.

Mr. Latham—Very many trees have been sent out by mistake for Wealthy that were Molly, which is not a very hardy variety.

Mr. G. P. Peffer considers it well worthy of cultivation. Has blighted but little the past year.

Mr. Hoffman got some scions and trees that were genuine, and they are doing well.

Mr. Grimes has two trees standing on his grounds four years old, making a good growth every year and not killed.

Mr. Jewell said trees on his ground top-worked on crab have stood well and grown from the terminal buds. Has seen the variety in many places, and it shows itself to be hardy and successful. Thinks the reason it has blighted so badly at Gideon's is because there are so many blighted crabs in the same orchard.

Mr. Clark believes the Wealthy worthy of general cultivation in this State, notwithstanding his losses.

Moved and carried to recommend the Wealthy for general cultivation

Adjourned till 1½ P. M.

AFTERNOON SESSION.

The President called the meeting to order.

During the forenoon Mr. J. E. Booth, of Minneapolis, brought in and placed on exhibition in the rooms occupied by the society, some very beautiful flowering plants, which were in bloom. Among them were specimens of Chinese

Primrose, Libonia Florabunda, Zonale Geraniums, Lycopodiums Erectum, Erianthus, &c. There was also an elegant bouquet of cut flowers upon the table. Mr. Booth received many high compliments for the elegance and fine condition of his plants. He is the proprietor of the Minneapolis greenhouses on Tenth street, and also a professional landscape gardener.

Truman M. Smith, of St. Paul, had on exhibition some fine samples of grape wine and crab cider, also some jars of cider jelly. Some fine varieties of apples were on exhibition.

The Secretary presented some reports, but they were not read for want of time, it being necessary to remove to the Tribune rooms for the afternoon. They will be found under the head of Reports and Miscellaneous Papers.

Discussions resumed.

STEWART'S SWEET CALLED UP.

Mr. Stewart, the originator of the variety, being absent, a motion was made and carried to postpone the action upon this variety until more members were present who are acquainted with it, and proceed to the discussion of the list for cultivation in favorable localities.

HAAS.

The Secretary moved that this variety be placed first on the list. Seconded by Mr. Jewell.

Carried.

PLUMB'S CIDER.

Mr. Harris said he had not had much acquaintance with this variety, having no trees that had commenced bearing; but from the appearance and growth of his young trees he thought it would be safe in his (Houston) county, and would therefore move its adoption as second on the list.

The motion received a second, and Mr. Peffer spoke favorably of it for Wisconsin, and Mr. Jewell said that it was about equal in value and hardiness with the Haas.

Without further discussion, it was adopted.

FAMEUSE.

Mr. Jewell, of Lake City, gave his experience with this variety. Said that in favorable localities it would stand, and that previous to the winter of 1872 and 1873 it had stood well

enough to pay for itself many times over. We could not afford to leave out so good an apple.

Dr. Humphreys, Minneapolis, had an experience with one tree which had grown and borne fruit in 1872, but the winter of 1873 destroyed it.

Mr. Grimes, of Minneapolis, said he had cultivated it with encouraging success, and raised fruit up to season of 1872, but the winter of 1873 destroyed them, but not his confidence in the tree. He should continue to plant and grow the Fameuse whether this society recommended it or not, believing that only an exceptionally cold winter would injure them.

Mr. Clark had a limited experience with this variety. With him it stood next to Duchess and Tetofsky ; could recommend it for favorable localities.

Mr. Harris, of Houston county, said he was a strong advocate for the Fameuse. Considered it the safest apple for Minnesota, that had been thoroughly tested, after the Duchess, Tetofsky and Haas. It was an early and abundant bearer, and was almost sure to live long enough to bear fruit. He had seen trees of it that were nearly dead revive and become fruitful. He was fortunate with this variety last winter ; most of his trees were deep planted and not cultivated, and were not generally seriously injured. None were entirely destroyed.

By a decided vote the Fameuse was placed on the list.

The next variety under consideration was the

WALBRIDGE.

Mr. Peffer, of Pewaukee, gave his experience with it in Wisconsin. Said he knew trees twenty-five or more years old not killed last winter and bore fruit last summer. It is very valuable for its keeping qualities, and stands second to none for growth in protected localities.

Mr. Harris said his personal experience with this variety did not extend far enough back to recommend it for general cultivation under the rules we had adopted for our government in this meeting. He had about twenty trees under cultivation. Found it an easy tree to transplant, and with the exception of a single tree, it came through the last winter as well as the Duchess and better than some of the crabs. For many years he had been looking about for a late keeping apple, and his attention being called to the Walbridge he had taken every opportunity to secure information about it, and finding that it was universally doing well in Wisconsin, as far north as the latitude of Southern Minnesota, had concluded to give it a trial, and had the utmost confidence in its value for Houston county.

Mr. Jewell had been personally familiar with the Walbridge for several years. Found it generally regarded valuable. Considered it more hardy than Fameuse and second only to the Duchess. In this State his familiarity with it extended only during the last four years. He regarded it as the best late keeper yet offered to us.

Mr. Moulton set a few trees three years since. They had generally stood well.

Mr. Ford said he was satisfied to recommend it for favorable localities, and it was finally placed on the list.

THE ST. LAWRENCE

Was next taken up.

Mr. Day had fruited this variety in Dakota county the past season; considered it hardier than Fameuse or Fall Stripe.

Mr. Stubbs said he had planted a few in Hennepin county which stood pretty well until the last winter, but he had not much confidence in it for his locality.

Mr. Jewell said that while this variety was not as hardy as some, it was too valuable to throw over, it coming early into bearing, and he believed it would succeed in favorable localities.

Mr. Harris spoke in its favor, and moved to place it on the list.

The motion was carried.

PRICE'S SWEET.

Mr. Jewell would place this apple upon about the same footing as the Saxton, and thought by all means it ought to be placed on the list.

On motion to that effect, it was placed upon the list.

RED ASTRACHAN.

The Secretary moved to place this variety on the list to recommend for general cultivation.

Mr. Grimes dissented from this idea, in that his experience placed it inferior in hardiness even to the Fameuse.

Gen. Nutting, of Faribault, objected to placing it on the list for general cultivation. Even if hardy its season was near the same as the Duchess, and it was so slow coming into bearing, and bore so little, that it was an unprofitable investment.

On putting the motion it was voted down, and a motion to place it on the dead list was carried, with but two opposing votes.

SAXTON OR FALL STRIPE.

Mr. Stevens highly recommended this variety for hardiness as having in his own experience rewarded the labor bestowed on them by producing bountiful crops of fruit while very young. On his grounds it passed the winter of 1873, and bore well the past season.

Mr. Latham, in his experience and observation, took issue with Mr. Stevens, reporting several instances on Lake Minnetonka, where the Saxton had proved a failure.

Messrs. Brand and Nutting, of Faribault, and several others were in favor of placing it on the list, not so much for its perfect hardiness, but because wherever planted we are pretty certain to enjoy its fruits.

On motion of Mr. Harris, it was placed on the list.

PERRY RUSSET

Was next discussed and objected to on account of the long time before it comes into bearing, and on motion of Mr. Ford it was placed on the dead list.

GOLDEN RUSSET.

This variety was taken up, and after a brief discussion, placed on the dead list.

PEWAUKEE.

Mr. Jewell moved to place this variety on the list for favorable localities.

Mr. Peffer, of Wisconsin, who originated this variety, rather modestly spoke highly of this variety. Said it was a seedling of the Duchess of Oldenburg, a good keeper, and of fair quality; fruit nearly size of Duchess.

Mr. Gould, of Excelsior, had not had experience with this tree beyond the past three years, and in his nursery, out of some 250 trees, about three-fourths stood the severe winter of 1873. He thought favorably of the tree for protected localities.

Mr. Stubbs, of Long Lake, had about the same experience as Mr. Gould. Prior to the last year's experience the tree killed back some each winter, and finally to the ground in 1873, but believed his trial was not a fair test, he having forced the growth by excessive cultivation, getting a growth of three or four feet each year.

Mr. Grimes said he had some experience with ten trees of

this variety for three years, and regretted that his opinion must be recorded against its hardiness, though he should not discard it without another trial.

Mr. Jewell said his experience was somewhat similar to those gentlemen who preceded him.

Upon a vote being taken, this variety was finally placed on the dead list.

STEWART'S SWEET.

Amasa Stewart, the originator of this valuable variety, being present, it was again taken up. He stated that it was a fall apple, that it originated from seed some fourteen years since, and it had proved hardy with him through all winters past; bore fruit in Blue Earth, Le Sueur and Hennepin counties, and did not know of any trees having been killed by winter.

Mr. Stubbs said he was acquainted with the tree, and he fully corroborated what Mr. Stewart had said.

Also Mr. Hoffman said the same.

Mr. Gould considered it a better variety than almost any other sweet apple, and hardier than even the Duchess.

Mr. Clark, Hennepin county, had cultivated Stewart's Sweet the past four years, and would bear testimony to its perfect hardiness. The tree is beautiful growth, and second to no sweet apple in quality.

Mr. Ford's testimony sustained that previously given.

On motion, it was placed on the list for general cultivation.

The apple list being finished, it was moved that the committee on Siberians be called upon to report.

Carried.

SIBERIAN APPLES OR CRABS.

Mr. Jewell, for the committee appointed to prepare and present a list of Siberian crabs and their hybrids for general cultivation in the State of Minnesota, said: "Our committee submit for your consideration the following list of Siberian apples arranged in four classes:"

First Class.

Early Strawberry,
Orange,

Beecher's Sweet,
Minnesota.

Second Class.

Conical,
Quaker Beauty,

Maiden's Blush,
Hutchinson's Sweet,

Meader's Winter.

Third Class.

General Grant, Hesper Blush.
Aiken's Striped Winter.

Fourth Class.

Aiken's Green Winter, Transcendent,
Hyslop.

A motion was made to receive the report.
Carried.

The list was taken up and discussed, one variety at a time, and finally adopted as reported, with the exception of the Hyslop, which was voted unworthy of general cultivation.

Mr. Jewell has given us the following report and description of them since the adjournment of the meeting :

The committee of the Horticultural Society arranged the Siberian apples in four classes—the first three with respect to hardiness and the fourth with reference to their special adaptation to cooking.

FIRST-CLASS - IRON-CLAD.

Early Strawberry—Tree a strong and handsome grower, bearing heavy crops alternate years.

Fruit, size and appearance of Transcendent, excellent for eating. Season, August.

2d. Orange—Tree a moderate grower and an annual and abundant bearer. Fruit larger than Transcendent, flesh firm, crisp, juicy and delicious. October to December.

3d. Beecher's Sweet—Tree vigorous and erect, a biennial and abundant bearer, fruit resembling in appearance the Transcendent, but larger, very pleasant for eating. September.

4th. Minnesota—A medium grower, with pale green leaves of unusual size, often becoming highly colored in autumn like the foliage of the sugar maple. Fruit larger than the Golden Russet, skin thin, nearly white, with beautiful blush on the sunny side. Quality excellent. December to February.

CLASS SECOND—EXTRA HARDY.

1. *Conical*—Tree vigorous and handsome, and a good bearer. Fruit is large as Transcendent, mellow, dry, and with a peculiar spicy flavor. In appearance and flavor resembling the Black Gilliflower. October.

2. *Maiden's Blush*—Tree medium grower, of slender, graceful habit. Fruit not quite as large as Transcendent, of pearl

white color, with a beautiful red cheek, flesh tender, fine grained, with a peculiar pleasant flavor. December to January.

3. *Meaders's Winter*—A handsome, strong growing productive tree. Fruit size of the last; excellent for eating. Season April and May.

4. *Hutchinson's Sweet*—Tree a good grower, with slender twigs; a moderate bearer. Fruit size of the last described; superior quality, keeping until April or May.

5. *Quaker Beauty*—A stronger grower than the Transcendent; a biennial bearer. Fruit large, handsome and of excellent quality. April to May.

CLASS THIRD—HARDY.

1. *Gen. Grant*—A vigorous, erect and symmetrical tree; an annual and profuse bearer, fruiting in dense clusters. Fruit very large, dark red, nearly black when ripe, and in quality much like the Duchess. October and November.

2. *Hesper Blush*—Tree among the handsomest, and a good bearer. Fruit a little smaller than the Gen. Grant; smooth, handsome, quality good. Season, November to January.

3. *Aiken's Striped Winter*—A fine tree, but the least hardy of the class; an annual and free bearer. Fruit good sized and valuable for either eating or cooking. Season, mid-winter.

Class Four, except Green Winter, are too well known to need description. They are suitable for cooking and drying only.

A few additional facts in regard to these Siberian varieties may not be without interest. The first class is slightly more hardy than the second, but both are regarded as sufficiently so to warrant general planting. The third class is less hardy than the two preceding, but will probably succeed in all but the most trying situations.

None of them are as orchard trees like the Transcendent badly given to blighting, except Meaders's Winter and Gen. Grant.

In fruitfulness the several varieties differ greatly, but in the aggregate fruit younger and more profusely than the common kinds of apples.

For eating none are inferior to the Duchess, while several kinds are equal in this respect to any apple grown.

As a harvest fruit the Early Strawberry is more valuable than the Tetofsky, the fruit being as good in quality, and the tree more vigorous and hardy, and adapted to all kinds of soils.

The Orange is unquestionably more valuable for general

cultivation than the Duchess of Oldenburg. The tree is even more hardy, not less productive, the fruit less perishable, lasting several months, and perfectly adapted to every use to which an apple can be applied—eating, cooking or the manufacture of cider.

As an early winter apple there are none of the common sorts, that have come to public notice, that in hardiness of tree, size, quality and beauty of fruit, are equal to the Minnesota, the largest of Siberian seedlings.

The only unsettled question on which the value of this variety measurably depends, is its productiveness.

P. A. JEWELL.

PEARS.

The next topic announced was Pears.

Mr. Fuller inquired if any member knew of any variety of pears, of bearing age, that endured last winter in this State. Said he did not like to give up the idea that they could be produced in Minnesota.

Mr. Harris said that he lost all of his, about fifty trees, of about ten varieties, but chiefly Flemish Beauty. Had heard of some trees in Houston county reported all right, but had examined them and they were no better than dead. Did not think it expedient for us to say much about raising pears.

A motion was made and carried to pass over this subject without recommending any variety.

PLUMS.

All varieties of tame plums have thus far been a failure in this State, never living to pay the first cost of the trees.

Moved by Mr. Ford, of St. Paul, and seconded by Mr. Harris, that we recommend for general cultivation only the best varieties known as native, or belonging to the wild order.

Carried.

CHERRIES.

Mr. Myers, of St. Peter, said he was cultivating a variety of cherry that he brought over from Germany, which with him and wherever tried had proved hardy, prolific and desirable. They are known as the Hartz Mountain cherry.

Col. Stevens said he had seen the cherries, and thought they were very valuable.

The President, T. M. Smith, said he considered this variety one of the best cherries he ever saw. He had on his place

several other varieties, but the only other one of them that bore fruit was the Early Richmond grafted on the Black English Morella.

Mr. Carter, of St. Peter, is familiar with this cherry. Does not think that too much has been said in its praise. It is valuable, hardy, and a great acquisition to the fruits of Minnesota.

This variety of cherry was endorsed and recommended for cultivation.

Mr. Ford wanted to know if any one had trees under cultivation of the Lieb cherry.

Mr. Grimes had them, but could not speak understandingly of the merit of the fruit because the plants were too young.

Mr. Ford had heard considerable in its favor, and moved that the society recommend the Lieb cherry for trial.

The motion was agreed to.

Mr. Truman M. Smith said he had been successful with the Early Richmond cherry grafted on Morella stock, and moved that it be recommended for trial.

Carried.

GRAPES.

Mr. Ford moved that the list adopted last year be reindorsed by the society.

Carried.

(The varieties recommended at the last year's session were Concord and Delaware.)

Mr. Ford then suggested that the President (who has had an extensive experience in grape culture) recommend an addition to the list of three varieties for family use and three varieties for general cultivation.

This suggestion meeting with favor, the President was appointed a committee of one to prepare such lists and report in the evening.

Meeting adjourned until 7 P. M.

EVENING SESSION.

Meeting called to order by the President. Vice President Dartt then took the chair, while the President made the following report :

GENTLEMEN—For one individual to select a list of three or six varieties of grapes from the scores of candidates to be found in catalogues, and with even a greater variety of tastes to please, is a difficult undertaking.

But I have considered the merits of the following, and submit them for your consideration :

1st List.—For Amateurs.

1. Croton. 2. Rogers' No. 4. 3. Rogers' No 15.

2d List.—For General Planting.

1. Creveling. 2. Martha. 3. Salem.

Report was received and adopted.

The Secretary read the following report from A. C. Hamilton :

CHICAGO, ILL., Jan. 19th, 1874.

To Minnesota Horticultural Society, at Minneapolis :

DEAR FRIENDS IN THE CAUSE:—I am very sorry I cannot be with you at your annual meeting, but I venture a word by way of writing you. I presume you will have one of the most interesting meetings we have ever had, for it being at Minneapolis, the *Banner City* of Minnesota, with all its hospitality, and with a people who are always in sympathy with horticultural and agricultural meetings, and for any real reform which is for the general good of Minnesota, I will say then I am heartily sorry I cannot be with you.

I will venture one thought, which will be wholly upon the subject of how trees should be set in Minnesota. The last winter has shown us that many of our trees have been killed, and even some of the most hardy ones. Many causes have been given. I will tell you my reason, and then tell my way of avoiding any future trouble from same cause. The trees were killed by extreme freezing in the early part of winter, and by the dry soil; not enough moisture to sustain the roots. I know a whole orchard garden that was saved in this way. Last August a year ago the man who owned the place raised his house about 15 to 20 inches higher than it had been. When this was done his grounds were not high enough, so he filled in the orchard so as to make it about the same in proportion to the house. The consequence was his trees were 15 to 20 inches lower down, so he filled up to the same proportion as he had raised the house. All were in good condition and made good growth—even a nice Flemish Beauty pear—while ten feet from there, almost everything was killed. Now the conclusion is, in my mind, that we had better set trees much deeper in the ground, so they will get more moisture, which the tree always needs. I hope this will be discussed freely. One more instance. I know a tree which stood near the back kitchen, down where all the slops from all the wash days had been thrown out all winter around the tree, and in spring the ice was more than 12 inches thick about it. This tree lived and fruited well, while the rest in garden nearly all died. This seems to be true, moisture is very much needed.

Minnesota has no winter rains to feed the trees upon. The tree needs this even in winter, or a certain moisture on the roots kept up. Chicago has rains, and I know it, for I saw some yesterday. Was any one ever in Chicago and not see it rain? But I see the trees look nice.

I will not use any more of your time. Hoping you will have one of the best meetings you have ever had, I am

Yours, very respectfully,

A. C. HAMILTON.

Moved that the report be received and placed on file to be embodied in the Transactions.

Carried.

CURRENTS

Were next in order.

Moved, that we recommend Red Dutch, White Dutch, White Grape and Victoria.

Passed without discussion.

GOOSEBERRIES.

Mr. Jewell moved to recommend Houghton's Seedling and Pale Red, for general cultivation.

The motion to recommend was lost.

BLACKBERRIES.

Mr. Loring said there is a blackberry growing on his place, without covering or protection, that does not winter-kill, called the Banton Seedling, from Vermont. It bore heavy last year.

Mr. Truman M. Smith said they were hardy, stout and good.

Col. Stevens said it is well known that they are hardy.

Mr. Brand moved, that we have no blackberries known to do sufficiently well here to recommend for cultivation.

Adopted.

STRAWBERRIES.

The Wilson's Albany was adopted for general cultivation.

Mr. Grimes moved that the Green Prolific be recommended for amateur cultivation as an abundant bearer.

Carried.

Mr. Harris said the Downer's Prolific was a good berry, and abundant bearer, and moved that it be recommended for general cultivation.

Adopted.

Charles Downing was spoken of as doing well on sandy soil; very vigorous grower, a little later in the season.

The Michigan Seedling and Charles Downing were recommended for trial.

WEALTHY APPLE.

Mr. Carter, of St. Peter, said he had voted to place the Wealthy apple on the list for general cultivation.

He would now move to reconsider the vote. The motion received a second and was carried.

Mr. Harris moved that the Wealthy apple be recommended for trial.

Mr. Dart, of Owatonna, said his theory was to oppose recommending anything unless it was established that it had a permanent value.

He did not think this variety had been tested in many parts of the State. He knew the location of Mr. Gideon, of Excelsior, was a favorable one, more so than with him at Owatonna; as many failed as of the Ben Davis. He had a seedling which was a good winter fruit, and stood as well as the Wealthy. Thought it would come out about the same.

The Wealthy was taken from the first list and left for trial.

Mr. Dartt moved to place the Stewart's Sweet in the same list.

Motion lost.

The following resolution of the Kansas State Horticultural Society was read by the Secretary :

WHEREAS, The "American Pomological Society" is composed largely of men residing in the States east of the Mississippi Valley, consequently its meetings are generally held in some one of the Middle or Eastern States; its fruit lists are made up of varieties generally successful in said States, most of which are not adapted to the Western sections; and, believing that a co-operation of those States lying west of the Alleghany mountains, whose interests and experiments are allied, would result in great and important advantages to those concerned, therefore be it

Resolved, That the time, in our opinion, has fully come, and demands the organization of a "Western Pomological Congress," to be composed of the States above indicated. That the Secretary of our society be requested to correspond with the Secretaries of the various State Horticultural and Pomological Societies, with a view to effect such an organization.

Col. Stevens moved that the communication be accepted and referred to a committee of three, consisting of Messrs. Harris, Dartt and Nutting, with P. A. Jewell as alternate.

Carried.

Adjourned till 9 A. M. to-morrow.

THIRD DAY.

The President called the meeting to order, and the Secretary read the following communication from Bates & Northup, of Stockton, Winona county :

The year 1873 was quite a disastrous one to the horticulturists of our young State. We, with the rest, can say we saw many of our brightest hopes dashed away, but nevertheless we are not discouraged, but intend

to still keep trying until we help demonstrate the fact, "We do raise fruit," the croakers to the contrary notwithstanding. We find that all kinds of our hardy apples suffered equally. They seem to root-kill, the cause we charge to lack of moisture in the soil, as in some instances in low moist spots the trees suffered very little. We lost some Duchess, Haas and Fameuse in nursery row, while in orchard they stood well. Two-year-old trees suffered the least. Our grapes suffered with other fruits; still Concord and Delaware are our favorites. We think they hurt before winter set in by early freezing. We look for good results in the hybridization of the apple by the crab, and think we can add to our hardy list by this method. Our trial of the Wealthy proves it to be very hardy; we never lost one tree of it. We have a seedling of the Yellow Bellflower, which we found growing on the farm of Mr. Burns, of this county, which has the appearance of being a cross of the Bellflower and the Yellow Siberian, the fruit being of the Bellflower type and the tree of the Siberian family. The original tree stood last winter and bore two and a half bushels of nice fruit the last summer. The few trees we had in our nursery row were not injured. We had specimens of the fruit saved, but unfortunately they got frozen, so we cannot present it as intended. We call it the Burns' Winter, as it is a good winter keeper, and shall at some future time present it to you for examination.

Accepted and ordered to be filed with the Transactions of this meeting.

A report was also read from E. P. Evans, Brownsville, Houston county, for the counties of Houston, Minn., and Vernon, Wisconsin. (See Reports and Miscellaneous Papers.)

PRESIDENT'S ADDRESS.

Gentlemen of the Minnesota State Horticultural Society:

The constitution of our society makes it my duty to deliver an annual address, but, fortunately, does not prescribe the length, breadth and depth of such an address, consequently I shall endeavor to make it as short as possible, knowing that brevity will be its chief ornament. Since we last met in council, one year ago, there have been many and great changes in regard to hardy fruits in the State of Minnesota, or the entire Northwest, and even extending over New England and the whole northern limit of fruit culture, and I apprehend that but few in this or any other society would to-day advocate as iron-clad or even hardy, what was considered one year ago as hardy as the oaks, or nearly so. The losses of 1872 and 1873 will long be remembered in Minnesota. But as heavy and severe as our losses were to individuals, myself not excepted, I firmly believe they will, in the end, prove a great blessing and save millions of dollars to our State in the future; for had it not have been for last winter's severity and losses coming just as we thought we had a list of trees capable of withstand-

ing the rigors of our cold and dry climate, there would have been, this and the next season, millions of tender and half hardy trees, sold and spread broadcast over the length and breadth of our State, only to bring ruin and sorrow, instead of fruit, to the purchasers and planters.

Now, with last winter's experience and loss, all hope of fruit-growing is not gone; on the contrary, my faith in being yet able to not only raise a good and sufficient supply of apples has been strengthened, but I think the matter has become a certainty that there are varieties, and more will be found, that will stand and bear fruit even in our cold and dry climate; and that the rigors of last winter only blew off the chaff, so to speak, and saves us the wheat, and it also settles in my mind another problem which I have long contended for, viz.: to have perfectly hardy trees we must in every case graft or bud upon perfectly hardy stocks only, and in this I think lies more of the secret of success than many will admit. That the cause of the wide-spread ruin of the past winter was not due to the extreme cold many are willing to admit, but attribute it to some peculiarity of soil, climate or air, of which all disagree, or at least are not able to agree upon any one theory that can be satisfactorily explained, some claiming that the injury was done in spring or mid-winter, or in warm spells by the roots being too warm, or by the sap running by day and freezing by night, thus searing the cells and killing the trees. Others contend that the ground froze too deeply around the roots and stopped all circulation of sap in the roots, and thus killed the trees. My own views are that the hard freeze of November came so suddenly that the sap had not all returned to the roots, and the trees were not in as ripe a state as they should be for severe weather. But in support of this I will say that my Minor plums, which ripened up their wood very early in the fall of 1872, stood the last severe winter much better than the two preceding winters of 1871-2.

ENTOMOLOGY.

I shall not attempt to dictate any course of action or rules of business, but must be permitted to call your attention to several things which I deem worthy of consideration by your honorable body, and among the first of these is the importance of this society and the State Agricultural Society urging upon the State Legislature the appointment and providing for the payment of a State Entomologist. All would be astonished at the loss sustained to our young and growing State from insects alone. I have no doubt that our loss from this source alone is more than three times the amount of our State taxes. That

the whole of this vast amount would be saved is not expected, but on the other hand, might we not expect, and with confidence, that a good and competent entomologist who could spend his time in studying our insects and the best methods of exterminating them and disseminating such knowledge, could save many times his salary in each year? Take for instance the potato bug, and how many hundreds of thousands of dollars' damage, if not millions, to our State has been done by this pest, and as entomology is a science, no man expects to make money out of it by his services unless in some way paid by the public. It is but just that he should be paid by the State, and the people of the State all receive the benefit.

CRANBERRY CULTURE.

Again I would call your attention to the subject of Cranberry culture, as one of vast importance to our State. Believing that we have many thousands of acres well situated for the cultivation of this, may I say, the best of all small fruits, I will say, without fear of contradiction, the most important of all small fruits, in a financial point of view. When we consider the fruit, when well ripened and perfectly handled, can be kept in its fresh state the year round, or longer, without canning or other expense; and again, if properly packed, it bears shipment to distant markets better than any other, and can be made to yield our State a large and steady income, as an article of export to distant markets. Even our wild fruit, picked from our marshes in their native state, has heretofore brought no small amounts of money to our State. This fruit improves by cultivation, and here as much as any other, if not more than most States. No one who saw the fine specimens of cultivated berries at our State Fair would really wish to produce the half-ripe and small wild fruit offered at our stores alongside of those cultivated.

VEGETABLE GARDENS.

Again permit me to call your attention to our vegetable gardens, which hitherto have received only neglect or a passing notice at your hands. This branch of horticulture is a very important one, and I hope will, as it deserves, receive your careful attention. The flowers, of course, will not be overlooked, as they are in constant demand from the cradle to the grave. Another item suggests itself to my mind, and that is the importance of

HORTICULTURE AS AN ART,

and our duty in bringing it before the rising generation in our schools, academies and universities. It was the first art ever taught man. God himself, in His infinite wisdom, planted the first garden, and from that day to this it has been man's greatest and best blessing on this earth, and consequently should stand at the head of all other arts and sciences. The too common idea that to be a good gardener or horticulturist requires but little education and less brains, is a sentiment only fit for the dark ages, and is only entertained by those who know nothing of its first principles, as is also the idea that it is not an honorable or lucrative pursuit. Is not the name of Marshall P. Wilder known and honored as far and wide as that of U. S. Grant? Are not the names of Downing, Kincutt, Hooper, Wilson, Barry, Vick, Ellwanger, and hosts of others, household words among the enlightened and intelligent of this and other lands? and have not Hendersen, Paly, Ellwanger and Barry, Hoveys, Vick, Briggs and many others, demonstrated that horticulture, with capital and intelligence to guide and manage its affairs, can be made profitable? What trade or profession can we find that will run itself without brains or capital, and make a fortune for the men who pursue it? With knowledge, labor is capital. Again, what trade or profession offers as many inducements at the present time for young men and ladies as horticulture? I mean for men of intellect and energy. All other trades and professions are full to overflowing. But can there be found a supply of competent gardeners, fruit-growers or florists? and where is there a town or city among the inhabitants of the civilized portion of the globe, but what there is a demand for all the products of the horticulturist? His fruits, vegetables and flowers not only grace the table of kings, presidents, and nobility of the land, but the poor and the middle classes. Each and all come in for their share, and no highly civilized or enlightened community will be without them in abundance. They form a large part of the imports and exports of our commerce, and of the commerce and trade of all the civilized world. Now, this suggests another idea to me that, in view of the importance of our calling and profession, shall we always stand in the background and play "second fiddle," as the saying is, to horse-racing and herdsmen? I say not, and that horticulture is as far ahead of those callings as the enlightened countries on the globe, where horticulture flourishes, are ahead of the Arabs and the half-civilized tribes of Mexico and South America, where horse and cattle-raising form the chief occupation. Now, cannot we under our new constitution and our

acts of incorporation, within the next two or three years, raise funds enough to purchase a lot or lots, and erect a fine building, and have a house and a hall for our meetings, and a place to hold our fairs and exhibitions, and have our fruit and flower shows at least twice in each year, and have our place for a distributing point of seeds, plants and horticultural implements. Look at the horticultural halls in Boston and Philadelphia. Are they not the pride of those cities? And does horticulture go a begging in Massachusetts, with her society worth over \$2,000,000, and numbering among its members some of the best educated and noblest minds of that Commonwealth? I tell you, members of the Minnesota Horticultural Society, if you would have your society and your calling respected and exalted in the minds of others, you must respect and exalt it yourselves, with your hands, minds, and purses if necessary.

A vote of thanks was tendered, and a committee appointed to report in the afternoon upon its very striking suggestions.

Messrs. Moulton, Nutting and Jewell were the committee.

A communication from Peter M. Gideon, of Excelsior, was read. It was relative to the rejection from the horticultural report of his address on the "fast horse," and the toleration of horse-racing at State Fairs to the detriment of more interesting and worthy objects.

Moved that it be accepted and placed on file for future reference.

Moved that the reports of each day's proceedings be read and corrected the following morning.

Mr. Ford stated that his reasons for wishing this motion to pass was that last year the reports had made it appear that he had said entirely contrary to his views, and in that shape they had found their way into the volume of Transactions.

Motion carried.

The Secretary requested all members whose remarks were wrongly reported to notify him of the fact before the proceedings are compiled for publication.

Considerable discussion followed on the recent horticultural reports printed, and C. H. Clark moved, and was seconded by Mr. Harris, that we pass the following vote of thanks:

Resolved, That the thanks of this society are due, and are hereby heartily extended to the committee who have so laboriously, and from the scattered condition of the material, effected so satisfactory a compilation of our Transactions as appears in our first published volume.

Passed.

Moved by Mr. Jewell and seconded by Mr. Clark, that a committee be appointed by the chair for drafting rules and by-laws for the use of this society.

Messrs. Jewell, Dartt and Clark were appointed as such committee, and were instructed to report in the afternoon.

The meeting then adjourned till afternoon.

AFTERNOON SESSION.

The committee to whom was referred the circular from the Kansas Horticultural Society submitted the following report :

We have carefully considered the resolution therein embodied, and the preamble to the same. It is true that in the past the American Pomological Society has been largely composed of men residing east of the Mississippi Valley, and its meetings have been held chiefly in the Eastern and Middle States; nevertheless, as its name implies, it is an American institution, and includes in its membership the best and most experienced men of the land. The doors are open to all, and the hand of welcome is extended to us of the Northwest. If we do not get an equal benefit in the places of meeting and the making up of fruit lists it is our own fault. Therefore, in our opinion, it would not be expedient to favor the organization of a Northwestern Pomological Congress, and that the Secretary of this society be instructed to reply to all official correspondence upon the subject, in accordance with this report.

J. S. HARRIS,
L. NUTTING,
P. A. JEWELL.

The report was accepted and adopted.

ELECTION OF OFFICERS.

The society then proceeded to the election of officers, and elected for President, Truman M. Smith, Esq., St. Paul.

The Vice Presidents being elected from members of each Congressional District, the election by ballot was suspended, and Messrs. E. H. S. Dartt, of Owatonna, for First District; Gen. Levi Nutting, of Faribault, Second District; and G. W. Fuller, of Litchfield, Third District, were elected Vice Presidents.

L. M. Ford, St. Paul, was elected Secretary; Amasa Stewart, Minneapolis, Treasurer; and Messrs. J. S. Harris, J. C. Fleischer, of St. Paul; P. A. Jewell, Lake City; O. F. Brand, Faribault, and J. T. Grimes, of Minneapolis, for Executive Committee, the President and Secretary elect being members *ex officio*.

The President, Col. J. H. Stevens, and Messrs. Gould, Moulton and Jewell were appointed delegates to the State

Agricultural Society, which meets in St. Paul in February next.

Moved that \$15 be paid the ex-Secretary for stationery and postage for the last year.

Carried.

Col. Stevens' bill of \$47 for copies of the Farmers' Union of last year, containing horticultural reports, and for compiling the said reports for publication, was ordered to be paid.

Moved that the subject of regulating the premium list of the State Fair be left with the Executive Committee.

Carried.

Moved that the name of O. F. Brand be added to the Committee on By-laws, and report in the evening.

Col. Stevens offered the following resolution :

Resolved, That the retiring Secretary, J. S. Harris, be empowered to prepare the proceedings of this meeting for publication and present them to the printer.

The committee on the President's address presented the following resolution :

Resolved, That we recommend that the able address of our worthy President be accepted and put on file, and that the numerous topics suggested by it be carefully considered.

That a committee of five be appointed by the President, whose duty shall be to solicit subscriptions of the citizens of Minneapolis and St. Paul for the purpose of purchasing property in one of these places to be used as the headquarters and permanent place of business of the State Horticultural Society.

Accepted and adopted.

The President appointed as such committee Messrs. C. M. Loring, Geo. A. Brackett and Wyman Elliott for Minneapolis, and Messrs. Truman M. Smith, J. H. Stewart and E. F. Drake for St. Paul, the President's name having been added, on motion.

The Secretary stated that there was a premium of \$25 at the last State Fair for the best and most instructive report of viewing committee in the horticultural department, the award to be made by the State Horticultural Society, and that a very able report had been handed in to compete for the premium.

The reports being quite lengthy, it was moved that a committee of three be appointed to examine them and award the premium offered, and ascertain if there is anything in such report worthy of being incorporated in the Transactions of this society.

Dr. O. M. Humphreys and Messrs. Ford and Carter were appointed on the committee.

Moved, that a committee of three be appointed to visit the State University and report to the society at its regular annual meeting next year what progress had been made in the horticultural department of that institution.

Messrs. G. W. Fuller, J. S. Harris and C. M. Loring were appointed as such committee.

This business having been disposed of, a motion was made to adopt the list of annual flowers recommended last year with the addition of the Morning Glory.

Considerable feeling was shown in the discussion of this motion, and a substitute for the motion was adopted as follows:

That a committee of three be appointed to present a list of annuals, hardy herbaceous plants, hardy shrubs, tender or half hardy shrubs, hardy and tender bulbs, and bedding plants.

Committee to report this evening.

W. Cannon and Messrs. Fleischer and Ford were appointed such committee.

Mr. Harris was added to the committee.

The society next proceeded to the discussion of

SHADE TREES.

On motion of Mr. Ford, it was changed to shade trees for streets and lawns.

The list of such trees recommended last year was adopted.

The list is as follows: White Elm, Basswood or Linden, White Ash, Box Elder or Ash Leaf Maple, Soft Maple, Rock Maple, Butternut, Black Walnut and Hackberry.

ORNAMENTAL TREES.

Moved, that the list of last year be adopted.

Carried.

Moved, that the European Larch and Kentucky Coffee Tree be added.

Carried.

The list recommended is as follows:

Mountain Ash, White Birch, European Larch and Kentucky Coffee Tree.

EVERGREENS.

Moved, that the list received last year be adopted.

Carried.

Mr. Ford said that the Norway Spruce stood at the head of the list; that it was not as hardy or good a tree as the White

Spruce, and he would move to reverse their position and place the White Spruce first on the list.

The motion received a second, and a very interesting discussion followed.

Mr. Charles Hoag thought it judicious in arranging the different varieties of the list to be recommended, that care should be taken as to what kinds were placed first, that people might not be deceived in making their selections.

Mr. Clark expressed himself warmly in favor of the hardiness of the White Spruce, as being worthy of a first place in the list, in preference to the Norway Spruce, which was materially affected by severe winters. He referred to several fine Minneapolis gardens for specimens of the White Spruce, and intimated that nurserymen had so far entirely manipulated and controlled the action of this meeting in its recommendations as to confine their lists to stock they had to sell, and that amateurs, whose sole interest was to beautify and adorn, were not considered or consulted as to their opinion.

Mr. Jewell said that the Norway Spruce, each succeeding year, became more handsome, while the Balsam, as it advances in years, is liable to become imperfect, losing its lower limbs. The value of evergreens depends on this fact of increasing in beauty as they grow older, and tried by this test the Norway is a very valuable tree.

Col. Stevens said that at one time he purchased five Norway Spruce. After planting them out in early spring he was absent from home for a while. Upon his return he found the trees had shed their leaves *a la mode* deciduous style. Not knowing that an evergreen ever shed its leaves, he concluded that the trees were dead. He pulled up four of them and cast them over the fence. He tried to get up the fifth, but that was planted so deep that it resisted his efforts. Judge of his surprise afterwards when he found that the remaining tree had put forth a new foliage, and to-day his Norway was one of the most beautiful trees in his grounds. So much for Mr. Ford's idea that the Norway was not hardy.

Mr. Carter would vote for the Norway, as his experience with it warranted him in doing so.

The motion to place the White Spruce at the head of the list, instead of the Black Spruce, was lost, Mr. Ford voting for it.

The list of Evergreens, as adopted, stands :

1. Norway Spruce.
2. Austrian Pine.
3. Scotch Pine.
4. Balsam Fir.
5. American Arborvitæ.
6. American Black Spruce.
7. White Spruce.
8. Red Cedar, (when clipped.)
9. Siberian Arborvitæ, for small yards.

The following resolution was then presented by Mr. Harris, and adopted :

Resolved, That all ladies residing in Minnesota, Wisconsin, or Iowa, who own or manage greenhouses, flower gardens or conservatories, without the aid of professional florists, and who shall forward their names to the Secretary, and donate an essay or paper on floriculture, in some one or more of its branches, shall be elected members of this society, and be entitled to reports of its Transactions, and all other privileges conferred upon members by the constitution.

The President said it was his object to give the ladies a prominent position in the society, as they deserved. He knew a lady that owned and managed a greenhouse herself and made it a success.

Mr. Peffer said the ladies of Wisconsin took a share in the proceedings of their society and furnished valuable essays and suggestions in horticulture.

Adjourned till evening.

EVENING SESSION.

President Smith in the chair.

The 21st topic in the order of business was taken up.

WHAT SOILS ARE BEST ADAPTED TO THE VARIOUS KINDS OF FRUIT,
AND WHAT MANURES PROMOTE THE MOST HEALTHY GROWTH ?

Mr. Dartt, of Owatonna, opened the discussion by saying that he thought sandy loam with clay sub-soil, and good natural drainage, was the best for apple trees. He did not think the aspect of so much importance as the soil; although in Wisconsin a northern exposure is thought to be preferable.

Mr. Harris said he endorsed what Mr. Dartt had said. He did not think the soil of Minnesota needed very heavy manuring. Our trees generally grow too fast and too late in the fall, but if the soil is too poor to give a fair, healthy growth, he thought barn-yard manure applied on the surface, just as winter sets in, the best fertilizer.

Mr. Fuller thought that good care and attention was of more importance than soil. Thought the ground generally selected not rich enough, especially for small fruits. Raspberries require deep, rich soil, to perfect large crops of good fruit, and the same is true of Currants. Strawberries do well on new land—sandy loam, without manure.

Mr. Stewart wanted high ground for an orchard, with plenty of clay, and not too rich.

The President thought a northern slope with clay soil, and not rich, the best adapted to apple trees.

Mr. Dartt considered that barnyard manure with ashes is best for fruit trees, but would not manure land that is rich enough to bring a good crop of corn. On soil too rich he would throw aside the sub-soil from the holes and fill in rubbish or surface soil around the tree.

Mr. Jewell did not want manure for most varieties of apple trees, but for such trees as the Duchess and Tetofsky, which are of slow growth, manure would be of benefit; but for vigorous growing trees it is no benefit.

Mr. Peffer said that the soil should be well pulverized, and the ground should not be enriched to make a large growth. Trees should not be grown too fast in the nursery rows.

Mr. Clark thought that nurserymen prune their trees too much. His land is black sandy soil, with clay sub-soil. His theory was for cultivating in spring and mulching in June.

Mr. Jewell, as chairman of the committee on by-laws, presented the following code, which was adopted clause by clause :

BY-LAWS.

DUTIES OF OFFICERS.

1. It shall be the duty of the President to preside at all meetings of the society when present, and to deliver an address at the annual meeting of the same. In the absence of the President one of the Vice Presidents shall preside in his place.

2. The Secretary shall record all the doings of the society, collate and prepare all communications, &c., for the public press, and pay over all money received from members or otherwise to the Treasurer, on his receipt; shall receive and answer all communications addressed to the society; establish and maintain correspondence with all local, county, district and State Horticultural Societies, and secure, by exchange, their Transactions as far as possible; to aid the President, as an executive officer, in the dispatch of business relating to meetings of the society, and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which shall become part of the Transactions for the current year, and shall be prepared by him for the public printer.

3. The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the Secretary, countersigned by the President.

4. An Executive Committee of five shall be chosen annually, who shall, in connection with the President and Secretary (who shall be members ex officio), have in charge all matters pertaining to the interests of the society; shall revise all matter coming into the hands of the Secretary, and pass upon the same its approval before its submission to the annual meeting.

5. The Executive Committee may call a meeting of the society at any time and place they may deem advisable and for the interests of the society, giving at least thirty days' notice through the public press, and

shall in no case incur any expense exceeding fifty dollars, except by authority of the vote of the society at its annual meeting, when the specific object and the amount so appropriated shall be designated.

6. The President, at each annual meeting of the society, or as soon thereafter as practicable, shall appoint a General Fruit Committee, consisting of one member from each Senatorial District in the State, and it shall be the duty of each member to report upon the fruit crop in his respective district annually; also, a limited list of fruits best adapted to general cultivation in the district which such member represents.

7. That committees on vegetables and market gardens, flowers and floriculture, trees for the forest and forest culture, and entomology, be appointed each year, whose duty it shall be to report on their several topics to this society at the annual meetings.

Mr. Wm. Cannon presented the report of the committee on varieties of flowers to be recommended for cultivation. The report was adopted. It is as follows :

ANNUALS.

Astors, Balsams, Candytuft, Catchfly, Caliopsis, Cockscomb, Escholtzia, Larkspur, Morning Glory, Morning Bride, Mignonette, Petunias, Phlox Drummondii, Portulacca, Sweet Peas, Sweet Alyssum, Whitlaria, Zinnias Elegans.

HARDY HERBACEOUS PLANTS.

Achillea, three varieties; Asclepias Tuberosa, Clematis, Erecta, two sorts; Columbines, Dielytria or Bleeding Heart, Delphinium or Double Larkspur, German Iris, Hollyhock, Lychnis and Japan Day Lillies, four varieties; Lily of the Valley, Pardonthus Chinensis or Blackberry Lily, Native Phloxes, Peonias, Pansies, Perennial Flax, Phloxes, May Pinks, Ledunis, Sweet Williams, Spireas, Tall Day Lilies.

HARDY SHRUBS.

Acacia or Moss Locust, Barberry (common and purple), Burning Bush (Wahoo), or Strawberry Bush, Buckthorn, Carrigana or Siberian Pea Tree, Cranberry, Yellow Flowering Currant, Charles the Tenth Lilac, Purple, White and Persian Lilacs, Lilac Josekia, Upright Honeysuckles (three kinds), Hyderangea Dentzalfolia, Hyderangea Boreii, Hyderangea Panicula.

DUTCH BULBS.

For Fall planting only—Hyacinths, Tulips, Crocus and Snow-drops.

TENDER BULBS.

For Spring or Summer planting—Gladiolus, Cannas, Caladium Esculatum, Dahlias, Madeira Vine, Tigreda or Shell Flower, Tuberoses.

HARDY BULBS.

For Spring or Fall planting—Lilium Auratum, L. Candidum or old Garden Lily, Japan or Lancifolium Lilies, Tiger Lily and Native Lilies.

BEDDING PLANTS.

Achranthes, Alternantherus, Centaureas, Double Petunias, Feverfew, Zonale and Sweet-Scented Geraniums, Gazanias, Heliotropes, Lobelias, Lantanas, Pyrethrum (Golden Feather), Tea, Bourbon and Noisette Roses.

TENDER CLIMBERS.

Manriandis, Colea Scandens.

HARDY ROSES THAT NEED NO PROTECTION IN WINTER.

Yellow Harrison, White, Yellow and Pink Scotch Cinnamon Roses, Old Blush Rose, Sweet Brier.

ROSES THAT NEED PROTECTION.

Hybrids, Perpetuals, Moss Rose, Madam Planter (a fine white), George the Fourth, Russell's, College Centifolia (pink and white), Old Cabbage Roses, Tuscany Rose, Miralba, Monthly Cabbage, Old White.

CLIMBING ROSES THAT NEED COVERING.

Queen of the Prairies, Baltimore Belle, Seven Sisters, Gem of the Prairies.

TENDER SHRUBS THAT GENERALLY NEED PROTECTION IN WINTER.

Flowering Almond, Wigelas, Rosea and Alba, Spirea, Prunifolia and Billardin, Tree Peonia, Tamarisk Africana, Calicanthus, Purple Fringe or Smoke Tree, Deutzia, Gracalis and Crenato, Japan Quince, Celthra Alnifolia or Spice Bush, Deciduous Cypress.

HARDY CLIMBERS.

American Ivy, Virginia Creeper, Celastrus, Scandens (Climbing Bitter Sweet), Clematis or Virgin Bower.

TENDER CLIMBERS.

Honeysuckle, Scarlet Trumpet, Yellow Monthly, Monthly, Fragrant and Parifolia, Chinese and American Wisteria.

After the adoption of the flower lists, the following resolution was offered and passed :

Resolved, That the thanks of this society are hereby tendered to John E. Booth, for his contribution of green-house plants and cut flowers that graced our table, and to Messrs. Stubbs and Hoyt of this State, and Mr. Peffer of Wisconsin, for their contributions of fruit.

It was also

Resolved, That we would urge upon our delegation in Congress to use all means in their power to secure the adoption of Mr. Dunnell's bill, with the amendment of Senator Freeman of Jackson county, allowing two quarters on each section instead of one, as provided by the act of March, 1873.

A motion was made and carried to adjourn till 9 A. M. to-morrow.

FOURTH DAY.

President Smith in the chair.

A resolution was offered and passed, that the President, retiring and incoming Secretaries, be authorized to act as a committee on publication, and be requested to revise all proceedings and communications that have come before the meeting, and reject all matters foreign to the objects of this society or too voluminous to be of general interest.

The following communication was read from the Secretary of the Wisconsin Horticultural Society :

MADISON, Wis., January 20, 1874.

John S. Harris, Secretary Minnesota Horticultural Society, Minneapolis, Minn. :

DEAR SIR:—In accordance with arrangement suggested by me and offered by you, I have this day shipped, by American M. U. Express Co.,

fifty copies of the Wisconsin State Horticultural Society Transactions for 1873, and will be pleased to receive copies in exchange.

I regret that we are unable to be represented at your meeting by a large delegation, but hope this will not prevent the sending of delegates from your society to our meeting at Madison, February 3-5, of which a programme is enclosed. We anticipate an unusually important meeting.

In many respects Wisconsin and Minnesota have the same horticultural wants, and our experiences will be mutually advantageous.

The experiences of the last year—discouraging for the present—will ultimately do good. I look forward with entire confidence to successful fruit-growing in both the States in the future.

Let me express the hope that your society will not confine itself to fruit culture, important as this is. The cultivation of vegetables, of plants and flowers, are parts of horticulture, and should receive attention from our societies.

I regret that time has not been found to fulfill my partial promise to furnish a paper for your meeting. I can only say that there is here in Wisconsin a hopeful field for the future, a growing interest in the cause, an increasing number of local horticultural societies, and an increased interest in horticultural literature.

With best wishes,

Truly yours,

G. E. MORROW,

Recording Sec. Wis. State Hort. Society.

It was voted that this communication be received, and that copies of the Minnesota State Horticultural Society Proceedings be sent in exchange for those we had received.

The President moved that the retiring Secretary be elected a delegate to the Wisconsin State Horticultural Society in the meeting to be held February 3-5.

Carried.

The President made a brief address in which he said that he hoped that we would soon have a permanent fund for sustaining the State Horticultural Society upon a permanent basis. It is asking too much of delegates to spend their time and defray their own expenses in visiting other State meetings. We ought also to have a summer meeting, for the exhibition of fruits that cannot be exhibited at a winter meeting.

A communication was read and received from D. F. Kelly, of Northfield, Minn. (See Reports and Miscellaneous Papers.)

The President moved a vote of thanks to the citizens of Minneapolis, for their princely hospitality, and to the City Council for the use of their Chamber.

Mr. Harris seconded the motion, and said that it was well known that there was no better place for a Horticultural Convention, and no place in the Northwest where the horticultural interest was better represented than in this city.

The motion was carried unanimously.

L. M. Ford, chairman of the committee to award premiums on report of Viewing Committee, said the report on Flowers was an excellent one, and he hoped it would be published.

REPORT OF COMMITTEE.

Your committee to whom was referred the report of the awarding committee of the horticultural department of the State Fair, made by W. H. Kelley and Wm. Cannon, would report that they have examined said report, and would recommend that it receive the premium offered by the State Agricultural Society; but as since our appointment there has been a standing committee appointed by this meeting to examine all documents with reference to publication, therefore this supercedes any action on our part with reference to that matter.

L. M. FORD,
F. G. CARTER.

The report was received and the Secretary instructed to notify the State Agricultural Society of the report made by the committee, and the action of the State Horticultural Society upon the same.

Resolved, on motion of L. M. Ford, that J. C. Fleischer be requested to hand in his essay on the "Cultivation of Roses" for publication.

Mr. Harris moved that Wm. Cannon be requested to hand in his essay on "Green houses, and Management by Amateurs."

Carried.

Truman M. Smith moved to take up small fruits, and especially new varieties.

Mr. Harris inquired if any one knew anything of the Desota plum. He had understood that some trees had been sold in Minneapolis. A Mr. Hale, of Lansing, Iowa, is exhibiting bottled fruit of it and selling trees in Southern Minnesota. Says the trees commence fruiting at from two to three years old.

Col. Stevens said that he purchased ten trees of the Desota plum two years since; they were two years old and about three feet high; they bore last year, and he had about a peck of the finest native plums he ever saw. The trees were hardy with him. The fruit is larger and better than the Harrison plums.

Mr. Ford wished to know about the Minor plums.

Mr. Myers, of St. Peter, had trees seven years old; fruit very nice. Commenced to bear at six years old, and ripened with him.

Mr. Moulton said that he had had them since 1867. They had commenced bearing small green plums. Thought if the season was twice as long they might have got ripe. He thought they were small and inferior to most of our wild plums.

Mr. Carter said the Minor plum was very large, but thought he had some wild ones as good.

Mr. Smith had purchased some from a nurseryman, but they were dead when received, and therefore he could not say they were not good. Same with Wild Goose.

Mr. Howe said that he hoped the Minor plum would not be recommended. He had never seen any that were fit for use, and the trees are not hardy.

Col. Stevens had seen the Minor Plum, on Apple River, in Illinois. They were always infested with all kinds of insects. They are worthless for Minnesota.

W. J. Abernethy had seen and raised lots of Minor plums. They were large, handsome and of superior flavor. Thought his were genuine. They came from Galena.

Mr. Moulton said he thought we were cultivating two kinds of Minor plums.

Mr. Harris said he thought so too. He had never tried them, but they had been planted extensively at his place, and no one would speak a good word for them except they had trees to sell. However, to get the opinion of this meeting, he would move that it be recommended for general cultivation.

Motion lost.

Mr. Harris said he could not ignore such a decisive vote as had been given against the Minor, but he wanted *Plums*. Had tried Lombards, Egg, Sages, Damsons, and almost everything that tree peddlers had to sell, and they had all proved poor investments. Has heard of the Wild Goose plum, and would move that it be recommended for general cultivation.

Lost by a unanimous vote.

Mr. Smith, of St. Paul, moved to recommend the best varieties of the wild plum, which is found growing in our own State, for general cultivation.

Carried.

CRANBERRY CULTURE.

Mr. Dartt wished to say a word about Cranberries. They are a valuable fruit and can be grown on land which is worthless for anything else. Thought it would be better if we would spend less of the time in our meetings discussing apples and more upon other fruits, and wished to have this meeting appoint a committee to secure for the society the proper information on the subject.

Mr. Moulton moved that Mr. Dartt be appointed to write a brief essay on Cranberry Culture, to be read at the next annual meeting of this society.

Carried.

Col. Stevens moved that Mr. Myers give us an essay on Cherries for the next annual meeting.

Carried.

Mr. Harris moved to instruct the incoming Secretary to secure an essay from the Professor of Botany at the State University.

Carried.

It was moved and seconded that all parties who had prepared or contemplated preparing essays and papers for this meeting be requested to hand them in or forward them to the Secretary in season to be incorporated in the transactions of this meeting.

Carried.

BLUEBERRIES AND HUCKLEBERRIES.

were then taken up and discussed at considerable length.

Some encouraging words were spoken for the Farmers' Union, and the fruit growers requested to write more for its columns; and Mr. Dartt moved and Mr. Carter seconded, to make the Farmers' Union the official organ of the society.

Carried.

The society then adjourned.

MISCELLANEOUS PAPERS, REPORTS, &C.

[Under this head it is designed to arrange reports from individuals, local and county societies, correspondence and essays, that were handed in to come in the body of the proceedings. Here will be found the individual experience of fruit growers (who have not been in attendance at this meeting) from various parts of the State, and although they only corroborate the experience related in the body of the Transactions, the Secretary deems them worthy of a place in this volume.]

CULTIVATION OF ROSES IN THE OPEN GROUND.

BY J. C. FLEISCHER, ST. PAUL.

During the session of the State Horticultural Society, held in January, 1873, among other matters of general interest, the question was brought up whether roses, and what kinds of them, could be successfully cultivated in our climate.

Those who took part in the debate differed widely in opinion. Some—our President, Mr. Smith, for instance—contended that of three hundred varieties he had not found one capable of withstanding the rigors of our climate, while others, Mr. Ford among the number, recommended the planting of inferior sorts, such as Yellow Harrison, Cinnamon, Sweet Briar, etc., varieties which I would not like to give a prominent place in any well-cultivated garden under any circumstances. Others again, myself among the rest, believed then, as I still believe, that roses of a far superior quality to those recommended by Mr. Ford, may and can be cultivated to advantage, and this in the open air.

In making this assertion, I may be allowed to remark that the cultivation of roses has been a favorite pursuit and study of mine during the past twenty-five years, fifteen of which I passed in Northern and Southern Germany, and ten in Minnesota. Basing my opinion upon this experience, I will endeavor to impart what knowledge I may have gained, as it

must be the wish of every real lover of flowers to see the rose cultivated in Minnesota to some advantage.

In this respect the florist in the Northwest has the same difficulties to overcome as his colleague, the fruit-grower. Both have to contend against severe cold, biting storms, &c. The fruit-grower is compelled to protect his pets by mulching, enwrapping, and other well known means. The florist must adopt similar measures, if he would be considered a faithful guardian of the tender "children of Flora" that may be entrusted to his care. If we can recommend and practice the cultivation of grapes, blackberries, raspberries and strawberries, neither of which can be successfully raised without protection against the severity of our climate, then there can be no good reason why the rose, that "queen of flowers," immortalized by Anacreon in the following stanza—

"Rose! thou art the sweetest flower
That ever drank the amber shower;
Rose! thou art the fondest child
Of dimpled spring, the wood nymph wild,"

should not receive equal attention, and it should be a matter of pride to domicile this beautiful plant in every garden of this great State, even if a little additional care and labor is required, although, in my opinion, no more than is bestowed upon the grape, &c.

Inasmuch as we are treating this subject with a view to the cultivation of roses in the open ground only, it is appropriate that we should know the quality of

THE SOIL.

This should be highly cultivated, for although the rose will grow in almost any kind of soil, the lack of richness will tend to decrease it in size and in the beauty of its form. The proper soil for the rose is strong, rich loam and well decomposed vegetable mould, cow or horse dung. If the soil be light, holes must be dug and loam and dung forked in at the bottom. Troublesome as this may be, it is the only way to secure a good growth and bloom. The evil of poor soil for the rose is, that it makes the flower that would otherwise be double come single or semi-double. As it is difficult to give the rose too rich a soil, it may be as well to work in a spadeful of dung with it, for it will do no harm, even if the state of the ground be ever so good. Of all soils one of a sandy or gravelly nature is the worst, while, on the other hand, a wet and dense clay is scarcely better. As a general principle, the rose requires rich soil, and if you have it not, you must

change the nature of what you have, by means of dung, or loam, or both.

After the preparation of the soil, we begin with

PLANTING THE ROSE.

Roses may be planted in spring or in autumn. In our State the severity of the winter demands to plant, if planted in autumn, as early as possible, that the roots may take some hold on the soil before winter sets in. The first part of October is the best time. If planted in spring, plant as early as the soil is in working order, that is, as soon as it is dry enough not to adhere in lumps to the spade. In planting, the root must first be examined, and every particle of it that has been bruised should be cut off with a sharp knife, but save as many of the small fibers as possible. If the holes are dug large enough to take the root in without cramping it, let one put in the plant and the other throw in the soil. By moving the stem backward and forward and pulling upward a little, it is easy to work the soil well between the roots. Instead of treading down, give plenty of water, so the soil will be firm around the roots. Be careful to keep the crown of the root near the surface of the ground. If you plant in spring, prune back to three, or even two good stems, at least half way to the ground, but if you plant in autumn, lay this operation over until spring. Next to soil and planting,

PRUNING

Is the most important point of attention. If the plant is very bushy, cut away all the weather branches, leave not more than three or four of the best of the shoots, and shorten even those down to a few eyes. If you wish the plant to continue dwarf and bushy, you may cut down to the last eye or two of the new wood, but leave no thin, half-grown shoots on at any rate. If the plant is a matured bush, with numerous branches and pretty strong generally, shorten the new wood down to two eyes. After this it may be found that you have a great many more branches left on than you require, cut one-half of them close off. It may be, also, that the plant will be improved by cutting some of the main branches clear away, for roses, like everything else, are easily spoiled by leaving too much wood.

The most vigorous growers among roses are the climbers. These require very little pruning; first, because of their vigor, and secondly, because quantity rather than quality of bloom

is asked for them. For all roses, it is the well ripened wood that bears the finest flowers.

One principle of pruning all roses will be: Weakly growing roses should be severely pruned; those of vigorous growth should be pruned but little.

COVERING.

In order to raise the better varieties of roses, especially the Hybrid Perpetual, it is advantageous to leave them in the ground during the winter. This, of course, cannot be done in Minnesota, without adequate covering. About the middle of November, a little sooner or later, as the state of the weather may permit, bend the bushes down upon the ground, and cover them well with earth to the depth of from six to twelve inches. To keep this so-formed hill of earth from thawing and freezing over again, it will be necessary to cover it with straw or old manure. In the spring, say at the latter part of April, when no further danger from heavy frost need be apprehended, the covering should be gradually taken off and the plants pruned in the manner above described. If this be conscientiously done, depend upon it the florist will be abundantly rewarded for all his pains in the sweet and beautiful display of flowers. In this manner I have succeeded in keeping the following named varieties in my garden at St. Paul, during the extraordinary cold winter of 1872-3, without even losing the smallest twig by the action of the frost: Augusta Mie, Baronne Provost, La Reine, L'Enfant du Mont Carmel, Jules Margottin, Triumphe de la Exposition, Souvenir de la Reine d'Angleterre, General Jaqueminot, General Washington, Leon des Combats, Piux IX, Prince Albert, Lydonia, Jacques Laffitte, King of Prussia, Lord Raglan. Madame Plantiere, all of the Hybrid Perpetuals; also the Monthly Cabbage, the Centifolia Kubra Major and Centifolia Unita. Of Moss Roses, Blanche Perpetual, Alfred de Dalmas, Crested Moss, Captain Ingraham, and Comtesse de Murinars. Of Climbing Roses, Queen of the Prairies and the Baltimore Belle.

Even the more tender sorts, as for instance the Bourbon and Noisette roses, &c, can be thus kept through the winter with a little additional labor, thus: Cover the bed of roses, with good, dry oak leaves, to the depth of twelve inches. Do this before the advent of frost. After the frost put on a layer of straw over the leaves, and about six inches of earth, and in the spring when all danger of frost is past, the plants will be found perfectly green and sound.

I have endeavored, in the foregoing, to do at least a little

towards imparting a better knowledge of the culture of a general favorite, whose nature, however, is not sufficiently understood by many, and if I shall have succeeded in interesting even a single lover of roses in working according to these directions, I shall be amply repaid, for success is sure to attend him.

REPORT OF THE COMMITTEE

Appointed to make awards in Classes 53, 54 and 55, in the Floral Department at the State Fair, held in St. Paul, Sept. 23, 24, 25 and 26, 1873, to which was awarded a premium by the State Horticultural Society at their annual meeting Jan. 20-23, 1874.

The committee appointed to make awards on Classes Nos. 53, 54 and 55, at the State Fair, respectfully report the following result of their labors.

The rules made by the Horticultural Society to govern the action of the committee, were as follows:

Exhibitors must have a separate and distinct quantity for each entry made.

Persons exhibiting plants for the largest and best collections, must exhibit them in one body or group, and none of such plants shall compete for any other premium.

In conformity with these rules, the committee have made the following awards:

CLASS 53. FLOWERS AND PLANTS IN POTS—*Professional.*

Best and most tastefully arranged collection of green-house plants. Premium to J. C. Fleischer.

Second best. Premium to J. E. Booth.

Best and most tastefully arranged collection of hot-house plants. Premium to Lemke Bros.

Second best. Premium to A. Bunde.

Best collection of ornamental foliage plants. Premium to J. E. Booth.

Best collection of Cactus. Premium to J. C. Fleischer.

Best collection of Coleus. Premium to J. E. Booth.

Best plant in hanging basket. Premium to J. C. Fleischer.

Best 10 single geraniums in bloom. Premium to J. C. Fleischer.

- Best collection Tri-Color and Silver Edge geraniums. Premium to J. E. Booth.
- Best 6 Fuschias in bloom. Premium to A. Bunde.
- Best 3 Tuberoses in bloom. Premium to Lemke Bros.
- Best collection of Roses in pots in bloom, not less than five varieties. 1st premium to J. C. Fleischer. 2d premium to Lemke Bros.
- Best collection of Asters. Premium to J. C. Fleischer.
- Best 5 Carnation Pinks. Premium to Lemke Bros.
- Best Double Petunia. Premium to J. C. Fleischer.
- Best 3 named Pansies in bloom. Premium to Wm. King.

CLASS 54. FLOWERS AND PLANTS IN POTS—*Flowers by Amateurs who employ Professional Gardeners.*

There were no exhibitors.

CLASS 55. FLORAL DESIGNS AND CUT FLOWERS—*For Professional Florists and all who employ Professional Gardeners.*

- Best floral design, natural flowers and leaves. Premium to Lemke Bros. 2d best—no exhibitor.
- Best arranged and greatest variety of Cut Flowers. Premium to Lemke Bros. 2d best premium to J. E. Booth.
- Best arranged basket of hot-house Flowers. Premium to Lemke Bros.
- Best pyramidal boquet of Annual Flowers. Premium to J. C. Booth.
- Best flat-round boquet of green-house Flowers. Premium to Lemke Bros.
- Best flat-round boquet of Annuals. Premium to J. E. Booth.
- Best boquet of Everlasting Flowers. Premium to J. E. Booth.
- Best and greatest collection of Roses. Premium to J. C. Fleischer.
- Best and greatest collection of Pinks. Premium to J. C. Fleischer.
- Best collection of Verbenas. Premium to J. E. Booth.
- Best collection of Seedling Verbenas. Premium to E. Booth.
- Best collection of Seedling Verbenas, 1873. Premium to J. E. Booth.

In awarding the premiums, the committee decided to judge on all the smaller contributions first. By this arrangement they were enabled to separate the plants, so that they would not receive more than one premium, and some of the contributors who had arranged their plants for the general effect of the whole, had very few plants left to compete for the high-

est premium. The adoption of this plan left the committee with only the two largest contributions to decide between, and the decision was made for the greatest number, according to the rule above recited, as well as the best and most tastefully arranged collection. For these contributions were made by professionals, and the premiums were evidently offered to encourage florists to make the largest display of their productions. Of course somebody was disappointed with the award, and the acting members were sorry that some gentleman could not have been found to take the place of the absent member of the committee. To show much care was taken to give offense to no one, the Lemke Bros. had contributed a splendid bouquet of what they had entered as annual flowers, but a couple of rose-buds put into the bouquet gave the premium to an inferior collection of annuals by a competitor.

We can sympathize with the florist who loses in a contest for premiums. He without doubt loves his plants, for he has passed his life with them since they were tiny cuttings, and has watched over and guarded them from the many dangers to which they are subject, and when they are placed on exhibition he is justly proud of their appearance; and although a professional may get hardened to his employment and lose the enthusiasm of an amateur, still the professional cannot be blamed for showing some feeling at any seeming slight to his pets.

The contributions to this department were not so numerous as at the fair of the previous year, but they were very fine in quality. A complete list would make some repetition, as certain kinds of plants were in the display of every contribution. The collection of Mr. Fleischer, to which was awarded the first premium, contained the following: *Abutilon Mesopotamicum*, *A. Striatum*, *A. Venosum*, *A. Alba*, *A. Thomsonii*, *Achenia*, *Malvariscus*, *Acacia Lophantha*, *A. Augustifolia*, *A. Conspicua*, *Ardesia Crenulata*, *Asclepia Curasvicia*, *Azalia Indica*, *A. Phoenexia*, *Bouvardia Hogarth*, *B. Leiantha*, *B. Triphylla*, *Begonias* in variety, *Calla Ethiopica*, *Camelia Japonica* in variety, *Carnations*, *Cestrum Auranticum*, *Cuphea Emineus*, *Caladium Esculentum*, *Cytissus Racemosa*, *Cyclamen Persicum*, *Citrus*, *Diasma Alba*, *Euphorbia Splendens*, *Enonymus Japonica*, *Eupatorium Arboreum*, *E. Elegans*, *Echeveria Secunda*, *Ficus Elasticus*, *Fuschias*, *Geraniums*, *Habrothamnus Elegans*, *Heliotropes* in variety, *Hetrocentum Alba*, *Hydrangea Hortensis*, *H. fol. Aurea Variegata*, *Justicia Carneae*, *J. Purpurea*, *J. Purpurea fol. Variegata*, *Jasminum Undiflorum*, *J. Azoricum*, *J. Grandiflorum*, *Laurus Nobilis*, *Libonia Floribunda*, *Myrtus Communis*, *M. Sinensis*, *Nerium Splendens*, *N. Flora Alba*, *N. Bayonet*, *Oxalis Boweii*, *Pittos-*

porum Tobiva, Plumbago Capensis, P. Larpentæ, Rosmarius Officinatis, Rubus Grandiflorus, Solanum Pseudo Capsicum, S. Pseudo fol. Variegata, Salvia Splendens, Stevia Serrata, Tuberoses, Veronica Andersonii, V. Lindlegana, V. Speciosa, V. Imperialis, Viola Odorata, Viburnum Laurestinus, Weigelia Amabilis, W. Amabilis fol. Variegata, Yucca Filimentoza.

PLANTS FOR HANGING BASKETS.

Geranium—Golden, Ivy Leaved, Balm variegata Ficus, Repens, Gazania Splendens, Panicum Variegatum, Isolepis Gracilis, I. Pygmea, Kanega Maritima, Linaria Cymbalaria, L. Cymbalaria fol. Variegata, Lycopodiums in variety, Saxifraga Sarmentosa, S. Tricolor, Sedum Carneum, S. Seiboldii, S. Seiboldii fol. Variegata, Tradescantia Viridis, T. Discolor, Fragaria Indica, Vinca Major, V. Major fol. Variega, V. Major Elegantissima Aurea.

CLIMBING PLANTS.

Senecia Hederifolia, Vinca Major Variegata, Cobæa Scandens, Hedera Helix, H. Helix Fol. Variegata, Smilax, Hoya Carnosa, Jasminum Grandiflorum, Geranium Ivy-Leaved, Passiflora Cœrulea, P. Trifasciata.

ROSES—HYBRID PERPETUAL.

Sydonie, General Washington, Alfred Halphin, General Jaqueminot.

TEA ROSES.

La Pactole, La Vesure, Solfaterre, Devoniensis, Triomphe de Luxemburg, Lamaoyne, Soette.

NOISETTE ROSES.

Agrippina, Purple Crown.

BOURBON ROSES.

Triumph de la Ducherre, Souvenir de la Malmaison, Cytheria, Marquise Balbiona, Hermosa, Setina.

Mr. J. E. Booth received premiums on the following plants

COLEUS.

Albert Victor, Beauty, Blumeii, Marvel, Princess Royal, Setting Sun, Vershaffeltii, Hendersonii, Banseii, Spangle.

ZONALE GERANIUMS.

Captain Darley, Cerise Unique, Commander-in-Chief, De fiance, Fire King, Giant Scarlet, General Grant, Hydrangeiflora, King of Scarlet, Lady Turner, Madam Vaucher, Ossian, President, Perfectum, Symmetry Spilfire, Tom Thumb.

GOLD AND SILVER VARIEGATED GERANIUMS.

Alma, Attraction, Brilliant, Brilliantissima, Countess of Warwick, Flower of the Day, Flower of Spring, Golden Vase, Golden Fleece, Italia Unita, Manglesii, Lady Cullum, Mountain of Snow, Madam Benyon, Mrs. Pollock, Quadricolor, Sunset, Silver Queen.

VERBENAS.

Boul de Niede, Peace, White Lady, Bridal Wreath, Blanche, Bird of Paradise, Ball of Fire, Brightness, Defiance, General Grant, Startler, Scarlet Circle, Sparkler, Santiago, Sunset, Welcome, Victor, Velvet Mantle, Celestial Blue, Mrs. Fairfield, Zula, Ada, Alhambra, Brunette, Blazing Star, Colossus, Cherry Ripe, Carolina, Clara, Claret Queen, Gettysburg, Harkaway, Gigantic, Lord Craven, Lieutenant General, Magnum Bonum, Moor, Mrs. Christie, Broemar, Charlie, Erebus, George Sterling, Star, Diana, Mrs. Veasy, Venus, Amazement, Dowager, Modesty, Melville, Pluto, Satanella, Mrs. McKay, Mrs. Brinckley, Elizabeth, Flirt, Princess Alexandria, Striata Perfecta.

In Mr. Booth's collection were the *Ficus Elastica*, *Abutilon Thompsonii*, *Begonia Venusta*, *Salvia Splendens*, *Centaurea*, *Argentea*, *Hoya Carnosa*, *Passiflora Cœrulea* and *Vinca Variegata*. The fountain in the center of Floral Hall was the design of Mr. Booth, and he had contributed the *Calla Lilies* and a Chinese Fern; the *Pteris Serrulata*, for its adornment.

Messrs. Lemke Bros.' collection of hot-house plants, to which was awarded the first premium, consisted of the following: *Begonias* in variety, *Dracaena Australis*, *D. Terminalis*, *D. Rosea*, *D. Punctata*, *Eucharis Amazonica*, *Corypha Australis*, *Phoenix Dactylifera*, *Zabal Palmata*, *Euphorbia Pulcherina*,

E. Japonica, *Pilea Sarpilifolia*, *Pepa Nobilis*, *Aspidistra Variegata*, *Hoya Carnosa Variegata*, *Centradenia Floribunda*, *C. Grandiflora*, *Pasistrophea*, *Sanchesia Nobilis*, *Cissus Discolor*, *C. Argentia*, *Hibiscus Cooperii*, *Passiflora Trifasciata*, *Caladiums* and *Coleus* in variety, *Cyperus Variegata*, *Fittonia Argyronenra*, *Gymnostocia Nobilis*, *G. Vershaffelt*, *Peperomia Arifolia*, *Gesneria Zebrina*, *G. Frugans*, *Lycopodium Lepidophyllum*, *L. Argenta*, *L. Maperum Passicum*, *L. Cordyfolia*, *Blechnum Longifolium*, *Mepiornia Abiatilisa*. *Pteris Longifolia*, *Asplenium Divipasia*, *Lomaria Gibba*, *Pteris Alba Lineata*, *Nephrolepis Neglestum*, *Scolopendrium Vulgare*, *Gymnogramme Aurea*, *Pteris Tricolor*, *Panicum Variegata*, *P. Spitala*, *Pteris Serrulata*, *Bletia Tancaravilla*, *B. Onsedium*, *Cocolaba Plityclada*.

Mr. A. Bunde was awarded the premium on the following fuschias: *Annie*, *Anne Boleyn*, *Acubifolia*, *Bianca*, *Conspicua*, *Crown of Jewels*, *Duchess of Lancaster*, *Day Dream*, *Elm City*, *Garibaldi*, *Glory*, *Rose of Castile*, *Rose of Denmark*, *Sir Colin Campbell*, *Schiller*, *Spesiosa*, *White Lady*.

Mr. Wm King's collection was the smallest, but contained some of the finest plants on exhibition. His carnations were superior to any others, but they were only four in number. The premium required five plants. In his display were the following: *Myrtus Communis*, *Cissus Discolor*, *Terrana Asiatica*, *Pteris Argyra Variegata*, *Isolepsis Gracilis*, several varieties of *Dracaena* and trailing mosses.

It will be seen that no attempt has been made to give a full list of the plants of any contributor, and the small number mentioned must not be considered as any disparagement of the collection it applies to. Where all did so well, the committee would have had a hard duty to perform if rules had not been laid down for their guidance. It was a great pleasure to learn that the demand for flowers and plants is increasing in this community, and that florists are yearly adding to their resources to supply the demand. The love of flowers is almost universal, and the cultivated taste requires the choicest for its gratification. For the purposes of decoration we use them on every possible occasion, from the cradle to the grave. Our wives and daughters are more attractive to our eyes when we ornament them with beautiful flowers, and the pleasure to them is greater in proportion as the flowers are rare and choice. And in sickness when our friends remember us by sending or bringing their choice floral gifts, the great pleasure can be known only to those who have experienced it.

Before closing this report, two illustrations of the different ways that people look at plants may not be out of place. A lady friend who had been admiring the splendid display came

to one of the committee and remarked, that her husband told her that he would wait and she could go and look at the weeds. When that gentleman's soul gets to the spirit land among eternal blooming roses and all the other beautiful flowers of Heaven—flowers that he can love and with the power to return his spirited caresses—perhaps then he will forget that he ever called the beautiful vegetation of this earth by the contemptible title of "weeds." How different must have been the thoughts of an old gentleman who examined minutely many of the plants, and at last remarked that he was reminded of what the Queen of Sheba said to King Solomon, "The half was not told me."

Respectfully submitted,

WM. H. KELLEY, }
WM. CANNON, } Committee.

REPORT OF THE HORTICULTURAL DEPARTMENT OF THE STATE FAIR.

BY THE SECRETARY OF THE STATE HORTICULTURAL SOCIETY,
LA CRESCENT.

After reading the reports of the severity of last winter, which have appeared so frequently in the agricultural papers during the summer, I was most agreeably surprised with the exhibition made at the State Fair, September 23-26. Owing to a frost in May last, the fruit crop was not very large, and a severe drouth had prevailed in the southern part of the State, so that in size and appearance the fruit was not fully up to the standard of the two previous years; but the exhibition made was very creditable, and had a tendency to diffuse new hopes in the minds of those who witnessed it. The large stand in the west wing of Floral Hall was filled to overflowing with choice collections of apples and grapes. Commencing at the southeast corner we will give it a careful examination: First is Mr. Knapider's show of grapes, eighteen varieties, natives and Roger's Hybrids, all fine and well ripened, which draws the first premium for greatest number by one exhibitor; next to the west of him is a basket of Duchess of Oldenburg apples that for size and beauty of appearance cannot be beat this year or any other; a basket of St. Lawrence, several varieties of Siberians and a collection of native plums by Mr. Brainard. Above these is a splendid display of Siberians, by P. A. Jewell,

of Lake City ; all of them attracted attention by their beauty of appearance. Some of them were as large as Golden Russets ; some varieties were delicious for eating from the hand, and all were excellent for cooking. Next are several varieties of hardy apples and Siberians, with a good assortment of native plums, by Mr. Brimhall, of St. Paul. Truman M. Smith, of St. Paul, who never does anything by halves, finishes out this side and a part of the west end with a grand display of grapes, Siberian apples, high-bush cranberries, &c. The remainder of the west end was filled up with fruit from Winona, by Mr. Clark and Mrs. Norman Buck, who also showed a plate of tame plums. Theirs were the best and most extensive collections of apples in the Non-professional Department.

On the northwest corner was a plate each of Tetofsky and Duchess of Oldenburg apples in fine condition, by Mr. Ramsden, who had learned the secret of making summer apples keep all winter. On the north end of the north side Mr. S. Bates, of Winona county, showed over twenty varieties of apples and several of grapes. He showed Netter's large red apples, of an enormous size and splendid appearance ; they were raised by top grafting on the Transcendent crab, and by this process the trees went through the last winter without injury. Next was a plate of Concord grapes, shown by a St. Paul lady, that surpassed any of that variety on exhibition. Above these Mr. Hawkins showed eight varieties of standard apples of great excellence. Next to him was a display of native and Rogers' Hybrid grapes, by Rev. C. B. Sheldon, of Excelsior, and thirteen varieties by Mr. Gould, of the same place. These two collections were remarkable for size of bunch and berry, and showed that the growers understand their business. The remainder of the north side was occupied with the magnificent collection of Moulton & Co.—apples and grapes so tastefully arranged that they were the most fascinating display in the Hall.

The east end was filled chiefly with a collection of twenty-six varieties of apples and several of the Siberians and eleven of grapes, from the garden of J. S. Harris, of Houston county. There were a few pears of enormous size, grown in California, and some from Virginia upon the stand, but none of Minnesota growth.

There were also several collections of apples and grapes in Railroad Hall, raised along the line of the Northern Pacific Railroad, and they were fully equal in appearance to those raised in the southern part of the State. The show of flowers in pots by professional florists was extensive, and showed a marked superiority over the exhibitions of previous years. The show of plants by amateurs was not large, probably owing

to the cold and unfavorable state of the weather, but many of their plants were most skillfully grown.

The show of vegetables was large and fine, and on the whole the Horticultural Department of the Fair was a grand success.

The show of fruit tells to the world that the fruit-growers have nailed their flag to the mast, and will not surrender until the last apple tree is dead and no seed can be procured from which to raise more. The flowers speak of our Minnesota as the home of those who love and cherish the good and the beautiful.

JOHN S. HARRIS,
Superintendent of Division H.

CONSTRUCTION AND MANAGEMENT OF GREEN- HOUSES FOR AMATEURS.

BY WILLIAM CANNON, MINNEAPOLIS.

To those who wish to extend the cultivation of flowers, beyond the use of annuals, it is necessary to have a green-house, if only a modest affair; and the house most suitable for amateur florists is the span-roofed. It should be sheltered from the north and run north and south, so as to receive the greatest amount of sun in the winter. It is best to grow good shaped plants, and the easiest to attend their daily wants.

A good house can be built by having a wall of brick twelve inches thick and four feet high for the sides; brick up the ends, having one door in the north end, and having a wood shed and work-room for your furnace at the entrance. Have the rafters of sufficient depth to admit the use of double sash in winter, also to cover with canvas or light board shutters on very cold nights, as it is much better to retain heat than to continually keep up the supply by extra fuel.

An excess of artificial heat is injurious to plant life, and our usual mode of heating (by furnace) too dry, unless care is taken to avoid it by sprinkling or by water placed upon the flue.

The cheapest mode of heating is by a brick furnace, about fifteen inches wide and high, and long enough to admit four foot wood. The fire will burn better if you have a grate, but it is not absolutely necessary. The furnace should be two thicknesses of brick (for the inner one fire-brick are the most

desirable.) The flue should be six inches wide at the base and top, and for the sides place bricks on edge and plaster upon the inside, the whole passing round the house with a gradual ascent from the furnace to the chimney.

To those not having the means to build an expensive house, a wooden frame building will answer every purpose, if care is taken to make it tight and secure from frost; but as a rule avoid cheap buildings for a green-house, for they will become dear enough in the end. Use only the best materials and those of the most durable kinds, as the alterations of temperature and constant moisture speedily affect the best timber, and the poor material will soon be rendered useless by dampness and decay.

In stocking your house, take first all those well known (although old) and reliable, as trying to cultivate store and green-house plants together will only end in disappointment.

For shading from the sun use whitewash, in which a handful of salt has been mixed, and apply to the roof on the outside. This is durable enough to last all summer.

SOIL.

For all plants usually grown in the green-house (especially soft wooded plants) use loam, leaf mould and sand, and a little rotten manure, well mixed together. Such soil will remain loose and porous.

POTS.

Use only the common flower pots, as they are more porous, and the plants will thrive better in them than in glazed ones, of either glass or china, or fancy painted pots.

POTTING.

So much has been said and written upon this point about drainage that it is hard to determine in every case what is best. My experience has been to dispense with potsherds for drainage (using the coarse soil only) in all pots less than four inches wide. Care should be taken to have the soil pressed firmly about the roots by a few sharp raps upon the bench, always leaving sufficient room for watering. Care should also be used to avoid having plants in too large pots, as the soil becomes sour and the plants become sickly by so doing. Always protect fresh potted plants from the sun for a short time.

WATERING PLANTS.

Watering is one of the most important duties in successful

plant growing. The best time to water plants is at sunrise or at evening, and use rain water if at hand. My experience favors a thorough soaking when dry, as plants slightly watered every day often perish. Water may be given at the root at any time, but not sprinkled over the leaves in a hot sun, as it will blister and spoil the foliage. Cold water, before being applied to a heated soil, should be exposed to the sun for a few hours.

INSECTS.

The green fly is one of the most troublesome insects that infest green-houses. Fumigate with tobacco about once a week, either morning or evening, never during the day while the sun shines, as it will injure the foliage.

Red spider can be avoided by keeping the house moderately damp, but care should be taken not to have it damp enough to cause mildew upon the plants or in the house.

In conclusion, allow me to say that gardening is the most ancient of all arts. An occupation so ancient and so full of pleasure and profit to man is entitled to respect, and is worthy of the devotion of all who have control over even the smallest portion of "mother earth."

There is no one, whether it be the merchant absorbed in the duties of his office, or the mechanic engaged in his laborious art, or the housewife encumbered with domestic cares, who would not be better for the change of employment in body and mind which an hour or two devoted daily to gardening would afford. Flowers are nature's holiday garb, and to all lovers of nature and art have become an indispensable luxury. In the cultivation of flowers each one can indulge their peculiar fancy, and each one's character will represent itself in the taste indulged. The motives for the cultivation of flowers are as various as the tastes of mankind. They are the simplest and least expensive ornaments of the homestead, imparting an air of taste and comfort and awakening dreams of beauty, especially in the minds of children, that will never fade from memory.

Flowers abundantly compensate those who cultivate them by the associations to which they conduce. They are socializing in their tendency. The flower garden diffuses pleasure beyond its own precincts, and gladdens other hearts than those of its possessor.

"Bright gems of earth, in which perchance we see
What Eden was, what Paradise may be."

REPORT OF LAST YEAR'S EXPERIENCE IN FRUIT GROWING IN MINNESOTA.

BY M. C. BUNNELL, MONEY CREEK.

Last year proved a severe one on a great many varieties of standards; not only in this State but in other States they suffered to a greater or less extent. Being a dealer in trees in Minnesota, I have had a very good opportunity to learn the opinions of others interested in getting orchards. Some are inclined to think it is a poor investment to buy standards in this country, and nothing but crabs will prove a success, while others think it is not best to give up yet, but replace with hardy varieties.

Minnesota is not alone in this misfortune, consequently we should take new courage and replant with good hardy varieties. I find that there are but a few who refuse to try it again. To be sure we have been disappointed in varieties that we termed hardy previous to the winter of 1873, but nevertheless I think those same varieties are going to produce fruit here in abundance some years. Because they injured last winter is no indication that they can't be fruited here.

We may not get another such winter for the next generation, and I find that a great many others take the same view. Farmers might say that, because certain products of their farm proved a total failure one year, they would never try the same crop again, on the same principle that we would discard the idea of raising standard apples in Minnesota because the trees killed in 1873. The success of raising fruit in this State I attribute to the soil, also location. I believe that the soil as it becomes older is better adapted to the standard apple. The tree gets a slower growth, it ripens up better in the fall, therefore stands the winter better. Some have more favorable locations than others, north and east, which I consider the best where trees can be kept back in the spring and the sap not allowed to start too soon.

I find that the Duchess has given general satisfaction, also Tetofsky. In some locations the Fameuse stood very well; more fault found with the Ben Davis than any other varieties that have been recommended for cultivation. I observe that orchards on high ridge land came through much better than

on the low ground. Banking up around the trees with earth in the fall before it freezes is a great protection to them through the winter. I have learned that by practical experience. Would advise those who want orchards for profit not to set too many varieties, but take pains in selecting hardy varieties, and plant largely of those.

The Haas and Walbridge should have a fair test. Saxton, I think, will stand in all ordinary winters.

One cannot expect to be successful in getting an orchard without he gives it proper attention. And I don't know why it is not for the farmer's interest to spend a portion of his time in horticultural improvements as well as in making other improvements.

Faith and works go together. If one has faith that he can grow an orchard, and goes to work to do it, he is pretty sure to meet with success.

FLOWERS.

BY J. S. HARRIS, LA CRESCENT.

An essay read before the State Horticultural Society, at the summer meeting held in Minneapolis, July 4th, 1872.

LADIES AND GENTLEMEN :—Although I have been an enthusiastic lover of flowers from my earliest childhood, and fully realize that earth possesses no greater charms than a little flower garden all one's own, I feel very forcibly my inability to do anything like justice to a subject which the sweetest of poets have lauded to the skies and the ablest pens have essayed upon—a subject which points us back to a "Paradise Lost" and urges us a Paradise to regain.

Floriculture shuts out the darkness of sin and lifts the veil to refreshing bowers, luxurious verdure, pure crystal streams and breezes that waft out upon a fallen world the sweets of fragrance, the spices of life.

The cultivation of flowers, whether it be the tiny plant in the cracked cup of the poor man's cottage or the stately palm, or other tropical glories in palatial gardens and crystal palaces, is wielding an influence to elevate the human race which no one to-night can tell, no pen describe.

It is calculated to engage the intellect, and open fields of inexhaustible treasure which the longest life is far too short

to fully explore, and will forever be replete with animating discoveries of new beauties. To stand upon an eminence in the midst of a beautiful landscape, to behold the "king of day," after having cheered a world with light, life and warmth, as he sinks beneath the horizon, touching up the tree tops, rocks, hills and threatening clouds with lights and shadows, is glorious.

It is a glimpse into paradise, a foretaste of the bliss of heaven. The first is like the passing away of the life of a good man, the last like the beginning of the life of glad childhood. Leigh Hunt says: "Flowers sweeten the air, rejoice the eye, link you with nature and innocence, and are something to love. If they cannot love you in return they cannot hate you; cannot utter hateful words, even if neglected, for though they are all beauty they possess no vanity."

Rand, in his "Flowers for Parlor and Garden," says: "The love of flowers is universal. It is an old melody which, first attuned in earliest time in the golden age of legendary lore, has come down to us, growing more mellow and sweeter as it chimed through the centuries, and now as then echoes with a music akin to that of heaven in the human heart."

I will say, in addition to Leigh Hunt, that flowers sweeten the disposition, lighten the burden of toil, and soothe sorrow; and I will agree with Mr. Rand that the love of flowers is nearly universal where civilization has reached, and the love ought to be encouraged by every friend of mankind. But the degree of this love is as varied as the individuals of the human race.

Flowers add very much to the attractions of a home; they hide deformities and cover imperfections; they fill up the depressions and round the sharp angles that would otherwise be painful to the cultivated taste. It is not the grandest architecture, the latticed casements and marble pillars that adorn the palatial residences upon the grandest avenues of our American cities that attracts the notice of the travelers, so much as the sweet fragrance of brilliant flowers and the rich hues of trailing vines that adorn, drape and embower them. Rich and gaudy clothing may attract the attention from the plain face, but the humble flowers will be seen before the most stupendous works of man.

It is difficult for me to tell you what flowers to plant, and what selection to make from the scores of thousands that have been brought into cultivation. The varieties of flowers have been so much improved within the last twenty years, and many rare gems added to our collections, while their cultivation, especially as house plants, has been greatly simplified. But probably in no class has there been so great improvement

as in what are usually termed bedding plants. As this class of plants is best adapted to the wants of the people universal, I will devote the remainder of the time allotted me to mentioning a few of the most common and easily procured. As commonly used, the term "bedding" is given to such plants as in winter require the protection of the green-house, but which, if planted in the garden, bloom profusely during the summer. Some of them may be raised from the seeds, as annuals, and will bloom profusely in the autumn; but generally the best results are secured by raising them from cuttings in the early spring.

First of all, I will mention the Geranium. I love them, the name is so sweet, the flowers so bright, the foliage so pleasing. They are well known, and the old Fish and Rose-scented were favorites in the days of our childhood. Great improvements are yearly being made in the varieties, and they are all rapidly growing in popularity. They are brilliant and continuous in flowering, and a mixture of varieties form a bed of great beauty and elegance; but perhaps the best results are obtained from planting in groups or masses of single colors. There are several classes of them, but for our purpose the Zonale and Sweet-scented are the best. Of the Zonale, I would recommend the President and Gen. Grant for scarlet; Rival and Regalia for rose; Blue Bell and King of Pinks for pink; Clorie de Carbohy and Bridesmaid for salmon; Emily, Vaucher and Snowball for white; the Rose and Lemon-scented for fragrance and for leaves to use in the formation of boquets.

Next in order will come the Verbenas, which give the garden a gay and lively appearance. They are probably cultivated more than any other variety of plants, and they are all that can be desired for quantity and variety of bloom. They may be grown each year from seed, but are now sold so low by all florists that it is more economical to purchase plants of the desired colors, as many of the seedlings will prove inferior and are later coming into bloom. It is hardly worth while to enumerate the names of varieties, as those which are considered standard this year will give place to others in the next. Many new candidates are brought out each year.

Heliotropes fill important places among bedding plants. They are desirable for their fragrance, as well as for their profusion of flowers of various shades of blue and lilac. They propagate readily from cuttings, but old plants give the most flowers.

Of the Salvias, the *Salvia Splendens* is the most gaudy, and in fact of all autumn blooming plants the most desirable. The small plant purchased of the florist in the spring, becomes a beautiful bush by September, three or four feet high, and

covered with tassels of the brightest scarlet flowers. They are, however, very tender, and will be entirely destroyed by the first frost. They may be grown as an annual by sowing the seed in a hot-bed.

Among the "Feverfews," the double white "Feverfew" is indispensable in the smallest collection of flowers, as it blooms freely throughout the whole summer and is so very useful in the formation of boquets.

If time would permit I should love to speak of roses, pinks, dahlias, fuchias, pelargoniums, and hosts of other favorites; but I must refer you to the splendid exhibition which the ladies and gardeners of Minneapolis have arranged so tastefully in this hall; and I must confess that my greatest help in this, my first attempt in essaying, came from witnessing a gorgeous sunset while passing through Lake Pepin as the last rays fell upon the famous Maiden Rock, and my visit to this hall.

In conclusion, I advise every lady to grow flowers and make Paradises to sweeten their lives. And do not be satisfied with growing them. Set them on your table, a whole boquet if you have it; if not, a single flower, a rose, a pink, a violet, or a geranium leaf, the best and sweetest that you have, to remind you of the elegance of nature's productions, the glories of creation and the bliss of heaven. Give them freely to the children of the poor, and plant them where they may gladden other eyes than your own. This is a blessed world if we would make it so.

REPORT OF O. D. STORR, WINSTED LAKE, IN REPLY TO CIRCULAR OF THE SECRETARY.

1. I have about thirty-five different varieties of apples, among which are the Duchess, Haas, Ben Davis, Tetofsky, Red Astrachan, Perry Russet, Tallman Sweeting, Sweet Pear, Saxton or Fall Stripe, Wealthy, Morrison's Treasure, Julia, Bellflower, Walbridge, Black Vandivere and several others, also many varieties of crabs.

The first eleven varieties are three and four years old, trees planted out two years ago, all froze more or less. Morrison's or Shakopee, injured the least, only three or four inches late fall growth; Wealthy, one-half the tree killed, Julia killed to the snow line. The others killed half-way down, others to the

snow. These were yearlings set out last October. (I suppose this refers to the Shakopee and other new varieties.)

2. I have only one variety that has come through without injury to either trunk or branches, and that is a seedling called the Winsted Seedling. Ben Davis killed back from three to six inches. Red Astrachan, some dead, and others in the same row not injured. Tallman Sweeting, the tips of last year's growth frozen; trunk and branches all right. Haas, the trunk is killed close to the ground; the tips but very slightly injured. Sweet Pear, dead root and branch. Duchess, Minnesota grown, not injured; Illinois and Wisconsin trees killed back.

3. None but the crab varieties are bearing except the Winsted, that is budding all right.

4. My soil is a black clay loam, with clay subsoil, mixed with lime, on the south bank of lake, and slopes to the north; no protection. Last year, part in wheat, part in potatoes and garden vegetables; this year all in corn.

5. I have one seedling tree that is worthy of note, that is in bearing. Since it first came from the seed it has never killed back a bud. The fruit is a little larger than the Duchess; smooth yellow skin and a good keeper; will keep until March or April; a very pleasant sour, fine-grained and rich flavor. It has never had any protection from cold or sun. The fruit ripens the last of September, and it will more than fill the place of any Russet.

6th, 7th and 8th. None.

Plums—I had the Lombard, Miner and Richland Purple. The Lombard killed to the root, were five years old and froze each winter. Miners and Richlands all right.

REPORT OF E. P. EVANS, BROWNSVILLE, FOR HOUSTON CO., MINN., AND VERNON CO., WIS.

I have examined a great many orchards in both of the above counties since June 1st, and find the trees ranging in hardiness as follows: First, Siberians; second, Red Astrachan; third, Duchess of Oldenburg; fourth, Fameuse (snow); fifth, Golden Russet; sixth, Tallman Sweet; seventh, Haas and Ben Davis. But very few trees of Rawhey's Jannet, Northern Spy, Autumn Strawberry, Perry Russet, Fall Stripe and Fall Winesap, that have been set from four to ten years, will ever bear^e any more fruit. Full 60 per cent. of the old orchard

trees are dead. Orchards in sod have done better than those cultivated. Orchards sowed to grain or corn did better than those planted to potatoes. Orchards taking free blast of north and west winds are better than those sheltered by belts of timber. The injury is mostly in the body and roots. Considerable damage was done in the crotches of low-top trees. Twenty per cent. of our Transcendent and Hyslop crabs died from root killing, and consequently I think our *ironclads* are very scarce, unless grafted on the Siberian roots.

Of pears, cherries and plums, scarce 6 per cent. are alive, except of the Miner plum. It has done about as well as the native.

Vernon county, Wis., comes out about 30 per cent. better than Houston county, Minn. The above counties are separated by the Mississippi river; soil and climate as near alike as possible. I think the difference is in the varieties planted. In Vernon county they planted mostly of the *ironclads*, such as the first seven varieties mentioned above, while Houston county planted of whatever tree peddlers happened to bring along.

I was like a great many others who did not approve of Charles Waters' method of cultivating orchards, viz., plowing between the rows and leaving full stretch of the tree's branches to sod, but his orchard proves that his theory is right. It is the healthiest and best of over a hundred that I have seen this summer.

There are three seedling apple trees in Vernon county that are worthy of note. One grown by C. S. Sterton, this year's growth eight to twelve inches, bearing a few apples. Another was grown by Mr. Weitz, growth this year six to ten inches, bearing about five or six bushels this year. This is a splendid market apple. It bore its first apples the fourth year from seed, a half bushel the next year, and a heavy crop every year since, and last year ten bushels.

The third by Mr. Yeely, good market apple, vigorous healthy tree.

REPORT OF D. F. KELLEY, NORTHFIELD.

Regretting my inability to attend your session this week, I send you a brief report of the condition of my orchard since last winter.

The winter made sad havoc with my seedlings, of which I

had about one hundred in bearing, the majority of them from eight to ten inches in diameter. One-third of them are "dead as a smelt." Another third are more or less damaged. The balance are all right, though they did not bear very profusely last season.

I have gathered 150 bushels of apples from these trees in one year, and previous to last winter had considered the trees perfectly hardy. In the spring of 1872 I set about 3,000 root grafts, the scions of which were mostly taken from these trees. They came out last spring in very good condition, and, although they did not make a very large growth last season, appear to be healthy.

The early fall apples came through the best. Those producing sweet and winter fruit suffered the most.

I am not wholly discouraged with reference to raising apples in Minnesota, as are some of my neighbors, though I must say my faith is somewhat shaken.

REPORT OF BARNETT TAYLOR, FORESTVILLE.

About fourteen years ago, I saw in the American Agriculturist the enquiry of J. S. Harris, of La Crescent, Minn., as to the best way to start a fruit garden. About that time, without experience, health or money, I commenced the same business with the determination to raise fruit in Minnesota. Will state my success by stating the fact, that last year I had 27 varieties of splendid apples, with fine pears, plums and other kinds of fruits; some trees yielding \$10 per tree, and of course things looked bright. You know without my telling it how things are changed this year; although my experience differs from yours, as you state in the Farmers' Union that your Sweet Pear and Haas are but slightly injured; my Sweet Pear are about done for; Haas some entirely dead; all badly injured. Early Harvest, Northern Spy, Sam Bough, and Primate in same condition; Sops of Wine and Perry Russet badly hurt; Duchess 8 or 10 trees killed in the roots. but the rest of the Duchess, 50 to 75 trees, in fine condition, Tetofsky all right, and strange to relate, Grimes' Golden wintered without the loss of a bud. Early Richmond cherries unhurt. Flemish Beauty pears slightly damaged. The encouraging fact is, that all hardy kinds where well mulched or shaded are but little hurt.

All kinds on clean ground killed more or less. I set an orchard one, two and three years ago for a neighbor, on high prairie, cultivation corn. The stocks stand over winter; every tree came through splendid.

CRYSTAL LAKE, June 16, 1873.

To Secretary State Minnesota Horticultural Society :

DEAR SIR:—I noticed in the Farmer's Union of May 24th, a circular from the State Horticultural Society, with the following caption: "Information wanted." Believing it to be the right course for us to pursue, and being somewhat interested in fruit culture, I propose to give my mite of experience, and if we all do the same we can come to some conclusion as to what fruit it will do to cultivate and what not. I feel disposed to differ from you in regard to our winter. You state that "the winter set in early and dry, and frost penetrated to a great depth before any snow fell." That might have been with you, but not with me. To be sure the winter set in early, on the night of the 12th or 13th of November, with several inches of snow and no frost, and we kept having snow storms before the ground froze any; and that is just what played the mischief. It was the absence of frost and not its presence that has caused so much mischief, and I think that if we had removed the snow from under the trees and let the frost penetrate down to its usual depth, and then mulched to keep the frost in we should have had quite a different result. I think that our trees were *spring killed* and not *winter killed*. Our hot sun in March caused the sap to flow to the tops of the trees, and then it turned cold and froze, and that is what has killed our fruit trees. I came to this conclusion from the following reason: I had a piece of land about 1 1-2 acres that I planted to potatoes. On planting that piece this spring I plowed up perhaps a bushel of potatoes as sound and handsome as any potatoes that I ever dug in any time of the year. They eat as well as those that I kept in the cellar. I have planted the same piece this spring and the best potatoes that I have on the piece are those that came up themselves, and are budded to blossom.

Now sir, we all know that when the frost penetrates to a great depth in Minnesota that potatoes will not stand the test.

The piece that I had reference to is on an eastern slope—the same result out on the prairie where the snow had drifted.

And now to your questions.

1. I have the following varieties of five year old trees, Transcendent, Hyslop, Soulard, Red Astrachan, Stewart's No. 7 (Honey Sweet.) Stewart's No. 7 is the only apple tree that I have but what has been more or less affected, I never have mulched it summer or winter, and it never has killed in root, branch or bud to my knowledge. The same tree has stood on the prairie beside the Tetofsky, Transcendent, Hyslop and Soulard; all others have been more or less injured, but No. 7 is all right, I do not know anything about the fruit; my trees are bearing this season for the first time.

I purchased some trees of the following varieties (three years old), Gen. Grant, Akin's Green Winter—both killed to the ground—also, Ben Davis and Perry Russet. The two last are so badly killed that I consider them no better than dead. The Haas and Fameuse, of the same age, also Alexander in our neighborhood have killed; Duchess, of several years bearing, killed and badly injured.

Nos. 2 and 3 I have answered in No. 1, *i. e.* Stewart's No. 7.

4. Sandy loam, clay subsoil; edge of prairie and bluff land.

5. I have no seedlings of my own. Have been propagating from about 50 varieties of our hardiest Hennepin county seedling, which we have considered perfectly hardy, have been more or less injured.

6. I am propagating from a seedling pear tree that has never killed unless this winter. Have not been informed how the tree is this spring.

7 and 8. We are cultivating Wilson's Seedling, Agriculturist and Scarlet are the principle ones cultivated.

Plums—I have none except choice natives, and if any one has got any that are better I would like to get some.

Cherries—I purchased several trees several years ago of the Morello Cherry; they are about four inches through, and killed last winter. Have some of the Early Richmond, injured considerably.

I have about eight or ten thousand seedling apple trees, one and two years old; I think I can select about 50 that have not killed a bud, that stood beside the following varieties that killed down to the snow: Ben Davis, Fameuse, Densmore, Morrison's Treasure and a host of others equally hardy.

J. H. WHITE.

REPORT OF J. H. THOMAS, YOUNG AMERICA, MINN.

As my business will not permit me to attend the Horticultural Society I will here state some of my experience with fruit-growing the past year. I have had some trees killed within the last year. Apples—Transcendent and Duchess of Oldenburg, were the only kinds that were not injured; Soulard, Hyslop, Haas and Tetofsky, lightly hurt; Ben Davis, Perry Russet and Tallman Sweet, all killed, Flemish Beauty Pear, killed to within one foot of ground.

My grape vines were all buried with earth about two inches deep. The Delaware came out best, and fruited well; Clinton next best; Franklin next; Roger's Hybrid No. 15 killed. Salem, Iowa, Logan, Martha and Isabella, killed root and branch; Hartford Prolific and Concord, all of the vines killed; they made good growth during the summer. I have four kinds without names that went through in good condition, one is short wood, leaf five-lobed, and lighter color than any I have. It ripened about the last of August, and is a better grape than the Concord, but not so large. The next best is a white or yellow grape, that came to me for an Isabella, and the next is a blue grape, size of the Clinton, leaf and young wood, color light yellow, came for Golden Clinton, but the fruit is of a wrong color; Eumelian and Maderia too young to fruit, but the vines went through in good condition.

Small fruits, currants, &c., did not fruit heavily, and some twigs were killed. The gooseberry fruited heavy, and was not hurt, while the raspberry, Davis, Thorn, Doolittle and Blackcap, fruited well, with no protection and but little care.

My soil is black loam, about 12 to 14 inches deep, with yellow clay subsoil. It was formerly covered with oak timber, with a few elm and bass-wood undergrowth, hickory and some hazel brush.

REPORT OF G. A. PERLEY, WASIOJA, DODGE CO.,
MINN.

Having read a communication in the Farmer's Union, from the Secretary, in reference to the coming meeting of the State

Horticultural Society, and wishing to cast in my mite for so good an occasion, I venture to send a little of my experience, to be disposed of as may be seen fit.

In the year 1865, my first year in Minnesota, we bought \$100 worth of apple trees from a nursery in Rochester, N. Y., twenty of which trees were dwarfs. The balance of several varieties, called hardy, were healed in in the fall of 1865. In the spring of 1866 we set them out in rich black soil, with a slight mixture of sand. This soil was too feet deep, with a subsoil of yellow clay. This land would be called low or bottom land, sloping to the south. About one-half of the dwarfs died that summer, and in the fall of 1867 there were but three of them alive, and they in a sickly condition. The other trees, when bought, were from four to six feet in height. The winters of 1867 and 1868 were severe on them, and the mice, too, wished to help along the matter of destruction, as they had girdled thirty. The summer of 1868 showed that they were struck with death. The pocket gophers, not wishing to slight me showed what they could do, as they had cut off a great number of the large roots of the live trees, and in 1870, there was not one left out of the entire number.

Not wishing to give up the undertaking, I concluded to try another plan, and in the fall of 1871 I planted some seeds from the Snow and Maiden Blush apples, grown in this latitude in Wisconsin. These seeds were planted on sloping ground, on the north side of a few rows of cottonwoods four years old, the first row being six feet from the cottonwoods, the others four feet each from this, all the rows running east and west. In the fall I counted 200 trees. As the winter of 1872-3 was so severe I did not expect any of them would survive it, as I had cultivated them pretty thoroughly. In digging them up this last fall I found but thirty of the two hundred had died.

I should think there were about six varieties, some quite wild-like, being thorny and small, while others had but few limbs, a dark glossy bark, and were three feet in height; others again were of a yellowish-green bark, two and a half feet tall. These had to be watched with care during the latter part of summer to prevent their being destroyed by a worm from one-half to three-fourths of an inch in length, and in color resembling the bark and the green leaf of a tree, on which it would feed until every leaf was devoured.

Perhaps you may wish to know my plan for setting out some more in the spring. I intend to dig out the holes for them three feet in diameter, two feet in depth, and twelve by sixteen feet apart, on an eastern slope of black loam. These holes I shall line and partially fill with the refuse stone and

soil of a limestone quarry ; on the top of this and immediately under the tree I shall place a thin flat stone ; over this I will set the tree, with black loam. The flat stone will prevent the roots from running down into the cold, wet soil, and the refuse stone will cause a slow but hardy growth. In this manner, and by trapping the pocket gophers and a careful watching of the mice, I hope for success, and will give the result in the future.

REPORT OF W. B. SMITH, OWATONNA.

Secretary Minnesota Horticultural Society :

DEAR SIR.—I am pleased with the course you are taking to get information in regard to fruit growing in this State, and will contribute my mite.

1st. I have about 175 trees of apples and crabs that have been set from one to six years. The apples are Duchess, Tetofsky and Ben Davis.

2d. The Duchess and Tetofsky came through the winter without injury.

4th. My soil is clay and gravel ; have mulched and hoed until this year ; have seeded it down this year. Have timber protection all around. Some have commenced bearing.

7th. Wilson's strawberry is the best here. I have some cherry trees taken from the roots of an old tree, that are doing well ; some blossomed this year, May 1873.

FOREST TREE CULTURE.

BY GEO. P. PEPPER, PEWAUKEE, WISCONSIN.

In the Pantagraph, (Bloomington, Ill.,) there is an article headed "Forest Preservation," wherein the writer mentions that the government should reserve our woodlands, and only sell the timber, and enact laws to protect it, so that the timber can grow up again for future generations, as our forests in a short time will all be gone, etc., and refers to the European laws on forests. [Please insert the Minnesota or U. S. laws on forest tree planting]. As I have some recollection

about the laws and the reproduction of the European forests, I will give them if this paper should not prove too long.

I think, if our laws are adhered to, they are just right, and if our timber then gets scarce, many a farmer, at least in our section of country, can grow all he needs, and if of a speculative nature, will raise it to sell, and make it profitable, as there is a large quantity of poor and waste lands to be had very cheap. which can be planted or preserved by the owners, and make forest tree timber-growing profitable, which timber will increase in value from year to year, until it is worth as much, or more, than improved farming lands without the timber. If rich land can be afforded to grow timber, all the better, as it will grow faster, and for mechanical purposes will be worth more, as the layers of the new wood growth will be larger and of greater strength than slower grown timber.

But before I get into the details I will remark that fire and cattle have to be kept out for a number of years. On land, either in openings or where the timber has been cut off, or where fire has run over the forest, new seedlings will spring up again naturally, as there are generally live roots and dormant forest seeds left in the ground, which will spring up again; but if nothing of the timber kind should spring up, we have to assist nature and sow the seed of such forest trees as will be best adapted to the soil, and supply the places by artificial means.

For instance, on very poor, sandy lands, where it is rich enough to grow grass, timber seeds will grow; but if the soil is so dry that no grass can grow, it will be an uphill business unless water can be supplied. But on the very poorest land we have seen in this State (nearly dry sand,) the white birch will grow; or on moist sand, tamarack or larch, and if these should get large enough to shade the ground other timber seeds will grow, if sown so as to be in the shade, where they grow naturally. Pines are at home on sandy soil, but to start a pine forest, other tree seeds should be sown and grown to produce the shade required for them. If they are to be grown from the seed, and even where small seedlings are set out, shade they must have.

I have seen all kinds of land and timber lately, on my first visit westward to your State, Minnesota, and was surprised to see so much poor, sandy land between here and there, and also the variations of the soil by the growths of the different kinds of timber, bushes and plants, as we swept along by rail. Some appeared to be so poor that a sheep would starve to death in the month of June in a ten acre lot. Still there was always something growing on the surface, in the wood line,

which could be advantageously cultivated for profit, if not for timber.

The cranberry is at home on low marshes, and grows on land that is wet three-quarters of the year. If that sort of land is improved and drained to some extent, and that crop does not pay, tamarack seeds will grow if the water is drained in early spring, and in a very short time will be a forest, if the fire is kept out. Next we find the whortleberry, or low bush blueberry; next, the high bush black whortleberry; next are willows of various kinds; next, the red swamp birch and alder. On a little drier soil, yellow birch, tamarack or larch, check or pin oak, white birch and black pine. These must have shelter when young. Next we find bur oak, black oak, poplar, hazel, black cherry, and occasionally choke cherry. When we get where there are running streams, and where the wet had kept out the fire and preserved the underbrush and young seedling trees, we find swamp or white elm, black ash, yellow birch, red, sugar and ash-leaf maple, rock and red or slippery elms, and upon places, cottonwood, poplar and butternut; also, white oak, where the land gets better; pitch or Norway pine, and white pine, and in rare places red cedar, and in swamps white cedar, hemlock, balsam, and white and black spruces on a little drier soils.

All these different varieties of wood, trees, bushes and vines can be raised with profit, if a man with a determined mind and good judgment takes it in hand to do so. For instance, to grow forest trees on sandy soils, when there is substance enough to have a covering of grass to hold the ground or sods together, so as to make ridges that will withstand the rains and wind for one season without washing or blowing away by the wind, we shall commence with the seeds of the white birch, as that is about the only tree seed that will stand drift-sands, and washings and drouths. If the ridges are made with the plow or spade they should always be east and west, say from three to five feet apart, and the seedlings will be best always on the north side of these ridges, as a little shade is secured on that side, and as soon as they get well started and a year or two old, so as to make more shade, other varieties of evergreens, tree seeds, and tamarack or European larch, can be sown broadcast.

American larch or tamaracks will do best where quite wet; so will white cedar, balsam fir and hemlock, but the spruces and pines of the different varieties of our native sorts, also the Austrian, Scotch and Rocky Mountain, will do the best on drier and sandy soils; but all the evergreen tree seeds require shade the first two or three years, or until the roots have pen-

etrated deep enough to get moisture to sustain life during the dry and the freezing season.

If there should not be grass enough to hold the ridges required to start the white birches, grass seeds, or weeds, or grain of some kind, might be sown to afford shade enough to get the birch seedlings started. In some parts of Europe, where land had been abandoned for centuries on account of barrenness and drouths, and nothing could be grown on them, the government employed poor laborers and skillful naturalists to direct the laborer, in growing forests again, and they have succeeded in re-wooding and renovating the valleys that had been depopulated. At first, the work was carrying clay on side hills and slopes, and depositing it in holes, and watering to start vegetation and tree seeds, and by following it up year after year have now succeeded in covering the hills with timber and the valleys with fruit and grain; as they have now more dew and rain, and the government gets well paid for the undertaking.

If any one will observe the condition of the land, and is acquainted with the climate, and knows one variety of tree from the other, he soon can have a forest. He must undertake it understandingly, and select varieties suited to the soil. In this part of the State, where there are many openings, many good pieces or young groves of timber are now seen where twenty or twenty-five years ago nothing but prairie grass and hazel bushes, and a few oak grubs were seen; as the fires always burned everything down from year to year until the land was taken up and cultivation began; then the fires ceased. Now, many farmers have their fire-wood just from thinning these groves, and the timber is growing from year to year more profitable.

We saw in some of our newspapers an article going the rounds in which the writer sets down the destruction of our pine forests at seventeen years hence, and the hard wood at a few years later, in this State; but if we should commence planting or caring for our timber lots now, no such fear would be necessary, for any of us here sees the groves of oak of from 20 to 30 years growth, to be quite large already, many trees large enough for fence posts and other purposes.

If agricultural enterprise should be awakened to this subject, and artificial forests should be planted, they would be more profitable, as they grow much faster than the groves already mentioned.

Trees grown for the wood and shelter on rich bottom lands and prairies, will be needed in a short time to assist the new beginner. First of all, the sod has to be broken, or turned up in ridges, east and west, about three to five feet apart, accord-

ing to the size of the plow, and if soft wood is wanted it can be raised from cuttings if they are stuck very early, and the land must either have been made ready late in the fall or early in the spring; but if little seedling trees are planted, and kept back, as in a dormant state, late planting is also successful. They should be stuck or planted close to the north side of the ridge, two to three or four feet apart in the rows, and kept clean of weeds for a few years.

Cottonwood, Lombardy poplar, balm of Gilead, red and white willow, and the like, all grow readily from the cuttings. They should be about eight to twelve inches long, and so stuck that only one eye is above ground, and in a very short time they will be a forest. In the fourth year thinning out has to be begun, and kept up, so as to let sunshine in, or the trees will not thrive, and many would die; but if one-half are cut out in the fourth and fifth year, wood enough can already be saved to do the cooking on any ordinary farm, if the grove is one-eighth of an eighty acre lot, and in a few years more will supply all that is necessary, and if one-twentieth part of the trees should be standing for twenty years enough firewood could be cut, and be of as much value as if the land had been sown with grain, and the cost of raising it deducted.

But as such a lot could be planted with more useful timber, small seedling forest trees should be procured, such as white ash, shell bark hickory, white oak, black oak and butternut, black locust, red elm and the like; also different kinds of maple, all of which would be more valuable than soft wood, and pay a larger profit for the better varieties planted. If these little trees should be planted every third or fourth row, or in every eighth row, and the soft timber cut out from time to time, it would pay still better, as there would be more leaves for mulch, and the hard wood trees would be straighter and better for mechanical purposes. I have in mind a white oak tree standing in a fence corner, and the fields are mostly cultivated, that has gained in twenty years seventeen and a half inches in diameter. A Norway spruce thirteen years planted is twelve inches in diameter, and is thirty-six feet high; a cottonwood twenty-three years from the cutting, six feet from the ground, measures eight feet three inches in circumference; Lombardy poplar, thirteen years from cuttings, is two feet and over, and fifty feet high; black walnut, twenty years the nut planted where it stands, no cultivation, is fifteen inches in diameter. But enough of this.

FOREST TREE CULTURE IN GERMANY.

In my native country (New Bavaria, Germany,) the forests are all owned by village corporations, counties or States,

and foresters are employed by the government for five, ten or twenty years, as the case may be. These men have to see that no damage is done to the growing trees, to see to the new plantations and to the cutting of the old forests; to the gathering of the seeds, whenever it is the proper time to do so; also to take care of them until they are planted. Each forester has to oversee from 500 to 1,000 acres, which is owned and used generation after generation for forest culture. Whenever a piece is cut down (which is decided on by the trustees of the village, county or State, year after year,) the best timber is used for mechanical purposes, and the balance for firewood. All the government officers and public schools and the town poor are furnished a certain amount free. Then, if there is more cut than is needed for the use of the corporation, it is disposed of at public auction.

When the wood is all cleared off, the land is laid off like a village or town, into lots of from one-quarter to one-half an acre, and is sold at auction for the term of three years. The lot with the most stumps on it brings the highest price, as they are all grubbed out for firewood, and by this means the land is subsoiled or trenched. Those that buy for the wood only, sell or lease these lots again to farmers or planters that will raise grain, roots or garden products; and they generally manure very highly the first year, in order to make it more profitable. There are many families that have no property but these lots, and upon them they depend for subsistence.

The third year root crops are grown, and then the lots are again re-planted with forest seeds. If of rich, heavy clay soils, acorns, beach or white ash are planted. If of sandy or light soils, aspen, birch, blue beech or alder seeds are sown and in a few years pines or spruce are sown or transplanted. On the last-named soils, in our district, mostly white oaks were planted, as there was an oak orchard of about 15 to 20 acres, that furnished sufficient acorns annually to plant 1,000 acres. Lands that had ash and birch forests, when cleared off were re-planted with oak and beech, and that of the oak with ash, beech, or any sort that had not been grown on them before.

The nursery of new plantations were planted by the taxpayers or burghers, the same as our road taxes are worked here, and the forester is the overseer. As before stated, the land for the new plantation had for the last crop roots, such as potatoes, beets and turnips in rows, and the furrows left after gathering the crop in the fall were used early in the spring to plant the acorns or other seeds in. If too shallow, the hoe was used to make furrows, and the seeds covered one or two inches deep. After the seed had come up, and were a

a good stand, some of the poor people were permitted to grow a row of potatoes or bush-beans between them, for the purpose of keeping the tree rows clean of weeds and to transplant the little plants where they had failed. The second year no cultivation is done, except to keep the large weeds and grass out. On sandy land evergreens are set out, if there are vacancies.

After the second year all is left to nature. No grass, weeds, or dead forest leaves are allowed to be taken off from the new plantations for at least five or six years, when the first thinning is gone through with, and all crooked, deformed and dry trees removed, all in a day or two. This is about the only time the forester must have help to oversee, so that none are cut that will be of other use than firewood. As it belongs to the burghers to do this job, there is generally a large crowd, as all turn out that can on this occasion. After a day or two no one is allowed to cut or trim wood or brush for the next two or more years. In the older plantations it is allowable to get the dry limbs and sticks, and the limbs that grow downwards, or interfere with each other. In this way many people have to obtain their firewood, particularly those that are not on the town poor list, as they are not able to purchase it; or if they do buy, do so to have it in cold weather, when the women and children cannot go out to gather it.

I suppose many of you wonder why the Germans from villages or small towns carry their loads on their heads, and why they gather dry brush around their homes in this country. It is because they have been accustomed to it from childhood; and they can make a quick fire and cook a meal of victuals while they set the table.

There are heavy fines and imprisonment imposed for cutting down or girdling or removing little trees or dry leaves from any of the groves, without permission from the forester or trustees, and many a forester has been maimed and sometimes killed in attempting to arrest parties trespassing on these forests.

In old evergreen forests the large trees only are removed, and if large vacancies occur, burghers have to make ridges with grub hoe and spade and remove the surface soil, leaves and rubbish into small piles, when evergreen seeds are sown broadcast and left alone, as these places are mostly shaded. They will nearly all be covered with young plants, and grow up again for future generations.



TRANSACTIONS

OF THE

MINNESOTA

State Horticultural Society.

PROCEEDINGS, ESSAYS AND REPORTS

AT THE

ANNUAL WINTER MEETING,

HELD AT ST. PAUL, JANUARY 19, 20 & 21, 1875.

TOGETHER WITH

AN APPENDIX CONTAINING ESSAYS, REPORTS, AND OTHER
PAPERS ON MISCELLANEOUS SUBJECTS.

Prepared by L. M. FORD, Secretary.

ST. PAUL:

THE PIONEER-PRESS COMPANY.

1875.



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LIST OF OFFICERS—1875.

PRESIDENT :

TRUMAN M. SMITH.....St. Paul.

VICE PRESIDENTS :

W. ELLIOT.....Minneapolis.

T. G. CARTERSt. Peter.

E. H. S. DARTT.....Owatonna.

SECRETARY.

C. Y. LACY.....Minneapolis, E.

TREASURER :

A. STEWARTRichfield.

STANDING COMMITTEES.

EXECUTIVE :

J. F. TRUE.....St. Paul.

O. F. BRANDFaribault.

J. S. HARRIS.....La Crescent.

T. T. SMITH.....St. Paul.

E. B. JORDANRochester.

ON ENTOMOLOGY :

R. J. MENDENHALL.....Minneapolis.

REV. J. MARVIN.....St. Paul.

J. S. HARRISLa Crescent.

ON FLORICULTURE :

MRS. GEN. NUTTING.....Faribault.

MRS. GEN. VAN CLEVEMinneapolis.

MISS GILL.....St. Paul.

J. C. FLEISCHERSt. Paul.

J. E. BOOTH.....Minneapolis.

LIST OF MEMBERS.

Truman M. Smith.....	St. Paul, Ramsey county.
L. M. Ford.....	“ “ “
J. C. Fleischer.....	“ “ “
T. T. Smith.....	“ “ “
W. E. Brimhall.....	“ “ “
Gov. C. K. Davis.....	“ “ “
Gen. Wm. R. Marshall.....	“ “ “
Wilford L. Wilson.....	“ “ “
Philip S. Harris.....	“ “ “
Capt. Russell Blakeley.....	“ “ “
L. B. Hodges.....	“ “ “
E. F. Drake.....	“ “ “
J. W. McClung.....	“ “ “
Dr. J. T. Alley.....	“ “ “
J. F. True.....	“ “ “
J. F. Tostevin.....	“ “ “
R. Knaupheide.....	“ “ “
E. A. B. Jones.....	“ “ “
Col. John H. Stevens.....	Minneapolis, Hennepin county.
Geo. A. Brackett.....	“ “ “
Prof. C. Y. Lacy.....	“ “ “
W. T. Scott.....	“ “ “
Wyman Elliot.....	“ “ “
Thos. Moulton.....	“ “ “
J. H. Moody.....	“ “ “
Chas. M. Loring.....	“ “ “
R. J. Mendenhall.....	“ “ “
Anthony Kelley.....	“ “ “
S. M. Spaulding.....	“ “ “
J. T. Grimes.....	“ “ “
J. E. Booth.....	“ “ “
Rev. H. N. Herrick.....	“ “ “
G. H. Howe.....	“ “ “
Mrs. Gen. Van Cleve.....	“ “ “
Dr. P. A. Jewell.....	Lake City, Wabasha county.
Peter M. Gideon.....	Excelsior, Hennepin county.
E. B. Jordan.....	Rochester, Olmsted county.
E. H. S. Dartt.....	Owatonna, Steele county.
Amasa Stewart.....	Richfield, Hennepin county.
Gen. S. P. Jennison.....	Red Wing, Goodhue county.
Ditus Day.....	Castle Rock, Dakota county.
O. F. Brand.....	Faribault, Rice county.
T. G. Carter.....	St. Peter, Nicollet county.
John S. Harris.....	La Crescent, Houston county.
Wm. Fowler.....	Newport, Washington county.
J. L. McDonald.....	Shakopee, Scott county.
Chas. H. Lieneau.....	Watertown, Carver county.
K. Nelson.....	Alexandria, Douglas county.
A. Nelson.....	Litchfield, Meeker county.

PROCEEDINGS
OF THE
EIGHTH ANNUAL WINTER MEETING.

HELD AT ST. PAUL, JANUARY 19, 20 AND 21, 1875.

The Minnesota State Horticultural Society, pursuant to arrangements made by the President and Secretary, met in St. Paul, and opened its annual meeting in the Old Court House.

About twenty-five members and persons interested were in attendance. Shortly after two o'clock the President, Truman M. Smith, Esq., called the meeting to order, and on motion appointed O. F. Brand, C. M. Loring and J. H. Moody a committee on the order of business.

President Smith stated that there was a conflict in the by-laws. Article three of the articles of incorporation allowed any one to become a member on payment of a fee of one dollar, while article four made the capital stock \$25,000 in shares of \$25 each. Under this no money had ever been paid in. He suggested that books be opened to allow those present to subscribe to the stock and pay therefor. He had been requested to deliver an address of welcome to the members and to arrange for their hospitable reception and entertainment while here. He could not well perform such a duty, for no suitable arrangements had been made for the entertainment of members free of expense. If he were rich he would not ask the citizens to do anything of the kind, but would foot the bill himself.

Considerable discussion of an irrelevant nature here ensued, after which the articles of incorporation and the by-laws were read by the President.

Secretary Ford moved that committees for the time being be appointed on the subject of vegetables, market gardens, &c., which on motion of Mr. Dartt, of Owatonna, was tabled.

On motion of Mr. Dartt, the society voted to continue on under the old system of \$1 membership.

PROGRAMME OF BUSINESS.

The committee on order of business then reported the following for the government of the Society during its session :

TUESDAY AFTERNOON AND EVENING.

- 1st. Report of secretary.
- 2d. Report of treasurer.
- 3d. Report of standing committee.
- 4th. Report of special committees.
- 5th. Discussion of re-organization.
- 6th. Suggestions relating to granting of premiums at State Fairs.
- 7th. The effects of the winter of 1873-74 upon our various kinds of fruits.
- 8th. What tests are necessary to fully establish the perfect adaptation of any variety of apples to the trying climate of our State.

WEDNESDAY FORENOON.

- 1st. The propriety of sending delegates to our next National Pomological Society, and the necessity of State aid in defraying expenses.
- 2d. The best varieties of apples for cultivation in our State.
- 3d. The best varieties of crabs for general use in our State.
- 4th. Blight—its causes and treatment.

WEDNESDAY AFTERNOON AND EVENING.

- 1st. President's annual address.
- 2d. Election of officers for ensuing year.
- 3d. Reading of essays.
- 4th. Discussion to follow the reading of each essay.

THURSDAY FORENOON.

- 1st. Transplanting trees.
- 2d. Cultivation and protection.
- 3d. Pruning.
- 4th. Insects injurious to trees and fruits, and best means of destroying them.
- 5th. Pear culture.
- 6th. Plum culture.
- 7th. Cherry culture.
- 8th. Currant culture.
- 9th. Gooseberry culture.
- 10th. Blackberry culture.
- 11th. Strawberry culture.

THURSDAY AFTERNOON AND EVENING.

- 1st. What soils are best adapted for the cultivation of the various kinds of fruits.
- 2d. Hedge plants, the various kinds and habits.
- 3d. Ornamental shrubs and plants.
- 4th. Ornamental and shade trees.
- 5th. Reading of report on forest culture by L. B. Hodges and others.

Reports of the Secretary and Treasurer were next in order.

The Secretary remarked that he had not prepared a written report. On referring to the By-Laws of the Society he learned that all the report required was "an abstract of the matter that had come into his possession." No matter had come into his hands except the various essays and reports that are to be read at the meeting. He wanted to say some things pertaining to the affairs of the Society,

and horticultural topics in general, but had no authority for so doing, according to the By-Laws.

TREASURER'S REPORT.

Mr. A. Stewart, the Treasurer, made a report, which showed a balance in his hands of \$7.33.

LETTER FROM MR. HAMILTON.

The President then read the following from one of the members, who was unable to be present :

WINONA, January 19, 1875.

To the President of Minnesota State Horticultural Society, St. Paul, Minn. :

DEAR SIR: As it will be impossible for me to attend the annual meeting this winter (for which I regret very much,) I thought perhaps a word would not be out of place, for I know you will all need what sympathy you can get. If any one needs some one to lean upon and cast their burden upon, it is the nurserymen and fruit growers of Minnesota, and yet I must call each and all of them "public benefactors." But, oh! how little are they appreciated and how much they have to bear from the unsympathizing world. How little does the man who makes it necessary for the agent of some nursery grower to get out of his house and off his premises, know the long days and nights of toil that have been spent upon the propagation of one single crab apple, which he has had the fortune to raise one single specimen of fruit, and can be classed as one of the best and placed upon the list as delicacies and one of the "new crabs." Is not this public benefaction, something new to the world, and yet how little he is appreciated and how he is criticised: Will the tree be hardy in Minnesota? How long have you had it in bearing? Oh! only this year; but it must be as hardy as an oak. Does such a man need sympathy about now? Then we are in the midst of hard times and the farmers say can't afford to set trees, and if I did, the cold of winter would discourage the growth of the trees, or the extreme heat of the sun in the summer would scald the bark, and the south, east, or west wind (I do not know which does it,) will blast or blight the branches in summer. Does not the public benefactor need more than human sympathy?

Well, let us turn from this in part, and see if there is a bright side for the nurseryman and fruit grower. They must have their reward, for we are told that all will be rewarded either in "this world or the world which is to come," and "those who go up through much tribulation," &c. This aspect looks much brighter, so then friends take courage, you have my sympathies. I repeat it, and although I am entirely out of the business, I take a great interest in the enterprise of tree planting in Minnesota, and if any one wants a monument set in memory of past losses and past failures, I can erect for them either in the renowned durable Scotch granite or our Native American granite, something which will always be a reminder of what they have passed through, so they may never forget. Some will say, oh, that I could forget. So say I. Perhaps I am on the dark side of the picture, if so, I will retouch the negative a little. Misery loves company you know. Other States have gone through all this, and have come out at last very good fruit growing States, and why may we not? Let us learn to wait a little, but at same time keep at our knitting. Let us plant large tracts of forest trees, hedges, &c., across our farms. Let us protect from the cold of winter and heat of summer. Encourage forest tree culture in this your 1875 meeting. Get up an interest in this, and in my opinion, one of the great advantages will have been made, and one of the most necessary remedies will have been accomplished. Show this up

so it will look cheap on paper and it is cheap in reality. Our legislative men have given us encouragement in this by way of giving lands for this object, now let the people take hold and go ahead with the work.

A word and I am done, and this is in behalf of the citizens of Winona. We cordially invite you to hold your next annual meeting at Winona, and we pledge you a good hall well warmed and hospitable people to welcome you here, and we hope you will surely decide to come, and decide it at your meeting this winter, so no misunderstanding will occur.

I wish you, one and all, a happy and profitable meeting.

A. C. HAMILTON.

REPORTS OF COMMITTEES.

There being no reports from special or other committees, Mr. Dartt moved that the general fruit committee report.

Considerable discussion here arose in reference to the inability of members of committees to report, many of them alleging that they had no notice of their being on said committees, nor of the meeting of the Society.

Judge Baker remarked that the trouble consisted in members not reading the Press and the emanations of the agricultural editor.

Secretary Ford retorted that notice was published in the Pioneer and other papers. He supposed the members had copies of the Transactions in which their names were to be found, as on committees. Did not suppose it a part of his duties to notify them for a report. He concluded by saying the Press and Pioneer had inserted such notices without charge, and the Society had no money to pay for notices.

Col. Stevens promptly stated the Minneapolis papers had never charged a cent.

REPORT FROM STEELE COUNTY.

Mr. Dartt, of Owatonna, made a verbal report. The present prospect in his section was not encouraging. Many men had invested their last dollar in apple trees. The severe winters were the cause of the discouragement. The varieties tried were not hardy enough to stand the severe cold. Blight was another cause of discouragement. Disease was so prevalent and disasters so frequent as to cause general discouragement. There is one cause of encouragement, if we find a single variety hardy enough to stand the winter. If we find one we can get another. One variety at least, he thought, could be depended on, and that was the Duchess of Oldenburg. This he recommended for general cultivation. The greatest objection to this variety is that it is an early fruit, but this is better than none at all. It will take the farmer through his harvest very comfortably. In small fruits there are many sources of discouragement. The raspberry killed worse last year than ever before. Currants and strawberries were but little better off. This, however, should not be a source of discouragement. The time will doubtless come when this evil, which now works against the successful cultivator of small fruits, will be remedied.

E. B. Jordan, of Rochester, objected to the remarks of the last

named gentleman, as calculated to discourage the planting of trees. We come here, he said, to encourage horticulture, but the tendency of the last speaker's remarks was not encouraging. If any one knows of any varieties that have failed, it is well enough to speak of them, but he thought the gentleman too wholesale in his condemnation.

Mr. Dartt replied to the criticism of the last speaker. His object was not to discourage horticulture, but to tell the truth though it shamed the devil.

Col. Stevens remarked that from the favorable nature of Mr. Jordan's land, he could raise more than twenty varieties of fruits that could not be successfully raised on Mr. Dartt's place. This fact, he thought, would account for the discrepancy in the statements of the two gentlemen.

Mr. Jordan. We do not want in the very outset to discourage the planting of any kind of trees. Moreover I object to the assertion that the Duchess of Oldenburg is the only variety of apples fit for planting.

President Smith suggested that Mr. Dartt was only speaking of his own district.

Mr. Dartt rejoined that he did not mean that the Duchess was the only one that could be raised, but it was the best that he knew of. The Tetofsky was the next best. To this there are some objections. It does not take root readily; it is also an early fruit. As many or more trees of that variety died when transplanted than any other. It was also more liable to blight and to winter kill. The Haas is the next best, but it blights a little. The Saxton is liable to blight. So are all varieties when exposed to blighted trees. The Golden Russet was good for nothing in his section. These three varieties are hardy enough; others not so. The Wealthy killed down worse than the Haas or Ben Davis.

Col. Stevens denied this, saying that the Wealthy he has had stood the cold better than any other. There was a mistake. The Wealthy had never been known to kill even in the sandy soil near Minneapolis.

Mr. Dartt remarked that because a yearling tree kills ought not to discourage any horticulturist. He had no doubt there would be a large number of varieties that in time would succeed and recommend themselves. Those that have stood the test should be recommended. New kinds should be tried before being recommended. The great source of discouragement is getting up new fancy varieties and getting people to pay their money for them, and when found out they simmer down to nothing. Many that have been highly recommended to-day stand very low to-morrow. We should so act that the people will not believe we are a set of axe-grinders. If we come here recommending, from time to time, new varieties, and they turn out worth nothing, how long will it be before the people will lose confidence in the State Horticultural Society?

REPORT OF L. B. HODGES.

Mr. L. B. Hodges, of Olmsted county, remarked that it did him

good to hear this sort of talk. He had been trying to raise apples for a number of years at Oronoco. He had read everything they had done. When they said they had failed, they were only echoing the voice of a thousand men. Go slow and do not recommend. Years ago he planted a large number of varieties, and thought he had a soft thing—he started in the nursery business. He had a soft thing, for they were too soft. He finally paid a hundred dollars to grub them up. That had been the experience of many a man. The Society, he was free to say, had not exerted as beneficial an influence in this State as it ought. The members were laboring under the suspicion of being axe-grinders. It is said that those who recommend trees have a large stock on hand which they want to get rid of. They ought not to take anything for granted, but go slow. He would tell an instance of how this Society stands. A leading man had told him it was not worth while to join the Society. They were all horticulturists and gardeners, interested in palming off upon others their products. That was the reputation of the Society, and of course it carried no weight with it.

The speaker concluded by giving his experience in apple raising from the years 1856 to 1861, during which time he had labored hard to succeed, but had resulted in a disastrous failure.

After some further discussion of the relative merits of different varieties, during which some sharp things were said in reference to the interested motives of the champions of certain kinds of trees, a member remarked that this was not a body of politicians nor of axe-grinders. His idea was that the meeting was after the manner of a teacher's institute. It got together and talked over the matter for the general good, and not for the purpose of misleading the people.

REPORT OF TRUMAN M. SMITH.

The President stated that the trees he had planted in 1861 had continued to grow, stand the winters, and bear fine fruit until the winter two years ago. What had stood through 1864, with the thermometer at 34 degrees below zero, had failed then. He has no trees to sell. He was supplying the St. Paul market with fruit, and he was interested in getting none but desirable varieties. Nurserymen of the Union and of the State have examined his grounds and agree with him that the cause of the failure of success with apples was not the extreme cold, but the sudden freezing early in November, before the sap had returned to the ground. This was what used up the tree. He further detailed his experience with the Duchess eight years ago, and concluded by saying that 1873 had vanished his hopes by killing trees that had withstood harder winters before.

REPORT FROM HENNEPIN COUNTY.

Mr. Herrick, of Minneapolis, detailed his experience, which he described as "very limited and intermittent." He had planted some trees and raised a few apples. Out of a number of trees received from Dubuque in bad condition when planted, he had succeeded in saving three varieties. He had planted three acres in

fruit bearing trees and bushes, not as a means of livelihood, but as a matter of comfort. They should seek varieties of fruit to raise in this State. He had secured new varieties of crab last spring. Knew nothing about them. Small fruits, he thought, offered more encouragement.

The report of the committee on business, as given above, was then adopted, and the meeting adjourned to meet at 7.30 P. M.

EVENING SESSION.

President Smith took the chair, and announced as the topic for discussion :

“The effects of the winter of 1873 and 1874 on our various kinds of fruit.”

Mr. Moody, of East Minneapolis, said he thought on the whole the winter was not very injurious. Most kinds of stock with him had come through very well.

Mr. Dartt, of Owatonna, had a good deal of stock injured, and especially young trees. The Siberians were effected more or less, as also the raspberries.

Mr. Jordan, of Rochester, stated that some things had been injured as much as the year previous. Raspberries were badly injured, though heretofore considered hardy in all localities.

THE TEST OF VARIETIES.

The eighth topic came up: “What tests are necessary to fully establish the perfect adaptation of any variety of apples to the trying climate of our State.”

Mr. Dartt moved that we reaffirm our action of last winter, which is as follows :

That we do not recommend for general planting in large quantities any variety that has not stood a test of ten years in a variety of soils and situations, and shall have passed through at least one winter of great severity.

Mr. R. J. Mendenhall, of Minneapolis, was inclined to the opinion that ten years' trial was more than was really necessary, especially after such a winter as that of 1872 and 1873.

After a long debate, in which most of the members participated, the time was changed from ten to five years.

THE CRAB AS A STOCK TO GRAFT ON.

President Smith said he had a conversation with Mr. Soulard, who thought he had found a splendid variety to graft on, but time had proved his position to be incorrect.

Mr. Dartt had been successful in grafting on the crab stock.

Mr. Jordan gave an account of a visit to Mr. Soulard at Galena,

who took him to an orchard where the experiment had been tried on a large scale, but only one variety had done really well. In his own orchard probably one-half of his ten acres is worked on the crab stock.

A great variety of theories and practices were also advocated by other members, but nothing arrived at that was reliable or definite.

The subject was therefore left for future discussion. It was however quite evident that less importance was attached to the subject than in former years.

WEDNESDAY MORNING.

The Society met promptly at nine o'clock, and was called to order by the President. The attendance was somewhat in excess of that of the day previous, indicating an increase of interest on the part of the members as the session progressed.

FRUITS AND WINE ON EXHIBITION.

Upon a table in front of the Secretary's desk was a fine collection of apples of different varieties, grapes, &c., which attracted considerable attention throughout the day, and was the subject of critical examination and inquiry by those interested in the subject of their successful culture. The following is a list of the specimens exhibited, with the names of the exhibitors:

Wyman Elliot, of Minneapolis, some very fine specimens of the Wealthy apple.

Moulton & Co., also some excellent Wealthy apples, also some Haas and Duchess, some of the Minnesota Crab, General Grant and Hyslop.

Truman M. Smith, St. Paul, three varieties of choice grapes, Soulard crab apples, two jars preserved plums.

W. E. Brimhall, St. Paul, Fameuse apple, Haas apple, Hyslop crab, Soulard crab, Soulard preserve, dried Transcendent apple sauce, blackberry wine, currant wine, cider vinegar.

MISCELLANEOUS BUSINESS.

On resuming business, E. H. S. Dartt, of Owatonna, moved that no one be allowed to speak more than once on any subject, and then but five minutes at a time, which motion was carried.

On motion, the report of J. S. Harris was referred to a finance committee.

The reports of the delegate to the annual meeting of the Wisconsin Horticultural Society, at Madison, on February 3d and 4th, 1874, and of District No. 1, of Houston county, were received and placed on file.

THE VARIETIES OF APPLES TO CULTIVATE IN OUR STATE.

The order of business was next taken up, and discussion commenced on the second subject of the morning programme.

Mr. Jewell made some interesting remarks on the subject of recommending fruit trees for general cultivation, and then offered the following resolution, which was adopted :

Resolved, That we do not recommend for general planting, in large quantities, any variety not generally known, and that has not stood a test of five years.

Messrs. Jewell, Moody and Brand were appointed a committee to prepare a list of fruits to be recommended by the Society, and ordered to report in the afternoon. The third order of business was referred to the same committee.

BLIGHT—ITS CAUSE AND TREATMENT.

The fourth order, the subject of blight, was next taken up, and a long and running discussion ensued.

Mr. Jewell said he had had a great deal of experience on the subject of blight, but he professed to know very little about it. In fact, the more experience he had, the less he knew about it. The Transcendent was very subject to blight, and for his part he would not allow them to grow near other better varieties.

Peter M. Gideon, of Excelsior, Hennepin county, remarked he had tried almost every variety of apples. He was the originator of the Wealthy. Many kinds had blighted with him—the Duchess as well as the Transcendent. But to reject all that have been affected by blight would be, he thought, to reject many of our hardiest varieties. The blight had passed over the country three times, coming, it is said from Europe. In this country it had been more destructive than in the old country. In Germany and France trees 150 years old have been killed. He could not explain the nature and cause of its destructive power. The Siberian and Crab he considered a God-send to the Northwest. Many crabs in his vicinity had stood the blight pretty well. Keeping the roots in good condition will repair any breaches the winter may make, and as for the blight, he doubted not a remedy will eventually be found.

Mr. Dart's experience was that crabs were more subject to blight than other varieties. He had various varieties mixed together; some escaped, others were affected. As compared with others, the Duchess was quite free from the disease. His Tetofskys were very badly blighted near the Transcendent. So were several rows of crabs. As a stock for grafting, he should choose anything else rather than the Transcendent; had tried it in many instances.

Judge Baker, of Groveland, Ramsey county, had some couple of hundred Transcendent trees and had never seen blight upon them. It was true they had been affected in Minneapolis and some other parts of the State, but it would not be well to discard them. If they could not raise crabs they might as well give up apple culture. He

called on some of the savans present to tell them the cause of blight. It would be a most fatal thing to allow it to be spread on the record that they had discarded the Transcendent.

Mr. Jordan had discarded six or eight varieties of the crab.

Mr. Jewell thought the only remedy was to discard those kinds in which the blight originates. Had tried cutting off the tops of the trees. That retarded it somewhat. Trees trimmed in the spring of the year will blight worse. If trimming begins when the blight begins, it would check it, but the labor is too great. The cause of horticulture is not injured by the people understanding the difficulties that beset it.

Judge Baker wanted to know how it was that the discovery that Transcendents blighted worse than any other varieties was not made when they were selling at a dollar apiece instead of when they had come down to \$50 per thousand?

Secretary Ford had traveled over the St. Paul & Pacific and Sioux City roads and had seen very few trees blighted. Had been in the nursery business among the first in the State, and had not yet had a tree blighted; could not agree to discard the Transcendents and that class of apples. Blight was not liable to stay with them forever. They had only a few apples in the State, that were reliable, and it would sound very bad to discard this variety. One Transcendent had given him more profit than all his others.

Mr. Truman M. Smith did not pretend to know the cause of blight. His experience was that trees in protected localities were more liable to blight than those in exposed situations. Electricity, he thought, had something to do with it. Immediately after a thunder shower, followed by hot sun, blight generally prevailed. He didn't understand the remedies. He had Transcendents standing ten or twelve years on high ground free from disease, and which had borne as high as thirty bushels of fruit. In lower places they had blighted. One tree standing in grass did not blight last year, but one pruned late last spring blighted considerably.

Mr. Brimhall did not know anything about the cause of blight. Had had very little of it. His land was a heavy clay.

Mr. Gideon had Transcendent bearing trees in positions exposed to the sun that did not blight. Blight follows after showers followed by a warm sun. He believes the cause is the same as that of cholera. Both came originally from Asia. Crabs were an Asiatic tree. He had tried the process of pruning. Too much pruning did more harm than good. When the blight takes effect, young sprouts will put out just below, showing that nature had begun to work and repair the breach.

Mr. Jewell scouted the idea of electricity having anything to do with blight. He had never known of a situation high or low that was free from blight. It had taken hold in those localities where trees had stood the longest and had been growing worse from time to time. Some had thought it peculiar to the North, and that the South was not subject to it. This was not so. He had observed the same thing on trees near St. Louis and other places.

Mr. Gideon remarked that in Ohio apple and plum trees had been

damaged by it, also in Illinois. He admitted the crab caught the contagion more readily than other varieties, yet others will take it.

Col. Stevens said W. M. Harrison was the best horticulturist in Minnesota, and he was of the opinion the insect originated the blight. It came around every 15 or 20 years in Illinois. He believed himself it was an insect or parasite.

Mr. Loring did not know anything about blight; did not believe it was an insect; had examined the leaves of affected trees with a powerful microscope, but could not find it. It was not confined to this locality, but was prevalent in Massachusetts, Ohio, Illinois, and other places. His first tree was in an exposed situation. Others were soon affected. Could find no remedy.

Mr. R. Knapheide, of Ramsey county, had lost many trees. Did not understand the cause or remedy.

Mr. Brocklehurst inquired whether he thought the disease peculiar to cold or hot countries, and stated it was found in Australia.

O. F. Brand had no blight on his grounds; was satisfied that the Transcendent crab was a dangerous thing to have around; might flourish in some localities, but not with him.

Mr. Dartt knew of trees that had been neglected and in poor soil which had been blighted. He, too, thought it a sort of cholera and liable to strike in any place and at any time.

Mr. Jewell thought rich soil and high cultivation were more favorable to blight.

Judge Baker thought no crab had been shown to have the excellence of the Transcendent.

Mr. Grimes, of Hennepin, gave his experience as developed on his own grounds. He had no theories to advance. Did not think with Col. Stevens that an insect was the cause. Blight did not attack his trees until nearly two years after it had reached the locality. It had used up everything in the shape of a tree on a piece of his ground. Older trees were not affected. Smaller trees of three years' growth were not as subject as older ones of four or five. Different varieties of the Siberian crab, and Hyslop, have been worse affected in very rich ground; Duchess less affected than the Tetofsky. In some portions of his grounds Transcendents had not been affected at all; in another piece nearly every tree was blighted. First tree affected was a Montreal Beauty. It then run through the whole lot.

Mr. Stewart thought all varieties subject to blight—some more than others. Montreal Beauty first blighted in his grounds. Duchess less affected. Had never lost one. Had never known of a tree being injured the same season it was transplanted.

Mr. Graves had suffered serious loss of Duchess in consequence of blight.

Mr. Grimes thought a number of varieties of crabs were not subject to blight unless standing near blighted trees. Crabs were more subject to blight than standard apples.

Mr. True did not know anything about blight.

Mr. Elliot would like to know the cause. Duchess had done very well; Tetofsky was more subject. He thought the disease a fungus traveling in the air.

Thos. Moulton knew very little about it. Had commenced two

years ago in his nursery and was worst on land heavily manured. The General Grant, Quaker Beauty and Transcendents have all blighted some, especially on sandy soil.

Mr. T. G. Carter, of St. Peter, had not seen much blight until the past season. The Transcendent and other varieties had been affected more or less.

Prof. Lacy being called upon, stated that he had prepared a paper, at the request of the Secretary, to be read at the meeting, and one of the subjects treated was that of blight.

SOME PROBLEMS IN HORTICULTURAL PRACTICE—BY PROF. C. Y. LACY,
STATE UNIVERSITY, MINNESOTA.

It will hardly be expected of me, I think, to take up and discuss the details of practice peculiar to your own soil and climate. In the effort to make myself acquainted with such I have examined a very valuable and very creditable volume, entitled "History of Horticulture in Minnesota." It is full of the valuable experiences of horticulturists located in different parts of the State, and of the opinions based upon those experiences.

A recent writer has affirmed that Adam was born with two interrogation points on his eyes and one on the end of his tongue. I claim to have some of the characteristics of our illustrious ancestor, and in looking over the records of the Society, I have frequently asked myself "why" such and such a thing was done—"why" such and such a thing is true. I believe that if I can throw any light upon two or three of these points your time and mine will not be entirely wasted. If it shall appear that I am laboring under any misapprehensions, I beg that you will take occasion to set me right. Without further introduction I will now proceed:

MULCHING.—In the volume above referred to a majority of speakers and writers recommend mulching. The light and sandy character of many soils and the dryness of the atmosphere explains the importance of mulching in summer. Downing says, "mulching is nothing more than covering the ground about the stems with coarse straw or litter from the barn yard, which by preventing evaporation keeps the soil from becoming dry and maintains it in that moist and equable condition of temperature most favorable to the growth of young roots." This shows the benefit of summer mulching; but many claim to derive great benefit from mulching in winter also, applying the mulch even after the ground has frozen. What purpose can this mulch serve but to protect the roots? This, you perceive, brings up the question as to which is killed by our winters, top or roots. Without going into the merits of this question, I will simply avow the belief that winter mulching often saves the life of the tree. Freezing of the roots may not do any material injury, but sudden changes of temperature, especially sudden thawings, unquestionably do injure the tree, and cold snaps after the tree has started into growth are still more disastrous. Again, as has been recently stated by a member of the Society, the tree keeps up a certain amount of activity to which moisture is an essential condition, throughout the winter. Dry winds evaporate this moisture, and the

tree must have some means of replenishing the supply. These are mostly taken away when all of its roots are enveloped in a mass of frozen soil. Dry, porous soils freeze deeper and thaw out quicker than moist ones. They do this because of the comparative absence of water in them which is a poor conductor of heat, and therefore serves to render temperature equable. Thus, concerning mulching, science explains and enforces what practice has shown to be good. But mulching is not equally valuable on all soils, and some attach little importance to it. Clay soils need it far less than sandy soils. They are more retentive of moisture, and hence do not dry out so easily in summer, freeze so deeply in winter, nor thaw out so suddenly in spring. Again, thorough cultivation may in part take the place of mulching, since it favors the absorption and retention of moisture in the soil. To sum up this matter—mulching preserves the moisture of the soil in summer, lessens the depth of frost in winter, and renders changes of temperature in the soil less sudden. It is most beneficial on sandy soils, and less so on loams and clays. It is not so necessary if thorough cultivation be given.

PRUNING.—In looking over the records of the Society, I find summer pruning almost always recommended—spring pruning generally condemned; the contrary of that to which I have been accustomed. It is not, however, I believe, without a simple explanation. Writers on horticulture have long urged spring pruning to promote the vigor of the tree, summer pruning to check it. All the evidence I have noted indicates that nature in Minnesota needs no assistance in the development of trees, but in order that the development shall be a healthy one, nature needs rather to be checked and bridled. As to the precise effect of spring pruning I am not informed. You perceive I take it for granted that it produces too luxuriant a growth of wood—more than the tree can ripen.

CULTIVATION.—On this subject there is legitimate ground for difference in practice. Some would be shocked by an advocacy of non-cultivation. Others have practiced non-cultivation and are nearly or quite ready to declare in favor of it. Now, certainly, if the soil can supply both food and moisture for a crop of trees and a crop of grass, and the latter does not shade the former, I can see no reason why both should not be allowed to grow. That there are such soils I have no doubt whatever, and could adduce some instances to prove. But I am not going to weave an argument either for or against cultivation. Cultivation is much more frequently neglected than overdone, and non-cultivation is only too common, in spite of constant advice against it. My aim is to arrive at the *principle* and the truth. Poor soils and those only moderately rich, not only cannot support two crops at once, but the fruits growing upon them are highly benefited by thorough cultivation, at least in the fore part of the season, and by manures. On the other hand, very rich soils may not only produce grass when set in trees, but the former may be a positive benefit to the latter by moderating, not arresting, the growth of wood.

BLIGHT.—As this is a problem in horticultural practice, I do not feel free to close this paper without a word upon it. Still, I approach the subject with great diffidence, since I have no new facts to

add to what little is now known. All I have to offer is theory, and this chiefly the theory of others; but as much as I dislike mere theory, I think it will be as good, at least, as blindly referring the cause of the disease in question to some electric condition of the atmosphere.

The blight of the pear tree, which I assume is nearly the same as the blight of the apple tree of this section, Downing divides into two kinds—Insect Blight and Frozen Sap Blight. If this division be correct, I assume again that the blight of this section is mainly Frozen Sap Blight. To explain this, he presumes “a damp, warm autumn by which the tree is forced into a late growth, succeeded by a very sudden and early winter. While the sap vessels are still filled with their fluids, a sudden and sharp freezing takes place, or is, perhaps, repeated several times, followed, in the day time, by bright sun. The descending current of sap becomes thick and clammy, so as to descend with difficulty; it chokes up the sap vessels, freezes and thaws again, loses its vitality, and becomes dark and discolored, and in some cases so poisonous as to destroy the leaves of other plants when applied to them. Here along the inner bark it lodges and remains in a thick, sticky state all winter. If it happens to flow down till it meets with any obstruction, and remains in any considerable quantity, it freezes again beneath the bark, ruptures and destroys the sap vessels, and the bark and some of the wood beneath it shrivels and dies.

“In the ensuing spring the upward current of sap rises through its ordinary channel—the outer wood or alburnum—the leaves expand, and for some time, nearly all the upward current being taken up to form leaves and new shoots, the tree appears flourishing. Toward the beginning of summer, however, the leaves commence sending the downward current of sap to increase the woody matter of the stem. This current, it will be remembered, has to pass downward through the inner bark or *liber*, along which still remain portions of the poisoned sap, arrested in its course the previous autumn. This poison is diluted, and taken up by the now downward current, distributed toward the pith, and along the new layers of alburnum, thus tainting all the neighboring parts. Should any of the adjacent sap vessels have been ruptured by frost, so that the poison thus becomes mixed with the still ascending current of sap, the branch above it immediately turns black and dies, precisely as if poison were introduced under the bark. And very frequently it is accompanied with precisely the odor of decaying, frost-bitten vegetation.”

Thomas does not adopt any theory. He says, “but after admitting that the different theories may be in part correct, and that the blight may be caused by a combination, in a greater or less degree, of each assigned cause, we are driven to the conclusion, from a large number of observations of which these limits preclude even a brief recital, that the cause of blight, like that of potato disease, remains hidden in a large number of instances, from our knowledge. And that whether the latent tendency to disease is only increased and developed by changes of the weather, or whether those changes actually produce them, is yet enveloped in doubt.”

Now, while I do not think any of the theories suggested by the names fire-blight, insect blight, frozen sap-blight, sufficient explanation of the cause, I think it quite probable that anything which tends to an unhealthy growth may be a predisposing cause, while something else is the immediate cause. In order to introduce you to this supposed immediate cause, I take the liberty of a slight digression.

Far down in the scale of vegetable life there is a group of plants called Fungi, which despite the exceeding minuteness of many of its members, exercises a very important office in nature and upon human life and industry. Some of these plants render very important services, as seen in yeast, the value of which depends on the multiplication and growth of one of these plants; also seen in the manufacture of vinegar and all kinds of fermentation, and the curing of cheese. Others, again, cause great trouble and injury. Smut in wheat is caused by one, ergot in rye by another, mildew of the grape by a third, rust by a fourth, bread-mould by a fifth, and so on.

Many of these plants produce spores, which answer to seeds in higher plants, in immense numbers. These spores are very minute, float easily in the air, and often they possess great hardiness and vitality, some of them withstanding the boiling point of water and several degrees of frost. Of one it is estimated that a single square inch of leaf affected by it will produce 3,000,000 zoospores, a kind of seed or fruit peculiar to it. Of another it is estimated that in 24 hours a single spore will produce 20,000,000 of individuals. In germinating, these spores send out a net work of thread like filaments, and these in turn produce spores again, but sometimes the plant produces two or three forms of fruit before bearing its own true spores, and sometimes these filaments grow a considerable time without producing fruit of any kind. But in order that these spores may grow at all they must find suitable food and suitable conditions of moisture and temperature. Warm and moist conditions are in general most favorable.

But whether this or something else be the true cause of blight, no patent preventive or remedy is known for it. The best that can be advised by way of prevention is to place the tree under the best conditions and keep it in the most healthy growing habit possible. Place the tree in a moist but not a wet soil. Discourage very early spring, and especially late fall growths, and seek after only a moderate growth each year.

Probably the best mode of procedure when the disease appears in the nursery is to take out the affected trees as soon as discovered, and burn them, to prevent as much as possible the spread of the disease. When it appears in large trees cut out the branches one to three feet below the affected point, and burn the excised portion.

Among possible remedies and preventives may be mentioned washing trunks and branches with solution of copperas, or with carbolic acid. A friend on the appearance of blight among his pear trees immediately ceases cultivation, letting the ground grow up to grass, and thinks he checks the disease in this way.

In view of these facts relating to Fungi in general, it appears quite possible that the growth of some of these plants should be the

immediate cause of blight. But when we consider what diseases are almost certainly caused by such growths, this possibility becomes a probability. The potato disease which has caused such widespread havoc is, without doubt caused by the growth of a fungus in the vines and tubers. A chapter of its history will give us an idea of the nature of some fungi. In 1845 it first attracted great attention. It appeared in the Isle of Wight, and in two weeks overran the whole island, and in another month it was all over Ireland. An astonishing example of the rapidity of growth and distribution of this fungus.

The "Yellows" of the peach tree is also believed to be due to a fungus.

The "Black Knot" of the plum tree is still another disease, undoubtedly due to a fungus.

It may be further remarked that Mr. Taylor, Microscopist of the Department of Agriculture at Washington, by subjecting the bark of an unhealthy pear tree to certain processes, discovered the spores of a fungus in it, while the bark of a healthy tree treated in the same way showed none of these spores. His investigations do not, however, show whether the fungus is the cause, or merely the accompaniment of the blight.

Dr. Kirtland, of Ohio, favors, or did favor this hypothesis.

The contagious character which many suppose it to have also favors this view.

WEDNESDAY AFTERNOON.

The meeting re-assembled at 2 o'clock, and the President, Truman M. Smith, delivered the following lengthy and interesting address:

Gentlemen of the Minnesota State Horticultural Society:

One year has passed since we last met in council, for the welfare of our cause and ourselves and our State, and now the great question of the day is, what advancement have we made in that time, what have we learned and what have we new to offer at this time. Horticulture, like all other Arts and Sciences, cannot stand still, we must either be progressing upward and onward or else going backward, there is no stopping place, no standing point.

SUCCESS OF THE GRAPE CROP.

While some new fruits were brought out, among which were several varieties of grapes by Mr. Kramer, of La Crescent, and other fruits which the growers' names have escaped my memory, I fear the hard times have borne down with a heavy hand upon the horticulturists and horticultural prospects in this State. But still, not-

withstanding the cold and backward spring of 1874, and the almost entire failure of most of our small fruits, the year 1874 had some bright spots for horticulturists to note. The grape crop, although short, ripened up to perfection, and never before at our State Fair was there such a display of this luscious and best of all fruits, not by one or two, but from many and different parts of our State, showing plainly, if well and properly cared for, Minnesota need not send her money out of the State to purchase grapes at least, for better grapes were shown by Mr. Knapheide and Mr. Gould Harris and others than have ever been shipped here from our sister States south and east of us, and ahead of California grapes in flavor and eating qualities, and many species are rivaling them in appearance.

FRUIT AND FLORAL DISPLAY AT THE STATE FAIR—NON-RECEIPT OF PREMIUMS.

Then the display of apples from different parts of the State were worthy of the pride and admiration of the State Horticultural Society; also plums, pears and other fruits, and where shall I find words to express a just appreciation of the display of plants and flowers. Great credit is due our florists and fruit growers for the large and magnificent and well arranged display at our State Fair, a display which was a decided success in everything except our premiums, which have so far proved an entire failure, and for which failure the State Horticultural Society or its members are not responsible in the least. The most I will say in regard to our failure to receive our premiums is this: it was extremely unfortunate besides being very inconvenient, for the money due is not a large amount to the State at large, but to our poor horticulturists who so much needed it and had so honestly and fairly earned it, it would have proved a great blessing, and have helped to carry us through this cold and long winter; for you must remember that fruit growing and horticulture is the poorest paid of any occupation in our State as far as dollars and cents are concerned, hence the \$800 due our horticulturists are more to them, and would do them more good, than \$80,000 would some other branches of industry. To illustrate this, I will say, I have now in my possession a letter, received from one of our very best and most intelligent, active horticulturists in the State, saying he cannot be present at this meeting, for the railroad fare would be \$10 or \$12; he has not a dollar left, but had he have received his premiums due from the State Fair he should have saved enough to have come with, and his desire to be with us is such, he said he would willingly saw wood to raise the money to come with, but he had been sick and was not yet able. I mention this to show how much good our premiums would have done could we have got them, and how much dependence had been placed upon them. So far as I know this is only a fair sample of many other cases.

THE DUTY OF HORTICULTURISTS—STATE AID REQUIRED.

Now, as many advocate withdrawing from the State Agricultural Society Fair, and not exhibiting at the next State Fair, on account

of not receiving our premiums, I must say that I think such a course would be suicidal and contrary to all principles of Horticulture; for we all well know our last State Fair was held during the very worst weather of the season, and the elements, more than anything else, killed our Fair, financially. Now horticulturists are not the men, and should not be the men, to give up at one or two failures; if so, we may as well abandon our calling and go at something else. But I for one will not admit that our Society or its members are composed of any such material; but on the other hand, though we fail one hundred times, we will up and try, try again; and now let each and every member make up his mind to make the greatest effort and to make the best show of our products at the next State Fair ever made in this or any of our sister States, and help in every way to make the State Fair of Minnesota, next fall, a decided success in every way, and then we will be not only enabled to secure our back but future premiums, and the good will, not only of the State Agricultural Society, but the State at large. You must remember that our business depends more upon the success and prosperity of our State and citizens at large than almost any other, for we have almost solely to depend upon a local and home market for our sales, and consequently everything that advances and enriches our State helps us; and the good time for Horticulturists in Minnesota is yet to come, and may many of us who have struggled and worked in its infancy and borne the heat and burden of the day yet live to reap some of its rewards, and if not, die with the prospect that our children may receive some of them, and that the world, and Minnesota in particular, is better for our having lived, and that the Minnesota State Horticultural Society was not established in vain. And in speaking of the welfare of Minnesota, brings to mind the importance and necessity of being represented in the next meeting of the American Pomological Society, to be held at Chicago, Ill., in September, 1875. Now will not the Legislature of our young and growing State take a sensible and business-like view of it, and assist us to send delegates with the best show of fruits and vegetables that Minnesota can produce? All who ever have had much to do with the subject of inducing emigration to our State know the great drawback, and the chief argument to be met, and the ones used by States and railroads south of us having land to sell, with the greatest force is, "Do not go to Minnesota. I would not live in a country where you cannot grow fruit." And this is the argument that keeps thousands and tens of thousands of emigrants from our beautiful and healthy State. And now let the State Legislature aid us to show them at the show of fruits at Chicago next fall, that they have belied Minnesota; and if the Legislature and the railroads will provide us with the means—\$300—to collect fruits and send delegates to attend the meeting at Chicago, I think we can not only redeem Minnesota from the reputation that we cannot grow fruit, but will induce 1,000 to make Minnesota their future home, and thereby do more and lasting good to Minnesota than \$10,000 worth of emigration tracts. For seeing is believing, and many will not believe we can grow fruit until they can see it; and they will not believe we can grow fruit unless we show it at that meeting of the Pomological

Society. We are invited and expected to make a display of fruits if we have them, and consequently if we do nothing in the way of show it will be admitting the arguments of those interested parties, that we cannot grow fruit in Minnesota. It was once said we could not grow "cawn" in Minnesota, but they have backed down a peg or two from that, and the story that we could not grow wheat and vegetables. And now let the State aid us. It will cost but little, and will pay well, and we will make them back down from the proposition that we cannot grow fruit in Minnesota. I for one have faith in Minnesota, and in our fruit growers and fruit growing. But it takes time, and we have much to learn. But we are improving, and year by year something turns up more and more suited to our climate and soil. The introduction of the Wealthy apple, by Peter M. Gideon, Esq., is a triumph of itself worth more to the State of Minnesota than all the fast horses ever introduced, and we are not to stop here. Other and more hardy apples will be found that will stand our climate, and bear good fruit. Stewart's Sweet I hear highly spoken of, although I have not seen it as I remember; but the show of new fruits, apples, plums, pears and grapes at our State Fairs, shows we are started on the right road. And when we can raise enough fruits to stop the importing of so much and save the million dollars that now goes out of the State for fruits alone, we shall have done much to relieve our State from hard times. In one year St. Paul alone has imported at a cost to consumers of \$3 to \$5 per barrel, over 34,000 barrels of apples; over 26,480 packages of small fruits, and nearly 20,000 packages of canned fruits, making in all over \$500,000 worth, at first cost, to our city alone. And what have we exported? 7,149 barrels of cranberries in 1873, and there is no reason why we should not have exported 70,000 instead of 7,000 of cranberries. And here again let me urge not only our Society but the State Legislature, to, by every means possible, encourage the growing of cranberries, not only for home use, but for export. In the city of New York for 1870 over \$10,383,000 worth of fruit was imported from abroad, besides as high as 667 car loads of strawberries from Delaware Peninsula alone, making 7,470,400 quarts; and one man in 1873 shipped to New York 125,000 baskets of peaches; and in 1872 John S. Coles marketed \$22,500 worth of blackberries; and this in a market that 85 years ago was much smaller than St. Paul is at the present time. As statistics will show, New York city in 1790 contained only 32,328 inhabitants, and city and county only 33,131, and that year bragged of the enormous exports and trade, and was then, as now claimed to be, the first city for business and commerce on the the American continent.

A COMPARISON—PROMISING FUTURE.

Perhaps a few items will be interesting: In 1790 New York exported 667,700 bushels of wheat, 28,000 barrels of flour, total exports amounting to \$2,516,197. While St. Paul exported in 1871, just 80 years after, 1,279,645 bushels of wheat, 128,118 barrels of flour; and when it is recollected that New York at this time, 1790, had been an incorporated city for 100 years, or nearly, (1696)—and

had a population of 4,322 in 1697, and with all her advantages had been over 100 years in growing as much as St. Paul or Minneapolis has within the last 25 years, and that the State of Minnesota had in 1870, by the United States census, 100,000 more people than the Empire State had in 1790, only 80 years before, and which population it has nearly doubled in the last five years—we as horticulturists may look for the good time coming. In view of these facts it shows our State is fast growing in wealth, education, and refinement, and when we take into consideration that horticulture is only appreciated among the civilized and enlightened portions of the globe, and that it is one of the chief ornaments and necessities of an highly educated, wealthy and prosperous community, may we not hope in the not far distant future to find horticulture in all its branches recognized and supported by the wealth and intelligence of Minnesota.

ORGANIZATION OF LOCAL HORTICULTURAL SOCIETIES RECOMMENDED.

In view of this fact I must urge upon this Society the importance of organizing and sustaining, in every town and city of our State, local horticultural societies, and keeping up a constant series of weekly and monthly meetings, at regular stated periods, in which the fruits, and flowers, and vegetables of the locality can be discussed, and then the experience gained by each local society brought to the winter meeting of this society, and the best fruits and flowers of each brought in competition at our State Fairs. In this way we could gain knowledge, and knowledge is power and capital, and would enable us to succeed where we now fail. Now, let us be up and doing, and keep up with the times and age of industry and improvements, and not lag in the race. Let us be worthy of our most noble and most ancient and honorable of all occupations that man was ever called upon to perform on this earth, and not forgetting our Great Author and co-worker in all our efforts at horticulture. And in conclusion, let me sincerely thank you for the kindness and attention you have shown me, and honored me with your confidence and esteem, by twice electing me unsolicited on my part, to be your President. Hoping you will with much charity forgive my shortcomings and imperfections, and believe me ever your humble servant and co-worker in the great and glorious cause of Horticulture in Minnesota.

On motion of Judge Baker, the address was received and ordered printed.

COMMITTEE ON NOMINATIONS.

Messrs. Jewell, Baker and Moulton were appointed a committee on the nomination of officers.

During the absence of the committee Mr. Scott, who was present, made an interesting report of what had been done in horticultural operations at the University farm. Some of the statements elicited some comment from the members, but the results may be somewhat varied another year, or in other hands.

EXPERIMENTS AT THE UNIVERSITY FARM—REPORTED BY W. T. SCOTT,
SUPERINTENDENT.

Messrs. P. W. Fuller, J. S. Harris and C. M. Loring :

In accordance with a resolution passed at the last annual meeting of the Minnesota Horticultural Society, I present the following report from the Horticultural Department of the State University :

Owing to the lateness of the season in beginning operations, and no suitable preparations having been made in seed or soil, the greater part of the year has been devoted in preparing for future operations in Horticulture. The soil used in experiments is a light sand, cropped for fourteen years, without manure of any kind being used in former cultivation.

The seed used was mostly obtained from New Jersey ; a part was obtained the present year, and a part in former years, and grown in Minnesota, three to five years. Having closely observed the growth and habits of most of the plants, both in the East and in our own State, it seems proper to make the following statement :

- 1st. The quality and quantity is materially improved.
- 2nd. The time required to mature for market purposes is lessened each year, from five to ten days.
- 3d. Isolated specimens not to be relied upon, in determining experiments.
- 4th. Only one exception apparent, in quality.

MARKET GARDEN.

Experiment No. 1. Potatoes—Best yield, Early Rose ; 2nd best, White Peachblow ; 3d, St. Helena ; 4th, Jackson White ; 5th, King of the Earlies and Early Goodrich.

No. 2. Quality—Best, White Peachblow ; 2nd, Fluke ; 3d, Early Rose ; 4th, Jacksons, 5th, Early Goodrich and King of the Earlies.

No. 3. Seed—Best yield per acre from seed cut to two eyes each, planted in drills, worn out soil, no fertilizers, ten rods, six bushels, or ninety-eight bushels per acre, by weight.

No. 4. Potatoes planted without cutting, in drill, same conditions as No. 3, four bushels, or sixty-four bushels per acre.

No. 5. Deep vs. shallow covering—one-sixteenth part of an acre planted May 9th, in drills, four inches below surface, covered with two-horse plow, twelve inches deep, and leveled with drag twenty days after planting, ridged culture, yield, by measure, six bushels, or ninety-eight bushels per acre, old ground, no manure.

No. 6. One-sixteenth part of acre in drills four inches deep covered with hoe four inches in depth. Same soil and conditions as No. 5. Yield $4\frac{1}{2}$ bushels or 76 bushels. Difference in yield in favor of deep covering 22 bushels. Difference in time of maturing in favor of shallow covering eleven days. Difference in favor of cost of cultivation in favor of deep planting one-seventh less.

No. 7. Potatoes—Culture. In favor of well-ridged up, against level culture, 50 per cent. in favor of first named.

No. 8. Potatoes—Fertilizers. One-eighth of acre, 5 ton well rotted manure, product 23 bushels or 184 bushels per acre. One-eighth of acre one bushel gypsum, $21\frac{1}{2}$ bushels or 172 bushels per acre. One-eighth acre without manure, 13 bushels or 104 bushels per acre. Conditions alike in each respect. Cost of gypsum and application of same \$1.25 ; increase of yield 68 bushels per acre. Cost of drawing manure and application \$5.50 ; increased yield 80 bushels per acre.

No. 9. Salt and ashes (leached) in proportion to $\frac{1}{4}$ th salt and $\frac{3}{4}$ th ashes increased the yield of beets 40 per cent. and carrots 30 per cent. at the rate of 1,200 pounds per acre in drills.

No. 10. Sweet Potatoes. Four varieties planted. Southern Queen matured only; plants set May 15th, matured October 12th; yield good; quality nearly equal to the Nansemond when grown in New Jersey. Lest the above statement might result in a partial failure under different culture, will give the details for success: Select light sandy soil, plow shallow, drag and mark out with single shovel plow (from north to south) drills $3\frac{1}{2}$ feet apart, scatter *well rotted manure* in the drills and cover with double furrow, two-horse plow, throw the furrows well up, and set the plants about 16 inches apart on top of furrow; keep clean by light surface culture, but do not disturb the soil near the base of plant. MEM.—Planted on a level surface, was a failure; plant as near the 10th of May as possible, and see that the plants be exposed to the atmosphere at least three days before removing from the hot bed.

No. 11. Cabbage—Jersey Wakefield, new, early, fair size, quality good, one of the best.

No. 12. Cabbage—Winingstadt, new, early, large, extra, promises to be one of the best.

No. 13. Tomatoes—Canada Victor, early, fair size smooth, good quality, fair yield.

No. 14. Trophy, large, prolific, good, succeeds best on trellis work.

No. 15. Tomatoes for pickling, preserving and canning. The pear shaped yellow, seems to be the favorite of the small varieties and greatly superior in flavor and appearance.

No. 16. Beet—Sugar Yellow Globe, greatest yield; Yellow Silesian, 2d; and long white Maugle Wortzel, 3d.

No. 17. Deep Blood Red, (imported from France,) Long Blood Red, Early Bassoon, Early Blood Beet, as far as quantity and quality were concerned, seemed about equal in all respects and worthy.

No. 18. Egg Plant—Early Purple, worthy.

No. 19. Squashes—seven varieties. Summer and Winter Crookneck, Summer bush, Turban, Boston Marrow, and Mammoth and Hubbard, all worthy.

No. 20. Turnips—Rutabagas. Yellow Swedish best yield; White German, best quality.

No. 21. Peas—Dwarf, McLean's Little Gem, wonderfully prolific on rich soil; Tom Thumb, fair; Champion of England, vigorous and productive; Landreth's Extra Early, good. Perhaps there may be better kinds, but we have yet to find them.

No. 22. Onions—Wethersfield, large red, reliable, best for planting to perfect a crop in first season: Yellow Danvers, best from sets, second season.

No. 23. Cucumbers—Early Frame, Long Green, good and productive; difference in maturing of Early Frame, eighteen days, in southern and northern exposures.

No. 24. Watermelons—Five varieties tested; Mountain Sprout, large, good, late; Mountain Sweet, medium size, extra good, ten days earlier than first; Ice Cream, (marked extra early) proved extra late, small size, good; Phinney's Early, medium size, prolific; Early Extra, good; Peerless, one of the best, if not the best.

No. 25. Skillman's Nettled Muskmelon seems worthy to be placed at the head of the list; Jenny Lind, small, early and good; Long Persian, too late; Mustang, (from New Mexico,) peculiar flavor, large and extra good.

FOREST AND ORNAMENTAL TREES.

No. 27. About six thousand forest trees have been planted, for experimental purposes, of various kinds—box elder, post oak, white, red, water and rock elm, soft maple, mountain ash, European larch, and a variety of evergreens. A large number of the mountain ash were materially injured last winter.

No. 28. Planting forest tree seed—Greatest source of failure found in the nature of the soil, if planted deep enough to be benefited by moisture seed failed, if too near the surface it failed for want of moisture; success insured by a light covering (very light) of soil, ditto of straw or hay, and a generous sprinkling of rain water.

No. 29. Result of experiments in propagating by cuttings, suggested by L. M. Ford, Esq., who also furnished cuttings for some of the white, yellow and Italian willows, Lombardy poplar, &c.; time selected, May 25—one month later than cuttings should be set to insure perfect success. Twelve white willow, eight inches in length, placed in the soil seven inches perpendicular, one bud above ground, one year old wood; ten made a fair growth, two failed.

No. 30. Twelve white willow cuttings, eight inches in length, two years old wood, set at an angle of forty-five degrees, lower part of cutting four inches below surface, the upper part one inch below surface; an entire failure.

No. 31. Twelve white willow cuttings, cut four inches in length, placed in the ground four inches perpendicular, two years old wood; two grew, ten died.

No. 32. Twelve white willow cuttings, cut eight inches long, placed in the ground seven inches perpendicular, two years old wood, one bud above surface; eleven made a growth of from three to four feet, ground well tramped around each cutting.

The above apply to each of the other kinds named in No. 29, except the Lombardy, the last being an entire failure; also, except the growth named in No. 32.

HEDGE PLANTS.

No. 33. The buckthorn will, without doubt, make a good hedge, and will, I think, be found to have more good points for a Northern hedge plant than any other on the list.

No. 34. Ripening a late and excessive growth of wood on fruit or forest trees.

Banking up the earth around base of tree from eighteen to thirty inches according to size of tree. This is given without comment or theory, as the result of a series of experiments, instituted for the purpose of preparing an excessive growth of wood, to withstand the cold of Minnesota winters. In the search for more light on this subject, have learned with surprise and dismay, that non-culture was considered by many eminent horticulturists to be a condition of success. Being well assured that non-culture or stunted growth both in the animal and vegetable kingdom has the greatest retarding influence on fruit culture and forest tree planting, earnestly contend for a vigorous and healthy growth.

No. 35. Pruning—Time. Effect on vigorous growth; Effect on stunted growth; Effect of stimulants or plant food; Effect on change of climate and soil. Experiments carefully noted but will require longer time to mature. EXPERIMENTS.—The effects of extra culture continued and selection of seed, with reference to localities, is deemed of the utmost importance, to insure perfect success in orchard, garden or farm.

Early Sweet Corn and White Dent hybridized. One crop; time five years; result: an established sweet corn (evergreen) by selection of seed grains; greatest difference in time of maturity twenty days.

No. 36. Common Sweet Corn and Early Sweet Corn, by selection of seed, and extra cultivation produced a superior evergreen sweet corn, superior in flavor and equal in every other respect to the best evergreen sweet corn known in the West; time—six years, with greatest apparent improvement the last year in quantity or size of ears, with a slight decrease in quality; perhaps the nature of the soil or condition of atmosphere at time of maturing may have governed the quality. The experiments made seem to justify the conclusion, that extra culture and a judicious selection of seed will finally ensure the highest and best results.

W. T. SCOTT,

December, 1874.

Supt. of Experimental Farm, State University.

ELECTION OF OFFICERS FOR 1875.

The committee on nominations then reported the following list of officers, and the report was adopted:

President—Truman M. Smith.

Vice Presidents—W. Elliot, T. G. Carter, E. H. Dartt.

Secretary—Professor C. Y. Lacy.

Treasurer—A. Stewart.

Executive Committee—J. F. True, O. F. Brand, J. S. Harris, T. T. Smith, E. B. Jordan.

A difference of opinion here sprung up as to what effect the adoption of the report had. Some thought the adoption of the report elected the officers, while others thought that it did not. In order to get at the matter, the vote adopting the report was reconsidered. The report was then received, and the Secretary was instructed to cast the vote of the Society for those persons named in the report, and he did so. Accordingly they were elected.

LIST OF APPLES.

The committee on apples made the following report:

List of apples for general cultivation—Duchess, Tetofsky, Wealthy.

The minority adds Stewart's Sweet, by J. H. Woods; Malinda, O. F. Brand.

List for favorable localities—Haas and Price's Winter Sweet.

List for most favorable localities—Fameuse, Plum's Cider, Walbridge, St. Lawrence, Saxton.

Minority report read by O. F. Brand—Siberian apples or crabs, first class—Early Strawberry, Orange, Beecher Sweet, Minnesota. Second class—Conical, Quaker Beauty, Maiden Blush, Hutchinson, Sweet Meaders, Winter. Third class—General Grant, Hesper Blush, Aiken's Striped Winter. Fourth class (minority report)—Aiken's Green Winter, Hyslop, Transcendent.

Mr. Tostevin, of this city, stated that he had three hundred trees that were bearing apples, and that last year he shipped a considerable quantity of apples to New York city. He desired to learn something as to what kind of apples were the best to raise.

Mr. Gould, of Excelsior, did not like the Tetofsky as well as he did the Duchess. It was too slow of growth.

Mr. Gideon said the Duchess was altogether the best, and that the windfall of the Duchess would sell for more than the whole crop of the Tetofsky. It was finally decided to recommend the Tetofsky for general cultivation in small quantities for home use.

On a vote being taken it was decided to give the Wealthy the same position as the Duchess.

Stewart's Sweet was placed on the list for general cultivation. Mr. Ford stated that he had visited a number of orchards in the Minnesota valley, and that he found the Stewart Sweet to be far the most hardy, much more hardy than the Duchess.

Mr. Gould found the Duchess more profitable for him in the tim-

ber than the Stewart Sweet would be. On the prairie it might be different.

Colonel Stevens thought the Stewart Sweet the most hardy kind we have, and though it is not quite so prolific, it is invaluable.

Finally, on a vote being taken, it was decided by a vote of 14 to 4, to place the Stewart Sweet on the list for general cultivation.

Mr. Brand, of Faribault, gave a brief history of the Melinda. It was brought from Orange county, Vermont.

Dr. Jewell stated his views of the Melinda. He did not like it at all. He doubted its hardy character. It was corky, and was neither a good eating or cooking apple.

Mr. Jordan gave his experience in regard to the Melinda, and the experience of a good many others, and claimed that it was a very hardy variety on the prairie.

Finally the Melinda was rejected for general use.

The Haas was adopted for favorable localities, 11 to 3.

The Price's Sweet was adopted for favorable localities by 10 to 1.

The Saxton same, 10 to 1.

The Fameuse was adopted for the most favorable localities, 14 to 3.

Plum's Cider was adopted for the most favorable localities, 7 to 5.

Walbridge the same, 10 to 1.

St. Lawrence same, 9 to 1.

Utter's Red for favorable localities, 4 to 4. The President decided the matter by giving the casting vote in its favor.

Tallman Sweet was adopted for the most favorable localities, 12 to 5.

The Alaska, a new apple, was next taken up, and its history was given by Mr. Grimes, who read a communication from L. D. Mills, of Blue Earth county.

On motion of Mr. Jewell, this seedling was recommended for trial by amateurs and pomologists.

WEDNESDAY EVENING.

The Society was called to order at 7½ o'clock. President Smith in the chair.

THE PIONEER VINEYARD OF MINNESOTA.

The following communication, regarding grape culture in Minnesota, was received from Mr. Rudolph Knaupheide, and read before the Society:

My vineyard was commenced on a very small scale in the year 1853, more than twenty years ago. Coming from the State of Missouri where most kinds of fruit was raised in abundance, I was anxious to have all I could of such luxuries in my new home. At first, I tried many kinds of apples, pears, cherries, and German prunes in

connection with a few grape vines. The trees and vines set out when I commenced on my place were bought at a nursery in Quincy, Illinois, by a brother who lived at that place. I have raised some apples, but have not been so successful as with grapes. Like many of the early settlers near the timber adjoining the Mississippi I commenced to live in a log cabin, after selecting a claim, which I bought second-hand.

The two Isabellas brought from Illinois by my brother were planted in April, 1853. In 1856 I built a new house and the next spring the vines were carefully taken up and set out on the south side of the building. This was in fact their second removal after planting, as I had occasion to build an addition to my shanty from whence they were taken and set out in the fence corners in 1854.

The first winter they were killed down to the ground, when I concluded the vines would need protection in this cold climate. While in the fence corner, I began to cover the vines a little and found they did better.

Soon after being planted by the new house they began to bear fruit, and have produced more or less from that day to this. Of course they have been well protected in the autumn, which has always been done with earth. Sometimes I have put a little manure over the covering of earth, but do not deem it necessary—except perhaps in the case of small vines of the more tender varieties. Soon after the Isabellas were planted by the new house I set out two more vines, one the Old Clinton, and the other what was said to be the Catawba, but was not true to name.

From my old vines I propagated a number of young ones which were set out by a high fence. I kept on propagating until I had growing about thirty vines of the four sorts first obtained.

I was so well pleased with my success with grapes that I concluded to plant more kinds and start a vineyard. My first Concords and Delawares were obtained of Mr. Ford, who had often urged me to go into the business, as the climate seemed so well adapted to the cultivation and ripening of this excellent fruit. I was pretty careful, however, and would not go ahead faster than I had proper experience, with the various kinds and their treatment.

Some time after, I got a few Northern Muscadines, Oportos, Delawares, and some others of Mr. Smith. From time to time I purchased of others, and a great number of varieties.

In starting my vineyard I prepared the ground with the plow, then followed with the spade throwing out the soil until it was worked up about sixteen inches deep. I next built a tight board fence from eight to ten feet high, on all sides except the south. This was done because I had not a good site for the vineyard business, it being almost level, or sloping a little to the southwest. It is also at the foot rather of quite a hill. Hence it is not so free from frost as on the top of a hill.

MY FIRST SHOW AT THE FAIRS.

In 1860 I took my first grapes to the State Fair, which was held at Fort Snelling. The kinds exhibited were the Isabella and a dark

grape that was bought for the Catawba, but nobody knew its name, and it has since been discarded. I did not take any to the fairs when held too far from my home, but have had fruit every year. One season, however, in 1869, I believe, they did not mature well, on account of a very early frost. The next season the vines did not yield a first rate crop, as they seemed to have been injured by the hard freeze the previous fall.

THE NUMBER OF VINES, SALES, &C.

The amount of ground I now have in my vineyard is about two acres, but one-half acre of which has been set during the past two years and has not produced a crop. The whole number of vines in bearing is 825 including about forty varieties, some twenty of which have produced fruit. My leading kinds are the Concord, Delaware, Hartford Prolific, Northern Muscadine and Creveling.

Since the fair at Fort Snelling, I have raised more or less fruit to sell. My markets are St. Paul and Minneapolis, the latter being the place to get the best prices, not being so overstocked with fruit from below. One year my crop brought forty cents per pound at retail, and thirty cents at the stores. In 1874 my sales were 8,600 pounds, being my largest crop. The amount received was \$1,077. They were nearly all sold at wholesale, the Delawares bringing 18 to 20 cents, the Concords 10 to 12½ cents, the Creveling 12½ cents per pound. The Hartford and Muscadine brought 15 cents at first and 12½ to 10 cents later.

The average for Delaware per vine \$1.39½; Concord \$1.43; Hartford \$1.41; the Northern Muscadine \$1.51½, the best of all. Some of the Delawares were not in a suitable place, which reduced their amount. They are quite particular about their treatment. Some seasons the result might be quite different from the above. The business has paid well the past four years.

TIME OF RIPENING.

The first to ripen is the Hartford, and a few days later the Muscadine, then the Delaware and Creveling, and last the Concord.

The first two drop their fruit and last but a short time. Some of the newer sorts may take the place of the above. When we have a good year for dent corn, our grapes ripen well. We need something that will do well when we have a short season.

I am looking for some variety as good and productive as the Concord, but earlier. This would be a great thing for the vineyardist, and indeed for the masses.

PROTECTION, SOIL, &C.

My practice is to prune the vines in the fall and cover, leaving a pretty good supply of wood as some damage is quite sure to occur. If too many buds start in the spring some are rubbed off. I do not follow the course laid down in the books altogether, in this climate, but am guided very much by circumstances.

My soil is rather a sandy loam and was formerly covered with such timber as maple, basswood, elm, butternut, hickory, iron wood, &c.

RUDOLPH KNAUPHEIDE.

Reserve, Ramsey Co., January, 1875.

REPORT FROM SOUTHEASTERN MINNESOTA—BY J. S. HARRIS, LA CRES-
CENT, HOUSTON COUNTY—READ BY GEN. S. P. JENNISON.

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

In discharge of my duty as defined in Art. 6 of the By-Laws, I would submit the following very imperfect report:

The season of 1874 was rather unusual for this part of Minnesota. The whole season averaged dry, and the heat at times was excessive. Several days during the summer the mercury stood for hours at 102 in the shade, and on the 10th of September it reached 106 in the shade, and 130 in the sun. This kind of weather was disastrous to some kinds of fruit, and injurious to all, unless it was grapes, which are better in hot, dry seasons than cold wet ones.

From all the information I am able to procure, the disasters of the winter of 1872 and '73 were not over-estimated. The slaughter of apple, pear, cherry and tame plum trees was very great. Our largest and best orchards were mainly planted before the organization of the State Horticultural Society, and before any correct information had been collected and disseminated in relation to hardiness of varieties, and consequently each individual ordered and planted largely of those varieties they were familiar with in their former and more favored homes. As a consequence almost every variety named in Eastern catalogues, to the number of hundreds, had a representative here, and they all, with few exceptions, perished. No doubt the loss would not have been as extensive, if hardy roots had been used for grafting upon. Those who have from time to time added to their lists the hardier and newer varieties have trees still living and promising fair returns, and it is a remarkable coincidence that nearly all of the fruit raised the past year in this district, is of the varieties that have been recommended by the State Horticultural Society; and of all the varieties they have ever recommended for cultivation or trial the Ben Davis is the only total failure, and all others are recovering from their injury, and promise good returns. The heaviest loss occurred in and around Caledonia, where but few of the newer varieties were grown.

The apple crop of the last year was larger than any previous year except 1872. The Duchess, Tetofsky, Red Astrachan, Fameuse, Saxton, Tallman Sweet, and some varieties of Russetts, have done the best. The Red Astrachan although discarded by the Horticultural Society is redeeming itself and proving more valuable for this district than the best Siberians. As an illustration I sold fruit from six trees to the amount of \$55.00 and from 25 trees of Transcendent Crab that would average much larger to amount of \$60. The Astrachans were eagerly sought for and the crabs were hard to dispose

of. Very likely our market needs educating, and perhaps the time may come when people will appreciate the merits that the Siberian have over the common apple. The winter of 1872-3 may have been a God-send to croakers and tree men but it was a great misfortune to the fruit growers for the time being.

Transcendent and Hyslop Crabs have borne much less than a full crop with some few exceptions. The exceptions are trees upon the high bluffs where the blight has not yet reached. The short crop is attributed to the fire blight which prevailed more extensively among the crabs than usual, while the common apple generally was exempt except when growing in the immediate vicinity with crabs.

Strawberries and Raspberries were a short crop. The Wilson is the leading and most popular strawberry grown, and Doolittle's Black Raspberry is more extensively grown than all others.

Currants and gooseberries were also a poor crop. They were probably injured by a late frost and dry weather.

The grape crop was average, and the quality surpassed any previous year. The bunches and berry were somewhat smaller than usual, but the richness and sweetness were all there. The most attention is paid to the cultivation of grapes in the towns of Brownsville, Hokah and La Crescent. The variety most extensively grown are the Concord and the Delaware.

NEW FRUITS.

Some new seedling apples and crabs have fruited for the first time, but as far as I am able to learn, nothing has been brought out that promises to be of any great value.

Insects injurious to fruit and fruit trees have been more numerous and destructive than ever before. The apple worm, the larvæ of the codling moth is doing considerable damage, and unless a united effort is made to head them off and destroy them, sound, fair apples will soon be the exception and not the rule. The borer, of two or more species, is making sad havoc among the newly planted trees, and as but few of our fruit growers have any knowledge of entomology, they are compelled to fight them at a disadvantage. The twig pruner or saw-worm is increasing to an alarming extent. Their visitations may be only periodical, as with the oak tree-pruner, but if not, they must be met and conquered, or disaster will be sure to follow. By capturing and destroying the perfect beetle before the eggs are laid, and gathering and burning all affected branches, they may be headed off. I have but just commenced the study of entomology, but have during the past year raised some of the worms to perfect insects, and from the study of their habits am satisfied that they may be kept under by keeping paper bands, same as for codling moth, about the trees, and removing and killing as often as twice a week. The perfect beetle is a neat little fellow, more than half an inch long, dark brown color, and belongs to the class of snapping bugs, and feeds upon the foliage, and sometimes the fruit, of the apple tree. The larvæ burrows in and feeds upon the pith of the branches, and just before entering into the pupa state, saws the

branch from the tree and falls with it to the ground, and probably comes forth a perfect beetle the next spring.

In the month of August last I received a communication from the Secretary of the Penn. Hort. Society, requesting specimens of fruit to show upon the National Dessert Table, at their Autumn Fair. I complied with his request, and also sent specimens of most of the finer fruits grown upon my place, which without any solicitation on my part were entered for competition, and were awarded the third prize, a silver medal, which (unlike the awards made at our last State Fair) has been duly received, and is highly appreciated.

JOHN S. HARRIS.

La Crescent, Minn., Jan. 15th, 1875.

P. S. I raised last year about three hundred bushels of apples, which I consider a pretty fair thing after losing so many trees by the winter of 1872 and 1873.

On motion the above was accepted and placed on file.

Mr. Jewell moved that any member be allowed to bring up for discussion any seedling apple that he thinks of value to the State.

The motion was adopted.

THE PEACH APPLE.

Mr. Jewell said this apple he considered quite as hardy as the Duchess. He obtained cions of this variety from Northern Vermont. It probably came from Canada.

Mr. Elliot saw it on exhibition at the biennial session of the American Pomological Society, by Mr. Bryant. He stated that it was a very hardy tree well adapted to northern climates. The apple is a little larger than the Malinda of a light peach color. From all the facts he could gather, he thinks it will prove desirable for us to experiment with.

Mr. Brand said he had one tree of this variety.

THE JENNITON.

Mr. Jordan spoke of the Jenniton. He thinks it more hardy than the Fameuse or Haas. They are the finest trees in appearance of any in his orchard of 1,000 trees. He has some in the nursery that were three years old the hard winter of 1872 and 1873.

Dr. Jewell said this tree was a Southern apple. It ripens like the Ben Davis, when the tree becomes old. The fruit is much smaller than at the South, where it originated. It soon dies after beginning to bear, even in northern Illinois and southeastern Wisconsin.

Mr. Gideon thought there were two kinds of Jennitons, one large and the other small. He had seen them differ in size in Illinois. He thought the kind Mr. Jordan has is the smaller.

Mr. Gould endorsed what Dr. Jewell said, according to his personal knowledge. He had seen them in Carver.

Dr. Jewell insisted there was but one variety, as he had lived in a Jenniton country many years.

Mr. Knaupheide had some experience with the Jenniton. The

first were brought from Illinois and set many years ago, but died in the ground the hard winter of 1856-7.

He got some more of Mr. Ford later that seemed more hardy, but smaller. They died a few years ago.

Dr. Jewell said

THE DRAKE APPLE

is a Minnesota seedling; as fine a tree as he had ever seen; more hardy than the Haas or Saxton, and is much prized by the person on whose ground the original tree stands.

OTHER VARIETIES.

Mr. Jewett called attention to the White Astrachan. It is hardy and a very fine bearer, deserves to be put in the place of the Red Astrachan, for it is much more productive, but it is of slow growth. Ripens before the Duchess about two weeks. Bears at about six years old.

Burns' Seedling is a Siberian crab, smaller than the Transcendent.

Pickett's Seedlings originated in southern Minnesota from the Haas. All are remarkably hardy; some are very fine growers and fruit early and well. The fruit of none is large, but very good for cooking; about the size of the Soulard crab; the most perfect seedlings he had seen in the State. Valuable, he thought, for the extreme Northwest.

Mr. Jordan said the Pickett Seedlings were undoubtedly hardy enough for the extreme Northwest, as perfect trees as any of the Siberian variety. The season reaches to the middle of winter.

Mr. Jewell recommended particularly the No. 5, because it bore at five years old, and yielded well.

A committee of five was appointed to secure such legislation as was needed, consisting of C. M. Loring, D. A. J. Baker, Truman M. Smith, P. A. Jewell, General Jennison and Wyman Elliot.

On motion, adjourned to meet to-morrow morning, at 9 o'clock.

THURSDAY FORENOON.

The Society met at 9 o'clock, President Smith in the chair.

O. F. Brand was chosen Secretary *pro tem.* during the absence of the Secretary.

MORE SPECIMENS OF FRUIT, ETC.

In addition to the specimens of fruits, etc., already noticed, there was a fine collection of the Wealthy apple, raised by Mr. L. G. Gould, of Excelsior, Hennepin county, and also an interesting collection of beetles and millers, exhibited by Wyman Elliot, of Minneapolis.

THE APPLE LIST—THE EARLY STRAWBERRY.

The Society resumed consideration of the fruit list. A motion was made to recommend for general cultivation the Early Strawberry. Mr. Jewell said it was handsome, and hardy, and free from blight. Had three trees in bearing, finest in his orchard. In its season was preferable to Transcendent. It had one fault, it don't keep long.

Mr. Dartt moved that it be named for general trial. It had not been known sufficiently long. Same might be said of all such varieties.

Mr. Jordan thought it as good as any of the Siberian apples he knew of. Thought it perfectly hardy.

Mr. Dartt's motion was then put and carried.

THE ORANGE.

Mr. Dartt moved that the Orange go on the same list.

Mr. Jordan thought it the best crab. It ought to constitute 90 per cent. of the crabs in every orchard. Does not blight and keeps till midwinter.

Mr. Jewell said it was a special pet of his—had planted and would plant largely of this variety. Fruit kept nice for two months, and was fit to ship to other markets. The tree was a moderate grower, annual bearer, and handsome as an ornamental tree.

Mr. Brand favored the Orange. Would keep till February. It flourished as far north as Alexandria, and is found also at Wells and Albert Lea.

The variety was therefore unanimously recommended for general trial.

BEECHER'S SWEET.

Mr. Jewell said Beecher's Sweet was very hardy, strong and a handsome grower. Does not bear very young, yet very profusely—much larger than the Transcendent crab. Inclined to blight.

Recommended for general trial.

THE MINNESOTA.

Motion was made to place the Minnesota on the same list.

Mr. Jewell thought this the most remarkable of all our crabs. The fruit is the size of the Fameuse. Tree scarcely inferior, and very hardy and free from blight. Skin of fruit very thin. Was inclined to think it would keep, and that it was the most valuable of all the crabs.

The motion was carried, seven for and none against.

THE CONICAL.

The Conical was next considered. Mr. Jewell thought it a very good thing. It was about the size of a Transcendent. Hardy

enough, and not liable to blight. Although not a culinary apple, it has a peculiar spicy flavor, and to pass it by as had been suggested would be a great mistake.

Mr. Brand had a few of the variety; were rapid growing trees; the largest of their age. Fruit good and very much like the Black Gilliflower. His had not blighted.

It was then placed on the list for general trial. The Quaker Beauty and Maiden's Blush were disposed of in the same way.

HUTCHINSON'S SWEET.

The Hutchinson Sweet was next taken up.

Mr. Dartt said his trees did not promise very well.

Mr. Jewell said his trees were hardy, but blighted some. It was not a very good bearer, nor an apple highly productive. His trees had not suffered very much.

A motion to pass it over was then adopted unanimously.

MEADER'S WINTER.

A motion was made to put Meader's Winter on the list for general trial.

Mr. Jordan moved to amend by adding "in localities not subject to blight."

He said it was worse with him than the Transcendent.

Mr. Jewell said it was the best keeper of all the crabs, but was very subject to blight.

Mr. Jordan said but for the blight it would have been a pet with him instead of the Orange. Unsurpassed for productiveness and quality, but blighted a good deal.

Mr. Brand said the twigs of his trees had blighted. It grows very well, and is of enormous growth. Not quite so hardy as the Orange crab. Fruit highly flavored and keeps well—very well.

A member said he had grafted some on Transcendent stock, but the hard winter had killed them.

Motion as amended was then carried—4 for, 3 against.

GENERAL GRANT.

Mr. Jewell said the General Grant was the most productive tree he had ever had.

Mr. Dartt moved to recommend it to those not afraid of blight. Carried.

HESPER BLUSH.

Hesper Blush was next taken up. Mr. Jewell said it was a handsome tree, but didn't bear very well. With him it had never blighted.

A motion to pass it was adopted by 6 to 3.

AIKEN'S STRIPED WINTER.

Aiken's Striped Winter was then put on the list for favorable localities by a vote of five for and none against.

AIKEN'S GREEN WINTER.

Aiken's Green Winter was passed, four to none.

HYSLOP CRAB.

A motion was made to discourage the cultivation of the Hyslop Crab.

Judge Baker coming in just then made a heavy speech against the motion. They looked, he said, to the Hyslop and Transcendent to get all their fruit.

Mr. Dartt would like to see the tree stricken from the list. The tree was hardy, but subject to blight.

Mr. Smith's experience did not coincide with those of others. The Hyslop in the St. Paul market would bring one-third more than any other crab. It was famous for jelly. If fruit growers would take hold of it, thousands of dollars might be saved by going into the manufacture of jelly. It keeps longer than any other crab in the market, with the exception of the Soulard. Blights a little, but should be retained on the list.

Mr. Gideon gave his experience. He could get 25 per cent. more for the Hyslop than for the Transcendent, but could make more at selling the latter at \$1.25 than the former at \$1.50. He was not in favor of discarding it, by any means.

Mr. Brimhall was in favor of retaining it. It sells readily in market, the color is good, and he thought it a valuable apple for this locality. He could never get enough to supply his customers.

Mr. Jewell said the objection to the Hyslop was in his mind so strong as to constitute a sufficient reason for its rejection. It has a thick skin, is liable to blight, and generally inferior to the others.

A motion to strike it from the list was lost.

Mr. Jordan thought the Hyslop, in comparison with the others, was pretty much as the fellow's mixture of sawdust and meal, for wintering calves—the less sawdust there was, the better. The less Hyslop there was, the better.

The variety was finally recommended for cultivation in small quantities, by a vote of 10 for and 3 against.

THE TRANSCENDENT.

The Transcendent was next taken up. Mr. Jewell moved that it be placed on the list for general planting, for those not afraid of blight. There was, he said, no dispute as to the quality of the fruit. Blight was the only cause of trouble.

The motion was passed, 14 to 1.

COMMITTEE TO VISIT THE LEGISLATURE.

Mr. Ford then offered the following resolution, which was adopted :

Resolved, That a committee consisting of Gen. Nutting, Dr. P. A. Jewell, Judge Baker, Col. J. H. Stevens and Mr. Brimhall, be appointed a committee to visit the capitol and invite the members of the Legislature to meet with us for the purpose of examining the Minnesota fruit on exhibition, and to unite with us this evening in discussing the question of forest tree planting on the prairies.

Resolved, further, That the same committee endeavor to secure one of the Legislative halls for the meeting of the Society this evening.

WOODLAWN RED.

Mr. Jewell moved that the Woodlawn Red, of Wabasha county, be recommended for trial. The tree was hardy, fruit not quite first class, a little larger than the Transcendent, and keeps till midwinter. Its best season was November and December, but will keep till January and February. Color yellowish, with a red cheek, and was highly esteemed by its originator. It fruits at four years old.

Judge Baker thought the motion had better be adopted as they had to live on the crab family.

Mr. Brand regarded it as a first-class fruit, a little larger than the Transcendent.

Mr. Dartt said that as it was bearing in only one or two localities, it had already been given sufficient notoriety.

The question was put, and a tie resulted—3 for and 3 against.

THE SOULARD.

On motion of Judge Baker the Soulard crab was recommended for general use in small quantities—6 for, 3 against.

PLAN FOR OPERATIONS AT THE UNIVERSITY.

Prof. Lacy read a paper on the general plan and operations at the experimental farm and garden at the University.

A resolution was passed asking persons to make contributions of seeds, &c., to the State University.

AMENDMENT TO THE BY-LAWS.

Mr. Dartt moved that the by-laws be so amended as to elect officers by ballot.

Col. Stevens moved to amend by *viva voce* vote. The ballot partook of the nature of dark lantern affairs, and he didn't like them.

Judge Baker went back to Jefferson, and talked about office seeking the man, and not the man the office, then branched off to emoluments, the caucus, the dead lock at the capitol, comprehending all things celestial and terrestrial, and finally wound up for a moment, when on motion the whole matter was laid on the table.

DISCUSSION ABOUT THE MINUTES.

An effort was here made to have the Secretary read his minutes of the last two days for the purpose of corrections, but after considerable discussion was abandoned.

A motion was adopted that no member be allowed to patch up any speech he may have made during the present session.

THE NEXT PLACE OF MEETING.

President Smith spoke of the difficulties under which the Society had heretofore labored. This year there were three propositions before the Society—one to meet at Winona, a second at Northfield, and a third at the State University.

Prof. Lacy spoke of having a summer meeting, and would be glad to have them at the University. It would be a good time to show small fruits.

Mr. Herrick moved that the executive committee be empowered to call a meeting next summer.

AMENDMENTS TO THE CONSTITUTION.

Mr. Jewell moved that a committee of three be appointed on amendments to the constitution and by-laws, to report at the next winter meeting.

The motion was adopted, and Messrs. Ford, Gideon and Dartt were appointed such committee.

Mr. Dartt declined, and this led to considerable talk, during which some sharp things were said by several members, and Mr. Gideon declining also, Messrs. Gould and Hodges were substituted in their places.

LADY MEMBERSHIP.

Another question sprung up relative to the admission to the Society of ladies, owners of, or managers of, conservatories or flower gardens, and contributing to the Society a paper on Floriculture, and wives of members, without the payment of the necessary dollar. A motion to the above effect was voted down.

THE EX-SECRETARY'S REPORT.

Mr. Hodges called attention to a line on the 15th page of the Secretary's report of last year, "Corrupt and ignorant legislators may defraud us of our rights," and moved to expunge it from the record.

The question recurring on Mr. Hodges' motion, Mr. Ford moved to amend by adding that "the Society do not approve the statement."

Col. Stevens disapproved of the amendment. He had been a legislator, and he knew how it was himself.

Judge Baker contended there was nothing wrong in the words.

The legislators were the servants, not the masters of the people, and it was their duty to promote the interests of the Society.

The matter was finally laid on the table, and the meeting adjourned to meet at 2 P. M.

THURSDAY AFTERNOON.

The Society met at 2 o'clock, and was called to order by the President.

THE NEXT ANNUAL MEETING.

Col. John H. Stevens moved that the next annual meeting of the Society be held either at Minneapolis or at the State University.

The President stated that Winona and Northfield, as well as the University, had extended the Society invitations.

Col. Stevens thought it would be best to hold the next annual meeting at the University on the 3d of next January.

Mr. Brand thought it no more than justice to the southern part of the State, where the great majority of the fruit growers reside, that they should have the next meeting. They could attend with greater facility.

Mr. Ford thought different. Minneapolis and St. Paul were more central and convenient to all.

Mr. Gould favored leaving the matter to the executive committee. It was a burden to members of the Society from the southern part of the State to force them to come to St. Paul and Minneapolis every year.

Mr. Dartt was of the opinion that localities where the meeting is held had a decided advantage. He didn't care to intimate that there was a "ring," but if the Society was permanently located in either of the cities named, it would be regarded as a local institution. The Mississippi Valley could raise fruits that could not be raised back of that river. He thought it would be just to give the towns back of the river a little chance. The executive committee should give notice that they are open to propositions from places that want the meeting held there.

Mr. Brimhall moved to lay it on the table, as it was time enough for the executive committee to determine the matter. Carried.

LADIES TO BECOME MEMBERS.

Mr. Ford, from the committee on amendments, made the following report, which was adopted:

The committee appointed on amendments to the constitution recommend the following to be added to article 3: That the wives of members may become honorary members without the payment of the

annual fee; also any lady or ladies who may contribute articles or papers for the annual transactions of the Society.

In article 5 the words "by ballot" be inserted after the word "elected."

OBITUARIES.

The Secretary stated that several of the pioneers of our Minnesota horticulture had died during the past year. It would seem as though some action ought to be had by the Society on the subject.

On motion the Secretary was instructed to prepare obituary notices for the Transactions, of such persons as have died during the year.

REPORT FROM HENNEPIN COUNTY, BY WYMAN ELLIOT, OF MINNEAPOLIS.

The past year can hardly be called a success by the fruit culturist. Frost, drouth, and insects have given him much to contend with, and except in few cases, where extra care and situation has insured him a fair yield and good prices for fruit sold, has shortened the crop of all varieties of fruit. Our first summer fruit is the

Strawberry,

and I think none of us can deny a failing in that direction, especially when served with good, rich cream and sugar. The vines wintered as well as usual. Notwithstanding the poor prospect for fruit in the early part of the season, caused by drouth blighting the blossoms, a few light showers helped materially to increase our anticipation, although on an average it proved not half a crop, many of the berries being shriveled and tasteless, lacking the delicious flavor usual in more favorable seasons. Some complained that their vines had not their usual healthy appearance, the leaves being full of holes and appearing ragged and worm-eaten. Some patches were almost entirely destroyed by the larvæ of the June or Dor bug.

Perhaps a word or two of what I heard and saw while in southern California, may not be out of place here. There strawberries are grown in forty, eighty, or one hundred acre patches. The land used is interval valley land, rich, deep soil, inclined level, falling one foot to three or four hundred feet. When not as level as desired, it is graded so that waters from the upper side will flow gently over the whole area. The water is obtained from a zanja (water ditch) or artesian well. When the grading is completed, the land is divided into beds three feet wide or laid off into rooms for receiving plants; plants set and a quantity of water sufficient to saturate the surface turned on. When dry enough it is well raked over and loosened leaving it in a condition to withstand drouth and prevent baking and cracking. After from three to six weeks it is again irrigated and raked as before—not a weed to be seen, nothing but clean, healthy vines that yield abundantly. Nearly all the work is done by Chinamen. Many lease their grounds to the Chinese for a certain share of the receipts from the sale of crops, deducting freight and com-

mission. Strawberries are in season almost throughout the year, but the fruit is not so richly flavored as ours.

Currants.

The crop was very light, and in many instances an entire failure, owing to the injury received from the currant borer and worm (*abraxas ribearia*.) In some cases the bushes were entirely destroyed. I managed to save a small part of my crop from the ravages of this pestiferous insect, by the use of Paris green and flour. One part Paris green to twenty-five parts flour dusted on when the bushes were wet with dew or wet by sprinkling water. I prefer flour to any other article I have used. The gluten in the flour causes the green to adhere and often withstand several showers. I made two applications during the season, and am in hopes to secure part of a crop the present year.

Gooseberries.

The gooseberry crop was very poor, owing to the loss of foliage by the small green gooseberry worm. Apply the same remedy as for the currant worm.

Raspberries.

The yield of fruit was quite small, the canes of both black caps and red Philadelphia being much injured the previous winter. Although the winter of 1873 and 1874 was considered very mild, from some cause the raspberry canes in the spring were in many instances killed down nearly to the ground.

Apples.

Most of the apple trees withstood the winter without injury. Many of the tender varieties have done well the past season, and some few bore quite abundantly, but as a general thing the crop was below the medium. The summer's drouth caused many to fall prematurely, and those remaining to ripen were in comparison with fruit of other years small. Many of our seedlings have risen in the estimation of our fruit culturists in a remarkable degree. Foremost among these stands the Wealthy, which should be looked upon with pride. And we as a society should render due praise to Peter Gideon, the originator and propagator of a seedling comprising hardiness, productiveness and flavor, qualities very essential to a tree in this climate. It is sought after from all the States in the Union, and at no distant day will be looked upon as the *ne plus ultra* of the Northwest.

Plums

in the early part of the season promised a heavy yield. In July the trees were overladen, but the drouth in August shortened the crop. Still, plums were never more abundant in our market, ordinary qual-

ities selling oftentimes for fifty cents per bushel, which hardly paid for picking up; while the fine varieties, such as Harrison's Peach, Apricot, Big Red, Elliot's Big Cherry, and some others, sold readily at \$2.50 to \$3.00 per bushel. Quality and size are as much sought in this class of fruit as any other.

EVERGREENS AS A PROTECTION TO FRUIT TREES—AN ESSAY READ BY
O. F. BRAND, OF FARIBAULT.

If, as has been often stated, "A thing of beauty is a joy forever," and gladdens the heart of its possessor continually, of how much greater worth to the appreciative mind of man must it be, if at the same time, while imparting perpetual joy to its owner, it likewise contributes directly or indirectly to his material wants, thus becoming in a double sense a *joy forever*.

In the Horticulture of Minnesota, where man's most vigilant care and greatest skill is taxed to its utmost to counteract the perpetual war of a remorseless climate, I can conceive of no tree or class of trees so admirably adapted to meet the wants of our horticulturists as a "*Thing of Beauty*" as our coniferous trees. There is a grandeur about an evergreen imparted by no other tree. All people of keen perceptions admire them, whether in clumps or single specimens—planted to adorn the humble cottage of the villager with his one small lot, or the palatial residence and extensive grounds of his more pretentious suburban neighbor. I repeat, there is a beauty and a grandeur about them which fills the heart of every appreciative person with delight. As wind-breaks in this climate they should be regarded as indispensable to the comfort of man and beast.

Of their benefit to orchards, and their influence on fruit trees, there can be no doubt, while used as a protection from the severe winds. As a wind-break they are the most perfect protection that can be grown.

But it is not only as wind-breaks that they are valuable. In this climate, remote from water, even though we find hardy varieties of apples which so far as growth is concerned, seem capable of resisting the extremes of our climate, still they produce but little fruit, owing to the fact that their fruit buds kill, or their vitality is so impaired that they produce little or no fruit. The evergreens when planted around and among apple trees are said by one of our best authorities to continually give off an exodium of warmth and moisture, that reaches a distance of its area in height. He goes on to state that he has studied this matter thoroughly, and that it is his firm conviction that to ameliorate climate—to assist in prevention of injury against extreme climatic cold in winter and of the frosting of the germ buds of the fruit in spring—all orchards should have planted in and among them evergreen trees. Such being the facts, the double purpose will be filled, and the evergreens utilized by the horticulturist, and thus be made not only a protection but an imparter of life and force, whose power will gladden the heart of the fruit-grower when he beholds his trees bending beneath their weight of luscious fruit.

Then let us plant evergreens; not one or two in the tough grass

or dry sod to die, but plant in cultivated ground by hundreds and by thousands. Plant small trees under two feet, as they are less expensive than large ones. Plant all around your orchard, and promiscuously among your orchard trees, and if well cared for you will find that indeed you have a thing of beauty that will force you to see in it a joy forever.

Col. D. A. Robertson thought the essay sound doctrine. The Colonel then made a long speech, in which his pet theories were fully enunciated, and with much vigor and earnestness.

Dr. Jewell responded at considerable length, controverting Col. Robertson's theories, after which a recess of ten minutes was taken to enable the exhibitors of apples and other fruit to show the same to ex-Gov. Austin and several members of the Legislature, who had just previously entered the room.

DELEGATES TO THE AGRICULTURAL SOCIETY.

After recess the following gentlemen were appointed delegates to the Agricultural Society: C. M. Loring, Thos. Moulton, J. F. True, and Wyman Elliot.

Messrs. Dartt and Jewell spoke further on the subject of ever-greens.

On motion of Mr. Dartt \$5 was appropriated to the present Secretary, Mr. Ford, to pay for postage.

MARKET GARDENING ON LAKE SUPERIOR—REPORT OF J. S. BROCKLEHURST, ONEOTA.

Mr. President and Members of the Minnesota State Horticultural Society:

It may be considered somewhat presumptuous on my part to venture to place my views on the above subject before the members of this Society, knowing as I do how short a time I have resided in this country, having arrived from England only in May, 1873, and got settled on my farm in the above locality during the month of June of the same year.

But in this matter I have bowed to the peremptory commands of your worthy and enthusiastic Secretary, who issued his orders on the subject, without listening to a yea or a nay being allowed on my part; and in due obedience I will endeavor, briefly, to outline what I know of the matter in hand. Egotism forms a feature that is unavoidable, but for such feature your indulgent consideration is craved.

My farm is situated on the western extremity of Lake Superior, abutting on that part known as Oneota Bay, and very picturesque in its position. It is composed of bluffs, flats and bottom land, the soil being mostly reddish sandy loam, and very quick and warm. The timber upon it was mostly of white birch, of large size, indicating, as I am informed, and have found to be the case, a rich and productive soil. The subsoil is on most parts, so far as I have proved it, a strong clay, forming a good retaining bottom, not allowing the manure used to leach wastefully.

During the year 1873, having arrived so late in the spring, I had to bend to work, and was principally occupied in clearing up and burning the brush, with which the land was thickly covered. Notwithstanding I prepared about one-half acre around my house for raising such vegetables as were required for household purposes, such as potatoes, radishes, lettuce, cabbage, beans, (string, snap and Windsor,) peas, carrots, onions and turnips, as well as putting in a variety of herb seeds.

That season, as you are doubtless all aware, was wet. Everything put into the rich soil, (without one forkfull of manure,) owing to the warmth and moisture of the season, came rushing up with a vigor gladdening to my heart. In twenty-three days from sowing my radish seed I had that salad on my table, and as everything I had put in came in its due season, I had that year an abundance of vegetables of every description for household use, and of several a good winter supply.

I experienced, however, one drawback; owing to the advanced period of the season in which I sowed my seeds, those from which I wished to secure seed for future use, with the exception of peas, did not mature, more especially owing to an early and severe frost in September. This mishap, I am convinced now, would not ordinarily occur again, if the seeds were put into the ground at the earliest possible season.

The ensuing fall and winter I was occupied in chopping and clearing more land, and this spring I had fifteen acres roughly cleared for cultivation, the whole of which I got under farm and garden crops and grass, presenting "a thing of beauty," when the crops were all growing, not often seen before in that neighborhood, though alas, not "a joy forever." I also planted 1,200 rhubarb plants on about one-third of an acre of ground; also 4,000 Wilson's Seedling strawberry plants.

I need not inform the members of this Society to what perfection my vegetables arrived, for is it not "writ" on the book of the State Agricultural Association, that I am entitled to the premium for the "best display of vegetables, not less than thirty varieties?" Also the sweepstakes of \$50 for the county of St. Louis. My exhibits labored under one disadvantage, however—that the Fair was held here too early for vegetables grown in that northern locality being shown in their best maturity. Fortunate, perhaps, for the Association, it was so, otherwise the judges might have awarded me so many other premiums as to have put the commissioners utterly and hopelessly beyond the possibility of solvency.

Many have expressed the opinion to me that Lake Superior is too far north, and its growing season too short for productive and profitable cultivation. Neither of these is in my opinion true, after only two seasons of trial. But I may here refer to what the Weller Brothers have done—also Messrs. Youngblood and Gray, Lemagie, and one or two others. I unhesitatingly affirm that all kinds of vegetables, natural to temperate climates, will mature to the greatest perfection. I may say, without detracting from any small merit of my own, that if some of those gentlemen had sent to the Fair a few

of their choice vegetables, that some of mine would have been put into the shade.

I am convinced that with proper manuring and cultivation that that district is unsurpassed for raising all kinds of roots and pulse, and also cauliflower and broccoli. I raised some heads of the former on land without manure, quite new, and never turned over either with plough or spade, that weighed, when trimmed, from two to four pounds each. The kind was Carter's "Dwarf Mammoth."

I also raised to ripeness, corn, tomatoes and musk and watermelons, as also Marblehead and Canada Crookneck squashes. The tomatoes were of two kinds—Canada Victor and Carter's Early Red, one of which latter, without any forcing, and taken from the plant with a large quantity of others, weighed one pound six ounces.

But I do not think as a general thing or to be counted as a certainty, that these fruits last referred to would ripen every year in that neighborhood. However, to sum up: I did not find my gardening business a commercial success, principally from the great collapse that occurred in the prosperity of my principal market, Duluth, and from the fact, too, that owing to the lateness of the season at which garden products come to maturity, the public demand for early vegetables is supplied by importations from this neighborhood and the public appetite satisfied. There is therefore but small local demand for vegetables, properly so called, till Duluth rises from her present depressed state. My future intention, so far as I can peep into futurity at present, is to cultivate my land in small fruits, and I hope at some future time to force from St. Paul a return of the dollars she now draws from Duluth for vegetables, for the strawberries, &c., I expect to send her before a very long period elapses.

The seeds I used were in the major part brought from England.

Before closing allow me to say a few words on "hedges:" There seems a difficulty on the most part on this subject, where there should in reality be none. America, in many States, produces abundantly its own best plant for this purpose. I allude to the "Pear Thorn." It is objected to by some as too slow growing. This feature, I maintain, is its great recommendation. What farmer wants to occupy valuable time every year in trimming or repairing fences? It is true the "Pear Thorn" may be some years coming to a sufficient growth to repel cattle, sheep and hogs, but when once in that condition it may be said always to be so. What man, with a grain of judgment, can call willow a fence? It may be grown to be a wind-break, but can never be urged into a fence. Let me entreat my hearers to patiently give this plant a trial—say round their half acre or acre garden, or to a small enclosure of flower garden in front of their houses, and I am sure the result will be satisfactory to them. The raising of "quicks" will present itself, probably, to some of the nurserymen present, as another profitable branch of their profession.

COMMITTEE ON ENTOMOLOGY.

R. J. Mendenhall, Rev. J. Marvin, and J. S. Harris were appointed a committee on entomology.

REPORT OF FINANCE COMMITTEE.

The report of the finance committee was accepted and placed on file.

BAY WINDOW PLANTS—AN ESSAY BY MRS. GEN. VAN CLEVE, OF EAST MINNEAPOLIS. READ BY THE SECRETARY.

My pretty setting room is bright and elegant this cold winter morning, and looking all around it with calm content, I see no rose-wood furniture, no Brussels, Axminster or Wilton carpet, no lambrequins or fleecy lace window draperies, and no "what-not" in the corner, filled with rare and costly articles of *vertu*, and I mentally exclaim, what is it that so beautifies and brightens this *homely* little room?

On one side hangs a fine engraving of Ary Scheffer's "Christus Consolator"—a constant source of delight and encouragement; on another, a "Landseer," so life-like that the dogs almost greet me audibly. Scattered about, in appropriate positions, are some pretty chromos and fine photographs. On either side of the window, on rustic brackets, stand an Apollo, and she who went mad for him, the shy modest Clytie, just in the transition state from the broken-hearted maiden to the sun-loving Helianthus, and between these statuettes a bay window filled with lovely plants. As the bright sun streams through and over them making summer in my room, it is hard to believe the report just brought in: "Mercury down to 25° below," and this window is what gives an air of elegance to our plainly furnished but wonderfully cosy, family room. A friend once said to me, "a painting of that size representing such a bower of beauty, could not be purchased for a thousand dollars."

Sometimes when busied and perplexed with cares and wearisome duties, I come into this room, look at my plants, and get so filled with a sense of God's goodness in creating such loveliness, and his love in placing it within my reach, that, after resting a few moments, my weight of care seems lightened, and there creep into my heart, sweet thoughts of the fadeless flowers of that beautiful land, where by God's grace I hope some day to find my home, and remembering "that the sufferings of this present life are not worthy to be compared with the glory that awaits those who love God," I rise up refreshed, comforted and strengthened, and go singing to my work, which although just as hard as ever, has, through the influence of my "bay window plants," been made endurable and even pleasant.

Such a window then, is not only beautiful to look at but has a real moral influence, and it rejoices my heart that so many of my neighbors are making efforts to establish in their winter sitting rooms, window gardens which not only gratify themselves but cheer the passers-by.

Now one of the chief sources of satisfaction to be derived from "Bay window plants" is the pleasure they give to outsiders. I never put a curtain to the window nor close the blind, but as soon as it grows dusk, just "twixt the gloaming and the mirk," light a lamp, placed conveniently for the purpose, which with the light from our

open old fashioned fire place makes a warm, bright picture for those, who having, perhaps, been overburdened through the day, are hurrying home tired and worn; they cannot look in upon such brightness and beauty, breaking suddenly upon them, out of the cold and darkness, without being cheered and softened. Who can tell but some boy who, far from home influence, has been tempted to leave the right way, may be hurrying to some low haunt of vice, and seeing the bright bay window with its beautiful occupants, may be reminded of the geranium that grows in "mother's window at home," and thinking of that dear mother who he knows calls down blessings on his head, may turn from his evil purpose, and resolve to do nothing which could grieve that loving, trusting heart.

By all means let every one who can, cultivate "bay window plants," and let their light shine on and through them, in such a way that others seeing their good works, may be led to glorify our Father who has created so much beauty for wayfarers through this world of trial, temptation and suffering.

As the result of several years' experience in this special department of floriculture, I would say that many plants which thrive well out of doors through the summer, will not prove satisfactory in a bay window.

Those that have best repaid me for the care necessary to bestow upon them are the Zonale or horse shoe geranium; the Pelargoniums; the various kinds of Abutilon; the Ivy geranium with its rich, dark green, wax-like leaves, made perfect by their zone of brown.

The Fuchsias, with their brilliant pendants so exquisite, that one must be cold indeed to see them without expressing delight; the different varieties of Bouvardia, a comparatively new and very satisfactory plant, with trumpet-shaped flowers in clusters, reminding one somewhat of the Honeysuckle; the brilliant crimson Coleus; the Maurandya, a beautiful, graceful vine, and very easily cultivated; all the varieties of Ivy; the time-honored, graceful and free-growing Madeira vine and Smilax, so justly admired and so useful for all sorts of floral decoration. Last and best loved by me of all my floral family, because it was my first and has been a most enduring treasure, I name the elegant Calla Ethiopica, exceedingly valuable for its bright glossy foliage, and bearing a magnificent fragrant monopetalous blossom, which standing out fair, pure and saint like, makes one feel that "Solomon, in all his glory, was not arrayed like this" queen among the lilies, clothed and made glorious by the Almighty hand.

Hanging baskets are beautiful adornments to a bay window, and for these I find very suitable any of the vines above mentioned; also the silver-edged Vinca, the glossy-leaved Myrtle, (the Periwinkle of Old England,) a plant I dearly love, from having seen it in great profusion covering, protecting the nameless graves in the neighborhood of Southern battle-fields. Then there are the different varieties of Saxifrage that grow so thrifty and with their pretty pink blossoms are very satisfactory, and the Moneywort which seems to have been made for this very purpose.

There are many other plants suitable for window culture. I have confined myself to those which have proved most satisfactory to me,

and experience has taught me that it is unwise to try to keep too many. Sometimes in the fall, when everything is looking its loveliest, we are tempted to bring in so many things that we cannot give them all the sunshine they need; then it is wonderfully disheartening to have to remand one after another to the cellar. To me it seems like putting friends, who have been condemned, through no fault of their own, in a dungeon, to weep their lives away. A south bay window is the proper one in which to keep plants—one catching the morning sun is of all things desirable. Plants are sun-worshippers, and they thrive much the best when they attend to their devotions in the early morning.

The care of house plants in the winter is by no means easy or light; but they of the weaker sex can almost always secure the assistance of one or more of the dear group, whose stockings we darn, or whose shirt buttons we replace. Love labor is very faithful and satisfying, and fortunate will she be who, like myself, has ever at hand one whose happiness is to minister to her comfort and joy, and who in doing so becomes so interested in the work itself, and learns to love it so well, that he needs no urging or persuading from her to induce him to take the very best care of her dear "bay window plants."

C. O. V.

Minneapolis, Jan. 18, 1875.

A vote of thanks was tendered the writer, for her very able and instructive essay, which was ordered placed on file, for publication.

COMMITTEE ON SUBSCRIPTION BOOKS.

Judge Baker moved that a committee of three, in conjunction with the President, be appointed to open the books and receive subscriptions to the Association. The motion was adopted, and C. M. Loring, Col. D. A. Robertson, and Norman Buck, of Winona, were appointed such committee.

Judge Baker moved that when the meeting adjourns, it adjourn to meet at the Capitol at 8 o'clock. Adopted.

VOTE OF THANKS.

Mr. Wyman Elliot offered the following, which was unanimously adopted:

That we render a vote of thanks to the citizens of St. Paul for their generous entertainment to our members, and to the press of the city and State for the able manner in which their reporters have brought our proceedings before the public. Also, to the County Commissioners and the Sheriff of Ramsey county, for the use of their hall, and may the genial shadow of the sheriff never be less.

COMMITTEE ON FLORICULTURE.

The following were appointed a committee on flowers and floriculture: Mrs. Gen. Nutting, of Faribault; Mrs. Gen. Van Cleve, Minneapolis; Miss Gill, St. Paul; J. C. Fleischer, St. Paul; J. E. Booth, Minneapolis.

On motion of Mr. Dartt, President Smith was allowed \$3.00 for postage.

Adjourned to seven o'clock.

THURSDAY EVENING.

The Society assembled shortly after 7 o'clock, in the hall of the House of Representatives, President Smith in the chair.

The committee on constitution and by-laws was re appointed, and ordered to report at the next annual meeting.

NOTES ON THE BIG WOODS.—BY N. H. WINCHELI.—READ BY PROF. LACY.

“The Big Woods” of Minnesota consist of a southward spur from the forest-covered portion of the State, covering a strip about forty-five miles wide in the centre of the State, and reaching nearly to the Iowa State line. By this spur the prairies of the State, at least those in the southern part, are divided into two parts, the greater of which lies on the west of the Big Woods. The great material advantage the farmers of Minnesota occupying the prairies, have over those who in other States are much further removed from timber, is easily seen, while others who prefer timbered land to prairie, have the choice of thousands of acres yet unoccupied in the region of the Big Woods. The boundary of this southern prolongation of the northern timber is not well marked, the trees gradually becoming thinner and smaller, and more and more restricted to the valleys of streams, till the country is changed to a treeless prairie. Around the outskirts of the woods small oaks and aspens constitute almost the only arboreal vegetation, but within the woods a great variety of hardy deciduous trees are found, mingled with the usual species of shrubby vegetation. The general surface is much more rolling than in the prairie region on the east or west, and the soil seems to be coarser, with more frequent boulders. Yet there are also extensive flat tracts in the Big Woods, that are as level as any prairie region.

In general, the Big Woods may be thus bounded: Beginning a few miles west of Minneapolis the eastern edge of the Big Woods crosses the Minnesota in a line toward Lakeville in Dakota county. Continuing in a southerly direction, it passes about a mile east of Cannon City, and of Owatonna, when it takes a short bend to the west and northwest, passing about four miles north of Waseca, and near East Janesville, in Waseca county. In Blue Earth county it is variously modified by the valleys that are tributary to the Minnesota from the south. Continuing west, about six miles south of South Bend, it turns north and crosses the Minnesota, sending out a spur northwestward which follows indefinitely the Minnesota valley. Running along the west side of the Minnesota, distant from it about four miles, it begins to bear off toward the northwest at St. Peter, and passes five miles west of Henderson. Between Arlington and

New Auburn, in Sibley county, the timber line is on the east of the direct line. Near the former village, about four miles north, are some large patches of timber, containing large oaks on the west of the main road, and the line seems to swell several miles to the west, but at Arlington the timber is entirely on the east of the town. Between New Auburn and Glencoe the timber line runs about a mile east of the main road, and about three miles east of Glencoe. It is found again at four miles north of Glencoe. Thence it continues west and northwest to Darwin on the St. Paul and Pacific Railroad. North of that its exact location has not been traced. It seems to run still northwestwardly, and to include the region of small lakes in Pope, Douglas and Otter Tail counties and the region known as the *Leaf Mountains*, in the wooded portion. North of the St. Paul and Pacific Railroad, the Big Woods widen out rapidly, both to the east and west, merging into the general forest of the northern part of the State. The term is strictly, and originally, only applicable to the spur that includes the Lower Minnesota valley, extending nearly to the Iowa line. The writer has crossed this spur in a number of directions. In passing from Farlington in Dakota county to Shakopee in Scott county the following species of trees and shrubs were seen. For ten or twelve miles after entering the woods very few large trees were seen, the oak shrubs being the largest, and almost the only treelike vegetation. About half way to the Minnesota river the maple and large elms, bass and ironwood appear.

Trees and Shrubs of the Big Woods.

- Oak shrubs. Apparently *Quercus ilicifolia*. Wang.
 Hazelnut. *Corylus rostrata*. Ait. (?)
 Bur Oak. *Quercus macrocarpa*. Michx.
 White Oak. *Quercus alba*. L.
 Wild Red Cherry. *Prunus Pennsylvanica*. L.
 Trembling Aspen. *Populus tremuloides*. Michx.
 Choke Cherry. *Prunus Virginiana*. L.
 Wild Plum. *Prunus Americana*. Marshall.
 White Ash. *Fraxinus Americana*. L.
 Thorn. *Crataegus*.
 Rose. *Rosa blanda*. Ait.
 June Berry. *Amelanchier Canadensis*. Var. *Botryapium*. Torr. and Gray.
 Round-leaved Cornel. *Cornus circinata*. L'Her.
 Common Elder. *Sambucus Canadensis*. L.
 American Crab-apple. *Pyrus coronaria*. L.
 [The young twigs and the under surface of the leaves are very woolly pubescent.]
 Black Cherry. *Prunus serotina*. Ehr.
 Frost Grape. *Vitis cordifolia*. Michx.
 American Elm. *Ulmus Americana*. L. (Pl. Clayt.) Willd.
 High-bush Cranberry. *Viburnum opulus*. L.
 Two or three species of Willow. *Salix*.
 Green Ash. *Fraxinus Vividis*. Michx. f.
 Prickly Ash. *Zanthoxylum Americanum*. Mill.
 Cockspur Thorn. *Crataegus Crus-galli*. L.
 Red Raspberry. *Rubus strigosus*. Michx.
 Black Currant. *Ribes flodidum*. L.
 Cottonwood. *Populus monilifera*. Ait.
 Large-toothed Aspen. *Populus grandidentata*. Michx.

Bass. *Tilia Americana*. L.
 Red Mulberry. *Morus rubra*. L.
 Ironwood. *Ostrya Virginica*. Willd.
 Sugar Maple. *Acer Saccharinum*. Wang.
 Soft Maple. *Acer rubrum*. L.
 Alternate-leaved Cornel. *Cornus alternifolia*. L.
 Bitternut. *Carya amara*. Nutt.

[Rare east of Spring Lake.]

Butternut. *Juglans cinerea*. L.

[Very rare except at Spring Lake and westward.]

Slippery Elm. *Ulmus fulva*. Michx.

Staghorn Sumac. *Rhus typhina*. L.

Tamarac. *Larix Americana*. Michx.

Box Elder. *Negundo aceroides*. Moench.

Wolfberry. *Symphoricarpus occidentalis*. R. Br.

Panicled Cornel. *Cornus paniculata*. L'Her.

[The most common species of Cornel.]

Between Shakopee and Mankato the following additional species were seen in the valley of the Minnesota:

Kentucky Coffee Tree. *Gymnocladus canadensis*. Lam.

Red Cedar. *Juniperus Virginiana*. L.

Black Walnut. *Juglans nigra*. L.

Hackberry. *Celtis occidentalis*. L.

Blue Beech. *Carpinus Americana*. Michx.

Yellow or Gray Birch. *Betula lutea*. Michx. f.

[This birch has oblong catkins, and spreading obtuse lobes on the scales, the latter being three lines long. The hickory grows to about six inches in diameter and then is invariably winter-killed. A large tract has lately been cut for fuel near St. Peter. The hackberry is used for fuel, and for furniture. It frequents the heaviest timber. The butternut is rarely large. The box-elder sometimes exceeds three feet in diameter. In the absence of the sugar maple its sap is used in the Upper Minnesota valley by the Sioux Indians for making sugar and syrup, of which it is said to furnish a very fine quality.]

In traveling through the Big Woods in 1874, the white birch (*Betula alba* var. *populifolia* spach,) was noted in Hennepin and Carver counties. The bittersweet, (*Celastrus scandens*, L.) is also abundant in the Big Woods. There is a species of oak that appears like red oak, (*Quercus rubra*, L.) that frequents the outskirts of the Big Woods. It is sometimes associated with the burr oak in the "openings," and sometimes is found in company with the trembling aspen. It makes a smaller tree generally than the burr oak. Besides these the Virginia creeper, (*Ampelopsis quinquefolia*. Michx.) and the blackberry, (*Rubus villosus*, Ait.) have been seen. At Jordan, in the valley of the Minnesota, the black raspberry was noted, (*Rubus occidentalis*, L.) The white pine grows near Minneapolis, (*Pinus strobus*, L.) and in Mower county; it is found along the rocky banks of the streams in Mower county. The black ash (*Fraxinus sambucifolia*, Lam.) has also been observed in the Big Woods, but it seems not to be common. The red-berried elder (*Sambucus pubens*, Michx.) has been seen at Minneapolis; also the sweet viburnum, (*Viburnum Lentago*, L.) and the strawberry bush (*Euonymus Americanus*, L.) Two species of *spiræa*, the ninebark, (*Spiræa opulifolia*, L.) and the common meadow-sweet *spiræa salicifolia*, L., were noted at St. Peter.

Although according to the foregoing boundary of the southern end

of the Big Woods, they extend, *en masse*, only to about the center of Blue Earth county, the area of continuous timber is extended considerably further south through the agency of the valleys of the Blue Earth, the Cobb, and the Maple rivers,—tributaries of the Minnesota that run northward from the watershed that lies along the southern State boundary line. Consequently there is more than the usual amount of timber, for prairie lands in Faribault and Freeborn counties. In those counties, as the suppression of the prairie fires is rendered more complete by the forming of the soil, the scattering shrubs of oak and the aspens, that are *avant couriers* of encroaching forests, bring on more and more the character and aspect of a wooded country. Other species then gradually venture out from the sheltered valleys, and flourish on the open tracts. It is in some of these more southerly spurs from the main body of the Big Woods that the shagbark hickory (*Carya alba*, Nutt.) sometimes appears.

The existence of this great spur of timber, shooting so far south from the boundary line separating the southern prairies from the northern forests, and its successful resistance against the fires that formerly must have raged annually on both sides, is a phenomenon in the natural history of the State that challenges the scrutiny of all observers. While it holds mines of wealth, open to the practical economist, it affords to the scientist a rich field for observation and study. With timber, comes the fauna that is peculiar, in our latitude, to timbered regions. This fauna is strikingly different from that of the prairies. The bear, the wolf, deer, a great number of forest warblers, and numberless winged insects, that would otherwise be restricted to the northern half of Minnesota, are by this spur of timber brought into a much more southern latitude. The deer at present roams over the whole of this tract from north to south. It furnishes shelter for thousands of birds that winter among us, but which otherwise would become exterminated, or driven from the State. It has also its climatic effect, and its sanitary influence. It is eminently a region of small lakes. What may be the cause underlying, that has wrought this wonderful diversity in the heart of our great State is a subject for legitimate investigation, but the limits of this paper do not permit me to enter on that. It is only possible here to give a few notes, and to call attention to some of the salient points. That this tract is destined to be one of untold benefit to the State cannot be questioned. It is as yet but sparsely inhabited, and the details of its natural history are unknown.

The following have been noticed by Mr. L. M. Ford: Two varieties of the wild gooseberry (*Clematis Virginiana*), a well known climber, blooming in August; the Dutchman's pipe, (*Aristolochia sypho*), another climber; one variety of the honeysuckle, (*Lonicera*;) the leather wood, (*Dirca palustris*), a dwarf sort of thorn, heavily laden with fruit in autumn, probably *Crataegus coccinea*, and near Minneapolis the trailing juniper, (*Juniperus prostrata*.)

TREE CULTURE IN NOBLES COUNTY.

ADVANCE OFFICE, WORTHINGTON, Minn., Jan. 16, 1875.

L. M. Ford, Secretary Horticultural Society:

Your letter asking information concerning tree culture in Nobles county,

is received. We have not had time, in this new county, to report results, and any facts I might furnish would not therefore be of much practical value. I could give theories and opinions innumerable from both practical and impractical men, but suppose you do not want these. Here are the main facts concerning tree culture in this county:

1. The people are thoroughly alive to the importance of tree planting, and there is scarcely a claim, or a farm, upon which there is not already from one to ten acres started. A great many tree claims have been taken, and hundreds of acres will be planted next season.

2. Last year was a very poor year for trees. The streets of Worthington were lined with soft maples from two to five years old, on Arbor Day, and most of these lived and were doing well when winter set in. It is worthy of note that those which were watered and mulched have done best. Tens of thousands of white willow and cottonwood cuttings were set last spring, and I judge that hundreds of acres were planted with soft maple seed, but probably not one seed or one cutting in a thousand came, owing to the dry weather. I planted about twenty acres with soft maple seed, and about two acres with cottonwood and white willow cuttings, and have nothing to show for it. The grasshoppers cut off the few soft maples which sprouted, and the cuttings dried up in the ground.

3. I made a discovery with box-elder seed which is probably worth mentioning. During the winter of 1872-3, we sold from the Colony Office, for other parties, quite a quantity of box-elder seed, which were planted throughout the county. Very few of the seeds sprouted, and there was a general complaint at the apparent worthlessness of the seed. Most of those who planted plowed up the ground used and prepared it for other crops. My ground was left unmolested until the spring of 1874, when, what was my surprise, to find the little box elders pushing through the ground by hundreds after having lain over one season!

4. There are several groves in this county which have been remarkably successful. One of these was planted by the Railroad Company, for a snow-break, about two miles west of town. Some 1,500 cottonwood and European larches were set in alternate rows in the summer of 1873. Last fall I took a stroll through this grove, and found many of the cottonwoods from ten to fifteen feet high, and the larches doing well. Two years more will furnish a grove at this point ample enough to accommodate any pic-nic party which Worthington may send out.

5. Esquire Brown, of Graham Lakes, in this county, claims to have had uniform success in tree culture. He prepares his ground thoroughly, and is very careful in the treatment of settings and cuttings. He gathers cuttings in the fall of the year, ties them in bundles of convenient size, and sets them on end upon the damp ground of his cellar during the winter, and then plants as early in the spring as possible.

Call on us for a report two or three years hence, and we shall be able to give you some astonishing results, for our people are awake to the importance of tree culture.

Yours, etc.,

A. P. MILLER.

REPORT ON FOREST CULTURE ON THE MAIN LINE FIRST DIVISION ST. P. & P. R. R., AND A PORTION OF THE COUNTRY TRIBUTARY THERETO.—PREPARED FOR THE MINNESOTA STATE HORTICULTURAL SOCIETY.—BY L. B. HODGES, SUPT. OF TREE PLANTING DEPARTMENT.

Forest tree culture on this line was commenced in the spring of 1870, by the planting of two thousand large sized deciduous forest trees in the parks at Litchfield and Willmar.

As I am now writing what some day may become history, truth compels me to say that these first experiments were failures. We are none of us proud of our failures. We are too often ashamed of our failures. But failures even have their value, and frequently fur-

nish such instructive lessons, that even *success* is largely indebted to failure.

CAUSES OF THIS FAILURE.

I give only such causes as I know of, and which are indisputable, and were of themselves certain to insure failure. The trees were simply "grubbed out," and not as well grubbed out as a good farmer would grub out a young tree which his breaking plow frequently encounters. They were then planted on unbroken, uncultivated prairie—thrust into post holes, for I can call them nothing else, and the dirt trampled down. I know not how long they were laying around exposed to sun and wind, it is not material; the "grubbing out" barbarism sealed their fate at the outset. The poor mutilated things didn't want to die, and assisted by kind nature made persistent struggles for life. Some of them retained vitality enough to enable them to *leaf* out for several springs, but they couldn't grow, and have gradually disappeared. Of the two thousand so transplanted perhaps a dozen still retain sufficient vitality to *leaf* out next spring. Those trees were planted by contract for fifty cents each. The contract was too mercenary. The company erred in trying to get good work done at half price. No genuine tree-planter would have disgraced his profession by making such a contract. The result could be predicted from the outset, as a dead loss to the company of an even thousand dollars.

In another direction the loss was still more serious, because the failure had its influence in discouraging others who were deterred from planting by the results of this mercenary stupidity. These parks have since been replanted and are now in a fair way of realizing the anticipations of the original projectors.

The next chapter was commenced in the spring of 1872, in the letting of a contract to James Hoffman & Son, of Minneapolis for planting 7,500 soft maple, box elder, Lombardy poplar, cottonwood and European larch.

Another contract was assigned to the same parties for the planting of 50,000 cottonwood, Lombardy poplar and box elder, in October, 1872.

The trees embraced in the first contract were planted just west of Summit Lake, between the 95th and 96th mile posts, between Atwater and Kandiyohi, on the highest ground on this line, between the Mississippi and Red Rivers. High, rolling prairie, soil first-rate, subsoil clay. Planted in right of way, on north side of track, in rows four feet apart, and two feet apart in row. Received good cultivation, and with the exception of the European larch have made a very satisfactory growth. The growth of all this lot of trees has been seriously interfered with in consequence of the erection of storm fences, which have arrested the drifting snow, precipitating large drifts, eight feet deep, upon the young trees, breaking and mangling them fearfully; like the toad in the well, jumping up three steps and falling back two; yet under this incubus, gradually asserting their supremacy, and now averaging about the height of the fence, (eight feet.) On the final estimate of this lot in May, 1874,

7,496 were found to have weathered the elements, and were accepted by the Company and paid for. It is proper to state, that in anticipation of some fatality, Mr. Hoffman planted some 300 or 400 more than his contract called for. Cause of loss, depredations of cattle and snow drifts. Soil and climate not to blame.

Of the second contract but 41,500 were planted; about one-half on the cuts between Kandiyohi and Willmar, and the balance on the Pomme de Terre cuts just east of Morris. This planting was badly done—was done on ground broken out of season, and badly broken—was done too late, and every condition supposed to be necessary to ensure a failure, having been fully complied with, the final estimate, made two years after planting, showed about 18,500 live trees which were accepted and paid for by the Company. The greatest mortality in this lot occurred among those planted on the Pomme de Terre cuts, and was confined principally to the Lombardy poplars. The cottonwoods in this lot have done much better than could have been expected. Most of them were seedlings when planted. The ensuing winter the tops froze off clear to the ground, and on June 1st, 1873, they were about the size of young cabbage plants. At this writing most of them stand from six to twelve feet high, and very thrifty and well proportioned.

During the summer and fall of 1872 about sixty acres in small strips twenty-five feet wide, along about fifty of the worst cuts, was broken under the supervision of C. W. Moore, Esq., Superintendent of the Western Division. These strips were broken within right of way limits, the outer edge of the strips coming up to or on the right of way lines, and the inner edge of the breaking to within fifty feet of the centre of track. This breaking was designed for the planting of forest trees, which when grown to a sufficient height and denseness, would serve to protect the road from snow drifts.

Many of these strips were planted in the fall of 1872 with acorns. The ground not having been properly prepared for planting; many of the acorns worthless, and the gophers being on short rations the following spring concluded to "go for" those which were good, which they did in "a way I despise." The result was a failure.

We now approach what may be styled the

SECOND EPOCH

in this history; the abandonment of the contract system and the organization of a Tree Planting Department.

The bitter experience of all railroad men in the Northwest in shoveling and "bucking" snow-drifts, running snow blockades, during the winters of 1871 and 1872, and 1872 and 1873; the immense cash outlays for removing snow and ice, added to the loss from damage to machinery, reaching in the aggregate many hundred thousands of dollars; the loss of time, the absolute impossibility of operating many of our roads during such winters, the consequent derangement of all business and commercial transactions, called loudly for a permanent and practical remedy, and when the great electrical storm of January 7th, 8th and 9th, 1873, swept over the entire Northwest, burying the roads in impassable drifts, arresting travel, stopping the

mails, paralyzing business, and carrying desolation, suffering and death to an hundred households, it became patent to every thinking, intelligent mind that the only practical and permanent remedy, one that would secure absolute immunity from such public calamities consisted in the energetic, persistent, patient and laborious execution of a comprehensive, broad gauge *system* of forest tree culture. That great storm, although an unmitigated curse, from whose effects Minnesota yet suffers, had an excellent effect in calling the attention of her people to the imperative necessity of tree-planting. Although many have been awakened to a true appreciation of this great interest, yet it is my candid impression that as a *State*, we need the chastening influences of just such a storm at least once a month, for six successive months to awaken us to a realizing sense of duty in this behalf. I have said years ago, I say now, and I propose to keep on saying it, until this fact is branded upon the memory of every Minnesotian, that our entire Western borders, from Manitoba to Iowa is a vast treeless region, too destitute of timber to admit of successful agriculture; without any protection from the wintry blasts which rake us fore and aft with the accumulated momentum of a thousand miles uninterrupted sweep—precipitating the climatic peculiarities and eccentricities of Alaska, Hudson Bay and Greenland upon the inhabitants thereof on short notice—that this region is the fairest portion of Minnesota, rich in all the elements of wealth except timber; soil of unsurpassed fertility, bountifully supplied with running streams, dotted with lakes of surpassing loveliness, and natural meadows of the most valuable grasses; crossed and re-crossed by seven different lines of land-grant railroads, convenient and accessible to the markets of the world, capable when fully developed of furnishing food for a continent, yet still, comparatively speaking, a “howling wilderness” with railroad stations, embryo town-sites, isolated farms, mixed up with any amount of government land to be had for the taking.

The Big Woods stretching along between the densely settled portion of the State and the treeless region is fast disappearing, and what is being done to supply the inevitable necessities of the not far distant future? As this is a question no one man is at present prepared to answer, I will endeavor to furnish my proportion to this query, by picking up and resuming the report of work already done on the Main Line of the St. Paul and Pacific Railroad.

Soon after the great storm of January, 1873, the president of the First Division of the St. Paul and Pacific Railroad Company, determined to try the experiment of tree planting along the Main Line more thoroughly and systematically than had hitherto been attempted. I was placed in charge of this work with instructions from the company to go ahead in my own way and accomplish what I could with the limited amount at their disposal for this purpose; to remember the company was poor and had no money to waste, but to deal fairly and liberally with all. This, if not the exact language, is at least the spirit and substance. I at once proceeded to Olmsted county, and purchased 500,000 white willow cuttings of John J. Repner, of Little Valley, Hon. Wm. Somerville, of Viola, John James, of Eyota, Harrison Waldron, of Byron, and Peter Kinney, of Pleasant Grove,

assigning to each of these gentlemen such a number as he could make a sure thing of. I take great pleasure in acknowledging and recording the fact, that these gentlemen fully appreciated the merits of this work, and took pride in furnishing us, with probably the finest lot of cuttings ever made, for the paltry consideration of \$2.50 per thousand, payable in filthy lucre in the following June. I hope the company nor the Legislature won't go back on me if I invite each of those gentlemen to take a free ride over the Main Line some day next season, to see what their cuttings look like now. As the success of this work depended largely upon the intelligence and fidelity of my force, I took the precaution of picking my men from a large number, many of whom I had known for years and had tested. My own reputation, which I considered fully as valuable as the company's money, was at stake, and I selfishly employed men I could go my bottom dollar on without risk; and among those who particularly exerted themselves to make this experiment a success, I wish to record the names of William Somerville, W. A. Stebbins, James F. Wilson, Manning McLane, John Hill, Charles Moulton, Henry Brockway, Charles Allen, C. E. Hewitt and Wm. Carley, of Olmsted county; and Jerry Leary and Dennis O'Brien, of Kandiyohi county. While nearly every man employed in platting this great lot of cuttings did his duty and earned his pay, I feel it only justice that the above mentioned names should have honorable mention in the transactions of this society.

Making our headquarters camp at Willmar, we divided our force in two parties, putting one crew in charge of Mr. Somerville. and the other in charge of Mr. Stebbins. We started the teams and plows a couple of days in advance of the planting parties, preparing the ground for the cuttings. And right here I wish to remark, that any man who breaks prairie out in that country in the months of August, September, October and November, as this breaking was done, should be adjudged guilty of a grave misdemeanor, and punished by fine or imprisonment, at the discretion of the court. We found this breaking decidedly tough. Back-setting had no effect on it, except to throw the sod in better shape for the harrow to get hold of. We back-set and harrowed this breaking until the sod was tolerably well mutilated. We then set our stirring plows in *beam deep*, and succeeded in burying those wretched sods out of sight. May they rest in peace. Then with repeated harrowing, we at length succeeded in getting this ground in a tolerably fair condition for tree planting. I am particular in describing our method of overcoming the difficulty of planting trees on such ground, as many who have made tree planting claims will find the same difficulty when they commence work next spring. Some are even now urging our Congressmen to procure an amendment of the tree planting act, giving them another year to prepare the ground for tree planting, intending to fit it up for trees by planting some other crop on it this coming season. My Christian frontier friend, let me say to you, that an experience of twenty-nine years among the sods and clods of the northwest, has convinced me that no *paying* crop can be raised on any such ground. It is simply a *fight*, you have got into thorough inexperience, and you might as well fight it out next spring and plant your trees *at once* on the battle ground, as to ask Hercules for

help. After you have made this fight and conquered, you have a piece of ground you can grow trees on or anything else; but until you do make it, every month's delay gives the enemy an advantage. Take the bull by the horns! Having made this fight over a hundred small battle fields on the Main Line, and conquered, we followed up the victory, by plunging our cuttings into the deep mellow earth as deep as we could stick them. Between April 23d and May 23d, 1873, we made this fight, and planted this first installment of 500,000 white willows.

They are strung along in small, isolated tracts from Swede Grove to the Breckenridge Flats, a distance of over a hundred miles. But another enemy was putting in an appearance. No sooner did the willows commence growing than the weeds and grass came up as thick as hair on a dog. We lost no time in organizing a campaign against this new enemy, and the fight was kept up without intermission until August 1st. It was a lively tussel between the willows and the grass and weeds, but the willows came out ahead, excepting in one or two instances near Swede Grove where the pigeon grass was too many for them.

During the month of June and a few of the first days of July we broke about 500 acres for future tree planting. This breaking was done in strips parallel with the road, and on each side of the track—two strips on each side; the first strip from eight to sixteen feet wide with the right of way lines in the centre of the strip; then, parallel with these strips, and from 100 to 150 feet back, another strip on each side was broken 25 feet wide. By planting white willow cuttings exactly on the right of way lines the company will in four or five years have a live fence sufficient to keep cattle and horses away from the track, and at the same time grow a valuable wind-break. The strips 25 feet wide and 100 to 150 back are also to be planted to willow, cottonwood, soft maple, box elder, ash, butternut, oak and other valuable varieties of timber. Here we obtain an outer wind-break at small cost, which will not only protect the road from snow blockades but will, also, in the course of fifteen or twenty years, and from then for all time, furnish ties, just when, and where, they will be needed. In the future construction of railroads across prairie regions, such strips should be broken while the road is in process of construction; or better yet, would be the breaking of all the ground between the strips and planting the whole belt. This would fill the bill.

To resume, September 1st, 1873, all hands commenced pulling up and piling the weeds which had grown during harvest. Then when this was done we mowed around the young trees, burned around them, burning up all the weeds and rubbish, and thus protecting the trees from the prairie fires which had not yet begun to run.

This is the payment of the premium on a kind of insurance the tree-planter cannot safely postpone beyond the last of September.

In October of this season of 1873 we went into our June breaking between Kandiyohi and St. John, with plows. Found it mellow as an ash heap. October 12th commenced planting white ash seed on some of this ground, between Willmar and St. John. Planted enough for 1,500,000 trees, when the ground froze up, the last of Oc-

tober, and we disbanded and went into winter quarters. The tree-planting campaign on the Main Line for the season of 1873 was a brilliant success, and marks an era in forest tree culture in Minnesota.

The spring of 1874 opened inauspiciously for tree-planting interests on this line. Litigious Dutch bondholders, scheming financial agents, hostile legislation, suits for a receiver, suits to foreclose, suits to vacate the charter, with the senseless clamor of noisy demagogues, gave the management full scope for their abilities, without bothering their heads about tree-planting.

It was not until April 1st, 1874, that anything was decided upon with reference to tree planting, and even then I had to hire my crew with the understanding that the work might be suspended any time.

We managed however, to get some 115,000 white willow, lombardy and cottonwood cuttings. We had on hand ash and box elder seed enough for two million trees. These were all planted in good season. In the meantime, the company had succeeded in obtaining 20,000 two-year old European larch trees, from the nursery of Douglass & Sons, Waukegan, and with 110,000 two and three year old trees from Peterson's Chicago Nurseries, and also with 50,000 willow cuttings from our old friend Somerville, for the parks which had been broken in 1872, fenced in 1873, at Willmar, Randall, Hancock, Morris, Hermann, Gorton and Campbell, and partially planted in spring of 1874, with this stock so opportunely furnished. When the soft maple and elm seed commenced falling, the company furnished money to buy and plant them in their proper season, and also in the fall, the company managed to furnish the means to buy and plant seeds for several millions of box elder, ash, white, black, red, burr and jack oak, butternuts and sugar maple, which were all planted just before the ground froze up, excepting a few bushels of box elder seed now on hand. The ash seed planted in the fall of 1873 came up in the spring; scarcely a seed failed and the young ash stand from 12 to 20 inches high. The ash and box elder sowed in spring of 1874, have done equally well, and we have every reason to believe the seed planted in the fall of 1874, will realize our reasonable expectations. Although the season of 1874 was not as favorable as the preceding season, we have no cause to complain. The seeds and cuttings have come to time in good shape, and are now thrifty young trees. Our 500,000 white willow cuttings of the planting of 1873 now stand from six to fourteen feet high, already in many places forming very respectable wind-breaks. Another winter they will afford sufficient protection to repay their cost. Our last work before breaking up camp, was to thin out from this first planting enough for 500,000 cuttings for another springs' planting, or for the accommodation of settlers who may wish to plant. We can at any time next spring thin out enough for another 500,000 lot if necessary.

The results of the last two seasons operation in tree-planting on the Main Line is the production of not far from four million young forest trees where none stood before; the practical demonstration of the adaptation of the soil of the treeless region to forest tree culture, and consequently the practicability of forest tree culture on a scale

of such magnitude as to protect the roads from snow blockades, and ultimately redeem the fairest portion of Minnesota, and render it an inviting and productive region. So much for what the First Division St. Paul and Pacific Railroad has already accomplished in this behalf. I wish I could say as much of the country tributary to it. I think I can truthfully say that the people are waking up to the feasibility and necessity of tree-planting, and the good example the company has set has encouraged them. They did more tree-planting last season than in any season before; next season they will do still better. The great want of cheap cuttings and trees has been met by the company, so that the poorest men can make a beginning. Gen. Becker and Jno. Swainson have already planted 40,000 forest trees on their farm near Morris, and intend to plant from year to year until they get about 700 acres into timber. Mr. Morris, our chief engineer, has a fine grove well under way on his farm near Morris; Mr. Bartlett, near Hancock, has planted 30,000 cuttings. Mr. Bartlett has also planted enough forest tree seeds for a million of trees. Nearly every farmer in and about Hancock is engaged in forest tree culture to a greater or less extent. At Benson, Capt. Frank Thornton has made a good beginning, and has already several hundred thousand thrifty young ash, box elder and soft maple. John Clint, road-master of the Western Division, has a fine plantation of young forest trees on his farm near Benson. At Lac qui Parle great attention has been given to tree-planting, and the extensive and flourishing plantations of J. H. Brown and Abner Tibbits are the special pride of that locality. Mr. Parsons, near St. John, has ordered 27,000 cuttings and forest trees to plant on his farm. He wisely estimates that the enhanced value of his farm from this planting, will, to a great extent, make up for short crops and low prices.

At Willmar, the citizens are alive to the importance of the work and are generally preparing for extensive tree-planting in the spring. On the whole, the indications are favorable and encouraging. The mass of the people are slow and cautious; they are too poor to make many experiments, but when once convinced and educated to the proper degree in horticultural interests, they will do a work in tree-planting which in a few years will far exceed in magnitude anything the company can hope to do. This matter of educating the people in the correct principles and practice of forest tree-culture is a duty properly belonging to the Legislature.

The tree-planting committees of the Legislature at its last session recognized this duty and attempted to perform it, but failed. It occurs to me that this society would not go beyond its legitimate functions in calling the attention of the Legislature to this important subject. Measures of general public benefit, should not be dealt out wholly by private or corporate individual efforts. I have every reason to believe that the State is willing to do its whole duty in this behalf, if the matter is properly brought before the Legislature. Not only should correct information be gratuitously furnished to the people, but in addition to the bounties already offered. Young trees and the ground on which they stand, should be exempt from taxation for a term of years throughout our whole agricultural domain. Such Legislation should also be obtained, which would protect nur-

sery-men from being taxed beyond reason, and driven from the State by the stupidity of township assessors or county commissioners.

Give the people of Minnesota some reason to believe that the "Minnesota State Horticultural Society" is not merely a "posey bed," an "apple stand," or a nursery-man's advertising medium.

CRANBERRY CULTURE IN THE ST. CROIX VALLEY.—REPORT BY SENATOR W. H. C. FOLSOM, TAYLOR'S FALLS.

My experience in cranberry culture is not of such a character as to enlighten you from practical cultivation. What I do know is gathered principally from the cultivation of the berry in Burnett county, Wisconsin, in townships 38 and 39, ranges 17 and 18. My attention was called to this locality in 1873. Having heard much of the enterprise there, I concluded to visit the cranberry marshes. The scene on approaching these marshes, where the native cranberry was found, before the white man had commenced to improve, was picturesque in the extreme, to those who have a taste for nature's handiwork. There are extensive tracts of land, covering thousands of acres, dotted here and there with islands of young pine, and points of high-land projecting in various shapes into the marshes. It reminded me of an ocean bay, in a calm, only changing the ocean water color to endless green.

I had the pleasure of meeting a gentleman there—Mr. Irving—who had spent much time in Massachusetts in the culture of this berry. He cheerfully gave me information of much interest in this culture.

There are in these marshes somewhere from one to two townships of land, on which cranberries were then growing, or susceptible of being improved so that cranberries can be raised thereon. One township of land contains 23,040 acres. Three hundred bushels of berries have been gathered from the cultivated marshes in Berlin and Oshkosh, Wis. Multiplying the number of acres, if you please, by one-half this amount and it will astonish you, by showing the millions of bushels these great marshes can be made to yield. Then estimate this amount at \$1.50 or \$1 per bushel, and you will find it will bring millions of dollars. And that into a country which has been considered worthless by most all our people.

This description is but a small area of the marshes of Minnesota and Wisconsin on which this berry is a native. Were we to cultivate on the introduction of this berry into all our marshes, and the benefit to be derived, by giving employment to multitudes of men, women and children, we would be lost in wonder at the magnitude of this future trade.

The time will soon come when this berry will be shipped to all parts of our habitable globe, thereby increasing the demand. Already these Wisconsin cranberry cultivators ship thousands of bushels to California, New Orleans and eastern cities. The future of this culture and the traffic will follow the disappearance of the pine. Never failing, save the usual casualties that befall all growing cultivated articles that sustain life, this trade will ultimately be of endless benefit to this and coming generations.

The parties operating on the marshes I visited, which I have heretofore alluded to, already have some thirty or forty miles of ditch made, averaging five feet at the top, three feet at the bottom, with an average depth of four feet, at a cost of about 75 cents per rod. These ditches are to drain the water from the marshes when desired. They have dams across these ditches, to flood the marshes when desired. The flooding of the marshes aids in subduing the wild grasses and other encumbrances, also is essential to the growth of the berries. On these marshes wherever the flowage is killing the grass, the vine is rapidly spreading, without transplanting. Undoubtedly they would yield a quicker return by transplanting.

Large tracts, of these lands, which, at this time, have no vines, are bought by companies, mostly from the cranberry lands in Eastern Wisconsin, who are experienced in this business, and know what they are doing. They openly declare that vines can be grown on these marshes, where sufficient water can be obtained, and controlled to flow the lands. Mr. Irvine informed me that this flooding process, and the manner in which it was controlled, was the key of success.

I examined the effect, which one year alone had accomplished, as these companies commenced operation in 1872. It surprised me, when I saw the mode, and heard it explained, that so little was generally known of this business. After the marshes are subdued, dams and ditches built, there is comparatively small cost in raising the fruit, until the harvest, when men, women and children flock in from the farming countries, to pick, to pack, to store, to dry, to box, and convey to market. An expert will pick from five to ten bushels per day by hand, no rakes being allowed.

In 1873, these marshes had an abundant yield. These companies paid to outsiders \$1.50 per bushel. In 1874, the crop was light. The failure of the crop on these marshes, was caused by the drains not being properly constructed, they not being acquainted with the peat formation, (which absorbs more water than the marshes they were accustomed to) The drains in many instances, were dug too deep, which drained the marshes too dry, it being a dry spring, and left the vine without sufficient moisture to form the blossom and propagate the fruit. They have learned by this season's failure, the proper depths necessary to control the different localities in the marshes. It will be an easy matter to control the flowage by their dams in all seasons hereafter. In instances where the tougher class of grasses will not yield to flowage, a course has been adopted in New Jersey, which is effectual, by spreading white sand to the depth of half an inch to one inch. Another benefit derived from practical flowage, is the controlling of the ripening of the fruit, by delaying the growth and formation of the blossom, in the spring which is calculated to place it beyond late frosts. Also, it affects the early ripening of the fruit by adapting the water to the natural wants of the vine. Whereas on marshes not controlled by dams, and water, they are subject to extreme drouths and excessive rains, often delaying the berry until it is killed by early frosts. The failure of a crop is not so great a loss as the failure in other agricultural crops,

for the reason that there is no annual expense of putting the crop in the ground.

There are several companies operating in Burnett county. They have made and are making substantial improvements, in building roads, dry houses, dwelling houses, &c. The past year a saw mill was erected for sawing staves for barrels, lumber for boxes, &c. These marshes are about twenty miles east of the Superior railroad.

APPENDIX.

REPORT OF THE DELEGATE TO THE WISCONSIN HORTICULTURAL SOCIETY, FEBRUARY 3D, 4TH AND 5TH, 1874.

At the last annual meeting of this Society, held in Minneapolis, Jan. 18th-20th, 1874, I was elected a delegate, and furnished with ample funds to attend the annual meeting of the Wisconsin Horticultural Society, of which meeting the following is my report. :

The annual meeting of the Wisconsin Horticultural Society opened Tuesday evening, February 3d, under very favorable auspices, in the agricultural rooms in the capitol, at Madison. The room was crowded to its fullest capacity, with delegates from all parts of the State. Many ladies honored the meeting with their presence, and some of them contributed their mite in the way of most entertaining papers, which showed a practical knowledge of floriculture, and their ability to present to the attentive audience the beautiful side of this "heaven-born art." It has never been my fortune to meet with a more genial body of horticulturists—men who were filled with enthusiasm and a thorough appreciation of the importance of this great branch of scientific industry—men who were willing to impart to others the knowledge they had gained by experience and observation, and eager to dive deeper into the hidden mysteries of this, the oldest and noblest of arts. The whole meeting, from the President's hearty and spicy address to the closing session and adjournment, was a success.

The programme of the meeting, which had been published and extensively circulated for some time previous, provided for a large number of essays and papers upon subjects pertaining to horticulture, and in this our Wisconsin friends are considerably in advance of us, as well as in horticultural experience, and the management of their Society, as by this course they are enabled to get out a more valuable report with less labor and expense.

In this meeting the programme was strictly followed, and the papers presented and read were numerous, able, entertaining and well worthy of preservation for future generations to read. The discussions were warm and animated, and in them much information was drawn out that will be profitable and an aid to greater improvement. The subject of the losses and injury to fruit and ornamental trees, in the winter of 1872-3 was discussed at considerable

length, and the facts drawn out go very far to show that it comes as the result of two or three seasons unfavorable for healthy growth of trees followed by a winter of unusual severity, absence of snow, and a lack of moisture in both atmosphere and soil, which together with the evaporation which is continually going on, even when trees are at rest, extracted the moisture from both root and branch, while no supply could be taken in. To me, this theory looks plausible, and is very well sustained. To prevent the recurrence of such a calamity it is recommended to supply moisture by artificial means when there is a lack of it, retain as much as possible by mulching and hereafter be more careful in the selection of our trees. At this point a very animated discussion arose upon the using of Crab and Siberian roots and seedlings by nurserymen for stocks to graft upon to insure greater hardiness. The strong argument was that the crab roots would endure any amount of freezing and drouth without injury. Although no definite conclusion was arrived at, some of the members are *very sanguine* that experience will prove the theory a good one.

The vexed question of fire-blight came up for investigation and various causes for it were presented, but the mists and fogs which enveloped it were not dispelled and the field remains open for more diligent research and practical experiments. Their meeting differed from ours in that there was a greater diversity of opinion upon the merits of varieties of apples for general cultivation, and not quite as much favor shown to the Siberian species. The portions of the State bordering upon Lake Michigan and surrounding the smaller lakes have proved much better adapted to the growing of fruit than the rest of the State, and I fear if the farmers in the more unfavorable localities plant largely of some of the varieties adopted, they will meet with failure. Most of the region north and west of the Wisconsin river seems to present more difficulties to the fruit-grower than even Minnesota. They have adopted what is termed a perfectly hardy list, viz.: Tetofsky, Duchess, Haas, Fameuse and Plumb's Cider, and a general list in which Rawle's Jannet and Ben Davis have found a place. In grapes, raspberries and strawberries more varieties find favor than with us.

There was a fine display of apples for so unfavorable a season, and from the great number and fine appearance of the seedlings shown, I am led to infer that our neighbors are awake to the importance of originating something better than they yet have, and there is no reason to doubt that systematic experiment will bring about improvement. The society are offering premiums for valuable seedlings and that will have a tendency to bring forward such as withstood the severity of the severe winter.

The secretary in his report, made a statement which we may profit by, viz.: "There is a promising field so far as apples are concerned in the neglected or unknown varieties in our older orchards. If it be found that in various parts of the State trees of any variety have lived and thrived and borne good crops of fruit for a score of years past, this fact makes this variety worthy of our notice." We have but few trees in Minnesota that date back a score of years and still

produce fruit, but I think we have some and they ought to be looked up and given a fair trial.

The Wisconsin Society has a membership two or three times larger than ours, and is in a prosperous condition, (the Treasurer reporting over \$400.00 in the treasury.) It works hand in hand with the Agricultural Society, which society places at their disposal to be offered in premiums for horticultural products at the annual State Fair, the sum of \$800.00, and also defrays the expense of making the exhibition.

They are receiving liberal aid from the State in publishing and illustrating their transactions; in fact the Society has advanced to that position which entitles it to general respect, and the Legislature and railroad corporations *dare* not ignore it. The talented, the wealthy, the influential, and the enterprising men of the State are working together to solve the great questions of fruit growing, home adornment and rural improvement, and all are eager to see them result in success.

Have we no such men in Minnesota? We certainly have, and why will they stand back and see the Society struggling in poverty, looked upon with contempt by our legislators, and branded as beggars and insulted by railroad officials, when we ask a slight reduction in fare in going to our annual meetings when a single dollar per year from a few of them would place us in such an advanced position that the aid and encouragement we so much need would come to us even without asking, for the people would consign to everlasting disgrace the legislator who would dare to oppose the granting of liberal appropriations to aid our work.

JOHN S. HARRIS.

La Crescent, Minn.

CRANBERRY CULTURE IN MINNESOTA.

BY REV. J. E. WOOD, DETROIT, BECKER COUNTY, MINN.

This inviting and profitable branch of fruit culture, I am glad to learn, is beginning to excite interest and inquiry among the farmers of Minnesota. It is really surprising that it has not sooner engaged their attention, inasmuch as the best facilities exist in many sections of the State, to an extent unsurpassed, if not unequalled, in any country. Nature evidently designed Minnesota as the garden of the world for the production of this delicious and healthful fruit.

I shall heartily rejoice to witness an experiment, under such conditions, and on such a scale, as shall command the attention of inquirers, and furnish them with the information needed to guide them in subsequent attempts; but I do not want to see the experience of eastern cultivators repeated here, and the lesson learned by mistakes, disappointments and losses.

Persons, being told that it is a sure crop, may be misled into in-

vesting money in locations and methods where total loss and disappointment will be the only result. With the confident belief that there is more solid gain to the wealth of the State in this, than in any other undeveloped resource, and with a sincere desire to see capital invested, yet I want it to be so invested at the outset, as to put the question of success beyond all doubt; thus encouraging the many to engage in the development of this almost limitless resource. The best cultivators of the cranberry in the east have received the most munificent returns for their capital and care.

The first object, therefore, is to sound a note of caution, to those who are contemplating the business by exhibiting some of the mistakes which have been made and which are liable to be repeated by the uninitiated.

Most of the errors attending the cultivation of the cranberry, have resulted, not from reading on the subject, but from the conceit, that having read a book or an article, the person was fully posted and capable of doing just the thing described.

Most persons without experience, will either err by leaving too much to their own understanding, or by a mechanical conformity to rules under all conditions, fail by too great pains and exactness. Whichever way the error is committed, the experimentors will invariably conclude that the writers were ignorant of the subject.

The cultivation of the cranberry commenced in Barnstable county, Massachusetts, a little more than a half century ago, and although it has now reached the magnitude of a leading interest there, yet what has been learned up to the present time, has cost that county not less than a hundred thousand dollars. This has been sunk in miserable failures.

A few cases will illustrate the causes of failure and the errors to be guarded against. One man after seeing a bog sanded, conceived the idea that sand and water were the only essentials for a crop; so he went to work in a sand bluff, abutting a small stream, and levelled a plat of half an acre, built a dam, opened sluices, set his vines, and then watched and fought the running blackberry vines for ten years, ere he would be convinced that his garden was better adapted to blackberries than cranberries. Another man took the opposite course. Having a peat marsh so situated that sanding would be very expensive, he resolved to make it without sand, and really counted upon a fortune in advance, like the milkmaid of the fable, and came to as great a disappointment. He cut and removed the turf entirely, piling it up around the outside, leaving a bed of clear, mellow peat mud, into which he set his vines. The first year he was surprised at the luxuriant growth, which continued rampant throughout the second year, but on the third year, when he looked for fruit, lo! there were vines; noting but vines.

Another man, having a spot of perhaps two acres, with rough surface and shallow muck, overlaying a clay subsoil, at great expense removed both turf and mud, replacing them with a light dressing of sand. Here the vines grew slowly; moss, briers and rushes asserted their supremacy; and, after years of patient care and waiting, with no fruit for his pains, he made it over at greater expense than at first.

Another man could not see the need of such expense in draining,

inasmuch as marshes are the native home of the cranberry, so he put his money into a marsh that could not be drained at all. The result was grass and rushes and little or no fruit.

Another man thought he had just the spot for a good bog; plenty of sand and water, both good, especially the water, being just the thing for trout raising. He indeed had all he counted on, and more too, for his bog was so full of springs that drainage was impossible, and his experiment goes on to the list of failures.

Another man had all the necessary conditions except as to the quality of the water. This, when drawn off, left a heavy scum on the vines, which blasted the berry in the blossom, and the investment of several thousand dollars proved unremunerative.

Another man had a splendid site—the bed of an old mill pond, with the dam and flume still remaining. It was a good meadow, but he wanted to make a fortune by raising cranberries. He had been told that this spot could not be beat, and it was really true. He had read considerably, but was going to use his common sense, and he could not see the use of expending \$300 or \$400 on an acre when it could be done for \$100. So he put on a heavy team and plowed it, cut his ditches, and carted material from a hillock near by—not sand, but sand and loam—spreading it on the furrows. This he did in the winter; in the spring the vines were set, and they grew splendidly, and so did the grass. Every year this bog produces a few berries, good in quality, but hard to find on account of the grass. Every year it produces a fine crop of hay, which he cannot cut without cutting his vines. This contest must ere long be decided in favor of the grass, as the method pursued was better adapted to grass than the growing of cranberries.

Instances of this character might be cited indefinitely, but these are sufficient to convince the interested reader that hap-hazard methods are no better in this than in other departments of business.

Any person contemplating the investment of money in cranberry growing should get all the information within his reach from books, papers, conversation, and if possible by observation, before he commences. But if he can avail himself of the company of an experienced cultivator to walk over and inspect his proposed site and its facilities, he will derive safer guidance from his advice than he would get by months of reading.

This is the negative side of the subject, and perhaps we have said enough to guard the mind against unduly expanding any general statements which may be made on the other side.

SELECTION OF A SITE FOR A CRANBERRY BOG.

The first point to which the attention of the person should be directed who proposes to engage in raising cranberries, is a suitable spot. This will depend, in some degree, on what he proposes to himself; if to purchase land, the whole State is open for selection. If he already owns land, he has to investigate and decide on its adaptation to the business. Then again, he should decide whether he intends to cultivate according to the strict meaning of the word, or merely to propagate the vine on lands in their normal condition. If the latter,

then he may take nature as his instructor, and imitate as closely as possible. The control of water for flowage will be of considerable advantage, but he must not expect results very much in excess of the product of natural bogs. The propagation, by simply transplanting vines on to land which cannot be worked, costs but little, and may pay well for the outlay. But to cultivate in earnest is a very different thing, and requires knowledge and practical skill at every step of progress. Not a few of the failures which we have noted resulted from selecting an unsuitable spot. We would therefore advise the beginner—

First. To select according to the amount of capital he may wish to invest. If he has got to buy the land he can just as well find a site containing about the desired area, as one twice as large as he intends to cultivate. The importance of this will be seen at a glance. Suppose his plot contains ten acres, and only five are cultivated, the uncultivated portion is flowed necessarily with the cultivated, and by the action of the water foul seeds of endless variety are scattered over his bog, imposing a formidable if not impossible task to keep his plat free from noxious vegetation. If only a portion of any selected marsh is made, the unmade portion should by all means be separated from the part improved by a dike to prevent the distribution of foul seeds.

Second. The next desideratum is drainage. This is of prime importance. Where drainage is imperfect it is impossible to keep out foul vegetation, and the quantity and quality of the fruit will be seriously affected, while the labor and discomfort of harvesting will be increased many fold. Such a bog is, at the best, but little better than one of nature's planting, and is quite likely to prove a total failure.

Third. Flowage is the next essential of a profitable bog. To be able to cover the vines whenever a frost is expected, or whenever worms commence their ravages, will render the bog worth one hundred per cent. more than one equally as good which can be flowed only during the winter. It will probably save his crop three years out of five. The quality of the water must also be taken into account. The standard considered perfect by experienced cultivators is a stream abounding with brook trout. It is not essential to find trout in your waters, but to be sure that it is so pure that your vines will not be covered with a thick slimy sediment when drawn off. This will blight the blossom, and but little fruit can be realized on the best bog, that has to be covered with impure water. The water of our streams, as far as I have observed, is remarkably pure, and there is probably little danger of a poor selection in this respect.

Fourth. The next feature to be considered, is the character and surroundings of the marsh. Deep muck is not essential. Some excellent bogs have been made on alluvial bottoms where there was a slight intermixture of vegetable matter with the sand, called black sand by farmers. These are desirable, because most easily and cheaply made. If it is a peat or muck formation, it must be of a loose, friable nature, through which the water will freely percolate. A thin muck overlaying a hard pan, if sufficiently porous to drain readily, will make a good bog; but a plat so full of springs that wa-

ter is found oozing out everywhere or which cannot be made dry enough for corn, with ditches from four to six rods apart, should be rejected.

Sometimes springs are found very abundant around the borders of a marsh, which a single ditch will cut off if run along next to the upland, leaving the interior well drained. A little experimenting in the way of ditching will determine this point.

The general level of the bog should be at least twelve inches above the water in the stream, before sanding, and more if there is a large surface to be drained. Many streams can be brought down to the required level by clearing out obstructions, by widening at the outlet, or by dredging a sand bar at the point where the dam is to be built.

Sand, being an essential to successful bog making, should be found convenient to the spot. A marsh not more than thirty to forty rods in width, with good sand on either side, can be profitably made; but sand is heavy, and it takes a great many tons to cover an acre, even the minimum depth of three inches. If I owned a bog of the above width, and my neighbor would sell me one half as wide, as good as mine in every other respect, for \$50 per acre, I should save money by the purchase.

The sand should be tolerably coarse, perfectly free from clay or soil, and the higher the bank the better, as less surface will have to be cleared of soil to get at the pure sand. I have noticed some very desirable situations along the Mississippi and its larger tributaries. These consist of marshes enclosed by crescent shaped highlands, and separated from the river by a narrow beach, of alluvium. On this beach the turf can be piled, making an effectual barrier to the river during freshets, and holding the water in the basin during the period of flowage.

The water for this purpose can be taken by a sluice, tapping the river at a convenient point above the bog.

Fifth. The last, though not least consideration, bearing on the selection of a site, is the character of the indigenous vegetation. The cranberry does not flourish well as a joint tenant. Every species of grass, brakes, bushes and creeping vines, must be exterminated. Some varieties of grass are very tenacious of life, and must be pared off and removed or turned under so deep as to bury the roots entirely, and the sand put on as soon as possible afterwards. Rosebushes and other bushes hard to kill, running briars, &c., must be dug or pulled up. If this task appears too formidable, look further for a site.

These comprise, in brief, all the necessary directions in regard to the selection of a situation for a cranberry bog, but I have found it difficult to express them as clearly as I desired to within the limits I had prescribed for myself.

LAYING OUT AND WORKING A BOG.

The methods to be pursued in working a bog will vary necessarily, according to the character of the site.

We will speak first of a peat or muck formation. If it is covered

with brush or wood, these must be cleared off and the refuse burned. If it is a hay bottom, the grass should be closely mown and burned over.

All obstructions to an easy and perfect view of the plot being removed, the cultivator should proceed to lay it out for working. A simple process, pursued in the East is as follows: Take a strip of board, ten to fifteen feet long, with the edges jointed and made exactly parallel; prepare a quantity of stakes, sharpened at one end and sawed off square at the other; if not owned, borrow a carpenter's level; with this preparation, select the spot where the work is to commence, and drive the first stake so that it will correspond with the proposed surface of the bog when completed. From this starting point, run several lines of stakes through and across the bog. Usually the point of departure will be the bank of the stream, passing through or alongside the bog, and from which a slight but even grade may be given, both up stream and toward the upland. The turf should be removed or inverted, where the stakes are to be driven so they will not have to be disturbed until the leveling and grading are completed. This operation is labor-saving. By a little calculation the cultivator can make the parts elevated above the proposed surface fill those below and thus greatly reduce and simplify the work of leveling.

A correct eye is a good thing in this work; that is, an eye which can detect inequalities in the surface, without constant resort to instruments. I will give an illustration from experience: Having a large gang at work on a plot which I was in a hurry to finish, and being unexpectedly called away, I borrowed a foreman from another gang to superintend the workmen during my absence. As he had the reputation of proficiency in the business, I gave no other instructions than simply to tell him we were engaged in leveling, and to be careful to make the work tell. What was my surprise on returning, to find that he had kept the men at work all the time, wheeling material on to a spot which needed lowering to begin with. The labor of the gang was worse than thrown away, for it required an equal amount of work to undo what was done wrong.

While engaged in laying out a bog, it is well to calculate the location and height of the dam required for flowage, and whether several grades and dams may not be required for ready flowage.

The laying out of ditches may be deferred until after turfing, as it is difficult to tell at first how near they will have to be for effectual drainage. If the bottom is very wet, it may be expedient to cut part of the ditches before turfing, and these through the lowest and wettest parts of the bogs, and at such intervals as to give assurance of no labor lost in ditching. Turf a strip wide enough to throw the material on, wherever a ditch is to be cut. This can be economically used in leveling.

Ditches should be cut, at least thirty inches wide at the top, and sloping with an angle of 45 degrees, and usually to the level of the stream in depth, *i. e.*, so the water in the ditches will be on a level with the stream. About twelve rods apart will be a safe distance for the preliminary ditches. If, however, the surface is sufficiently

dry to work comfortably, all ditching can be postponed till after the turfing.

The tools needed for turfing I will now describe. They consist of a turfing axe, a strong three pronged hook and a hoe, a bog hoe or one made on purpose, of the same shape but lighter. The hook must be very strong, with prongs eight to ten inches long, curving inwards a little, and furnished with a strong handle. The hoe should be ground sharp and kept in that condition. The axe is made for the purpose, with a broad edge and perpendicular ends, the handle fitting close to the top so as to prevent roots from catching between it and the axe. The axe has three edges properly. An old broad axe is sometimes used for turfing, but is heavier and much inferior to a real turfing axe. These tools are sufficient for the operation called turfing, which we will now describe.

If the ground has been covered with brush to any considerable extent, I would recommend turning the turf up to the air and sun, letting them remain exposed as long as possible. If it is a hay bottom I would advise deep turfing and grading in strips of convenient width, sanding as quickly as possible, and at all events before the inverted grass roots have sprouted. In turfing begin with the axe, cutting straight parallel lines fifteen to eighteen inches apart; then crosswise in the same manner, leaving the turf in squares of a convenient size to handle. The axeman should be followed by another with the hook or hoe, who will either turn up the turf to the weather, or invert it as the case may require. Bush turfing need not be very deep, unless it be to lower the surface; but grass turfing cannot be too deep. Turf holding briars, rose-bushes or other vegetation hard to kill, should be put in separate piles. If any slough holes exist, which require filling, they will furnish a convenient receptacle for these, only be careful to put them in so deep as never to hear from them again.

The next operation is grading, which consists in some instances, in carefully turning and adjusting the turf, so as to render the surface even; in other instances the turf has to be removed, or partly turned and partly removed. Sometimes low places can be conveniently raised by using several thickness of turf, in which cases about 33 per cent. should be allowed for settling, when the turf rots. It is a good plan when turf is used for this purpose to give it a dressing of an inch or two of mud from the ditches. Any roots protruding from the mud or turf should be pulled out or cut close to the surface. The sharpened hoe is useful for this purpose.

Surplus turf must be removed to the upland, never burned on the bog. Careful examination should now be made for any places that remain too wet, and if required additional ditches be cut. A ditch sufficiently wide and deep to drain the springs, and prevent the encroaching of foul vegetation from the upland, should always enclose a bog. The surplus turf piled outside of this makes a very good fence against cattle, which should never be allowed to trample a bog. A narrow walk between the outside ditch and fence is a convenient and useful arrangement.

The bog is now ready for sanding. Pits for this purpose should be opened at convenient points around the bog, so that the greatest

width will be as nearly as possible equally divided between sand pits on opposite sides. The surface soil must be carefully removed from these, uncovering as much sand as will probably be required in each place before beginning to sand. An inexperienced person should be very liberal in his estimate. For distances not exceeding fifteen rods the wheelbarrow commonly used on railroads is the cheapest and best vehicle for moving sand. A track of one and a half or two inch plank, wide enough to roll the barrow on conveniently, should extend from the pit to the farthest point to which sand has to be carried. Beginning farthest from the pit, the sand should be dumped in in courses and levelled to the desired thickness as fast as one or two courses have been dropped. As the track has to be frequently moved, the plank should be as light as possible. A convenient tool for levelling sand is a common hay rake, with tough twigs woven into the teeth about half their length. The leveler should stand on the track and work the sand to a smooth level surface, and no tramping over it, should be allowed until it is marked off for vine setting. Stones that can be hauled in at the bottom and covered entirely with sand, will do no harm; but if too large for this, they should be thrown out by the shovelers.

The depth of sand required will depend on the richness of the bottom. On pure black peat the vine will grow vigorously, produce one crop perhaps, and then become abortive. I am acquainted with a bog of this kind which was prepared with four inches of sand. The vines grew well and produced two decent crops, when the proprietor had to prue them, which he did by cutting them off close to the surface. The best results, on very rich bottoms, have been attained by putting on sand from six to twelve inches deep. The more sand, the longer the period required to bring the vines to full bearing; but once at that stage, they continue productive for many years.

All we have thus far written applies solely to muck or peat bottoms. Two or three illustrations will indicate how these directions are to be varied on locations having different characteristics:

A gentleman of my acquaintance made a cranberry bog of about two acres. The site, to begin with, was almost a dead level, bordering a small stream. An outside ditch from one and a half to two feet deep by three feet wide was found sufficient for ordinary drainage. It was laid out in plats or beds of four rods in width, divided from each other by shallow ditches, not more than four or five inches deep. These were intended to facilitate the drawing off of flowage water. The mud here was shallow and not very rich, so that four inches of sand was deemed enough. This was evenly spread over the entire surface, ditches and all. The vines were set in rows close to the margin of these ditches and were allowed to cover them with runners. This became a very productive bog, with no waste of ground by ditching.

The next illustration is a plot of larger extent, consisting of a substrata of loose sand overlaid with a thin muck and grass sod. The laying out and ditching here was done the same as in the last example. The sanding was mostly done by subsoiling. The soil on a strip farthest from the upland was wheeled ashore, then sufficient sand was taken away to make room for the mud on the next strip of

equal width, which was thrown on, leveled, and covered with sand. This process was repeated till the whole bog was made, the last strip being sanded from a sand pit.

Some interval lands are naturally adapted to the growth of the cranberry. These are found nearer the sources or on the borders of rivers and lesser streams containing much sand and fine gravel, and are easily and cheaply brought into cultivation. A light dressing of two or three inches of sand is all that is required to repress intruding vegetation, with shallow ditches to facilitate surface drainage after flooding. Interval lands, however, that are very rich, require to be heavily dressed with sand, or wild grasses will assert their supremacy.

In addition to what we have said already about tools, we hardly need add that a manure fork will be found convenient in handling turf. For shovelling sand the round pointed shovel is best, and for ditching, a square pointed one, ground sharp.

For moving sand long distances, a hand gravel car to be manned with five or six hands, is desirable.

A track for this car may be constructed with four inch joists, firmly tied by cross slats, and of a length to be conveniently moved. The car itself may be modelled after the gravel car of the railroads.

SELECTION AND SETTING VINES—VARIETIES.

There are three leading varieties of the cranberry, viz: The Bell, the Oblong or Egg shaped, and the Cherry, deriving their names from their form. Frequently all of these will be found growing wild on a single square rod. Careful examination has detected several other varieties, differing in form, color, productiveness, and time of ripening, but less distinct than the three named. I have not had opportunity to examine the native bogs of Minnesota, while in fruit, but from an examination of the product in market, I judge that they are marked by the same general characteristics of the natural bogs in the east. In the different lots, which I have seen on sale, the two first of the leading varieties, the Bell and Oblong, respectively predominate. In commencing the cultivation of this fruit here, it will hardly be possible to stock a bog with any single variety. To obtain vines from the east would be quite expensive, without any assurance of getting the desired variety after all. Most cultivators have obtained their vines from wild swamps, and the fruit exhibits the same variety; often in a single handful all the varieties are found. The native fruit, like the strawberry, is much improved by cultivation, both in size and solidity. There is a marked difference in the time of ripening of the same varieties in different localities, and it is desirable to stock a bog with some early growers to accommodate the time of harvesting. Late growers are generally more prolific, but in gathering the product of several acres it is desirable to begin as early as possible. The earliest bearers are ready for harvesting about the middle of September, and on a well arranged bog the harvest season can be prolonged till the first of November. One very essential point in the successful cultivation of the cranberry, is to procure *good*

healthy bearing vines. A barren plant cannot be made fruitful by transplanting. To incur all the labor and expense, to prepare the ground, and then fail by setting out vines that never did and never will produce fruit, would be an intolerable mistake. Every reader will, therefore, appreciate the necessity of the utmost vigilance in this part of the work.

The healthy vines are not generally the finest in appearance. The stalk is usually smaller and more wiry than the barren vines, the runners fine and regular, and the leaves have a mellow, brownish look. Avoid, therefore, wild vines, which throw out strong, vigorous runners, and are clothed in a beautiful green. The difference between the productive and non-productive vine is very apparent to the touch; while the barren vine is somewhat harsh, the productive vine, drawn between the fingers, will be decidedly unpleasant in its sharp, rasping effect, indicating the presence of silex to a great degree. Many persons, who may contemplate engaging in the business are well acquainted with some natural bogs on which they can rely for vines. To such it is only necessary to say, take your vines from those patches which produce the largest and best fruit. Any variety desired, as the Bell, or Cherry, or Oblong, may be found in small patches and thus propagated. If unacquainted with any natural bogs, obtain information of some person on whom you can implicitly rely, not failing, however, to test the vines by the directions above given.

SETTING THE VINES.

Of the different methods of propagating the vine in cultivated plats, we will only speak of two:

1st. By cuttings. By this we mean that the vines are collected in sufficient quantity and run through a hay or straw cutter, and then scattered evenly over the surface, and raked in. This, if done quite early in the spring, may result in stocking the ground thoroughly and quickly. But this method has several drawbacks. 1st. It will not admit of clean culture, which is very essential. 2nd. It is attended with great waste of vines at the best; and, 3d. If the sowing happens to be followed by dry, hot weather, the greater portion of the plants will die, and time as well as expense is lost.

The second method is the one which we would recommend, and denominate hole setting. It is slower, more expensive and laborious, but decidedly the best. Remember, *painstaking wins every time in this business.*

For hole setting, lay out the ground in squares of from 15 to 18 inches, by drawing a marker straight each way. Then with a hardwood stick sharpened, (some have an iron point,) punch a hole in each corner. The setters follow, inserting a small bunch, perhaps a single vine, folded several times, in this hole, leaving the top out a little, and pressing the sand close around them. This method has every advantage: clean culture, certainty of growth, regularity and beauty of appearance, and a general uniformity of spreading and matting.

TIME OF SETTING.

The spring of the year is, doubtless, most favorable for vine setting, but convenience may force the process at other periods. I have known vines to do well set as late as the middle of June, but would not advise it after the first of June. Fall setting may be done from the 20th of September till the ground closes up. But unless you are prepared to flow your bogs, vines should not be set after the ground begins to freeze hard nights, as freezing and thawing will be likely to throw them out of the ground. One advantage of fall setting is, that vines can be selected on the recommendation of a recent crop, and the cultivator will not be likely to be deceived in this important matter. Vines, however, may be collected in the fall for spring setting, and packed down in a damp cellar or other suitable place, where they will not dry up.

For the benefit of any who may desire to introduce the berry into their natural meadows and swales, without cultivation, we will describe another method, called sod setting. This is simple and sure with regard to the vines growing, and is the only method short of thorough cultivation that we would recommend to anybody; and we would by no means advise this, where the conditions are favorable for cultivation. The process consists in removing sods from your natural meadow two, three, or four feet apart each way, and inserting sods from a natural cranberry meadow, pressing them down well with the feet. Vines in natural meadows, bearing superior fruit, may be propagated to an indefinite extent by this method, at slight expense, and considerable profits realized.

A word about picking and packing. We must repeat here our adage, "Painstaking wins," in this business everywhere. Slovenliness always makes a dull market. The berries should be picked by hand, and spread, not more than five or six inches deep, in hurdles, made of laths, left open, so the air can draw through them.

These hurdles may be piled in a dry room for a period not longer than three weeks, when they should be winnowed, (hand cleaning is best,) and every unsound berry culled out, then packed in clean, dry barrels or boxes, for market. I have known \$2.00 a barrel paid to a man who had for several years followed this careful method, over the price which his neighbors were able to get for fruit, equally as good except in the method of packing. Every market gardener and dairyman will readily understand this.

With the hope that some additional hints may be gathered, of value to the intended cultivator, we give a brief history of the cranberry business in the Eastern States.

ITS HISTORY.

The first attempts to produce this excellent fruit by cultivation, were nearly simultaneous in this country and England. In 1813, Capt. Henry Hall, of Dennis, Barnstable county, Massachusetts, commenced the cultivation of the cranberry on a small scale. His experiment was very successful, the bog or garden continuing productive to a surprising extent, and without failure of a good crop for

more than fifty years. In the same year, Sir Joseph Banks obtained a small quantity of vines from America, and planted a plat of ground 18 feet square, from which an abundant crop was harvested, in the proportion of 460 bushels to the acre. During the next thirty years after Mr. Hall had introduced the cultivation, a great many experiments were made by others, mostly unsuccessful, and the subject was consequently brought into such disrepute that general attention was not attracted to it until about the year 1850. Even since then, many thousand dollars have been sunk in failures. These failures have been useful to some extent, yet the parties who made them "paid dearly for the whistle."

For some reason not explained, the English experiment, though remarkably successful, was not followed up, and the English market, as well as other European countries, has to be supplied from America. Cape Cod cranberries, for a score of years past, have been observed on sale in the streets of London and Paris. The exportation would doubtless have reached a much greater magnitude if the cultivators could succeed in producing enough to satisfy the home demand to a reasonable extent; but we confidently anticipate that the time is not far distant when this fruit will attain an important rank among our exports. With our wide adaptation of climate, natural localities, and admirable soil; with the new and increasing interest awakened by the almost fabulous profits, together with the opportunities now afforded for every person to acquaint himself with safe and successful methods of culture, it cannot fail to be prosecuted to a much greater extent, so that the ever increasing home consumption will be provided for, and at no very remote day a portion of our product may be spared for the foreign demand.

From time to time pamphlets and newspaper articles have been published, essaying to give the public reliable information on the subject, but most of the theories first advanced have been abandoned. I have before me a pamphlet of 32 pages, published in 1860, compiled from a great variety of sources, and professing to give concise, practical and complete information on the subject, which has no present value, except as affording a glimpse of the history and progress of its development. For a short period the subject of upland or field culture attracted considerable interest, growing out of the operations of Mr. Sullivan Bates, of Bellingham, Massachusetts. In 1846, he succeeded in raising about 400 bushels on an acre. His success was considered complete, and the newspapers were filled with recommendations, and rules for upland culture. Nurserymen throughout New England advertised the Bell or upland cranberry very extensively. Mr. Bates' vines were expressed all over the country, and many farmers engaged in the business.

The following is a portion of an advertisement appearing as late as 1860: "*Cranberry Plants for Sale.* The subscriber begs leave to offer to the public a selection of the finest cultivated cranberry plants in the country. They are constantly being received, fresh from the cranberry grounds of Mr. Sullivan Bates, of Massachusetts, and comprise the beautiful *Bell variety*, so celebrated for upland.
* * * * * Having taken the general agency for supplying to any extent these unrivalled plants, he will furnish any quantities,

from 100 to 200,000 plants on the most favorable terms," etc. This was nearly at the end of the delusion. The subject died away gradually and for a number of years has not been heard of. It has evidently taken its place with the Multicaun's speculation and others of that sort. Of the probable cause of the failure, the public has never been informed, but we conjecture that the cranberry worm had something to do with it. This worm does not usually appear in any neighborhood until several years after the cranberry has been introduced, but when they come, no plots in the neighborhood will be exempt from their ravages. Flowing is the only remedy—and where this is impossible, the best producing bog ever made will be comparatively worthless. We think this the obvious reason why the upland culture was abandoned. Mr. Bates and the newspapers which advertised the plants, and perhaps the nurserymen, made a good thing out of it, but the poor farmers who were deluded into spending time, money and land in the operation, were severe losers.

Another venture in cranberry raising was made by Mr. Addison Flint, of North Reading, Mass.

In 1843 he flowed a natural meadow to kill bushes and grass, keeping the water on for three years. After the water was drawn off and the surface dried it was burned over to get rid of the refuse vegetable matter. He next removed sods from a cranberry marsh to this spot, planting them three and a half feet apart each way. On about half an acre he planted berries the same distance apart, crushing the berries and covering slightly with mud. This was done in October. The spring following, a number of bushels of decayed cranberries were sown broadcast over the spot. From planting, very few vines appeared for two or three years, and no fruit for five years. From that portion set with sods, in three years, 17 bushels were harvested; the fourth year 28 bushels; the fifth year 93 bushels; the sixth year 150 bushels. The sixth year the planted vines yielded 40 bushels. This was then considered successful fruit culture, worthy of a premium from a county society.

Mr. Flint, in writing up the subject in 1864, says: "I have no doubt but there is swamp land enough in Massachusetts suitable for raising cranberries, to raise enough, at the prices they have brought for the two last years, to come to more than all the corn, grain and apples, raised in Massachusetts."

Mr. Flint's brilliant success was so terribly eclipsed, however, by other cultivators, that his methods were not followed, and of late years but little heard of. His methods have the virtue of involving but little expense, and the results would commend the methods had not others given manifold greater results. The extensive swamp lands of which he spoke remain to this day in the same condition they were in then. One remark of his, however, is worthy to be transcribed and kept prominently before the public, viz.:

"If I had ten acres and you had ten acres, and every man between Boston and New York and Boston and the Canada line, had ten acres each, and they all bore 300 bushels to the acre, it would not glut the market.

"Very few of the inhabitants of cities have yet begun to get a taste of cranberries."

What was then said about glutting the market is manifestly true now. The demand has outrun the production by a constantly widening distance.

From 1860 onward the production was mostly confined to the thorough cultivators, centering mainly in Parnstable county, Massachusetts. That county contains admirable soil, a favorable climate, but a scarcity of water, yet producing annually a crop worth from \$300,000 to half a million dollars. There is hardly a county between St. Paul and the N. P. R. R. which does not contain more good cranberry lands than does this famous cranberry centre. Of late years New Jersey has become quite largely interested in cranberry growing, and doubtless possesses much good land for the purpose. Connecticut, Rhode Island and New Hampshire have done something towards supplying the market, but it has failed to enlist much enterprise and capital in either of these States. Next to Massachusetts New Jersey has been most successful, yet it remains for Minnesota to outdo each and all other States in this most remunerative industry.

FACILITIES FOR PRODUCING AND MARKETING.

Minnesota undoubtedly possesses a greater area of land adapted to the production of the cranberry than any other region of the United States. It has been officially estimated that the northeastern section of the State, bounded by the St. Croix, Mississippi and St. Louis rivers, alone comprises not less than 256,000 acres of cranberry marsh. The wild marshes can in most instances be drained and brought into cultivation. But this is only a small part of the area in the section above named. There are numerous situations where the cranberry does not grow wild, as favorable to cultivation as the best of the native marshes. Beginning with Carlton county, on the line of the L. S. & M. Railroad, and following down that road to St. Paul, extending to the left to the St. Croix river; at the right to the Mississippi river, on all the tributaries and sub-tributaries of both rivers, as also the Nemadji and its branches, good cranberry lands exist to an unlimited extent. On the line of the N. P. Railroad, beginning with Crow Wing county, east of the Mississippi, and running west to the vicinity of Oak Lake, on both sides of that road, the explorer will constantly meet with admirable situations for cranberry culture. From Oak Lake, journeying towards St. Paul via Otter Tail and St. Cloud, keeping west of the Mississippi, through Wright and Hennepin counties, we will still find cranberry lands abundant. Our opportunities for observing the southern and southwestern portions have been less, but from having passed through by rail, seeing all that rapid traveling would allow, we judge these sections are by no means destitute of lands suitable for cranberry raising.

With our extensive area, we have unquestionably a most favorable climate for this fruit.

The abundance and early maturity of the wild product is sufficient evidence on this point. The use of sand so largely on cultivated bogs accelerates the growth and early ripening of the fruit, and ren-

ders those bottoms which were liable to frosts far less liable. We are confident that we run no hazard in predicting that when the cranberry shall be properly cultivated here, we shall be able to produce a larger, sounder and better flavored berry than has yet been seen in the Eastern markets. The *perfect maturity* of the fruit is seldom attained elsewhere, but we think it will be here.

The extraordinary profits of the business is a strong inducement to invest capital in it. From the time when cultivation began until now, fears have been entertained by some, that the market would eventually be overstocked ; but instead of this being true, the demand has kept far in advance of the supply. Experience, however, has proved, that when the market price of any commodity exceeds a reasonable limit, the people will abstain from its use. The production of this fruit might be multiplied manifold, without bringing the market price much below the average of the past few years. Even were the price reduced fifty per cent., what product is there which mother earth is capable of yielding, which will compare with this for profitableness? A friend of mine, on an outlay of \$225, realized, the third year, an income of \$600. Another on an outlay of \$400 in preparing an acre, realized \$1,000 a year for several years in succession. The first named friend, in discussing the prospect of an overstocked market, remarked that if he could be sure of \$6 per barrel, he knew of no business that he could engage in which would pay as well as cultivating cranberries. Here in Minnesota, the native soil of this fruit, the market is so poorly supplied, that but few of the people can afford to use it freely. They rank among the luxuries of life, which are beyond the reach of the majority. In view of these facts, the parties most interested in the production will not regret to see the price brought down to a standard more in accordance with the means of the people. A fruit so delicious and healthy, so easily produced and kept as this, ought to be cultivated to such an extent that all the admirers of it can afford its constant use.

In addition to the constantly increasing home consumption, the item of cheap transportation to other markets is worthy of our consideration.

No sane person will dispute the unparalleled commercial advantages of Minnesota. "Occupying the exact centre of this continent, and constituting the watershed of its eastern half, the steam navigation of three great internal water systems terminate here, namely: The Mississippi river, northward from the Gulf of Mexico; the Red River of the North, southward from Hudson's Bay; and the St. Lawrence river and chain of great lakes westward from the Atlantic ocean." These water lines, fed by our admirable net work of railroads, afford outlets for the products of manufactories and agriculture not exceeded, if equalled, by any community of our vast country. The wheat producers of Minnesota are thus enabled to compete with farmers who by lineal distance are much nearer the great markets. Whatever can be properly urged on this point, in favor of any other product, may be urged in favor of the cranberry. At the rates of flour and wheat, we can raise, pack and transport cranberries to New York as cheaply at least as the Cape Cod growers can. Without doubt, whenever the attention of our people shall be suffi-

ciently engaged in this business, special rates of a lower grade will be obtainable, giving us a decided advantage over all competitors.

Minnesota being our adopted home, we naturally feel a deep interest in everything which concerns her growth and prosperity; and having the fullest confidence in the ultimate success of the cranberry business, we are gratified to learn that a wide spirit of inquiry exists among our farmers, and to some extent among capitalists. We have endeavored to give these the benefit of our experience and investigations, by improving an occasional hour snatched from other pressing duties, in penning this short treatise. We have intentionally left much to the practical common sense of the intended cultivator, which would have increased the length of this essay. Possibly we may have omitted some details which would prove useful to the beginner. Should questions arise in the experience of any who may attempt the business, we will cheerfully endeavor to answer them through such medium as may be most convenient.

In conclusion, we will add a word in relation to what we deem the

BEST METHOD FOR INTRODUCING THE CULTIVATION OF THE CRANBERRY SUCCESSFULLY.

With private parties, and especially with those not possessed of ample means, the constant temptation is in favor of cheap methods. This is ruinous economy. The principle of association in our day has exerted a most powerful and widely beneficial influence in the prosecution of enterprises for which private means and capacity would prove inadequate. We would suggest to parties interested in this subject the formation of a stock company under the general law, for the purpose of introducing and prosecuting the cultivation of the cranberry on a large scale. Such a company will possess many advantages over a single handed attempt:

1st. Each person risks no more than he can well afford in an untried business.

2d. A company can afford to employ a man of experience and competent ability to superintend the making of a bog.

3d. There is economy in having a large area in a single plat; as the dam, fencing, packing houses and tending a large bog are much less expensive proportionately than for a small one.

4th. Individuals might be tempted to begin on an indifferent spot, by reason of nearness to their residence or cheapness. A company will not be likely to break ground on any other than the very best spot that can be selected.

5th. The proportionate profits to those interested in a large operation will be greater, if the company is wisely officered, than in a small one.

Lastly. Parties who would be reluctant to invest thousands in a private enterprise, would freely invest a few hundreds in a stock company.

We hope to see an early movement in this direction. Let no persons, however, who have the disposition and means to take hold of this business on their own account be deterred by what we have said in favor of associated effort.

A FRUIT FARM OF WINONA COUNTY.

BY PROFESSOR WILLIAM F. PHELPS, OF THE NORMAL SCHOOL.

Having enjoyed the opportunity of inspecting one of the finest farms in this region, and knowing the deep interest that is felt in the question of fruit culture in our State, I venture to send you a few facts that may be worthy of attention by the agricultural readers of your transactions.

The farm referred to is owned and worked by Mr. Stephen Eldridge, and is located upon what is known as Homer ridge, about five miles to the southeast of Winona, and two miles from the Mississippi. The ridge is elevated about five hundred feet above the surface of the river, and averages perhaps from half to three quarters of a mile in width. It was formerly covered with a thrifty growth of forest trees, principally oak, but is now the site of several splendid farms, among which that of Mr. Eldridge, containing 140 acres, is the most remarkable. He purchased the property some ten years ago, has cleared it all but 40 acres of timber, and has erected upon it a commodious dwelling house and one of the most convenient and well constructed barns in Winona county. The land lies mainly on the top of this ridge, with a somewhat gradual slope to the south and east. The soil is a strong clayey loam, and capable of producing the best of crops. In the ten years that he has occupied it, Mr. Eldridge informs me that he has never failed but once to realize from 30 to 33 bushels of wheat to the acre. That exception was the dry season of 1870, when his crops averaged 25 bushels. His crops of corn, oats, hay, and potatoes have been equally successful, although he has given less attention to that class of products than to others, which I had more especially designed to mention.

It is as a fruit grower that this modest, undemonstrative gentleman has achieved the most surprising success, and to this branch of his operations let us briefly turn our attention. Two pieces of ground, comprising, all told, only 17 acres, are devoted to fruit raising. These fields slope gently to the east, and are separated by a narrow lane leading to the woods in a ravine between two spurs of the ridge. On these two pieces of ground there are about 800 apple trees of some eight years growth, the bodies of the trees being about six to eight inches in diameter and standing in rows 20 feet apart. There are about 30 varieties of this kind of fruit, among the more important of which are the Red Astrachan, the Duchess of Oldenberg, the Fameuse, the Golden Russet, the Bell Flower and others.

Corresponding with each row of apple trees there are three rows of raspberry bushes, comprising two varieties each, of the red and black. The middle row of raspberry bushes is in line with the row of apple trees, and the others are on each side. The remaining spaces between the apple trees, embracing some ten or twelve feet,

are occupied with strawberry beds extending entirely across the fields and occupying fully one-half of the entire space. The strawberries are of the Wilson seedling variety, among the most prolific bearers known, enormous size, and of the most luscious description.

When I say that in the proper season these bushes and vines are simply loaded with blossoms and fruit, I speak the literal truth. Of strawberries, Mr. Eldridge usually realizes from 400 to 500 bushels, and of raspberries, from 500 to 700 bushels during each season. One year he sold 600 bushels of apples from these orchards. This is perhaps a little above the average yield. Only two crops of strawberries are raised from the same vines. Each two years, the old vines are ploughed under and replaced by new settings. In the fall the strawberry beds are covered with a light coating of straw which remains until after the frosts of spring. About every fourth year a thorough dressing of the best barn yard manure is applied to the soil and ploughed in. The new shoots of the raspberry plants receive in the spring of the year a "pinch" at the top to check the upward growth of the main stems, and to cause the lateral branches to develop the more fully. Mr. Eldridge has thoroughly studied the habits of these plants and trees, and his treatment of them is very scientific. The result is that his production is liberal and certain. He rarely fails to gather a good crop. In the season of picking and marketing he employs from sixty to seventy-five extra hands, mostly young women.

In order to give your readers some notion of what may be done on "a little farm well tilled," I append a few figures given me by Mr. Eldridge as to his operations in 1874. I first give the results of the seventeen acres devoted to fruit, premising that the year 1874 was a very unfavorable season for berries. The product was:

400 bushels berries at \$4.80	\$1,920
200 bushels Red Astrachans at \$2.00.....	400
100 bushels Duchess at \$1.75	175
200 bushels Fameuse at \$1.00.....	200
100 bushels Golden Russets, &c., at \$1.00	100
Total value of fruits sold.....	\$2,790

The farm products sold were:

1,200 bushels wheat at 85 cents.....	\$1,020
400 bushels corn at 60 cents.....	240
200 bushels oats at 50 cents.....	100
30 tons hay at \$12.....	360
400 bushels potatoes at 75 cents.....	300
Total farm products.....	\$2,020
Total fruit and farm products.....	\$4,810

But this is not all, on the same ground there are 1,600 young apple trees nearly ready for transplanting, and worth \$15 per hundred, total \$240, swelling the gross amount to \$5,490.

It would of course add to the interest of this subject if I could give an accurate statement of the expenses attending this production.

But this was impracticable since no account has been kept with sufficient care to render the showing satisfactory. The facts as they stand, however, are of much interest as bearing upon the general question of fruit raising in this State, about which there has heretofore been so much skepticism.

FRUIT GROWING AT EXCELSIOR.

BY PETER M. GIDEON.

We came here twenty-one years ago last November, the next spring set out 350 apple trees, about 50 pear, plum and cherry trees, and planted a bushel of apple seeds, and out of all there now remains a few branches of one apple tree, the centre having been cut out, killed some eight or ten years ago by leaf lice, at which time and by which cause we lost a great many fine trees. Three years thereafter we set about a thousand trees in one orchard, the most of which were killed by the grasshoppers at the time our settlers around the lake were so cleaned out; and not only the orchard trees, but several thousands of seedlings and root grafts, but few of either left that the winters had spared.

For the first twelve years we planted southern or eastern apple seeds, in quest of something hardy, and never less than to have brought a thousand young trees, and to-day only eight remain out of the twelve years planting of seed. The greater part were so tender they died in the nursery row; but of seedling and grafted trees over 10,000 died after being set in orchard. Up to the time of our getting seeds and cions from Bangor, Maine, we had set in orchard some four or five thousand trees—all dead save one tree and a part of one other, referred to above.

With the introduction of seeds and cions from Maine, our prospects brightened, the Duchess, Blue Pearmain and Red Astrachan being of the lot of cions, and soon into bearing—the Duchess first, and best ever since, and the fact being told, the Duchess tree was in demand, and set by thousands to good profit.

And from the seed got at the same time, and at same place cions were had, we grew the Wealthy apple, in tree as hardy as a crab. And indeed grown from seed obtained as crab seed, and from later experiments have no doubt but it came from a genuine crab seed, as I have since grown perfect crab trees from apple seeds, and perfect apple trees from crab seed—the majority of the seedlings from the Wealthy apple are perfect crabs, in tree and fruit. And the same is applicable to Duchess seedlings, though the Duchess, Wealthy and a crab tree stand in close proximity, which might account for the crossing without either of the originals being hybrids. Our crabs are all hybrids to a greater or less extent, and their seedlings are more or less apple in tree and fruit, and the nearer the proximity to other varieties the greater the variations in the seedlings.

So great is the gain in the reproductive process from crab seed, that we may truly call the crab a Godsend. For by careful selection we retain the tree in all its thrift, hardiness, and profusion of bearing, with the fruit enlarged and ameliorated at each remove. Those coming into bearing soonest show most crab in tree, and those showing most apple in composition of tree bear the largest fruit, and generally, though not always, best in flavor.

We have about 600 choice seedlings, from seed of our own growing, now set in orchard, and more than a thousand yet to set, which we expect to set next spring. Of those set in orchard about 60 have borne fruit, many far surpassing the famous Transcendent in size, flavor, beauty of fruit, and in hardiness of tree. In fact the average hardiness is better than that of Transcendent. The finest samples of our seedling trees have not borne yet, but those that have borne stand a pledge that better is yet to come in.

We have 4,600 apple, pear, plum and cherry trees in orchard, and those mostly hardy, reliable trees, the tender ones pretty well killed out. A vast amount are crab stocks, top worked with good varieties of large apples, which process we find to be a success with all varieties that we have so worked, not one having winter killed with us, though others have lost trees so worked, but ours were well mulched and theirs were not. I find that a crab root well mulched will repair any break that a cold winter may have made on its top, be that top of ever so tender a variety of apple. We lost a great many trees two years ago from excessive cold, but no crab trees so lost, though the blight took in the crabs full as bad, if not worse than on the apple—suffered great loss on all.

The blight and the cold of two years ago gave us a great back-set, but we are fast recovering by re-setting with our hardy seedlings, which are proof against all extremes of cold. Our reverses have been great financial drawbacks, but we never gave up in despair, but at each reverse sought new varieties and better seeds, till now success has crowned us—and only a matter of time, and a rich harvest is reaped, so far as the apple is concerned. But of the pear I am not quite so sanguine—yet feel quite sure that out of the great number of varieties we will find some that will stand our climate. We have over one hundred varieties of pears now in cultivation, and as many more tried and gone.

The cherry, we found, was not a paying crop; and it is mostly cleared out, and something else set in its place.

The peach and cultivated plums were failures. Grapes a paying success, as is also the strawberries, the blackcap raspberries, gooseberries and currants.

To sum up, with us fruit growing is a success, and the owner of land in the northwest that now fails to plant in variety sufficient for all family demands is a sluggard. Our break-downs of the past are bridges over which he can pass without fear of failure. The cost of success we have met, in poverty paid it, so that no one needs to pass over our experience, run our risks or foot our bills of losses to get a full supply of fruit in great variety, lasting the year through.

When we began our career we cultivated the ground, but did not mulch any. That year the trees killed, some only in the root, others

only in the top, and others in the top and root; both the root and top happening to be tender. We soon discovered that some were so tender in the top that no care could save them, but that others were sufficiently hardy in the top to stand, provided they were on hardy roots, or if on tender roots, so protected that the full force of the frost could not reach them. Therefore we began the process of mulching. But when to apply it was a problem that experiment had to solve, and we went at it with a will to know, and so applied the mulch at various seasons of the year, often using alternate trees, sometimes removed the mulch in spring from some, and left it to others the year round. Those mulched in fall before any freeze never bark-bursted nor root killed, and those around which the mulch was left the year round made the best growth, and those killed worst that were mulched after the ground had froze hard, fared even worse than those not mulched at all, side by side with them. The mulching should be applied from two to six inches deep, according to coarseness, and the greater the circumference the better; and any kind of litter is good, though I deem forest leaves and meadow muck (common peat) the best in their results, and the most lasting. One fall we had 1,000 trees mulched, and did not lose one of them, and 168 not mulched, and lost nine-tenths of them; and in other seasons a similar proportion. Our soil—a deep, rich, loose loam, on top of clay—and first trees set out at the usual depth of setting, which gave drouth and frost full force at them; but of late we dig down into the clay and set deep, getting a better growth, and finding them less affected by drouth or frost. And of late we effectually avoid sun-scald on the southwest side of the trunk by forming low heads—12 inches of trunk being enough for any tree. It is not every winter that roots kill, but to be successful you must be prepared for the worst ere winter sets in, not knowing what may come.

Having given a brief history of our losses and gains, and how come at, perhaps some would be eager to know the cost—a bill not easily summed up in dollars and cents, seeing our own labor has done it all. We labored to get money to buy trees, seeds and cions; set and re-set as destruction cleared spaces. Not a tree, seed nor cion free from any one during days of uncertain trial, though I often applied to persons from the east and north to send to their friends there for seeds and cions for me to test; but was as often refused, on the ground that fruit could not be grown here, and that they would not be a party to my poverty; that I was foolish for ever expecting to grow fruit here; and others, more abrupt, told me I was a fool for my efforts, so hopeless was the prospect, in the judgment of the mass of men, after a few years of first trial.

One year after we came here, by the dishonesty of two men whom I trusted in care of a drove of cattle, we lost all we were worth, and since been in no speculation to make anything—settled in timber, did all by hard knocks. Came here an invalid, so far gone with lung disease that our friends and physicians thought I could not endure one winter here. Fourteen years we were without a team of any kind, all teaming paid for by our own labor. At one time for the space of five years, was not five miles from home, and in that time only twice over two miles, and once in the time was five months

not off our own premises—no time to spend, nor anything fitting to wear.

To save money to send to Bangor, Maine, for seeds and cions, I patched two old vests, tacked them together, then cut the legs off of an old pair of pantaloons, patched the holes and sewed them to the old vests as sleeves, and the balance of the garb to fit was my rig for six months; and the result, the Duchess apple soon had a renown in Minnesota; for all my successes were quickly and faithfully given to the papers, and often the same article went to a half dozen papers. And from the seeds then and there got we grew the Wealthy apple, and from their seeds in turn, we have now a host of young trees that are sure to enlarge and extend the blessing.

Therefore, having given the facts in brief, I leave others to sum up the costs to us, and the worth of that old suit of rags to the northwest.

THE PLOW IN GRAPE CULTURE.

BY REV. C. B. SHELDON, EXCELSIOR, MINNESOTA.

The question is sometimes asked, shall the plow be used in tilling grapes?

My reply is, emphatically, yes; provided the management from the first has been right. The only objection to the plow is, that by its depth of culture, it may injure surface roots. My plan is, from the first to discourage surface roots, and promote a deep growth. The reasons for this will appear in the sequel.

I begin with the preparation of the soil. Owing to the high price of labor, we cannot trench our land from two to three or more feet deep, as is done in the vine countries of Europe. But the least that should be done is to subsoil plow the land. If this is done twice, so much the better; the second time crossing the furrows first made. The expense is slight compared with the benefit derived. This will stir the soil some 18 or 20 inches deep.

In the fall, after the first summer's growth of the vines, before covering for winter, dig away the soil from the crown of the plants, and prune off entirely all roots within six inches of the surface. One object of this is to retard the starting of the vines in the spring and so enable them to escape one of their chief dangers, that of being killed by the late spring frosts. The surface roots are the first to feel the warmth of the spring sun and are liable, by generating sap, to stimulate the buds prematurely into action. These being removed, the other roots lying deeper, are slower in their action, and the sap does not begin to circulate freely and force the buds until all danger of freezing is over.

The other reason for this pruning of the surface roots of the young vines, is to stimulate the growth of the lower roots, and form the

habit of the vine to depend upon them, and thus leave the surface for culture.

Let the vineyard be thus commenced, and no injury will result from the use of the plow. The plants will be more hardy, productive and lasting, and the expense of culture will not be one-quarter of that by hand alone. Two plowings alternating with the cultivator, together with a little hoeing between plants in the rows, are sufficient for the season.

The use of the plow also greatly facilitates the covering for the winter. After the plants are pruned and laid down I turn a furrow or two on each side of the rows, which about half covers them. Nothing could induce me to throw aside the plow in grape culture and return to the drudgery and inefficiency of hand tillage.

STEWART'S SWEET—HISTORY OF ITS ORIGIN, HARDINESS, &c.

BY A. STEWART, RICHFIELD, MINN.

My seedling was raised on the Le Sueur prairie, in 1856, and was one of two trees out of about 200,000 settings that was not injured by the hard winter of 1857-8. This tree stood in a real sand bed, but came out finely with neither top or root killed. This same season I had 60,000 grafted apple trees three years old, completely ruined by having the roots killed. The trying time seemed to be the 23d of February, 1858, when, after freezing the ground to a great depth, a thaw came on with rain at 9 o'clock in the evening, but the next morning the mercury was down to 30 degs. below. This great change of temperature and throwing off the ground around the root did not have any serious effect on this seedling.

In the spring of 1866, I removed to Minneapolis with what I had of the nursery. The next spring trees generally came out badly, many large Siberians having been ruined by killing of the roots. My soil was a light sandy loam, near town, and though my loss was very great to other varieties, yet my hardy seedling was not injured.

In regard to bearing qualities, it has not been fully tested. As compared to the Transcendent it is not a great bearer. The original tree did not come into bearing until eleven years of age, while I have known it to commence producing fruit at seven years. The specimens exhibited at the State Fair of 1874 were from trees of that age. A few years will prove the bearing qualities of the apple, as the trees become older, and it would not be a real objection if it did not produce so much fruit as the Transcendent, which is too often overloaded. I have never known it to be winter-killed on its own roots, but on common seedlings it has sometimes been somewhat affected in certain localities. It is generally considered more hardy than the Duchess, which seems to be more hardy than the other Russian va-

rieties. I then made up my mind that it was a most valuable apple tree for this climate, with regard to hardiness, at least. This fact was fully established in two localities, and with others, on the worst of soil, being light and sandy.

For many years I had supposed there was no danger from root killing, when the ground froze early and remained so. During my first year in Minneapolis the ground was bare until very late in winter, but frozen hard until spring. The damage that year to fruit trees was very severe, and thousands died when they ought to have started into vigorous growth.

THE SIBERIAN APPLES.

BY DR. P. A. JEWELL, LAKE CITY, MINN.

The committee of the Horticultural Society arranged the Siberian apples in four classes: the first three with respect to hardiness and the fourth with reference to their special adaptation to cooking.

FIRST CLASS—IRON CLAD.

1. Early Strawberry—Tree a strong and handsome grower, bearing heavy crops alternate years. Fruit, size and appearance of Transcendent, excellent for eating. Season, August.

2. Orange—Tree a moderate grower and an annual and abundant bearer. Fruit larger than Transcendent; flesh firm, crisp, juicy and delicious. October to December.

3. Beecher's Sweet—Tree vigorous and erect; a biennial and abundant bearer. Fruit resembling in appearance the Transcendent, but larger; very pleasant for eating. September.

4. Minnesota—A medium grower, with pale green leaves of unusual size, often becoming highly colored in autumn like the foliage of the sugar maple. Fruit larger than the Golden Russet; skin thin, nearly white, with beautiful blush on the sunny side. Quality excellent. December to February.

CLASS SECOND—EXTRA HARDY.

1. Conical—Tree vigorous and handsome and a good bearer. Fruit as large as Transcendent, mellow, dry and with a peculiar, spicy flavor. In appearance and flavor resembling the Black Gilliflower. October.

2. Maiden's Blush—Tree medium grower of slender, graceful habit. Fruit not quite as large as Transcendent, of pearl white color, with a beautiful red cheek; flesh tender, fine grained, with a peculiar, pleasant flavor. December to January.

3. Meader's Winter—A handsome, strong, growing, productive

tree. Fruit size of the last; excellent for eating. Season, April and May.

4. Hutchinson's Sweet—Tree a good grower, with slender twigs; a moderate bearer. Fruit size of the last described; superior quality; keeping until April or May.

5. Quaker Beauty—A stronger grower than the Transcendent; a biennial bearer. Fruit large, handsome and of excellent quality. April to May.

CLASS THIRD—HARDY.

1. Gen. Grant—A vigorous, erect and symmetrical tree; an annual and profuse bearer, fruiting in dense clusters. Fruit very large, dark red, nearly black when ripe, and in quality much like the Duchess. October and November.

2. Hesper Blush—Tree among the handsomest and a good bearer. Fruit a little smaller than the Gen. Grant; smooth, handsome, quality good. Season, November to January.

3. Aikin's Striped Winter—A fine tree, but the least hardy of the class; an annual and free bearer. Fruit good sized and valuable for eating, cooking or either. Season, mid-winter.

Class four, except Green Winter, are too well known to need description. They are suitable for cooking and drying only.

A few additional facts in regard to these Siberian varieties may not be without interest. The first class is slightly more hardy than the second, but both are regarded as sufficiently so to warrant general planting.

The third class is less hardy than the two preceding, but will probably succeed in all but the most trying situations.

None of them are, as orchard trees, like the Transcendent, badly given to blighting, except Meader's Winter and General Grant.

In fruitfulness the several varieties differ greatly, but in the aggregate fruit younger and more profusely than the common kinds of apples.

For eating, none are inferior to the Duchess, while several kinds are equal in this respect to any apple grown.

As a harvest fruit the Early Strawberry is more valuable than the Tetofsky, the fruit being as good in quality, and the tree more vigorous and hardy and adapted to all kinds of soils.

The Orange is unquestionably more valuable for general cultivation than the Duchess of Oldenburg. The tree is even more hardy, not less productive, the fruit less perishable, lasting several months, and perfectly adapted to every use to which an apple can be applied, eating, cooking, or the manufacture of cider.

As an early winter apple there are none of the common sorts that have come to public notice that in hardiness of tree, size, quality and beauty of fruit are equal to the Minnesota, the largest of Siberian seedlings.

The only unsettled question on which the value of this variety measurably depends, is its productiveness.

A CATALOGUE OF THE PLANTS OF MINNESOTA.

BY I. A. LAPHAM, LL. D., OF MILWAUKEE, WIS.—1865.

[NOTE.—Dr. I. A. Lapham, whose death occurred at Milwaukee on the 14th of September, 1875, had been a prominent scientific observer and writer in the Northwest for more than twenty years. While his field was mainly within the State of Wisconsin, of which he published an accurate geological map in 1869, he made several extended tours of observation in the State of Minnesota, in connection both with public and private surveys. He was first to call attention, in a systematic way, to the remarkable effect of the Great Lakes on the climate of the country contiguous to them. A work of his on the "Antiquities of Wisconsin," was published by the Smithsonian Institute in its contributions to knowledge, in 1855. Occasional papers of his have appeared from time to time in the *American Journal of Science* and the *American Naturalist*, on the Geology, Archæology, Zoology, Botany and Climatology of the region of the Great Lakes. Upon the organization of the present geological survey of Wisconsin, he was very wisely and justly appointed its director. He had contributed so largely to the working out of the natural history of the State that the minuteness of his acquaintance with it could not be acquired by a stranger in anything short of a lifetime. It is lamentable that a short-sighted economy refused, two years ago, to publish the results of his labors and of his coadjutors, and that his manuscripts, stored in the archives of the State, stifled vindicators of his industry and research, are liable to be ignored and forgotten in the further prosecution and final completion of the work.

With a generous and cosmopolitan spirit which characterized him in his scientific labors, he sent the manuscript of the following catalogue of the plants of Minnesota to the writer, soon after the initiation of the geological survey of the State, without expressing any desire as to the disposition that should be made of it. He designed it, of course, as a free contribution to the natural history of the State of Minnesota, which would be capable of producing more good in the possession of the officers of our survey than in his own. The Board of Regents accepted it with due acknowledgments, and would have published it when that branch of the survey should have been undertaken. But the death of Dr. Lapham renders it an act of justice to the memory of his generous labors to delay its publication no further.

The value of this catalogue to the State of Minnesota cannot be estimated—the result of no scientific labor can. To the development of the botany of the State it will add a very great impetus. It is the first attempt ever made to make out anything like a com-

plete list of our native vegetation. It is the embodiment not only of the labors of Dr. Lapham himself but also of all his predecessors, in studying the botany of Minnesota. Hundreds of local amateur botanists will scan its pages. It furnishes a platform from which to begin a careful search for other species, and to which, as a check-list, to refer future examinations. The issue of this catalogue, as here published, is actually the very first and most important step toward the exhaustive study and complete development of the botany of our State. By this means, when the State survey, ordered by the Legislature of 1872, is ready for the enumeration and classification of our flora, a vast amount of information will be at hand, in the possession of the botanists of the State, stimulated and guided in their work by the systematic arrangement here presented. In this sense, then, it is a publication of the geological and natural history survey of the State, since it will redound largely to the progress of that work, to whose care Dr. Lapham at first confided it.—N. H. W.]

But very little definite information has yet been published in regard to the native vegetation of Minnesota. Mr. Thomas Say, the distinguished zoologist, and one of the founders of the Academy of Natural Sciences at Philadelphia, while connected with the expedition of Maj. Long, collected a few plants which were examined by the late Lewis Von Schweinitz, and noticed in the narrative of that expedition. Prof. D. B. Douglass, of West Point, had previously brought home a few Minnesota plants which were placed in the hands of Dr. John Torrey, of New York, and noticed in Silliman's American Journal of Science for 1822; and Dr. Douglas Houghton, of Michigan, added quite a number to the list, on the return of the party that first visited Itasca lake, and discovered the true source of the Mississippi in 1832. In the reports of Nicollet and Owen lists are given of plants collected by persons connected with their surveys.

All these lists have been consulted in the preparation of this catalogue, which, nevertheless, rests chiefly upon my own observations and collections made during several excursions into the State; one of which, in the spring of 1857, was extended to the waters of the Red River of the North.

In 1858 Mr. Robert Kennicott made collections of plants and animals in the Red River country which are preserved by the Northwestern University at Evanston, Illinois. Mr. Charles A. Hubbard collected expressly for me a large number of plants including mosses and lichens, while on a tour from Lake Superior to Lake Winnepeg and Pembina, as well as while on his return by way of St. Paul. In 1861 Mr. T. J. Hale while prosecuting geological investigations along the Mississippi river in connection with the Wisconsin State survey, made some collections of plants in Minnesota, a list of which he has kindly furnished to me. Several species are introduced upon his authority.

This catalogue shows that there are growing naturally in Minnesota 48 forest trees, 77 species of the grass family, 133 compound flowering plants, 22 coniferous trees and shrubs, 38 kinds of pod-bearing (Leguminose) plants, 23 ferns, 56 mosses and lichens; and a total number of about 850 species. It is not to be supposed, however, that this is a complete list of the plants of Minnesota; hundreds of species yet remain to reward the industry of future observers.

SERIES I. SPERMIFERÆ.

(Plants bearing seeds with an embryo, and one, two, or more cotyledons.)

CLASS I. *Angiosperme.* (*Seeds inclosed.*)SUB-CLASS I. *Dicotyledons.* (*Cotyledons two.*)

RANUNCULACEÆ. THE CROWFOOT FAMILY.

- ATRAGENE, Linnæus.
 Americana, Sims.
 CLEMATIS, Linnæus. Virgin's Bower.
 cylindrica, Sims.
 Virginiana, Linn.
 PULSATILLA, Tournefort. Pasque-flower.
 Nuttalliana, Gray.
 ANEMONE, Linnæus. Wind-flower.
 Virginiana, Linn.
 Pennsylvanica, Linn.
 nemorosa, Linn. Low Anemone.
 HEPATICA, Dillenius. Liver-leaf.
 triloba, Chaix.
 THALICTRUM, Tournefort. Meadow Rue.
 anemonoides, Michx.
 diolcum, Linn.
 RANUNCULUS, Linnæus, Crowfoot. Butter-cup.
 reptans, Linn.
 Cymbalaria, Pursh.
 romboideus, Goldie.
 sceleratus, Linn.
 Pennsylvanicus, Linn.
 fascicularis, Muhl.
 repens, Linn. Creeping Crowfoot.
 ISOPYRUM, Linnæus.
 baternatum, Torr. and Gray.
 CALTHA, Linnæus. Marsh Marygold.
 palustris, Linn.
 COPTIS, Salisbury. Goldthread.
 trifolia, Salisb.
 AQUILEGIA, Tournefort. Columbine.
 Canadensis, Linn. Wild Columbine.
 DELPHINIUM, Linnæus. Larkspur.
 virescens, Nutt.
 ACTEA, Linnæus, Baneberry. Cohosh.
 spicata, Linn. White Cohosh.

MENISPERMACEÆ. THE MOONSEED FAMILY.

- MENISPERMUM, Linnæus. Moonseed.
 Canadense, Linn.

BERBERIDACEÆ. THE BARBERRY FAMILY.

- CAULOPHYLLUM, Michaux. Blue Cohosh.
 thalictroides, Michx.

NELUMBIACEÆ. THE NELUMBO FAMILY.

- NELUMBium, Jussieu.
 luteum, Willd. Sacred bean.

CABOMBIACEÆ. THE WATER-SHIELD FAMILY.

BRASENIA, Schreber. Water-Shield.
peltata, Pursh.

NYMPHÆACEÆ. THE WATER-LILY FAMILY.

NYMPHÆA, Tournefort.
odorata, Ait. White Water-Lily.
NUPHAR, Smith. Yellow Pond-Lily.
advena, Ait.

SARRACENIACEÆ. THE PITCHER-PLANT FAMILY.

SARRACENIA, Tournefort. Side Saddle flower.
purpurea, Linn.

PAPAVERACEÆ. THE POPPY FAMILY.

SANGUINARIA, Dillenius. Bloodroot.
Canadensis, Linn.

FUMARIACEÆ. THE FUMATORY FAMILY.

DICENTRA, Bork. Dutchman's Breeches.
Cucullaria, DC.
CORYDALIS, Ventenat.
aurea, Willd.
glauca, Pursh.

CRUCIFERÆ. THE MUSTARD FAMILY.

NASTURTIUM, Robert Brown. Water Cress.
sinnatum, Nutt.
sessiliflorum, Nutt.
lacustre, Gray.
DENTARIA, Linnæus. Toothwort.
laciniata, Muhl.
CARDAMINE, Linnæus. Bitter-Cress.
rhomboidea, DC. Spring Cress.
pratensis, Linn.
ARABIS, Linn. Rock Cress.
lyrata, Linn.
hirsuta, Scop.
lævigata, DC.
Canadensis, Linn. Sickle-pod.
TURRITIS, Dillenius.
glabra, Linn.
BARBAREA, R. Brown.
vulgaris, R. Br.
ERYSIMUM, Linnæus. Treacle Mustard.
cheiranthoides, Linn.
SISYMBRIUM, Linnæus. Hedge Mustard.
officinale, Scop.
canescens, Nutt.
SINAPIS, Tournefort. Mustard.
arvensis, Linn. Field Mustard.
DRABA, Linnæus. Whitlow Grass.
Caroliniana, Walt.
CAMELINA, Crantz.
sativa, Crantz.

- THLASPI**, Dillenius.
 arvense, Linn.
LEPIDIUM, Linnæus. Peppergrass.
 virginicum, Linn. Wild Peppergrass.
 intermedium, Gray.
CAPSELLA, Ventenat. Shepherd's Purse.
 Bursa-pastoris, Mœnch.

VIOLACEÆ. THE VIOLET FAMILY.

- VIOLA**, Linn. Violet.
 blanda, Willd.
 cucullata, Ait. Blue Violet.
 sagittata, Ait.
 delphinifolia, Nutt.
 pedata, Linn.
 Muhlenbergii, Torr.
 Canadensis, Linn.
 pubescens, Ait. Yellow Violet.

CISTACEÆ. THE ROCK-ROSE FAMILY.

- HELIANTHEMUM**, Tournefort. Rock-Rose.
 Canadense, Michx.
HUDSONIA, Linn.
 ericoides, Linn.
LECHEA, Linn. Pin-weed.
 minor, Lam.

DROSERACEÆ. THE SUN-DEW FAMILY.

- DROSERA**, Linnæus. Sundew.
 rotundifolia, Linn.
 longifolia, Linn.
 linearis, Goldie.

PARNASSIACEÆ. THE PARNASSIA FAMILY.

- PARNASSIA**, Tournefort.
 Caroliniana, Michx.

HYPERICACEÆ. THE ST. JOHNSWORT FAMILY.

- HYPERICUM**, Linnæus. St. Johns-wort.
 pyramidatum, Ait.
 corymbosum, Muhl.
 ellipticum, Hook.
 mutilum, Linn.
 Canadense, Linn.
ELODEA, Pursh. Marsh St. Johnswort.
 Virginica, Nutt.

CARYOPHYLLACEÆ. THE PINK FAMILY.

- VACCARIA**, Medik. Cow-herb.
 vulgaris, Host.
SILENE, Linnæus. Catch-fly.
 stellata, Ait. Starry Campion.
 antirrhina, Linn.
ALSINE, Tournefort.
 Michauxii, Fenzl.
MÆRINGIA, Linnæus.
 lateriflora, Linn.

- STELLARIA, Linnæus. Chickweed.
 longifolia, Muhl.
 longipes, Goldie.
 CERASTIUM, Linnæus.
 arvense, Linn.
 ANYCHIA, Michaux.
 dichotoma, Michx.
 MOLLUGO, Linnæus. Carpet Weed.
 verticillata, Linn. Carpet-Weed.

PORTULACACEÆ. THE PURSLANE FAMILY.

- PORTULACA, Tournefort. Purslane.
 oleracea, Linn.
 TALINUM, Adanson.
 teretifolium, Pursh.
 CLAYTONIA, Linnæus.
 Virginica, Linn. Spring Beauty.

MALVACEÆ. THE MALLOW FAMILY.

- CALLIRRHOE, Nuttall.
 triangulata, Gray.
 NAPÆA, Clayton.
 dioica, Linn.
 ABUTILON, Tournefort.
 Avicennæ, Gærtn.

TILIACEÆ. THE LINDEN FAMILY.

- TILIA, Linnæus. Linden.
 Americana Linn. Basswood.

LINACEÆ. THE FLAX FAMILY.

- LINUM, Linnæus. Flax.
 Boottii, Planchon.

OXALIDACEÆ. THE WOOD-SORREL FAMILY.

- OXALIS, Linnæus. Wood-sorrel.
 violacea, Linn.
 stricta, Linn. Sheep-sorrel.

GERANIACEÆ. THE GERANIUM FAMILY.

- GERANIUM, Linnæus. Cranes-bill.
 maculatum, Linn.
 Robertianum, Linn.

BALSAMINACEÆ. THE BALSAM FAMILY.

- IMPATIENS, Linnæus. Balsam. Jewel-weed.
 pallida, Nutt.
 fulva, Nutt.

RUTACEÆ. THE RUE FAMILY.

- ZANTOXHYLUM, Colden. Prickly Ash.
 Americanum, Mill.
 PTELEA, Linnæus.
 trifoliata, Linn. Hoptree.

ANACARDIACEÆ. THE SUMACH FAMILY.

- RHUS, Linnæus. Sumach.
 typhina, Linn. Staghorn Sumach.
 glabra, Linn. Smooth Sumach.
 venenata, DC. Poison Sumach.
 Toxicodendron, Linn. Poison Ivy.

VITACEÆ. THE VINE FAMILY.

- VITIS, Tournefort. Grape.
 æstivalis, Michx. Summer Grape.
 cordifolia, Michx. Frost Grape.
 AMPELOPSIS, Michaux. Virginia Creeper.
 quinquefolia, Michx.

RHAMNACEÆ. THE BUCKTHORN FAMILY.

- RHAMNUS, Tournefort. Buckthorn.
 alnifolius, L'Her.
 CEANOTHUS, Linnæus. New Jersey Tea.
 Americanus, Linn.
 ovalis, Bigelow.

CELASTRACEÆ. THE SPINDLE TREE FAMILY.

- CELATRUS, Linnæus.
 scandens, Linn. Bitter-Sweet.
 EUONYMUS, Tournefort. Spindle-Tree.
 atropurpureus, Jacq. Wauhoo.

SAPINDACEÆ. THE SOAPBERRY FAMILY.

- STAPHYLEA, Linnæus. Bladdernut.
 trifolia, Linn.
 ACER, Tournefort. Maple.
 spicatum, Lam.
 saccharinum, Wang. Sugar-Maple.
 dasycarpum, Ehrh. Silver-Maple.
 rubrum, Linn. Red-Maple.
 NEGUNDO, Moench. Box-Elder.
 aceroides, Moench.

POLYGALACEÆ. THE MILKWORT FAMILY.

- POLYGALA, Tournefort. Milkwort.
 sanguinea, Linn.
 cruciata, Linn.
 verticillata, Linn.
 Senega, Linn. Seneca Snake-Root.
 polygama, Waltr.

LEGUMINOSÆ. THE PEA FAMILY.

- LUPINUS, Tournefort. Lupine.
 perennis, Linn.
 TRIFOLIUM, Linn. Clover.
 repens, Linn. White Clover.
 GLYCYRRHIZA, Tournefort. Liquorice.
 lepidota, Nutt.

- PSORALEA**, Linnæus.
 argophylla, Pursh.
 brachiata, Douglas. Prairie Turnip.
 esculenta, Pursh. "Pomme de Prairie."
PETALOSTEMON, Michaux.
 violaceum, Michx.
 candidum, Michx.
 villosum, Nutt.
AMORPHA, Linnæus. False Indigo.
 fruticosa, Linn.
 canescens, Nutt. Lead Plant.
 nana, Nutt.
TEPHROSIA, Persoon. Hoary Pea.
 Virginiana, Pers.
ASTRAGALUS, Linnæus. Milk-vetch.
 caryocarpus, Ker. Ground-plum.
 Canadensis, Linn.
HEDYSARUM, Tournefort.
 boreale, Nutt.
OXYTROPIS, De Candolle.
 Lamberti, Pursh.
 splendens, Doug.
DESMODIUM, De Candolle. Tick-Trefoil.
 nudiflorum, DC.
 acuminatum, DC.
 canescens, DC.
 cuspidatum, Torr. and Gray.
 Dillenii, Darlington.
 Canadense, DC.
LESPEDEZA, Michaux. Bush-clover.
 procumbens, Michx.
 capitata, Michx.
VICIA, Tournefort. Vetch.
 Caroliniana, Walt.
 Americana, Muhl.
LATHYRUS, Linnæus.
 venosus, Muhl.
 ochroleucus, Hook.
 palustris, Linn.
PHASEOLUS, Linnæus. Kidney Bean.
 diversifolius, Pers.
 pauciflorus, Benth.
APIOS, Berh. Ground-nut.
 tuberosa, Mœnch.
AMPHICARPEA, Elliott.
 monoica, Nutt. Wild Bean.
BAPTISIA, Ventenat. False Indigo.
 leucantha, Torr. and Gray.
 leucophæa, Nutt.
CASSIA, Linnæus.
 Chamæcrista, L.

ROSACEÆ. THE ROSE FAMILY.

- PRUNUS**, Linnæus. Plum.
 Americana Marsh. Wild plum.
 pumila, Linn. Dwarf cherry.
 Pennsylvanica, Linn. Bird cherry.
 Virginiana, Linn. Choke cherry.
 serotina, Ehrh. Black cherry.
SPIRÆA, Linnæus.
 opulifolia, Linn. Nine Bark.
 salicifolia, Linn. Meadow-Sweet.
 tomentosa, Linn. Hard-Hack.

- AGRIMONIA, Tournefort.
Eupatoria, Linn.
- GEUM, Linnæus.
album, Gmelin.
Virginianum, Linn.
macrophyllum, Willd.
strictum, Ait.
triflorum, Pursh.
- POTENTILLA, Linnæus. Five-finger.
Norvegica, Linn.
paradoxa, Nutt.
Canadensis, Linn. Five-finger.
Pennsylvanica, Linn.
arguta, Pursh.
Anserina, Linn.
fruticosa, Linn.
tridentata, Ait.
palustris, Scop.
- FRAGARIA, Tournefort. Strawberry.
Virginiana, Ehrh. Wild Strawberry.
vesca, Linn.
- DALIBARDA, Linnæus.
repens, Linn.
- RUBUS, Linnæus. Bramble.
Nutkanus, Moçino.
triflorus, Richardson.
strigosus, Michx. Red Raspberry.
occidentalis, Linn. Black Raspberry.
villosus, Ait. Blackberry.
Canadensis, Linn. Low Blackberry.
hispidus, Linn.
- ROSA, Tournefort. Rose.
lucida, Ehrh. Wild Rose.
blanda, Ait.
- CRATÆGUS, Linnæus. Hawthorn.
coccinea, Linn. Scarlet-fruited Thorn.
tomentosa, Linn.
- PYRUS, Linnæus. Apple.
coronaria, Linn. Crab-Apple.
arbutifolia, Linn. Choke-berry.
Americana, DC. Mountain-Ash.
- AMELANCHIER, Medic.
Canadensis, Torr. and Gray. June Berry.

LYTHRACEÆ. THE LOOSESTRIFE FAMILY.

- LYTHRUM, Linnæus. Loosestrife.
alatum, Pursh.

ONAGRACEÆ. THE EVENING PRIMROSE FAMILY.

- EPHILOBIUM, Linnæus. Willow-herb.
angustifolium, Linn.
palustre, Linn.
molle, Torr.
coloratum, Muhl.
- ÆNOTHERA, Linnæus. Evening Primrose.
biennis, Linn.
rhombipetala, Nutt.
serrulata, Nutt.
albicaulis, Nutt.
pumila, Linn.

- GAURA, Linnæus.
 coccinea, Nutt.
- LUDWIGIA, Linnæus.
 polycarpa, Short and Peter.
 palustris, Elliott.
- CIRCÆA, Tournefort. Enchanter's Night-Shadow.
 Lutetiana, Linn.
 alpina, Linn.
- MYRIOPHYLLUM, Vaillant. Water Milfoil.
 spicatum, Linn.
 verticillatum, Linn.
 heterophyllum, Michx.
- HIPPURIS, Linnæus.
 vulgaris, Linn.

CACTACEÆ. THE CACTUS FAMILY.

- OPUNTIA, Tournefort. Prickly Pear.
 vulgaris, Mill.

GROSSULACEÆ. THE GOOSEBERRY FAMILY.

- RIBES, Linnæus.
 Cynosbati, Linn. Wild Prickly Gooseberry.
 hirtellum, Michx.
 rotundifollum, Michx. Swamp Gooseberry.
 lacustre, Poir. Swamp Gooseberry.
 prostratum, L'Her.
 Missouriense, Nutt.
 floridum, Linn. Wild Black Currant.
 rubrum, Linn. Wild Red Currant.

CUCURBITACEÆ. THE CUCUMBER FAMILY.

- SICYOS, Linnæus.
 angulatus, Linn.
- ECHINOCYSTIS, Torrey and Gray. Wild Cucumber.
 lobata, Torrey and Gray.

CRASSULACEÆ. THE HOUSE-LEEK FAMILY.

- PENTHORUM, Gronovius.
 sedoides, Linn.

SAXIFRAGACEÆ. THE SAXIFRAGE FAMILY.

- SAXIFRAGE, Linnæus.
 Virginiensis, Michx.
 Pennsylvanica, Linn.
- HEUCHERA, Linnæus. Alum-root.
 hispida, Pursh.
 Richardsoni, R. Brown.
- MITELLA, Tournefort.
 diphylla, Linn. Twin-Leaf.
- TIARELLA, Linnæus. False Mitre-wort.
 cordifolia, Linn.
- CHRYSOSPLENIUM, Tournefort.
 Americanum, Schwein.

HAMAMELACEÆ. THE WITCH-HAZEL FAMILY.

- HAMAMELIS, Linnæus. Witch-Hazel.
 Virginica, Linn.

UMBELLIFERÆ. THE UMBEL-BEARING FAMILY.

- HYDROCOTYLE, Tournefort.
Americanum, Linn.
- SANICULA, Tournefort.
Canadensis, Linn.
Marylandica, Linn. Sanicle.
- ERYNGIUM, Tournefort. Button Snake-root.
yuccæfolium, Michx.
- POLYTENIA, DeCandolle.
Nuttallii, DC.
- HERACLEUM, Linnæus.
lanatum, Michx. Cow Parsnip.
- PASTINACA, Tournefort. Wild Parsnip.
sativa, Linn.
- ARCHEMORA, DeCandolle. Cow-bane.
rigida, DC.
- CYMOPTERUS, Rafinesque.
glomeratus, DC.
- ARCHANGELICA, Hoffmann.
atropurpurea, Hoffm.
- THASPIUM, Nuttall.
barbinode, Nutt.
aureum, Nutt.
trifoliatum, Gray.
- ZIZIA, DeCandolle.
integerrima, DC.
- CICUTA, Linnæus. Water Hemlock.
maculata, Linn.
bulbifera, Linn.
- SIUM, Linnæus. Water Parsnip.
lineare, Michx.
- CRYPTOTÆNIA, DeCandolle. Honeywort.
Canadensis, DC.
- OSMORRHIZA, Rafinesque. Sweet Cicely.
longistylis, DC.
brevistylis, DC.

ARALIACEÆ. THE GINSENG FAMILY.

- ARALIA, Tournefort.
hispida, Michx.
nudicaulis, Linn. Wild Sarsaparilla.

CORNACEÆ. THE DOGWOOD FAMILY.

- CORNUS, Tournefort. Dogwood.
Canadensis, Linn.
circinata, L'Her.
sericea, Linn.
stolonifera, Michx. Red-twigged Dogwood.
paniculata, L'Her.
alternifolia, Linn.

CAPRIFOLIACEÆ. THE HONEYSUCKLE FAMILY.

- LINNÆA, Gronovius. Twin flower.
borealis, Gronov.
- SYMPHORICARPUS, Dillenius.
occidentalis, R. Brown. Wolf-berry.
racemosus, Michx. Snow berry.

- LONICERA, Linnæus. Honey-suckle.
 flava, Sims. Yellow Honey-suckle.
 parviflora, Lam.
 hirsuta, Eaton.
 ciliata, Muhl.
 DIERVILLA, Tournefort. Bush Honey-suckle.
 Canadensis, Linn.
 TRIOSTEUM, Linnæus. Horse Gentian.
 perfoliatum, Linn.
 SAMBUCUS, Tournefort. Elder.
 Canadensis, Linn.
 pubens, Michx.
 VIBURNUM, Linnæus.
 Lentago, Linn. Sheepberry.
 dentatum, Linn. Arrow-wood.
 pubescens, Pursh.
 Opulus, Linn. High-bush Cranberry.

RUBIACEÆ. THE MADDER FAMILY.

- GALIUM, Linnæus.
 Aparine, Linn. Goose Grass.
 asprellum, Michx.
 concinnum, Torr. and Gray.
 trifidum, Linn.
 triflorum, Michx.
 circeæans, Michx.
 boreale, Linn.
 CEPHALANTHUS, Linnæus. Button-Bush.
 occidentalis, Linn.
 MITCHELLA, Linn. Partridge-Berry.
 repens, Linn.
 OLDENLANDIA, Plumier.
 purpurea, Gray.

VALERIANACEÆ. THE VALERIAN FAMILY.

- VALERIANA, Tournefort.
 edulis, Nutt.
 FEDIA, Gærtner.
 radiata, Michx.

COMPOSITÆ. THE COMPOSITE FAMILY.

- VERNONIA, Shreber, Iron-Weed.
 fasciculata, Michx.
 LIATIS, Schreber,
 cylindracea, Michx.
 scariosa, Willd.
 spicata, Willd.
 pyncnostachya, Michx.
 punctata, Hook.
 KUHNIA, Linnæus.
 eupatorioides, Linn.
 EUPATORIUM, Tournefort.
 purpureum, Linn.
 altissimum, Linn.
 perfoliatum, Linn. Boneset.
 serotinum, Mich.
 ageratoides, Linn.

- ASTER**, Linnæus. Starwort.
 macrophyllus, Linn.
 sericeus, Vent.
 lævis, Linn.
 azureus, Lindl.
 Shortii, Boott.
 undulatus, Linn.
 cordifolius, Linn.
 sagittifolius, Willd.
 multiflorus, Ait.
 Tradescanti, Linn.
 miser, Linn.
 simplex, Willd.
 æstivus, Ait.
 præaltus, Poir.
 Novi-Belgii, Linn.
 puniceus, Linn.
 prenanthoids, Muhl.
 oblongifolius, Nutt.
 Novæ-Angliæ, Linn.
 ptarmicoides, Torr. and Gray.
 angustus, Torr. and Gray.
- ERIGERON**, Linnæus. Fleabane.
 Canadensis, Linn. Butterweed.
 bellidifolium, Muhl.
 Philadelphicum, Linn.
 glabellum, Nutt.
 strigosum, Muhl.
- DIPLOPAPPUS**, Cassini.
 linariifolius, Hook.
 umbellatus, Torr. and Gray.
- BOLTONIA**, L'Hertier.
 glastifolia, L'Hert.
- SOLIDAGO**, Linnæus. Golden-rod.
 bicolor, Linn.
 latifolia, Linn.
 puberula, Nutt.
 stricta, Ait.
 speciosa, Nutt.
 Virga-aurea, Linn.
 rigida, Linn.
 Riddellii, Frank.
 neglecta, Torr. and Gray.
 patula, Muhl.
 arguta, Ait.
 erecta, Torr. and Gray.
 ulmifolia, Muhl.
 nemoralis, Ait.
 Missouriensis, Nutt.
 Canadensis, Linn.
 serotina, Ait.
 gigantea, Ait.
 lanceolata, Linn.
- APLOPAPPUS**, Cassini.
 spinulosus, DC.
- GRINDELIA**, Willdenow.
 squarrosa, Dunal.
- CHRYSOPSIS**, Nuttall. Golden-Aster.
 villosa, Nutt.
- POLYMNIA**, Linnæus. Leaf-cup.
 Canadensis, Linn.

- SILPHIUM, Linnæus.
laciniatum, Linn. Compass-Plant.
terebinthinaceum, Linn. Prairie Dock.
integrifolium, Michx.
perfoliatum, Linn. Cup-Plant.
- PARTHENIUM, Linnæus.
integrifolium, Linn.
- AMBROSIA, Tournefort. Rag-weed.
trifida, Linn.
artemisiæfolia, Linn. Hog-weed.
psilostachya, DC.
- XANTHIUM, Tournefort. Cocklebur.
strumarium, Linn.
- HELIOPSIS, Persoon. Ox-eye.
lævis, Pers.
- ECHINACEA, Mœnch.
angustifolia, DC.
- RUDBECKIA, Linnæus. Coneflower.
laciniata, Linn.
subtomentosa, Pursh.
hirta, Linn.
- LEPACHYS, Rafinesque.
pinnata, Torr. and Gray.
columnaris, Torr. and Gray.
- HELIANTHUS, Linnæus. Sunflower.
rigidus, Desf.
occidentalis, Riddell.
giganteus, Linn.
grosse-serratus, Martens.
tomentosus, Michx.
strumosus, Linn.
trachelifolius, Willd.
decapetalus, Linn.
- COREOPSIS, Linnæus. Tick-seed.
trichosperma, Michx.
palmata, Nutt.
lanceolata, Linn.
- BIDENS, Linnæus.
frondosa, Linn. Beggar-Ticks.
connata, Muhl.
cernua, Linn.
chrysanthemoides, Michx.
Beckii, Torr.
- GAILLARDIA, Fougereux.
aristata, Pursh.
- HELENIUM, Linnæus. False Sunflower.
autumnale, Linn. Sneeze-weed.
- ACHILLEA, Linnæus. Mil-foil.
Millefolium, Linn.
- ARTEMISIA, Linnæus. Wormwood.
Canadensis, Michx.
caudata, Michx.
Ludoviciana, Nutt.
dracunculoides, Pursh.
frigida, Willd.
biennis, Willd.
Absinthium, Linn.
- ANTENNARIA, Gærtner. Everlasting.
margaritacea, R. Br.
plantaginifolia, Hook.
- GNAPHALIUM, Linnæus.
polycephalum, Michx.
uliginosum, Linn.

- ERECHTHITES, Rafinesque. Fire-weed.
 hieracifolia, Raf.
 CACALIA, Linnæus.
 reniformis, Muhl.
 tuberosa, Nutt.
 SENECIO, Linnæus. Groundsel.
 integerrimus, Nutt.
 aureus, Linn. Ragwort.
 CIRSIUM, Tournefort. Thistle.
 altissimum, Spreng.
 muticum, Michx. Swamp Thistle.
 discolor, Spreng.
 CYNTHIA, Don.
 Virginica, Don.
 HIERACIUM, Tournefort. Hawk-weed.
 Canadense, Michx.
 scabrum, Michx.
 longipilum, Torrey.
 NABALUS, Cassini.
 albus, Hook.
 racemosus, Hook.
 asper, Torrey and Gray.
 LYGOESMIA, Don.
 juncea, Don.
 TROXIMON, Nutt.
 cuspidatum, Pursh.
 TARAXACUM, Haller. Dandelion.
 Dens-leonis, Desf.
 LACTUCA, Tournefort. Lettuce.
 elongata, Muhl.
 MULGEDIUM, Cassini. Blue Lettuce.
 Floridanum, DC.
 leucophæum, DC.
 pulchellum, Nutt.
 SONCHUS, Linnæus. Sow-thistle.
 asper, Vill.

LOBELIACEÆ. THE LOBELIA FAMILY.

- LOBELIA, Linnæus.
 cardinalis, Linn. Cardinal Flower.
 syphilitica, Linn. Blue Lobelia.
 inflata, Linn. Indian Tobacco.
 spicata, Lam.
 Kalmii, Linn.

CAMPANULACEÆ. THE BELL-FLOWER FAMILY.

- CAMPANULA, Tournefort. Bell-flower.
 rotundifolia, Linn.
 aparinoides, Pursh.
 Americana, Linn.
 SPECULARIA, Heist.
 perfoliata, A. DC.

ERICACEÆ. THE HEATH FAMILY.

- GAYLUSSACTIA, Humb. Bomp. and Kunth.
 resinosa, Torrey and Gray. Black Huckleberry.
 VACCINIUM, Linnæus. Cranberry.
 Oxycoccus, Linn. Small Cranberry.
 macrocarpon, Ait. Cranberry.
 cæspitosum, Michx.
 Canadense, Kalm.
 corymbosum, Linn.

- CHIOGENES, Salisbury.
 hispidula, Torrey and Gray.
 ARCTOSTAPHYLOS, Adanson.
 Uva-ursi, Spreng. Bearberry.
 EPIGÆA, Linnæus.
 repens, Linn.
 GAULTHERIA, Kalm.
 procumbens, Linn.
 CASSANDRA, Don.
 calyculata, Dou.
 ANDROMEDA, Linnæus.
 polifolia, Linn.
 LEDUM, Linnæus. Labrador Tea.
 latifolium, Ait.
 PYROLA, Linnæus.
 rotundifolia, Linn.
 elliptica, Nutt.
 secunda, Linn.
 CHIMAPHILA, Pursh.
 umbellata, Nutt.

AQUIFOLIACEÆ. THE HOLLY TRIBE.

- ILEX, Linnæus. Holly.
 verticillata, Gray.
 NEMOPANTHES, Rafinesque.
 Canadensis, DC.

PLANTAGINACEÆ. THE PLANTAIN FAMILY.

- PLANTAGO, Linnæus. Plantain.
 major, Linn.
 Patagonica, Jacq., var. graphaloides, Gray.

PRIMULACEÆ. THE PRIMROSE FAMILY.

- PRIMULA, Linnæus. Primrose.
 Mistassinica, Michx.
 ANDROSACE, Tournefort.
 occidentalis, Linn.
 DODECATHÉON, Linnæus.
 Meadia, Linn. Shooting-star.
 TRIENTALIS, Linnæus.
 Americana, Pursh.
 LYSIMACHIA, Linnæus. Loosestrife.
 stricta, Ait.
 quadrifolia, Linn.
 ciliata, Linn.
 laceolata, Walt.
 longifolia, Pursh.
 NAUMBURGIA, Mœnch.
 thyrsiflora, Reichenb.

LENTIBULACEÆ. THE BLADDERWORT FAMILY.

- UTRICULARIA, Linnæus. Bladderwort.
 vulgaris, Linn.
 minor, Linn.
 intermedia, Hayne.

OROBANCHACEÆ. THE BROOM-RAPE FAMILY.

- PHELIPÆA, Tournefort. Broom-Rape.
 Ludoviciana, Don.

APHYLLON, Mitchell.
fasciculatum, Torr. and Gray.

SCROPHULARIACEÆ. THE FIGWORT FAMILY.

- VERBASCUM, Linnæus. Mullein.
Thapsus, Linn. Common Mullein.
Blattaria, Linn. Moth Mullein.
- LINARIA, Tournefort. Toad-flax.
Canadensis, Spreng.
- SCROPULARIA, Tournefort. Figwort.
nodosa, Linn.
- CHELONE, Tournefort. Snake-Head.
glabra, Linn.
- PENSTEMON, Mitchell. Beard-Tongue.
pubescens, Solander.
grandiflorus, Fraser.
- MIMULUS, Linnæus. Monkey-Flower.
ringens, Linn.
Jamesii, Torr.
- GRATIOLA, Lennæus. Hedge Hyssop.
Virginiana, Linn.
- ILYSANTHES, Rafinesque.
gratioloides, Benth. False Pimpernel.
- SYNTHYRIS, Benth.
Houghtoniana, Benth.
- VERONICA, Linnæus. Speedwell.
Virginica, Linn.
Americana, Schweinitz.
Anagallis, Linn.
scutellata, Linn.
- GERARDIA, Linnæus.
purpurea, Linn.
aspera, Dougl.
tenuifolia, Vahl.
setacea, Walt.
quercifolia, Pursh.
pedicularia, Linn.
- CASTILLEJA, Mutis. Painted-Cup.
pallida, Kunth. Mountain Painted-Cup.
coccinea, Spreng.
sessiliflora, Pursh.
- PEDICULARIS, Tournefort. Lousewort.
Canadensis, Linn.
lanceolata, Michx.
- MELAMPYRUM, Tournefort. Cow-Wheat.
Americanum, Michx.
- ORTHOCARPUS, Nuttall.
lutens, Nutt.

VERBENACEÆ. THE VERBENA FAMILY.

- VERBENA, Linnæus. Vervain.
angustifolia, Michx.
hastata, Linn. Blue Vervain.
utricifolia, Linn.
stricta, Vent.
bracteosa, Michx.
- PHRYMA, Linnæus. Lop-seed.
Leptostachya, Linn.

LABIATÆ. THE MINT FAMILY.

- TEUCRIUM, Linnæus. Germander.
 Canadensis, Linn.
- ISANTHUS, Michaux. False Pennyroyal.
 cæruleus, Michx.
- MENTHA, Linnæus. Mint.
 Canadensis, Linn. Wild Mint.
- LYCOPUS, Linnæus. Water Horehound.
 Virginicus, Linn. Bugle-weed.
 Europæus, Linn.
- PYCNANTHEMUM, Michaux. Mountain Mint.
 lanceolatum, Parsh.
- HEDEOMA, Persoon. Mock Pennyroyal.
 hispida, Parsh.
- MONARDA, Linnæus. Horse Mint.
 fistulosa, Linn. Wild Bergamot.
- BLEPHILIA, Rafinesque.
 ciliata, Raf.
 hirsuta, Benth.
- LOPHANTHUS, Benth. Giant Hyssop.
 nepetoides, Benth.
 scrophulariæfolius, Benth.
 anisatus, Benth. Anise Hyssop.
- NEPETA, Linnæus. Catnip.
 Cataria, Linn.
- DRACOCEPHALUM, Linnæus. Dragon-head.
 parviflorum, Nutt.
- PHYSOSTEGIA, Benth. False Dragon-head.
 Virginiana, Benth.
- BRUNELLA, Tournefort. Self-heal.
 vulgaris, Linn.
- SCUTELLARIA, Linnæus. Skull-cap.
 versicolor, Nutt.
 parvula, Michx.
 galericulata, Linn.
 lateriflora, Linn.
- GALEOPSIS, Linnæus.
 tetrahit, Linn.
- STACHYS, Linnæus. Hedge Nettle.
 palustris, Linn.

BORRAGINACEÆ. THE BORAGE FAMILY.

- ONOSMODIUM, Michx. False Gromwell.
 Virginianum, DC.
 molle, Michx.
- LITHOSPERMUM, Tournefort. Gromwell.
 latifolium, Michx.
 hitum, Lehm.
 conspicuum, Spreng.
 longiflorum, Spreng.
- MERTENSIA, Roth. Smooth Lung-wort.
 corymbosa, Don.
- CYNOGLOSSUM, Tournefort. Hound's tongue.
 Virginicum, Linn.
 Morrisonii, DC. Beggar's Lice.

HYDROPHYLLACEÆ. THE WATER LEAF FAMILY.

- HYDROPHYLLUM, Linnæus. Water-leaf.
 Virginicum, Linn.

POLEMONIACEÆ. POLEMONIUM FAMILY.

- POLEMONIUM, Tournefort. Greek Valerian.
reptans, Linn. Jacob's Ladder.
- PHLOX, Linnæus.
glaberrima, Linn.
pilosa, Linn.
divaricata, Linn.

CONVOLVULACEÆ. CONVULVULUS FAMILY.

- CALYSTEGIA, Robert Brown. Bracted Bindweed.
sepium, R. Br. Hedge Bindweed.
- CUSCUTA, Tournefort. Dodder. Love-vine,
tenuliflora, Englem.
Gronovii, Willd.

SOLANACEÆ. THE NIGHTSHADE FAMILY.

- SOLANUM, Tournefort. Nightshade.
nigrum, Linn.
- PHYSALIS, Linnæus. Ground Cherry.
angulata, Linn.
pubescens, Linn.
viscosa, Linn.

GENTIANACEÆ. THE GENTIAN FAMILY.

- GENTIANA, Linnæus. Gentian.
crinita, Frœl. Fringed Gentian.
detonsa, Fries. Small Fringed Gentian.
alba, Muhl. White Gentian.
Andrewsii, Griseb.
Saponaria, Linn.
puberula, Michx.
affinis, Griseb.
- MENYANTHES, Tournefort. Buckbean.
trifoliata, Linn.

APOCYNACEÆ. THE DOGBANE FAMILY.

- APOCYNUM, Tournefort. Indian Hemp.
androsæmifolium, Linn.
cannabinum, Linn.

ASCLEPIADACEÆ. THE MILKWEED FAMILY.

- ASCLEPIAS, Linnæus. Milkweed.
Cornuti, Decaisne.
phytolaccoides, Pursh.
Nuttalliana, Torr. (A. Vaseyi, Carey.)
obtusifolia, Michx.
incarnata, Linn.
tuberosa, Linn. Butterfly-weed.
verticillata, Linn.
- ACERATES, Elliott. Green Milkweed.
viridiflora, Elliott.
monocephala, Lapham.
longifolia, Ell.

OLEACEÆ. THE OLIVE FAMILY.

FRAXINUS, Tournefort. Ash.
 Americana, Linn. White Ash.
 sambucifolia, Lam. Black Ash.

ARISTOLOCHIACEÆ. THE BIRTHWORT FAMILY.

ASARUM, Tournefort. Wild Ginger.
 Canadense, Linn. Colt's Foot.

NYCTAGINACEÆ. THE FOUR-O'CLOCK FAMILY.

OXYBAPHUS, Vahl.
 nyctagineus, Sweet.
 angustifolius, Torr.

CHENOPODIACEÆ. THE GOOSEFOOT FAMILY.

CHENOPODIUM, Linnæus. Pigweed.
 hybridum, Linn.
 BLITUM, Tournefort. Blite.
 capitatum, Linn. Strawberry Blite.
 SALICORNIA, Tournefort. Glasswort.
 herbacea, Linn.
 CHENOPODINA, Moquin. Sea Goosefoot.
 maritima, Moq.

AMARANTACEÆ. THE AMARANTH FAMILY.

AMARANTUS, Tournefort. Amaranth.
 hybridus, Linn.
 MONTELIA, Moquin.
 tamariscina, Gray.
 ACNIDA, Linnæus. Water Hemp.
 cannabinum, Linn.
 FRÆLICHIA, Moench.
 Floridana, Moquin.

POLYGONACEÆ. THE BUCKWHEAT FAMILY.

POLYGONUM, Linnæus. Knotweed.
 amphibium, Linn.
 nodosum, Pers.
 Pennsylvanicum, Linn.
 Persicaria, Linn. Lady's Thumb.
 hydropiperoides, Michx.
 aviculare, Linn. Knot-Grass.
 ramosissimum, Michx.
 tenue, Michx.
 articulatum, Linn.
 Virginianum, Linn.
 sagittatum, Linn.
 dumetorum, Linn.
 RUMEX, Linnæus. Dock Sorrel.
 altissimus, Wood. Tall Dock.
 Hydrolapathum, Huds.
 maritimus, Linn. Golden Dock.

THYMELEACEÆ. THE MEZEREUM FAMILY.

DIRCA, Linnæus. Leatherwood.
 palustris, Linn.

ELÆAGNACEÆ. THE OLEASTER FAMILY.

- ELÆAGNUS, Linnæus.
argentea, Pursh. Silver-berry.
SHEPHERDIA, Nuttall.
Canadensis, Nutt.
argentea, Nutt. Buffalo-berry.

SANTALACEÆ. THE SANDAL-WOOD FAMILY.

- COMMANDRA, Nuttall. Bastard Toad Flax.
umbellata, Nutt.

CERATOPHYLLACEÆ. THE HONEWORT FAMILY.

- CERATOPHYLLUM, Linnæus. Honewort.
demersum, Linn.

CALLITRICHACEÆ. THE WATER STARWORT FAMILY.

- CALLITRICHE, Linnæus. Water Starwort.
verna, Linn.

EUPHORBIACEÆ. THE SPURGE FAMILY.

- EUPHORBIA, Linnæus. Spurge.
polygonifolia, Linn.
Geyeri, Engelm.
maculata, Linn.
hypericifolia, Linn.
marginata, Pursh.
cyathophora, Jacq.
corollata, Linn.
ACALYPHA, Linnæus. Three-seeded Mercury.
Virginica, Linn.

URTICACEÆ. THE NETTLE FAMILY.

- ULMUS, Linnæus. Elm.
fulva, Michx. Slippery Elm.
Americana, Linn. White Elm.
CELTIS, Tournefort. Hackberry. Nettle-tree.
occidentalis, Linn. Sugar-berry.
URTICA, Tournefort. Nettle.
gracilis, Ait.
LAPORTEA, Gaudich. Wood Nettle.
Canadensis, Gaud.
PILEA, Lindley. Richweed.
pumila, Lindley.
BØEHMERIA, Jacquin. False Nettle.
cylindrica, Willd.
PARIETARIA, Tournefort.
Pennsylvanica, Muhl. Pillitory.
HUMULUS, Linnæus. Hop.
lupulus, Linn.

PLATANACEÆ. THE PLANE TREE FAMILY.

- PLATANUS, Linnæus. Plane-tree. Buttonwood.
occidentalis, Linn. Sycamore.

JUGLANDACEÆ. THE WALNUT FAMILY.

- JUGLANS, Linnæus. Walnut.
 cinerea, Linn. Butternut.
 nigra, Linn. Black Walnut.
- CARYA, Nuttall. Hickory.
 alba, Nutt. Shag-Bark Hickory.
 glabra, Torr. Pig-nut or Broom Hickory.
 amara, Nutt. Bitter-nut or Swamp Hickory.

CUPULIFERÆ. THE CUP-BEARING FAMILY.

- QUERCUS, Linnæus. Oak.
 macrocarpa, Michx. Burr Oak.
 alba, Linnæus. White Oak.
 Castanea, Willd. Yellow Chestnut Oak.
 rubra, Linn. Red Oak.
 palustris, Du Roi. Pin Oak.
- CORYLUS, Tournefort. Hazel-nut.
 Americana, Waltr. Wild Hazel-nut.
 rostrata, Ait. Beaked Hazel-nut.
- CARPINUS, Linnæus. Hornbeam, Ironwood.
 Americana, Michx. Water Beech.
- OSTRYA, Micheli. Hop Hornbeam.
 Virginica, Willd. Lever-wood.

BETULACEÆ. THE BIRCH FAMILY.

- BETULA, Tournefort. Birch.
 papyracea, Ait. Canoe Birch.
 nigra, Linn. Red Birch.
 pumila, Linn. Low Birch.
- ALNUS, Tournefort. Alder.
 incana, Willd. Speckled Alder.
 serrulata, Ait. Smooth Alder.

SALICACEÆ. THE WILLOW FAMILY.

- SALIX, Tournefort. Willow.
 candida, Willd. Hoary Willow.
 humilis, Marshall. Low Bush Willow.
 tristis, Ait. Dwarf Gray Willow.
 discolor, Muhl. Glaucous Willow.
 cordata, Muhl. Heart-leaved Willow.
 fluviatilis, Nutt.
 rostrata, Richardson. Long-Beaked Willow.
 nigra, Marshall. Black Willow.
 lucida, Muhl. Shining Willow.
 longifolia, Muhl. Long-leaved Willow.
 pedicellaris, Pursh. Stalk-fruited Willow.
- POPULUS, Tournefort. Poplar.
 tremuloides, Michx. American Aspen.
 grandidentata, Michx. Large-toothed Poplar.
 monilifera, Ait. Cottonwood.
 balsamifera, Linn. Balsam Poplar.

SUB-CLASS II. *Monocotyledons.* (With but one *Cotyledon.*)

ARACEÆ. THE ARUM FAMILY.

- ARISEMA, Martius. Indian Turnip.
 triphyllum, Torr.

CALLA, Linnæus.
palustris, Linn.

TYPHACEÆ. THE CAT-TAIL FAMILY.

TYPHA, Tournefort. Cat-tail Flag.
latifolia, Linn. Reed Mace.
SPARGANIUM, Tournefort. Bur-Reed.
simplex, Hudson.
natans, Linn.
angustifolium, Michx.

LEMNACEÆ. THE DUCK-WEED FAMILY.

LEMNA, Linnæus. Duck's meat.
trisulca, Linn.
minor, Linn.
polyrrhiza, Linn.

NAIADACEÆ. THE POND-WEED FAMILY.

POTAMOGETUM, Tournefort. Pondweed.
pusillus, Linn.
pauciflorus, Pursh.
compressus, Linn.
lucens, Linn.
natans, Linn.

ALISMACEÆ. THE WATER PLANTAIN FAMILY.

TRIGLOCHIN, Linnæus. Arrow Grass.
maritimum, Linn.
SCHEUCHZERIA, Linn.
palustris, Linn.
ALISMA, Linnæus. Water-Plantain.
Plantago, Linn.
SAGITTARIA, Linnæus. Arrow-Head.
subulatus, Engelmann.
variabilis, Engelmann.

ORCHIDACEÆ. THE ORCHIS FAMILY.

ORCHIS, Linnæus.
Spectabilis, Linn. Showy Orchis.
GYMNADENIA, R. Brown.
tridentata, Lindl.
PLATANATHERA, Richard. False Orchis.
Hookeri, Lindl.
bracteata, Torr.
hyperborea, Lindl.
dilatata, Lindl.
leucophæa, Nutt.
psycodes, Gray.
SPIRANTHES, Richard. Lady's Tresses.
gracilis, Bigelow.
latifolia, Torr.
cernua, Richard.
POGONIA, Jussieu.
ophioglossoides, Nutt.
CALOPOGON, Robert Brown.
pulchellus, R. Br.

- MICROSTYLIS, Nuttall.
 monophylla, Lindl.
 ophioglossides, Nutt. Adder's Tongue.
- CORALLORHIZA, Haller. Coral-root.
 multiflora, Nutt.
 Macraei, Gray.
- CYPRIPEDIUM, Linnæus, Lady's Slipper.
 pubescens, Willd. Yellow Lady's Slipper.
 candidum, Muhl. White Lady's Slipper.
 spectabile, Swartz. Moccasin Flower.
 acaule, Ait.

AMARYLLIDACEÆ. THE AMARYLLIS FAMILY.

- HYPOXYS, Linnæus, Star-grass.
 erecta, Linn.

HÆMODORACEÆ. THE BLOODWORT FAMILY.

- ALETRIS, Linnæus. Colic-root.
 farinosa, Linn.

IRIDACEÆ. THE IRIS FAMILY.

- IRIS, Linnæus. Flower-de-Luce.
 versicolor, Linn. Blue Flag.
- SISYRINCHIUM, Linn. Blue-eyed-grass.
 Bermudiana, Linn.

DIOSCOREACEÆ. THE YAM FAMILY.

- DIOSCOREA, Plumier. Yam.
 villosa, Linn. China Root.

SMILACEÆ. THE SMILAX FAMILY.

- SMILAX, Tournefort. Catbrier.
 rotundifolia, Linn. Greenbrier.
 herbacea, Linn. Carrion Flower.
- TRILLIUM, Linnæus. Three-leaved Night-Shade.
 cernuum, Linn. Wake-Robin.
 erectum, Linn. Purple-Trillium.
- MEDEOLA, Gronovius. Indian Cucumber-root.
 Virginica, Linn.

LILIACEÆ. THE LILY FAMILY.

- POLYGONATUM, Tournefort. Solomon's Seal.
 biflorum, Ell.
- SMILACINA, Desfontaines. False Solomon's Seal.
 racemosa, Desf. False Spikenard.
 stellata, Desf.
 bifolia, Ker.
- CLINTONIA, Rafinesque.
 borealis, Raf.
- ALLIUM, Linnæus. Onion.
 tricoccum, Ait. Leek.
 cernuum, Roth. Wild Onion.
- LILIUM, Linnæus. Lily.
 Philadelphicum, Linn. Orange Red Lily.
 Canadense, Linn. Nodding Lily.
- ERYTHRONIUM, Linnæus. Dog's-tooth Violet.
 albidum, Nutt.

MELANTHACEÆ. THE COLCHICUM FAMILY.

- UVULARIA, Linnæus. Bellwort.
 grandiflora, Smith.
 sessilifolia, Linn.
 ZYGADENUS, Michx.
 glaucus, Nutt.
 TOFIELDIA, Hudson. False Asphodel.
 glutinosa, Willd.

JUNCACEÆ. THE RUSH FAMILY.

- JUNCUS, Linnæus. Rush.
 effusus, Linn.
 Balticus, Willd.
 fliformis, Linn.
 scirpoides, Lam.
 paradoxus, E. Meyer.
 nodosus, Linn.
 Conradi, Tuckerm.
 tenuis, Willd.

PONTEDERIACEÆ. THE PICKEREL-WEED FAMILY.

- SCHOLLERA, Schreber. Water Stargrass.
 graminea, Willd.

COMMELYNACEÆ. THE SPIDERWORT FAMILY.

- TRADESCANTIA, Linnæus. Spiderwort.
 Virginica, Linn.

CYPERACEÆ. THE SEDGE-GRASS FAMILY.

- CYPERUS, Linnæus.
 diandrus, Torrey.
 erythrorhizos, Muhl.
 Michauxianus, Schultes.
 strigosus, Linn.
 inflexus, Muhl.
 alterniflorus, Schw.
 phymatodes, Muhl.
 Schweinitzii, Torr.
 filliculmis, Vahl.
 DULICHIMUM, Richard.
 spathaceum, Pers.
 HEMICARPHA, Nees.
 subsquarrosa, Nees.
 ELEOCHARIS, R. Brown. Spike-rush.
 palustris, R. Br.
 intermedia, Schultes.
 tenuis, Schultes.
 acicularis, R. Br.
 SCIRPUS, Linnæus. Bulrush.
 Torreyi, Olney.
 lacustris, Linn. Bulrush.
 debilis, Pursh.
 fluviatilis, Gray. Clubrush.
 sylvaticus, Linn.
 Eriophorum, Michx. Wool-grass.
 ERIOPHORUM, Linnæus. Cotton-grass.
 polystachyon, Linn.
 FIMBRISTYLIS, Vahl.
 capillaris, Gray.
 PHYNCHOSPORUM, Vahl. Beak-Rush.
 alba, Vahl.
 SCLERIA, Linnæus. Nut-Rush.
 triglomerata, Michx.

- CAREX**, Linnæus. Sedge-grass.
 siccata, Dewey.
 Muhlenbergii, Schk.
 lagopodioides, Schk.
 festucacea, Schk.
 aquatilis, Wahl.
 straminea, Schk.
 Pennsylvanica, Lam.
 Ederi, Ehrh.
 lanuginosa, Michx.
 lacustris, Willd.
 hystericina, Willd.
 tentaculata, Muhl.

GRAMINEÆ. THE GRASS FAMILY.

- LEERSIA**, Solander. White-grass.
 oryzoides, Swartz. Rice Cut-grass.
 Virginica, Willd.
 lenticularis, Michx. Fly-catch Grass.
- ZIZANIA**, Gronovius. Wild Rice.
 aquatica, Linn. Indian Rice; Water Oats.
- ALOPECURUS**, Linn. Fox-tail grass.
 aristulatus, Michx. Water Fox-tail grass.
- VILFA**, Adanson. Rush-grass.
 cuspidata, Torrey.
 aspera, Beauv.
 vaginæflora, Torrey.
- SPROBOLUS**, R. Brown. Drop-seed grass.
 junceus, Kunth.
 heterolepis, Gray.
 cryptaudrus, Gray.
- AGROSTIS**, Linnæus. Bent-grass.
 perennans, Tuckerm. Thin-grass.
 vulgaris, Withering. Red-top.
- CINNA**, Linnæus. Wood Reed-grass.
 arundinacea, Linn.
- MUHLENBERGIA**, Schreber.
 sobolifera, Gray.
 glomerata, Trin. Wild Red-top.
 Mexicana, Trin.
 sylvatica, Torr. and Gray.
 Willdenovii, Trin.
- BRACHYELYTRUM**, Beauvois.
 aristatum, Beauv.
- CALAMAGROSTIS**, Adanson. Reed Bent Grass.
 Canadensis, Beauv. Blue-joint.
 confinis, Nutt.
 coarctata, Torr.
 longifolia, Hook.
- ORYZOPSIS**, Michaux. Mountain Rice.
 melanocarpa, Muhl.
 asperifolia, Michx.
 Canadensis, Torr.
- STIPA**, Linnæus. Feathergrass.
 spartea, Porcupine-grass.
- ARISTIDA**, Linnæus. Triple-awned Grass.
 purpurascens, Poir.
 tuberculosa, Nutt.
- SPARTINA**, Schreber. Cord-grass. Marsh-grass.
 cynosuroides, Willd. Fresh water Cord-grass.
- BOUTELOUA**, Lagasca. Muskit-Grass.
 oligostachya, Torr.
 hirsuta, Lagas.
 curtispindula, Gray.

- KELERIA**, Persoon.
 cristata, Pers.
- GLYCERIA**, R. Brown. Manna-grass.
 Canadensis, Trin. Rattle-snake-grass.
 nervata, Trin.
 aquatica, Smith. Reed Meadow-grass.
 fluitans, R. Brown.
- POA**, Linnæus. Spear-grass.
 sylvestris, Gray.
 serotina, Ehrh. False Red-top.
 pratensis, Linn. Kentucky Blue Grass.
 compressa, Linn. Blue Grass.
- ERAGROSTIS**, Beauvois.
 reptans, Nees.
 Frankii, Meyer.
 capillaris, Nees.
 pectinacea, Gray:
- FESTUCA**, Linnæus. Fesque-grass.
 tenella, Willd.
 ovina, Linn.
 nutans, Willd.
- BROMUS**, Linnæus. Brome-grass.
 Kalmii, Gray. Wild Chess.
 ciliatus, Linn.
- PHRAGMITES**, Trinius. Reed.
 communis, Trin.
- TRITICUM**, Linnæus. Wheat.
 repens, Linn. Couch Grass.
 caninum, Linn.
- HORDEUM**, Linnæus, Barley.
 jubatum, Linn. Squirrel Tail Grass.
- ELYMUS**, Linnæus. Wild Rye.
 Virginicus, Linn.
 Canadensis, Linn.
 striatus, Willd.
- GYMNOSTICHUM**, Schreber. Bottle-Brush Grass.
 Hystrix, Schreb.
- HIEROCHLOA**, Gmelin. Holy Grass.
 borealis, Roem and Schultes. Seneca Grass.
- PHALARIS**, Linnæus. Canary-grass.
 arundinacea, Linn.
- BECKMANNIA**, Host.
 crucæformis, Host.
- PANICUM**, Linnæus. Panic-grass.
 agrostoides, Spreng.
 capillare, Linn.
 autumnale, Bosc.
 virgatum, Linn.
 latifolium, Linn.
 pauciflorum, Ell.
 dichotomum, Linn.
 depauperatum, Muhl.
 Crus-galli, Linn. Barnyard Grass.
- SETARIA**, Beauvois. Bristly Foxtail Grass.
 glauca, Beauv. Foxtail.
 viridis, Beauv. Bottle Grass.
- CENCHRUS**, Linnæus. Bur Grass.
 tribuloides, Linn. Sand-bur Grass.
- ANDROPOGON**, Linnæus. Beard Grass.
 furcatus, Muhl.
 scoparius, Michx.
- SORGHUM**, Persoon. Broom-Corn.
 nutans, Gray. Indian Grass.

CLASS II. *Gymnospermæ*. (*Seeds naked.*)

CONIFERÆ. THE CONE-BEARING FAMILY.

- PINUS, Tournefort. Pine.
 Banksiana, Lamb. Northern Scrub Pine.
 resinosa, Ait. Red Pine.
 Strobis, Linn. White Pine.
- ABIES, Tournefort. Spruce.
 balsamea, Marshall. Balsam Fir.
 Canadensis, Michx. Hemlock Spruce.
 nigra, Poir. Black Spruce.
- LARIX, Tournefort. Larch.
 Americana, Michx. Tamarack.
- JUNIPERUS, Linnæus. Juniper.
 communis, Linn.
 Virginiana, Linn. Red Cedar.
- TAXUS, Tournefort. Yew.
 baccata, Linu. Ground Hemlock.

SERIES II. SPORIFERÆ.

(Plants bearing spores, with no true embryos, and no cotyledons.)

CLASS I. *Angiosporæ*. (*Spores inclosed.*)

EQUISETACEÆ. THE HORSE-TAIL FAMILY.

- EQUISETUM, Linnæus. Scouring Rush.
 arvense, Linn.
 sylvaticum, Linn.
 limosum, Linn.
 hyemale, Linn.
 scirpoides, Michx.

FILICES. THE FERNS.

- POLYPODIUM, Linnæus.
 vulgare, Linn.
 phegopteris, Linn.
 dryopteris, Linn.
- STRUTHIOPTERIS, Willdenow. Ostrich Fern.
 Germanica, Willd.
- ALLOSORUS, Bernhardt. Rock Brake.
 gracilis, Presl.
 atropurpureus, Gray.
- PTERIS, Linnæus. Brake.
 aquilina, Linn.
- ADIANTUM, Linnæus. Maiden-hair.
 pedatum, Linn.
- CHEILANTHES, Swartz. Lip-Fern.
 lanuginosa, Nutt. (*C. vestata*, Hook.)
- COMPTOSORUS, Link. Walking-leaf.
 rhizophyllus, Link.
- ASPLENIUM, Linnæus. Spleen-wort.
 thelypteroides, Michx.
 Felix-fœmina, R. Br.
- WOODSIA, R. Brown.
 Ilvensis, R. Br.
- CYSTOPTERIS, Bernhardt. Bladder-Fern.
 bulbifera, Bernh.

- ASPIDIUM**, Swartz. Wood Fern.
 Thelypteris, Swartz.
 spinulosum, Swartz.
 cristatum, Swartz.
 fragrans, Swartz.
 marginale, Swartz.
 acrostichoïdes, Swartz.
OSMUNDA, Linnæus. Flowering Fern.
 Claytoniana, Linn.
BOTRYCHIUM, Swartz. Moonwort.
 lunarioides, Swartz.
 Virginicum, Swartz.

LYCOPODIACEÆ. THE CLUBMOSS FAMILY.

- LYCOPODIUM**, Linnæus. Clubmoss.
 lucidulum, Michx.
 annotinum, Linn.
 dendroideum, Michx. Ground pine.
 complanatum, Linn.
SELAGINELLA, Beauvois.
 rupestris, Spring.

HYDROPTERIDES. THE WATER FERNS.

- AZOLLA**, Lamarck.
 Caroliniana, Willd.

MUSCI. THE MOSSES.

- SPHAGNUM**, Dillenius. Peat-moss.
 acutifolium, Ehrh.
DICRANUM, Hedwig.
 undulatum, Turner.
 scoparium, Linn.
 flagellare, Hedw.
CERATODON, Bridel.
 purpureus, Brid.
TRICHOSTOMUM, Bruch. and Schimper.
 glabrescens, Hedw.
BARBULA, Hedwig.
 mucronifolia, Br. and Sch.
TETRAPHIS, Hedwig.
 pellucida, Hedw.
POLYTRICHUM, Bridel. Hair-cap Moss.
 commune, Linn.
 juniperinum, Hedw.
 pilliferum, Schreb.
BRYUM, Bruch. and Schimper.
 cœspiticium, Linn.
 roseum, Schreb.
MNIUM, Bruch. and Schimper.
 affine, Bland.
 punctatum, Hedw.
 cuspidatum, Hedw.
BARTRAMEA, Hedwig.
 fontana, Brid.
FUMARIA, Schreber.
 hygrometrica, Hedw.
PHYSCOMITRUM, Bridel.
 pyriforme, Br. and Sch.

- NECKERA, Hedw.
 pennata, Hedw.
 CLIMACIUM, Web. and Mohr. Tree Moss.
 Americanum, Brid.
 HYPNUM, Dillenius.
 tamariscinum, Hedw.
 gracile, Br. and Sch.
 triquetrum, Linn.
 uncinatum, Hedw.
 crista-castrensis, Linn.
 molluscum, Hedw.
 Haldanianum, Grev.
 pratense, Koch.
 nitens, Schreb.
 rutabulum, Linn.
 polymorphum, Br. and Sch.

HEPATICÆ. LIVERWORTS.

- MARCHANTIA, Linnæus. Brook Liverwort.
 polymorpha, Linn.
 TRICHOCOLEA, Nees.
 Tomentella, Nees.
 MASTIGOBRYUM, Nees.
 trilobatum, Nees.

CLASS II. *Gymnosporæ.* (*Spores naked.*)

LICHENES.

- USNEA, Dillenius.
 barbata, Fr.
 EVERNIA, Acharius.
 jubata, Fr.
 prunastri, Ach.
 RAMALINA, Acharius.
 calicaris, Fr.
 CETRARIA, Acharius.
 ciliaris, Ach.
 PELTIGERA, Hoffman.
 rufescens, Hoffm.
 PARMELIA, Acharius.
 tiliacea, Ach.
 caperata, Ach.
 conspersa, Ach.
 parietina, Fr.
 chrysophtalma, Ach.
 stellaris, Waltr.
 obscura, Fr.
 cerina, Ach.
 CLADONIA, Hoffmann.
 cæspiticia, Floerk.
 pyxidata, Fr.
 rangiferina, Hoffm. Reindeer Moss.
 Floerkiaana, Fr.
 BIATORA, Fries.
 Tuckermanni, Fr.
 UMBILICARIA, Hoffmann.
 Muhlenbergii, Ach. Tripe de Roche.

IN MEMORIAM.

BY THE SECRETARY.

DR. ALFRED E. AMES,

Who died September 23, 1874, especially deserves mention in this report, because of the fact that he was ever identified with the development of horticulture in Minnesota, being one of its earliest pioneers, and manifesting an earnest interest in its success. It would almost seem to be a matter of supererogation to recount the many zealous efforts in behalf of the industries of our State, performed by one whose whole life was so familiar to its people; however, the following data, from his own diary, will doubtless prove interesting and acceptable:

He was born at Colchester, Vermont, December 14th, 1814, and was consequently at the time of his death, nearly sixty years of age. When seventeen years old, he removed to Orwell, Ohio. When at Barnesville, Ohio, he became, in 1833, engaged at brick-making, teaching and studying during a portion of the year, and thus fitting himself for greater and more extended usefulness.

On September 28th, 1836, he married Miss Martha A. Pratt, at Geneva, Ohio, and in the following October removed to Chicago, Illinois, that city at the time having a population of only 3,000. Near the present city of Bloiden, he shortly afterwards pre-empted a claim of 160 acres, residing the requisite portion of the year upon it, and the remainder at Chicago, engaged in his trade.

In November of 1838, at Vandalia, then the seat of government of Illinois, he became acquainted with Stephen A. Douglas, and with Alex. P. Field, the Secretary of State. By the latter he was appointed his deputy. He was also appointed private secretary to Governor Carlin.

In 1839, going to Springfield, which had become the capitol of the State, he became deputy to Stephen A. Douglas, who was then the Secretary of State; and private secretary of Governor Carlin, and chief clerk of the House Committee. It was during this year that he attended his first course of medical lectures at Rush Medical College, Chicago.

In 1841, he began the practice of medicine at Belvidere, Illinois. August 1st, 1842, he was elected to the Illinois House of Representatives. March 30th, 1842, he was appointed postmaster of Belvi-

dere, but removed July 1st, 1844, to Roscoe, where he practiced his contemplated profession, and also became postmaster.

In 1845, he graduated at medicine; in 1849 was elected State Senator, and during the same year was commissioned by Governor French as Paymaster General of his staff. In 1850, was re-elected to the Senate; in 1851, emigrated to Minnesota, going by wagon from Roscoe to Galena, and by steamer to Saint Anthony's Falls.

In November he entered into a partnership with Dr. J. H. Murphy, for the practice of Medicine at Saint Anthony.

In 1852 his family joined him. For a few months he acted as surgeon at Fort Snelling.

October 21st, 1852, he was elected to the Territorial Legislature for Hennepin county.

In October of 1854, he was elected Judge of Probate.

In 1856 he became postmaster at Minneapolis. June 1st, 1857, he was elected a member of the Constitutional Convention, and became chairman of the committee on school lands and the University, and in 1860 a member of the State Normal Board.

Dr. Ames built the third greenhouse in Minnesota and the first in Hennepin county. It was not a large establishment as compared with some of those of either Hennepin or Ramsey county at the present day. The Doctor was one of the very earliest of settlers on the west side of the Falls—after Col. John H. Stevens—it being at that time a part of the Fort Snelling Reserve. Through the influence of Capt. A. D. Nelson, Dr. Ames succeeded in getting a permit from Col. Lee, who had command at the Fort, to make a claim, which he did in November, 1851, not far from the present court house. In 1857, the Doctor commenced to fit up a first class place, using an entire block, and upon which was built a fine residence. If we are not mistaken, it was considered the finest place in Minnesota, if we except perhaps the Borup place, in St. Paul. In 1858, the grounds were laid out by Mr. Wm. Buckendorf, an experienced gardener, of Hamburg, who was obtained the previous season by Judge E. B. Ames, the Consul of our Government for that city. In March of the same year the Doctor and his gardener visited the Groveland Nursery, where, among other things, a number of evergreens were obtained, all of which lived and are now fine trees, though taken up while there was yet some frost in the ground. A number of plants were also purchased from our greenhouse, which, with many things grown from seed during the summer, formed the nucleus of the stock for the greenhouse that was erected in 1859. Quite a large collection of roses was imported from Hamburg. The stock of plants were kept over winter in a room of the new house which Mr. Buckendorf used for a sort of temporary conservatory. This pioneer plant house was built in a most substantial manner, the material used being brick and stone. It has a span roof, with two parts, for hot and cool house, with substantial ornaments here and there. In addition to the furnishing of plants for the Doctor's grounds, the gardener was allowed to raise some to sell. Minneapolis, for a number of years, was so small a place that this little greenhouse usually contained far more plants than could be sold, without going to St. Paul. Buckendorf always had good plants, and the grounds were

laid out in excellent taste. They were kept clean and well stocked with plants from the greenhouse, so that a host of visitors were quite familiar with Dr. Ames' place from many parts of the State. Indeed, for many years it was a kind of resort for all lovers of beautiful flowers, fine trees and well-kept grounds.

WILLIAM M'KENDREE HARRISON.

In the fall of 1859 the Harrison family, of Belleville, Ills., came to Minnesota and settled in Minneapolis. They were in quest of a more healthful climate, and being delighted with the country, they very soon made up their minds to purchase suitable places for building homes, which they did in 1860. They all secured quite a number of lots, so as to have room for trees, to gratify their love for horticulture. The place selected by William consisted of an entire block, located on Eighth street.

This city home of our departed friend, it is safe to say, in a few years contained more choice fruit than a majority of the large farms of Minnesota. The same may be said in regard to ornamental trees, beautiful plants, and garden vegetables. Everything was planted that seemed likely to succeed in this climate, regardless of expense. Mr. Harrison was continually making experiments in horticulture, not for his own benefit alone, but for the good of others who had less time and means to expend. The famous Transcendent apple was one of the notable things secured by these new comers. It was obtained from Ellwanger and Barry in 1861. After seeing these trees in bearing everybody wanted the kind of crab apples that was raised by the Harrisons. They did almost everything they undertook on a large scale. They came to the North Star State not to make a fortune, for this they had accomplished by years of hard labor and close attention to the milling business at their old home. Having passed their early years on a farm they still cherished a desire for a sort of country life. This they enjoyed in a measure by having ample grounds about their fine dwellings.

As an example of what may be done in the way of fruit culture on a single block, it is well known that in one season William Harrison sold fruit from his Transcendent trees to the amount of some \$200, besides giving away many to friends and visitors. This, of course, was before the appearance of blight, and while the fruit was not abundant in our markets. Other kinds of fruits, such as currants, strawberries, raspberries and grapes were grown on a liberal scale. Large sums of money were expended on common apples, pears, plums and cherries, but with little success in the end.

In the cultivation of our native wild plum the subject of this sketch was conspicuously identified. Some of his kinds are very popular, and have been cultivated by nurserymen for a number of years in place of sorts obtained from the east. The Harrison Peach plum has a wide reputation. We learn from Mrs. Harrison, to whom we are indebted for the main facts in the life of our late friend and co-worker, that a man by the name of Hepp, an early settler of Minneapolis, either discovered this valuable plum or introduced it from another State. It is supposed to be a native of Minnesota.

Mr. Harrison was not only a most prominent pomologist, but other departments of horticulture engaged his attention. Indeed, his was a life of enthusiastic devotion to such pursuits. In early years, he was fond of planting trees, and seeds of trees. His home in southern Illinois, as in this State, was noted for its choice fruits and beautiful trees, many of which he reared from seed or planted with his own hands. The last planting at Belleville was done the same year he left for Minnesota, and consisted of all the choice things of the present day. Among the trees worthy of note about the grounds of his late home are a number of fine European Larches, some twelve or fifteen inches in diameter, and 25 feet high. These have been noticed in some of the Eastern papers and nurseryman's catalogues, as examples of what may be done with this tree at the North, and on sandy soils. Another conspicuous thing, and the only one of large size we have seen in any place in the State, is a Kentucky coffee tree, standing on the south side of the house. This tree was obtained from the Groveland Nursery, with others, in 1861, and has made a fine growth. The hemlock is also to be seen on these premises, though often winter-killed. If planted on the north side of the building it might do much better.

Floriculture was not overlooked by Mr. Harrison. All the leading and hardy shrubs were planted in abundance. So, too, were the hardy herbaceous plants, such as peonias, phloxes, lilies and the like. For a number of years, we have noticed in these grounds the beautiful Japan or lancifolium lilies. In the bay window we noticed a choice collection of plants, among which was a large variegated century plant that is not often cultivated as a parlor ornament, though one of the very best for such a purpose.

Mr. Harrison was engaged in several large business enterprises at Minneapolis. He was for many years connected with the lumber firm of J. Dean & Co., that has grown to be among the heaviest in the State. The North Star Iron Works were founded by William Harrison and a few others, a large part of which he owned at the time of his death. He was also a director in one of the city banks. Bee-keeping was a favorite business with Mr. Harrison, and in it he was very successful. At one time at his Minneapolis home he kept nearly eighty stands, and from which a large amount of honey was taken annually.

The death of Mr. Harrison was quite sudden, and unexpected by friends at a distance. He was sick but a few days, and his life ended most peacefully, and full of the Christian's hope. He died May 2d, 1874, in his sixty-sixth year.

His father, Thomas Harrison, was a local preacher of the Methodist Episcopal church, in the faith of which his children were raised. William was connected with the Centenary for nearly fifteen years, and was considered one of its pillars. For its support, as well as all charitable objects, the ample means of William Harrison were liberally bestowed. In his death, the cause of religion, as well as the cause of horticulture, lost one of its most zealous friends and supporters. The place of such men is not easily filled. In his death, the State lost one of its most valuable citizens. May his noble deeds in life's great battle be an example for others to follow, and his ex-

cellent name be cherished by the members of this Society. The well known injunction of St. Paul was truthfully illustrated in the life of our departed friend: "Not slothful in business; fervent in spirit; serving the Lord."

CYRUS GRAY.

The subject of this memoir was the pioneer market gardener of St. Paul, and was well known to all the early settlers of that city. Previous to the establishment of his garden the citizens of St. Paul obtained their vegetables from Galena, furnished by the steamers, daily. We have a faint recollection of seeing this pioneer about the streets of St. Paul, soon after our arrival in 1850, with a wheelbarrow. It required but few things in this line to supply the St. Paul market of that early period. Besides, like most pioneers, the first horticulturist was not blest with an undue amount of this world's goods. He commenced the business in a very small way, when compared with some of the gardens of the present time. The site of the first garden was on the Selby place, and was a very good selection for the purpose, being free from frosts and having a strong clay loam soil. The same ground is now occupied by the fine residences of Dr. Day, Mr. Knight, Mr. Monfort, Mr. Thos. Cochran, Rev. Mr. Flint and others. Mr. Gray, commenced, we believe, on the Selby place in the spring of 1851. We are not informed in regard to his operations before that year. The writer used to visit his garden quite often, to see if vegetables could be grown in this hyperborean region, having in view the same business in addition to fruit growing and a general nursery.

In 1851 his garden was quite extensive, considering that he did all or nearly all his own work. Onions and cabbages, in particular, were very fine, as were indeed the beets, carrots, parsnips, &c. Manure was used in that garden, though on new land, and of a rich, deep soil.

The great fault of our old pioneer friend was in not sticking to his trade. He wanted more land, and in a few years went out among the romantic lakes near White Bear, where he attempted vegetable and fruit growing on a larger scale. His place, of course, was too far away from market to be very profitable, and fruit culture in those days was rather precarious in Minnesota.

The end of this pioneer gardener's career was rather tragic. He was on his way to Shakopee, where he once lived for a while, to look after some property, but while stopping over night at Minneapolis, the hotel was burned and he lost his life. An alarm was given, but Mr. Gray being quite deaf, was not awakened. In the struggle for life he failed to reach the door, and he perished by suffocation.

GEORGE W. STEWART.

The year 1874 is memorable for the work of the fell destroyer among Minnesota horticulturists. Mr. G. W. Stewart, of Le Sueur, is numbered among the fallen. He was one of the pioneer nurserymen of the State, and though having many years ago abandoned the

business, he evinced his ardent love for horticulture by the planting of both fruit and ornamental trees. His late home was conspicuous for the number and variety of the evergreens with which it was surrounded. Indeed, we may say, his cottage at Le Sueur was almost hidden within the beautiful spruces, firs, cedars, &c. Near the town he planted an orchard of various kinds of fruit trees. We paid a visit to our old friend and co-laborer a few months before his death. His trees were in very good condition, but some of the apples, generally considered as iron-clads, he had almost abandoned after the repeated hard winters. The best looking apples in his grounds were the Stewart Seedlings, that were originated by his successor in the business, and within a short distance of his home.

We believe the subject of this notice in connection with his cousin, Amasa Stewart, established the third nursery of note in Minnesota. He came from LaSalle county, Illinois, in 1854. The following season, in company with Mr. A. Stewart, he started a nursery out on the Stillwater road, some three or four miles from St. Paul. They brought from below an immense stock, in all numbering some 300,000 fruit and ornamental trees, shrubs, roses, currants, gooseberries, Osage orange, &c. These were planted on heavy clay soil, but many failed within a year or two from the effects of cold weather, &c. They were largely made up of such varieties as were generally grown in the nurseries below. Of course they were not very well calculated to endure the rigors of a climate like ours.

In 1856 Capt. Stewart sold out his interest to his partner, who continued the business for a number of years at Le Sueur.

The birth place of Mr. Stewart was Morrow county, Ohio, which occurred April 22d, 1823. He removed to Illinois in 1844, where he was also engaged in the nursery business, we believe, from 1850.

During the war Mr. Stewart was in the service of the country, and came out as Captain. One or two years he was honored with a seat in the Legislature, and for some time he took quite an active part in local politics.

His death was very sudden, and occurred at Omaha, while on his way to the west in company with his son.

Thus have we been called upon to record the departure from our midst of four members of our profession. They were all noted in the different departments of horticulture, and among the pioneers, hence it is a duty we owe the cause to preserve a record of their services in our Transactions, though none of them ever became active members of our society.

TREE CULTURE BY THE ST. PAUL AND SIOUX CITY RAILROAD COMPANY.

BY THE SECRETARY.

In Southwestern Minnesota more is being done in the way of tree planting than in any other portion of the State. The first settlers engaged in the business at an early day. Hence we see frequent groves, in every direction, after entering upon the prairie beyond Mankato. These timber groves and wind-breaks constitute quite a feature in the landscape. In the newer portions, like Nobles county, it will be seen, by the report of Mr. Miller, the people have commenced in real earnest. So, too, has the Railroad Company, though not on so large a scale as on the St. Paul and Pacific. They have had much to contend with, but the grasshoppers have proved the greatest hindrance. One or two years the planting has suffered on account of dry weather. The officers of this road are doing a good work on their own lands in tree-planting, and propose to go into the business on a large scale.

General J. W. Bishop, manager of the road, sends us the following figures, just as the work goes to press :

Trees and cuttings planted in the spring of 1873.....	55,455
Trees and cuttings planted in the spring of 1874.....	54,024
Covering the strips one hundred feet wide along the northwest side of cuts, where we had been troubled with snow.	
• Ground occupied by these trees is about one hundred acres. Generally, they are thrifty and doing well.	
We carry trees and cuttings during the planting season free to all prairie stations on our road, and the people have planted large numbers of them.	

NOTES ON OUR INSECTIVEROUS BIRDS.

[We extract the following from an interesting paper on the "Birds of Minnesota," by P. L. Hatch, M. D., contributed to the "Bulletin of the Academy of Natural Sciences," Minneapolis, published in 1874. The birds, by destroying the numerous insects injurious to plants and shrubbery, perform a work for the agriculturist and horticulturist which is hardly appreciated, and merits more attention than is apparently given to it by the class benefited:]

Many species have increased in great numbers. The conditions for their multiplication, and maintenance, have kept step with the march of improvements, and, let us add (at the peril of protest from

the somewhat sensitive, and most assuredly interested agriculturist) the inexorable necessities of civilization. With the occupation, and cultivation of the soil, there spring up as if by magic, myriads of entomological forms, many of which are inimical to agriculture, or to our comfort. We look to the birds for relief, and thank heaven for the wisdom which provides thus beautifully, and bountifully, for the preservation of those balances in organic life, so interwoven into the welfare of our race. The Raptores, or rapacious birds, have multiplied with the vermin and reptiles so obnoxious to our grains and our sensibilities, and if, perchance, our poultry has been levied upon by a hawk by day, or an owl by night, for a meal that the ordinary chase had failed to supply him, we are paying very cheaply for the benefits of their ordinary service, and the choice of those regal birds that soar over us, instead of the loathsome reptiles which creep at our feet. But, when we learn of the growing numbers of the insectivorous songsters, many of whom by their resplendant plumage, have been called "the butterflies of the vertebrate creation," we recognize a beneficence of design in their distribution, that exalts those attributes of the Creator which ally him so closely to our inner and higher being. Twenty-five years ago the Baltimore Oriole with its body of gold and wings of jet—the Tanager with its body of fire and wings of night, were solitary wanderers in this land of the Dakotahs, only represented by a few as the avant couriers of a coming civilization. Now, in the voluptuous spring, they are seen everywhere flashing in the sunlight through our forests and our shrubbery the winged flora of the glorious season. And so long ago only, the voluble and mellifluous song of the Brown Thrush and the Robin, and Bluebird, and the gushing, fussy little House Wren were scarcely heard, and in only a few favored localities. Now those delicious notes are borne upon the fragrance of spring into every open casement, and they herald the teeming summer from every tree top. The grand chorus of feathered songsters has become an annual repast for our willing and waiting ears which makes the long dreary winter bearable with its delicious anticipations.

LIST OF TREES, SHRUBS AND FLOWERS.

The time was so much occupied in discussing the apple question that nothing could be said on the list of trees, shrubs, and flowers. The former lists were adopted with a few additions.

SHADE TREES FOR STREETS AND LAWNS.

White Elm, Basswood or Linden, White Ash, Box Elder or Ash Leaf Maple, Soft Maple, Rock Maple, Butternut, Black Walnut and Hackberry.

ORNAMENTAL TREES.

Mountain Ash, White Birch, European Larch and Kentucky Coffee Tree.

EVERGREENS.

Norway Spruce, Austrian Pine, Scotch Pine, Balsam Fir, American Arborvitæ, American Black Spruce, White Spruce, Red Cedar, (when clipped,) Siberian Arborvitæ, for small yards, Hovey's Arborvitæ and Savin.

ANNUALS.

Asters, Balsams, Candytuft, Catchfly, Calliopsis, Cockscomb, Escholtzia, Larkspur, Morning Glory, Mourning Bride, Mignonette, Petunias, Phlox, Drummondii, Portulacca, Sweet Peas, Sweet Alyssum, Whitlavia, Zinnia Elegans.

HARDY HERBACEOUS PLANTS.

Astilbe Japonica, Achillea, three varieties; Asclepias, Tuberosa, Clematis Erecta, two sorts; Columbines, Dielytra or Bleeding Heart, Delphinium or Double Larkspur, German Iris, Hollyhock, Lychnis and Japan Day Lilies, four varieties; Lily of the Valley, Ixia or Blackberry Lily, Native Phloxes, Peonias, Pansies, Perennial Flax, Phloxes, May Pinks, Sedums, Sweet Williams, Spireas, Tall Day Lilies.

HARDY SHRUBS.

Acacia or Moss Locust, Barberry (common and purple,) Burning Bush, (Wahoo,) or Strawberry Bush, Buckthorn, Carrigana or Siberian Pea Tree, Cranberry, Yellow Flowering Currant, Charles the Tenth Lilac, Purple, White and Persian Lilacs, Lilac Josekia, Upright Honeysuckles (three kinds,) Hydrangea, Hydrangea Boreii, Hydrangea Paniculata, Deutzifolia, White Fringe, Clethra Alnifolia, Syringa, two sorts.

DUTCH BULBS.

For Fall Planting only—Hyacinths, Tulips, Crocus and Snowdrops

TENDER BULBS.

For Spring or Summer Planting—Gladiolus, Cannas, Caladium Esculentum, Dahlies, Madeira Vine, Tigredia or Shell Flower, Tuberoses.

HARDY BULBS.

For Spring or Fall Planting—Lilium Auratum, L. Candidum or

old Garden Lily, Japan or Lancifolium Lilies, Tiger Lily, and Native Lilies.

BEDDING PLANTS.

Achyranthus, Alternantheras, Centaureas, Double Petunias, Feverfew, Zonale and Sweet-Scented Geraniums, Gazanias, Heliotropes, Lobelias, Lantanas, Pyrethum (Golden Feather,) Tea, Bourbon and Noisette Roses, Cuphea or Cigar plant.

TENDER CLIMBERS.

Maurandia, Cobea Scandens, Cypress Vine.

HARDY ROSES THAT NEED NO PROTECTION IN WINTER.

Yellow Harrison, White, Yellow and Pink Scotch, Cinnamon Roses, Old Blush Rose, Sweet Brier.

ROSES THAT NEED PROTECTION.

Hybrid Perpetuals, Moss Rose, Madam Plantier (a fine white,) George the Fourth, Russell's Cottage, Centifolia (pink and white,) Old Cabbage Roses, Tuscany Rose, Miralba, Monthly Cabbage, Old White.

CLIMBING ROSES THAT NEED COVERING.

Queen of the Prairies, Baltimore Belle, Seven Sisters, Gem of the Prairies.

TENDER SHRUBS THAT GENERALLY NEED PROTECTION IN WINTER.

Flowering Almond, Wigelas, Rosea and Alba, Spirea Prunifolia and Billardia, Tree Peonia, Tamarix Africana, Calicanthus, Purple Fringe or Smoke Tree, Deutzia, Graclis and Crenata, Japan Quince, Deciduous Cypress, Snowberry, red and white.

HARDY CLIMBERS.

American Ivy, Virginia Creeper, Celastrus Scandens (Climbing Bitter Sweet,) Clematis or Virgin Bower, Matrimony Vine, Native Grape.

TENDER CLIMBERS.

Honeysuckle, Scarlet Trumpet, Yellow Monthly, Monthly Fragrant and Parifolia, Chinese and American Wisteria.

INCORPORATION OF THE SOCIETY.

ARTICLES OF INCORPORATION OF THE MINNESOTA STATE
HORTICULTURAL SOCIETY.

Know all men by these presents, that we, the undersigned, John S. Harris, of La Crescent, Houston county, John H. Stevens, of Hennepin county, Wyman Elliot, Charles Hoag, J. T. Grimes, A. Stewart, R. J. Mendenhall, Peter M. Gideon and Charles H. Clark, all of Hennepin county, D. A. J. Baker, Truman M. Smith, D. A. Robertson, William E. Brimhall, H. J. Brainard, L. M. Ford and Wm. Paist, all of Ramsey county, and Thomas Ramsden, of Washington county, O. F. Brand, A. W. McKinstry and Levi Nutting, all of Rice county, and P. A. Jewell, of Wabasha, E. H. S. Dartt, of Owatonna, Steele county, all of the State of Minnesota, do hereby associate ourselves together for the purpose of becoming incorporated under the name, and for the purposes hereinafter stated, pursuant to the provisions of title and chapter 34 of the General Statutes of said State of Minnesota, so far as the same may be applicable, and do now adopt the following Articles :

ARTICLE 1. This corporation shall be known as the Minnesota State Horticultural Society.

ARTICLE 2. The object of the society shall be to collect, condense and collate information relative to all varieties of fruits, flowers, and other horticultural productions, and dispense the same among the people.

ARTICLE 3. Any person interested may become a member of the society by paying to the Treasurer or Secretary, the annual fee of one dollar, and signing the constitution and by-laws.

ARTICLE 4. The amount of capital stock of this corporation shall be twenty-five thousand dollars (\$25,000,) with privilege to increase it to \$100,000, to be held in shares of twenty-five dollars each.

ARTICLE 5. The officers of this society shall be as follows: President, one Vice President to reside in each Congressional District of this State, Secretary, Treasurer, and an Executive Committee of three or more members, all of whom shall be elected at the annual meetings of this society, which shall be held on the third Tuesday in January.

ARTICLE 6. The principal place of business shall be wherever the majority of the society may hereinafter designate.

BY-LAWS

ADOPTED AT THE ANNUAL MEETING HELD JANUARY 20-23, 1874.

DUTIES OF OFFICERS.

1. It shall be the duty of the President to preside at all meetings of the society, when present, and to deliver an address at the annual meeting of the same. In the absence of the President, one of the Vice Presidents shall preside in his place.

2. The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the society; establish and maintain correspondence with all local, county, district and State horticultural societies, and secure by exchange their transactions, as far as possible; to aid the President as an executive officer, in the dispatch of business relating to meetings of the society, and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which shall become part of the transactions for the current year, and shall be prepared by him for the public printer.

3. The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the Secretary countersigned by the President.

4. An Executive Committee of five shall be chosen annually, who shall, in connection with the President and Secretary, (who shall be members ex-officio,) have in charge all matters pertaining to the interests of the society; shall revise all matter coming into the hands of the Secretary, and pass upon the same their approval before its submission to the annual meeting.

5. The Executive Committee may call a meeting of the society at any time and place they may deem advisable for the interests of the society, giving at least thirty days' notice through the public press, and shall in no case incur any expense exceeding fifty dollars except by authority of the vote of the society at its annual meeting, when

the specific object and the amount so appropriated shall be designated.

6. The President, at each annual meeting of the society, or as soon thereafter as practicable, shall appoint a General Fruit Committee, consisting of one member from each Senatorial District in the State, and it shall be the duty of each member to report upon the fruit crop in his respective district annually; also a limited list of fruits best adapted to general cultivation in the district which such member represents.

7. That committees on vegetables and market gardens; flowers and floriculture; trees for the forest and forest culture, and entomology, be appointed each year, whose duties it shall be to report on their several topics to this society at the annual meeting.

AN ACT

TO PROVIDE FOR THE PRINTING AND PUBLISHING OF THE TRANSACTIONS OF THE MINNESOTA HORTICULTURAL SOCIETY AND THE DISTRIBUTION THEREOF.

Be it enacted by the Legislature of the State of Minnesota :

SECTION ONE.

The object of the Minnesota State Horticultural Society, an incorporation duly incorporated under the general laws of this State, being to improve the condition of horticulture, rural adornment and landscape gardening, it shall be allowed for these purposes to take, hold and convey real and personal property ; the former not exceeding in value five thousand dollars.

SECTION TWO.

There shall be printed two thousand copies of the reports of the State Horticultural Society, from the organization of the Society until A. D. one thousand eight hundred and seventy-three, including its transactions at its annual meeting held on the fourteenth day of January, A. D. one thousand eight hundred and seventy-three, provided, the number of printed pages of said volume shall not exceed two hundred ; the Secretary of State shall distribute the same as follows, to-wit : two hundred copies in making the customary exchanges and in supplying one copy to every public library and to the editor of every periodical in this State, two copies to each member of the Legislature and the officers thereof ; and to each of the State officers ; one hundred copies to the State Horticultural Society ; fifty copies to the State Agricultural Society ; fifty copies to each County Horticultural Society who shall report its organization, with officers elect, and number of its members, with an abstract of its proceedings for publication in said volume, to the State Horticultural Society ; fifteen copies to each County Agricultural Society who shall report annually to the Secretary of the State Agricultural Society as provided by statute ; and all the remaining copies to the State Horticultural Society.

SECTION THREE.

Hereafter, or until the Legislature shall otherwise order, the report of the State Horticultural Society, together with the abstract of the reports of other Horticultural Associations of this State, so far as

the same shall be published, shall be annually printed, published and distributed, in like manner and number as provided in section two of this act. Provided, that such expense of publication shall not exceed in any one year five hundred dollars.

SECTION FOUR.

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

Approved February 27th, 1873.

STATE OF MINNESOTA, }
OFFICE OF THE SECRETARY OF STATE. }

I hereby certify that the foregoing has been compared with the original on file in this office, and is a true copy thereof.

Witness my hand, and the Great Seal of the State, this 14th day of March, A. D. 1873.

[SEAL.]

S. P. JENNISON,
Secretary of State.

AN ACT

TO ENCOURAGE THE CULTIVATION OF TIMBER AND HEDGE FENCE, AND TO APPROPRIATE MONEY THEREFOR.

Be it enacted by the Legislature of the State of Minnesota:

SECTION ONE.

That for the purpose of encouraging the growing or cultivation of timber and live hedge fences in this State, there shall be annually appropriated, out of any moneys in the treasury belonging to the general revenue fund, not otherwise appropriated, the sum of three hundred dollars.

SECTION TWO.

That the said sum is hereby placed at the disposal of the State Agricultural Society of this State, for the payment of premiums for the best five acres of cultivated timber, or continuous half mile of live hedge fence, or a less amount if deemed necessary; *provided*, That the said society shall make such classifications and regulations as may be deemed most expedient to encourage the largest competition, and all awards of premiums made under this act shall be impartial.

SECTION THREE.

That the provisions of this act shall apply only to timber or groves and hedges propagated from seeds, cuttings, or layers, subsequent to the passage of this act, and no person shall be entitled to more than one first class premium on the same piece of timber or hedge.

SECTION FOUR.

That the said society shall fix the rate of entrance fee of those wishing to compete for premiums under this act at a reasonable amount; and in order to encourage competition, said society may appoint a person or persons in each county, whose duty it shall be to visit the premises of persons competing for premiums in such county, and make out an accurate report of the condition, mode of propagation and cultivation of the timber or hedge growing on said premises, which report shall be made in accordance with instructions from said society, and shall be attested under oath or affirmation.

SECTION FIVE.

That said society shall cause an accurate account of all sums paid as premiums in accordance with this act, together with a list of persons competing for premiums, and to whom such premiums were paid, with the amount thereof, and shall annually, on or before the first Monday in February, make a true report of the same to the Governor of the State: which report, together with a certificate of the correctness thereof, shall be signed by the president and secretary of said society.

SECTION SIX.

This act shall take effect and remain in force from and after its passage.

Approved March 7, 1867.

STATE OF MINNESOTA, }
OFFICE OF THE SECRETARY OF STATE. }

I hereby certify that the foregoing has been compared with the original on file in this office, and is a true copy thereof.

Witness my hand, and the Great Seal of the State, this 20th day of June, A. D. 1867.

H. C. ROGERS,
Secretary of State.

AN ACT

TO ENCOURAGE THE PLANTING AND GROWING OF TIMBER AND
SHADE TREES.

Be it enacted by the Legislature of the State of Minnesota :

SECTION ONE.

Every person planting one acre or more of prairie land within five years after the passage of this act with any kind of forest trees, except black locust, and successfully growing and cultivating the same for three years, and every person planting, protecting and cultivating for three years, one half mile or more of forest trees along any public highway, said trees to be planted so as to stand at the end of three years, not more than one rod apart, shall be entitled to receive for ten years, commencing three years after said grove or line of trees has been planted, an annual bounty of two dollars per acre for each acre so planted, and two dollars for each one-half mile so planted, to be paid out of the county treasury of the county in which said grove or line of trees may be situated ; such bounty shall not be paid any longer than said grove or line of trees is cultivated and kept alive, and in a growing condition.

SECTION TWO.

Any person wishing to avail himself of the provisions of section one of this act, shall within three years after planting said grove, or line of trees, file with the county auditor of the county a correct plat of said grove or line of trees, showing on what section or other piece of land said grove or line of trees is situated, attested by his own oath, and the affidavit of at least two householders of the vicinity, setting forth all the facts in relation to the growth and cultivation of said grove or line of trees. The county auditor shall lay such plat and affidavit before the county commissioners, and if they find from the evidence, that section one of this act has been fully complied with, shall cause warrants to be issued from the county treasury of the proper county for the bounty above provided for.

SECTION THREE.

The affidavit of the claimant, and of at least two householders of the vicinity, showing the growth and condition of such trees, shall be filed each year in the office of the county auditor before the county

commissioners shall authorize warrants to be drawn on the county treasurer for the bounty for that year.

SECTION FOUR.

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

Approved March 6, 1871.

STATE OF MINNESOTA,
OFFICE OF THE SECRETARY OF STATE. }

I hereby certify that the foregoing has been compared with the original on file in this office, and is a true copy thereof.

Witness my hand, and the Great Seal of the State, this 25th day of May, A. D. 1871.

[SEAL.]

H. MATTSON,
Secretary of State.

AN ACT

FOR THE PROTECTION OF CRANBERRIES.

Be it enacted by the Legislature of the State of Minnesota:

SECTION ONE.

That if any person shall hereafter pick or gather cranberries on lands other than his own, in this State, before the tenth day of September in any year, such person shall be fined in the sum of ten dollars for each offense so committed.

SECTION TWO.

All prosecutions under the provisions of this act shall be commenced within six months from the time such offense is committed, and the same shall be upon complaint, under oath, before any justice of the peace in the county where the offense is committed, and all fines imposed and collected under this act, shall be paid, one-half to the complainant and one-half into the treasury of the county where such conviction takes place, for the use of the common schools within such county.

SECTION THREE.

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

Approved March 6, 1871.

STATE OF MINNESOTA, }
OFFICE OF THE SECRETARY OF STATE. }

I hereby certify that the foregoing has been compared with the original on file in this office, and is a true copy thereof.

Witness my hand, and the Great Seal of the State, this 25th day of May, 1871.

H. MATTSON,
Secretary of State.

AN ACT

TO ENCOURAGE THE PLANTING AND GROWING OF TIMBER AND SHADE TREES.

Be it enacted by the Legislature of the State of Minnesota :

SECTION ONE.

That every person planting one acre or more of prairie land, within five years after the passage of this act, with any kind of forest trees, except black locust, and successfully growing and cultivating the same for three years, and every person planting, protecting and cultivating for three years, one half mile or more of forest trees, along any public highway, said trees to be planted so as to stand not more than one rod apart at the end of three years, and when planted on each side of any highway, such trees shall not be planted within the four rod limit of such highway, shall be entitled to receive for ten years thereafter, an annual bounty of two dollars for each acre, and two dollars for each half mile so planted and cultivated, to be paid out of the state treasury; but such bounty shall not be paid any longer than such grove or line of trees is maintained and kept in a growing condition.

SECTION TWO.

Any person wishing to secure the benefit of this act, shall within three years after planting such grove, or line of trees, and annually thereafter, file with the county auditor of the county in which the same is located, a correct plat of the land, describing the section, or fraction thereof, on which such grove, or line of trees, has been planted or cultivated, and shall make due proof of such planting and cultivation, as well as of the title to the land, by the oath of the owner, and the affidavit of two householders residing in the vicinity, setting forth the facts in relation to the growth and cultivation of the grove, or line of trees, for which such bounty is demanded. The several county auditors shall annually, on or before the first day of August, forward to the state auditor a certified list of all the lands and tree planting reported and verified to them in compliance with this act, with the names and post office address of the respective owners thereof; Providing, this act shall not apply to any railroad company for planting of trees within two hundred feet of its track for the purpose of snow fence.

SECTION THREE.

If the state auditor shall find that the provisions of this act have been duly complied with, he shall issue to the several applicants entitled thereto his warrant upon the state treasurer for the bounty named in the first section, on or before the first Monday of October in each year. Provided, that if the aggregate of the bounty so applied for shall, in any one year, exceed twenty thousand dollars, it shall be the duty of the state auditor, on the first Monday of October, in such year, to equitably distribute twenty thousand dollars, and no greater sum, among the claimants who may be entitled to the aforesaid bounty, and his warrants for such pro rata shall relieve the state from further claims for such year.

SECTION FOUR.

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

Approved Feb. 20, 1873.

STATE OF MINNESOTA, }
OFFICE OF THE SECRETARY OF STATE. }

I hereby certify that the foregoing has been compared with the original on file in this office, and is a true copy thereof.

Witness my hand, and the Great Seal of the State, this 12th day of May, A. D. 1873.

S. P. JENNISON,
Secretary of State.

CONGRESSIONAL TREE PLANTING ACT OF MARCH, 1874.

An Act to amend the act, entitled: "An act to Encourage the Growth of Timber on Western Prairies," approved March 3, 1873, be, and the same is hereby amended so as to read as follows: That any person who is the head of a family, or who has arrived at the age of twenty-one years, and who is a citizen of the United States, or who shall have filed his declaration and intention to become such, as required by the naturalization laws of the United States, who shall plant, protect, and keep in a healthy growing condition for eight years, forty acres of timber, the trees thereon being not more than twelve feet apart each way, on any quarter section of any of the public lands of the United States, or twenty acres on any legal subdivision of eighty acres, or ten acres on any legal subdivision of forty acres, or one-fourth part of any fractional subdivision of land less than forty acres, shall be entitled to a patent for the whole of said quarter-section, or of such legal subdivision of eighty or forty acres, or fractional subdivision of less than forty acres, as the case may be, at the expiration of said eight years, on making proof of such fact by not less than two credible witnesses; *Provided*, That not more than one-quarter of any section shall be thus granted; and that no person shall make more than one entry under the provisions of this act, unless fractional subdivisions of less than forty acres are entered, which, in the aggregate, shall not exceed one quarter section.

SECTION TWO.

That the person applying for the benefit of this act shall, upon application to the register of the land district in which he or she is about to make such entry, make affidavit before the register or the receiver, or some officer authorized to administer oaths in the district where the land is situated, who is required by law to use an official seal, that such entry is made for the cultivation of timber; and upon filing said affidavit with said register and said receiver, and the payment of \$10, he or she shall thereupon be permitted to enter the quantity of land specified; and the party making an entry of a quarter section under the provisions of this act, shall be required to break ten acres of the land covered thereby the first year, ten acres the second year, and twenty acres the third year, after the date of entry, and to plant ten acres of timber the second year, ten acres the third year, and twenty acres the fourth year after date of entry. A party making an entry of eighty acres shall break and plant, at the times hereinbefore prescribed, one-half of the quantity required of a party who enters a quarter section; and a party enter-

ing forty acres shall break and plant, at the times hereinbefore prescribed, one-quarter of the quantity required by a party who enters a quarter section, or a proportionate quantity for any smaller fractional subdivision; *Provided, however,* That no final certificate shall be given or patent issued for the land so entered until the expiration of eight years from the date of such entry; and if, at the expiration of such time, or at any time within five years thereafter, the person making such entry, or, if he or she be dead, his or her heirs or legal representatives, shall prove by two credible witnesses that he or she or they have planted, for not less than eight years, have cultivated and protected such quantity and character of timber as aforesaid, they shall receive a patent for such quarter section or legal subdivision of eighty or forty acres of land, or for any fractional quantity of less than forty acres, as herein provided. And in case of the death of a person who has complied with the provisions of this act, for the period of three years, his heirs or legal representatives shall have the option to comply with the provisions of this act, and receive, at the expiration of eight years, a patent for 160 acres, or receive without delay a patent for forty acres, relinquishing all claim to the remainder.

SECTION THREE.

That if, at any time after the filing of said affidavit, and prior to the issuing of the patent for said land, the claimant shall abandon the land, or fail to do the breaking and planting required by this act, or any part thereof, or shall fail to cultivate, protect, and keep in good condition such timber, then, and in that event, such land shall be subject to entry under the homestead laws, or by some other person under the provisions of this act; *Provided,* That the party making claim to said land, either as a homestead settler or under this act, shall give, at the time of filing his application, such notice to the original claimant as shall be prescribed by the rules established by the Commissioner of the General Land Office, and the rights of the parties shall be determined as in other contested cases.

SECTION FOUR.

That each and every person who, under the provisions of the act entitled, "An act to secure homesteads to actual settlers on the public domain," approved May 20th, 1862, or any amendment thereto, having a homestead on said public domain, who, at any time after the end of the third year of his or her residence thereon, shall, in addition to the settlement and improvements now required by law, have had under cultivation, for two years, one acre of timber, the trees thereon not being more than twelve feet apart each way, and in a good thrifty condition, for each and every sixteen acres of said homestead, shall, upon due proof of said fact by two credible witnesses, receive his or her patent for said homestead.

SECTION FIVE.

That no land acquired under the provisions of this act shall in

any event become liable to the satisfaction of any debt or debts contracted prior to the issuing of certificate therefor.

SECTION SIX.

That the Commissioner of the General Land Office is hereby required to prepare and issue such rules [and regulations consistent with this act, as shall be necessary and proper to carry its provisions into effect; and that the registers and the receivers of the several land offices each be entitled to receive two dollars at the time of entry, and the same sum when the claim is finally established and the final certificate issued.

SECTION SEVEN.

That the fifth section of the act entitled "An act in addition to an act to punish crimes against the United States, and for other purposes," approved March 3, 1857, shall extend to all oaths, affirmations, and affidavits required or authorized by this act.

SECTION EIGHT.

That parties who have already made entries under the act approved March 3, 1873, of which this act is amendatory, shall be permitted to complete the same under full compliance with the provisions of this act.

TRANSACTIONS
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY.

PROCEEDINGS, ESSAYS, AND REPORTS

AT THE SUMMER MEETING,

HELD AT THE

STATE UNIVERSITY, JUNE 30th, 1875,

AND AT THE

ANNUAL WINTER MEETING,

HELD AT

Winona, January 18th, 19th & 20th, 1876,

TOGETHER WITH

APPENDICES CONTAINING ESSAYS, REPORTS, OBITUARIES,
AND OTHER PAPERS ON MISCELLANEOUS SUBJECTS.

Prepared by CHAS. Y. LACY, Secretary.

ST. PAUL:
THE PIONEER-PRESS COMPANY,
1876.

TRANSACTIONS
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY;

PROCEEDINGS, ESSAYS, AND REPORTS

AT THE SUMMER MEETING,

HELD AT THE

STATE UNIVERSITY, JUNE 30th, 1875,

AND AT THE

ANNUAL WINTER MEETING,

HELD AT

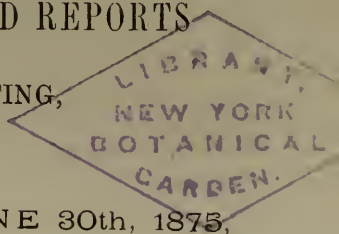
Winona, January 18th, 19th & 20th, 1876,

TOGETHER WITH

APPENDICES CONTAINING ESSAYS, REPORTS, OBITUARIES,
AND OTHER PAPERS ON MISCELLANEOUS SUBJECTS.

Prepared by CHAS. Y. LACY, Secretary.

ST. PAUL:
THE PIONEER-PRESS COMPANY.
1876.



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LIST OF OFFICERS FOR 1876.

PRESIDENT :

TRUMAN M. SMITH.....St. Paul.

VICE PRESIDENTS :

E. H. S. DARTT, First District.....Owatonna.

T. G. CARTER, Second DistrictSt. Peter.

J. T. GRIMES, Third DistrictMinneapolis.

SECRETARY :

CHAS. Y. LACY.....Minneapolis, E.

TREASURER :

A. W. SIASRochester.

STANDING COMMITTEES.

EXECUTIVE :

HON. NORMAN BUCK, Chairman.....Winona.

WYMAN ELLIOT.....Minneapolis.

P. A. JEWELL.....Lake City.

O. F. BRAND.....Faribault.

J. S. HARRIS.....La Crescent.

ON ENTOMOLOGY :

HON. R. J. MENDENHALL.....Minneapolis.

J. S. HARRIS.....La Crescent.

WYMAN ELLIOT.....Minneapolis.

ON FLOWERS AND FLORICULTURE:

C. M. LORING.....	Minneapolis.
WM. KING.....	St. Paul.
PROF. W. F. PHELPS.....	Winona.

ON VEGETABLES AND MARKET GARDENS:

J. T. GRIMES.....	Minneapolis.
W. E. BRIMHALL.....	St. Paul.
M. PEARCE.....	Rochester.

ON TREES FOR THE FOREST AND FOREST CULTURE.

L. B. HODGES.....	St. Paul.
A. STEWART.....	Richfield.
E. H. S. DARTT.....	Owatonna.

PERMANENT COMMITTEE ON OBITUARIES.

COL. J. H. STEVENS.....	Minneapolis.
HON. C. M. LORING.....	Minneapolis.
GEN. LEVI NUTTING.....	Faribault.

COMMITTEE ON CATALOGUING FRUITS, SHADE AND ORNAMENTAL TREES AND PLANTS.

P. A. JEWELL.....	Lake City.
WYMAN ELLIOT.....	Minneapolis.
A. W. SIAS.....	Rochester.

COMMITTEE ON AGRICULTURAL COLLEGE.

COL. J. H. STEVENS.....	Minneapolis.
E. H. S. DARTT.....	Owatonna.
WM. CANNON.....	Bismarck, D. T.

COMMITTEE ON FINANCE:

C. M. LORING.....	Minneapolis.
NORMAN BUCK.....	Winona.
A. W. SIAS.....	Rochester.

For Committee to solicit and collect fruits for the Centennial Exhibition see p. 32.

GENERAL FRUIT.

J. W. BOXELL	Washington Co.
M. C. BUNNELL	Houston Co.
R. SCHIFFMAN	Ramsey Co.
F. G. GOULD	Hennepin Co.
O. F. BRAND	Rice Co.
T. G. CARTER	Nicollet Co.
E. H. S. DARTT	Steele Co.
GEO. H. FISH	Stearns Co.
M. J. HOAG	Olmsted Co.
G. W. FULLER	Meeker Co.
GORHAM POWERS	Yel. Med. Co.
J. S. BROCKELHURST	Mille Lacs Co.
L. D. MILLS	Blue Earth Co.

LOCAL AND COUNTY HORTICULTURAL SOCIETIES.

RAMSEY COUNTY GERMAN HORTICULTURAL SOCIETY.

J. C. FLEISCHER, St. Paul.....President.
_____, _____.....Secretary.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

M. W. LELAND, _____.....President.
S. D. HILLMAN, Rochester.....Secretary.

NICOLLET COUNTY HORTICULTURAL SOCIETY.

ORGANIZED MARCH 9TH, 1876, WITH 12 MEMBERS.

ERNEST MEYER, St. Peter.....President.
T. G. CARTER, St. Peter.....Secretary.

LIST OF MEMBERS.

Adams, L. T.....	Hokah, Houston county.
Boxell, J. W.....	Afton, Washington county.
Bower, Thomas.....	St. Paul, Ramsey county.
Booth, J. E.....	Minneapolis, Hennepin county.
Buck, Hon. N.....	Winona, Winona county.
Bunnell, M. C.....	Money Creek, Houston county.
Brand, O. F.....	Faribault, Rice county.
Bates, W. K.....	Stockton, Winona county.
Baker, D. A. J.....	St. Paul, Ramsey county.
Brackett, Geo. A.....	Minneapolis, Hennepin county.
Brainard, H. J.....	St. Paul, Ramsey county.
Cannon, Wm.....	Bismarck, D. T.
Carter, T. G.....	St. Peter, Nicollet county.
Clark, Geo. W.....	Winona, Winona county.
Cook, M. S.....	Maple Plain, Hennepin county.
Cameron, G. W.....	Dundas, Rice county.
Dartt, E. H. S.....	Owatonna, Steele county.
Elliot, Wyman.....	Minneapolis, Hennepin county.
Fish, Geo. H.....	Sauk Center, Stearns county.
Fowler, Wm.....	Newport, Washington county.
Fleischer, J. C.....	St. Paul, Ramsey county.
Grimes, J. T.....	Minneapolis, Hennepin county.
Gould, F. G.....	Excelsior, Hennepin county.
Hart, John.....	Winona, Winona county.
Hackett, Geo.....	Money Creek, Houston county.
Harris, J. S.....	La Crescent, Houston county.
Hoag, M. J.....	Rochester, Olmsted county.
Hewitt, Dr. A. W.....	Kenyon, Goodhue county.
Hoyt, Lorenzo.....	St. Paul, Ramsey county.
Hodges, L. B.....	St. Paul, Ramsey county.
Jewell, Dr. P. A.....	Lake City, Wabasha county.
Jordon, E. B.....	Rochester, Olmsted county.
Judson, R. C.....	Farmington, Dakota county.
Lacy, Prof. Chas. Y.....	Minneapolis, Hennepin county.
Loring, Hon C. M.....	Minneapolis, Hennepin county.
Morey, Prof. Chas. A.....	Winona, Winona county.

Matthews, B. A.....	Knoxville, Iowa.
McKellup, C. D.....	Faribault, Rice county.
Mendenhall, Hon. R. J.....	Minneapolis, Hennepin county.
Pearce, M.....	Rochester, Olmsted county.
Phelps, Prof. W. F.....	Winona, Winona county.
Philips, A. J.....	West Salem, Wis.
Rollins, I. W.....	Elgin, Wabasha county.
Stevens, Col. J. H.....	Minneapolis, Hennepin county.
Smith, Truman M.....	St. Paul, Ramsey county.
Stewart, A.....	Richfield, Hennepin county.
Scott, W. T.....	Minneapolis, Hennepin county.
Somerville, Wm.....	Rochester, Olmsted county.
Sias, A. W.....	Rochester, Olmsted county.
Schiffman, Dr. R.....	St. Paul, Ramsey county.
Thompson, Josiah.....	Minneapolis, Hennepin county.
Theopold, F. A.....	Faribault, Rice county.
Train, Dr. H. B.....	Hokah, Houston county.
Uline, C. S.....	St. Paul, Ramsey county.
Wachlin, Wm.....	Faribault, Rice county.
Wilcox, E.....	Trempealeau, Wis.

HONORARY MEMBERS.

Geo. Peffer.....	Pewaukee, Wis.
A. G. Tuttle.....	Baraboo, Wis.
O. S. Willey.....	Madison, Wis.
Hon. Wm. W. Folwell.....	Minneapolis, Minn.

LIFE MEMBERS.

Mrs. Wm, Paist.....	St. Paul, Minn.
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TRANSACTIONS
OF THE
MINNESOTA STATE HORTICULTURAL
SOCIETY.

PROCEEDINGS OF THE SUMMER MEETING HELD AT THE UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN., JUNE 30TH, 1875.

Pursuant to notice given through the public press a meeting of the Society was held at the State University in Minneapolis East, June 30th, 1875.

The meeting was called to order by President Smith at 9:25 A. M.

Appointment of Committees.

The appointment of committees being first in order, on motion the President appointed the following :

A committee to report at the next winter meeting of the Society on the condition of the Agricultural College Farm. J. S. Harris, D. A. J. Baker, and Col. J. H. Stevens, were appointed, and on motion of Judge Baker, Wm. Fowler, President of the State Agricultural Society, was added.

A committee to report on the articles on exhibition in the hall consisting of C. M. Loring, Wyman Elliot and Mrs. W. E. Brimhall, was appointed.

Visit to University Farm.

A recess for the arrangement of articles on exhibition was then taken, at the end of which a visit was made to the Agricultural College Farm, which is located about one mile east of the University.

The following is a brief enumeration of what was seen growing :

By way of preface we should remark that the farm lies on either side of University avenue, about one half mile east of the University; that it consists of about 120 acres, of which by far the larger portion is so wet as to produce only hay, while the smaller portion, under cultivation, is of a sandy nature, and much reduced by continued cropping without manure. Under these conditions the results attained and likely to be attained, reflect no discredit on those having the farm in charge.

Entering the part of the farm lying north of the avenue, we found the plat here under cultivation divided into four sections by three alleys for passage of teams. Entering the first alley we found upon the right first two varieties of cauliflower, followed by a quarter acre of onions from the seed. These were mainly of the large red variety, but included also five other varieties for experiment. Then came two varieties of parsnips, student and hollow crowned, of which the former made the best show, probably because the seed germinated better. Next were two rows of beds containing five varieties of lettuce and the same of radishes, besides spinach, onions from sets, and other vegetables. Some of the lettuce showed the heading peculiarity so as to look like miniature heads of cabbage. Then follow a row of salsify and four varieties of carrots, some designed for table use and some for feeding purposes. Next we see four varieties of garden turnips, followed by specimens of kohlrabi, Brussels sprouts, herbs, Swiss chard, broccoli, peppers and egg plants. Last upon the right hand side we find one of eight varieties of garden sweet corn, which have been planted in various places, as much removed from each other as possible to prevent mixing. Some eight varieties of squashes were distributed in a similar manner for the same reason. On the left of this alley were first six varieties of late cabbage, covering about one-half acre. Then came two rows of celery, comprising five varieties. This was followed by five varieties of garden beets. Next came three-eighths of an acre of tomatoes, comprising seven varieties. These are succeeded by sweet potatoes one-quarter acre, and cucumbers one-eighth acre, and last, on the left of this alley, twenty-three varieties of peas. Some of these varieties of peas, but recently given to the public, promise to surpass in earliness, productiveness and flavor, some of the older and better known varieties grown side by side. Here, also, was tried an experiment with different kinds of fertilizers. Guano, bone flour and superphosphate of lime and animal fertilizer were applied on adjoining rows of early Kent peas. The results thus far have been plainly in favor of the guano, the animal fertilizer standing second.

Turning to the left and returning in the third alley, we meet on the left with the most marked failure yet experienced, viz., in the germination of forest-tree seeds. Of the kinds sown about one-half germinated. These were ash-leaved maple or box elder, honey locust, Kentucky coffee tree, green ash, ailanthus, Norway spruce and white pine. Next we come to the potatoes planted for crop purposes, comprising about three-quarters of an acre, and consisting chiefly of early rose, with a few early favorite and peerless. After these come thirteen varieties of potatoes planted for the purpose of comparing their yields, quality and characteristics. Then follow seven varieties of pole beans, some Chinese sugar cane, five varieties of early cabbage, and lastly nine varieties of dwarf beans. On the

right of this alley we found first some soft maples just coming up, then eight kinds of fertilizer, including compost of stable manure, applied on adjoining rows of early rose potatoes. These were followed by six kinds mangolds and sugar beets, and these in turn by dent corn for crop. We could see no attempt at what may be called "fancy" farming. Everything seemed to aim at utility. Not the greatest amount of money value, but the greatest amount of material for instruction and the greatest amount of information.

Leaving the north side of the avenue and entering that part lying on the south side opposite the barn we found first on the right eight plats of white dent corn, each manured with a different fertilizer. So far as could be judged from present appearances that which had received compost for stable manure would yield better than several other plats. That manured with ashes did not come up well, which was attributed to the ashes injuring the germinating power, as the ashes were simply scattered in the hill and the corn dropped directly upon them. The plat manured with Peruvian guano showed better than all others, except perhaps that manured with compost. The animal fertilizer produced effects inferior only to these two, while superphosphate of lime showed a slight superiority over the bone flour. Passing these experiments with the fertilizers we came to the orchard, which was set the past spring, and which shows but very few trees that have failed to grow. It contains over 200 trees, many of which were donated for trial by nurserymen and fruit-growers of the State. Of crab-apples there are seventeen varieties; apples, thirty-four varieties; plums, seven varieties, and cherries, four varieties.

Passing through the orchard we came to the small grain experiments. For these, poor soil was purposely chosen, in order that the effect of the soil should not overshadow and cover up the effects of the fertilizers and peculiarities of the different varieties. Great care was taken to select land of uniform character, and to secure the same conditions for the different plats compared with each other. First, were five plats sown with five different varieties of wheat, and the sixth with a mixture of these. One of these plats is five wheat, and with it the others are to be compared. On the seventh plat is sown wheat received from Department of Agriculture. On the eighth a mixture of wheat, barley and oats. The ninth and tenth are sown with five wheat, one at the rate of seventy-two pounds per acre, and the other at the rate of one hundred pounds per acre. Then follow five plats of five wheat, dressed with different fertilizers, one being left without manure. This plat shows a perceptible inferiority. Next are six varieties of oats, and lastly some spring rye, without manure.

Returning by another path we came upon fifty or sixty grape vines comprising some thirteen varieties. Some corn, planted for crop purposes showed a good many vacant hills, the gophers having stolen the seed. Thirty-nine plats, each one rod square and sown with clovers, grasses and mixtures of grasses, next met our view, but their peculiarities were pretty effectually concealed by the dense growth of weeds which had come with them and which could not be removed without destroying the grasses. Beyond this lay a plat of winter rye, sown the 10th of last November. The seed did not sprout and scarcely swelled until this spring, but now it stands about five feet high and well headed. Passing up the north side of this we

passed some Sanford corn, Hubbard squashes and five varieties of field beans, and then came upon the fruit garden, where had been set out three varieties blackberries, nine varieties raspberries, eleven varieties currants, one variety gooseberry and eight varieties strawberries. Then we met some fine looking corn, called by its improver, Mr. W. T. Scott, foreman of the farm, State Farm Yellow Dent. About ten varieties of field corn are growing in different locations upon the farm. Many of these, however, are represented by only a few hills or rows, while others that have given promise of value in the past are planted in larger quantity.

West of this corn were set the grafts of ten or twelve varieties of apples and crabs procured from the extreme northern part of Vermont. Next we came to the nursery containing elms, maples, larch, pines, spruce, &c. The pines here showed the blasting effects of last winter, as they do elsewhere. We must not forget to mention the Russian apple trees set out by Colonel Robertson several years ago. These stand on sandy soil and appear to be doing well. It was noticed that while the grafted growth was unimpaired last winter, whatever branches had grown up from the stock were partly or entirely killed.

The survey of the farm was quite too hasty to permit of many questions or criticisms. Several of the party, however, ventured the opinion that a large quantity of manure was needed to bring the farm up to a highly productive state. It is worthy of remark that this great variety of seeds and plants has been planted and cared for with a very small amount of labor. Less than an average of two hands besides the foreman have done all the labor of preparing the soil, planting, manuring in the hill and row, cultivating, hoeing, etc., and this where the nicest care was required in every operation. Having completed their hasty visit to the University farm, the party returned to the University, where the remainder of the programme of the meeting was carried out.

Col. Stevens then read his essay on strawberries, after which a vote of thanks was tendered and a copy requested for publication in the Transactions.

[Col. Stevens has not been able to furnish a copy for publication.—SEC'Y.]

DISCUSSION.

Cultivation.

The question was asked if wild strawberry plants would not produce as good berries as the tame ones if cultivated as well.

Mr. Harris:—The berries of wild plants brought under cultivation are not as large as those of the tame plants left uncultivated. Have a bed of Downer's Prolific 12 years old that now gives better berries than the new beds. The Wilson, if cultivated before the fruit ripens, develops the seeds more prominently. Would culti-

vate thoroughly after the crop is gathered, and pull the weeds, spading if necessary, early in the spring; then mulch and let alone.

Mr. Elliot:—Would cultivate when newly set out, but cultivation while bearing tends to produce knotty, seedy berries.

Mulching.

Mr. Tuttle inquired of Mr. Elliot concerning same berries thoroughly mulched with straw, and was informed that they did well.

Mr. Baker:—Have cultivated the Wilson in beds successfully.

Mr. Harris:—Have seen berries mulched with hop vines that did much better than those mulched with straw, as the hop vines were more open.

Varieties.

Mr. Abernethy:—Is not the Wilson the poorest berry we have? It is flavorless, sour and dry. The Green Prolific is much better.

Mr. Elliot:—You must be giving the characteristics of the green berries.

Mr. Harris moved to recommend the Wilson to the horticulturists of Minnesota as the best strawberry for market.

Mr. Baker:—I would add the words "and for use." It is the poor man's strawberry, and will grow most anywhere.

Mr. Smith:—Have had most experience with the Wilson. The Charles Downing, however, brought one-quarter more in the St. Paul market last year. The Green Prolific is a good berry, but softer than the Downing; good to run down weeds, but will sink one-half if left in the baskets over night.

Mr. Brimhall:—The Wilson keeps the best and freshest, but the Downing is the best eating. It brings one-fourth more than the Wilson, and is best for family use.

Mr. Harris:—I like the Wilson for market, because when I get there I want to know what I have, whether berries or jam.

The motion to recommend the Wilson, as above, was carried.

Mr. Abernethy moved that the society recommend Charles Downing and Green Prolific for garden cultivation or home use.

At this point a recess was taken for lunch, furnished by the Regents of the University, in an adjoining room.

AFTERNOON.

Meeting was called to order at 1:30.

The motion to recommend Charles Downing and Green Prolific was referred to a committee consisting of Messrs. Abernethy, Elliot and Harris, who presently reported, favoring a recommendation by the society for general cultivation by amateurs of the Charles Downing late and prolific; Downer's Prolific, medium early and prolific; Triomphe de Gand for large berries and fine flavor; Brooklyn Scarlet for flavor.

The report was accepted and adopted.

Varieties Recommended.

The action of the Society on strawberries was therefore as follows:

Recommended for general cultivation for market:
Wilson's Albany.

Recommended for general cultivation by amateurs:
Charles Downing, late and prolific.
Downer's Prolific, medium early and Prolific.
Triomphe de Gand, for large berries and fine flavor.
Brooklyn Scarlet, for flavor.

Obituaries.

Judge Baker moved the appointment of a permanent committee on obituaries, this committee to consist of Messrs. Stevens, Loring and Nutting. Motion carried.

Transactions.

Here followed a discussion on the report of the Secretary of the Society for last year. Mr. Loring moved the appointment of a committee to wait upon the Secretary of last year and request his notes of the proceedings of the Society to be published in the Transactions of the Society. Motion carried, and Mr. C. M. Loring appointed.

Flowers.

Rev. Mr. Tuttle then read his essay on Flowers.

The essay was accepted, the thanks of the Society tendered, and a copy requested for publication in the Transactions.

The following is the essay :

It can be said of flowers, but scarcely of any other thing, that they are universally admired. Human nature naturally varies so much, and education diversifies it so much more, there are few objects in this world which affect us all alike—which affect us all in any degree. Music appeals to a popular chord, but persons are found who do not care to hear it, and a small number who have a positive aversion to it, but who ever knew an individual, civilized or savage, cultivated or uncultivated, good or bad, who did not display more or less fondness for flowers? Did the man or woman ever live who hated flowers? If not, what better proof do we need that flowers answer a common want and come nearer the soul of man than any other material thing—that they are almost as much a necessity as the air we breathe. Some persons take especial enjoyment in mountain scenery, others prefer wide stretching prairie; some would have their home enveloped in thick clumps of trees, while others would have a green lawn and open sunlight; but no one asks for field, or forest, for glen or garden, for hill sides or river banks, for private laws or public parks, where flowers do not grow. Whatever else we have flowers must complete its beauty. Beecher said: “Flowers are the sweetest things God ever made and forgot to put a soul into.” But are we sure God did not put a soul into them. Richter, than whom no man ever had a keener insight for nature, quotes Undine as saying :

“I once fancied a paradise for the spirits of departed flowers.”

The very name of *Pansy* suggests a human quality. “Look,” says the poet Read :

“Look how the blue-eyed violets glance love to one another.”

Longfellow writes :

“How like they are to human beings.”

Flowers possess a universal fitness for

Symbols of Sentiment.

There is no time or place when flowers are inappropriate, no decoration to which they cannot add a charm. They lend fragrance and beauty to homes of joy and to homes of sorrow. The bride who wore orange blossoms on her wedding day, when dead has her coffin wreathed with immortelles. Flowers may tell our love for the living, and our mourning for those who have passed away. With equal fitness they adorn the cradle and grave—the portals of life and the portals of Heaven. There is no private meeting of friends, no public meeting of friends, no public festival, nor anniversary of any kind, no birth, no baptism, or religious ordination, which they may not embellish or grace with some sentiment. They appear

in the church, in public halls, in shop windows, in porticos and on balconies; they wind about columns, cover old walls, light up front lawns, decorate schoolrooms: they are worn as ornaments for the person; they make crowns for children and chaplets for heroes; and our nation could find no more delicate, genuine way of expressing its gratitude for the soldiers who perished in the late war than by covering the places where they sleep with flowers. Here the odor of roses succeeds the smoke of battle; violets and lilies heal the wound of war, while they deck the brow of remembered patriotism. It is said that the cupid of the ancient Hindoos tipped his arrows with flowers. This young god of love lives everywhere and always dwells amid flowers, lives on their breath, and reflects their colors from his eyes and lips. Says a certain writer: "The instinctive and universal taste of mankind selects flowers for the expression of its finest sympathies, their beauty and their fleetingness serving to make them the most fitting symbols of those delicate sentiments for which language itself seems almost too gross a medium."

Park Benjamin says: "Flowers are love's truest language." He might have said they are a medium for all our thoughts and feelings. If language were abolished, these silent tongues of the field and garden might be used to reveal us to one another.

Flowers seem to be equally

"Adapted to the young and to the old."

Emerson has written that "Flowers belong so strictly to youth that we adult men soon come to feel that their beautiful generations concern us; we have had our way; now let the children have theirs." As this New England sage is generally so clear in his judgment, I am more astonished at his willingness to give up flowers to children, for what among earthly things does old age require or desire more. There are some things which we must grow up to before we can be interested in them; and there are also some things which, although they please us for awhile, we finally outgrow, but children, as soon as they love anything, love flowers; and old people, whose hairs Solomon compared to the white blossoms of the almond, love them equally well. The odor of the garden delights him who bowed with years, treads slowly the winding paths there, no less than the airy-footed boy who trips about with almost the ease and swiftness of the humming bird.

Flowers are welcome and are

Sought for at all Seasons.

They brighten the morning and gladden the evening; their fragrance sweetens the noonday air and the darkness of night. There are many objects which we love to have about us in summer we can readily spare in winter—which, indeed, seem out of place in winter. Food that is enjoyable to the taste in warm weather we refuse in cold weather. Certain amusements cease to attract us beyond certain months; many of our feelings and moods come and go with the sun, with the spring and with the autumn, but our admiration for flowers seems not to be modified by either heat or cold, by south winds or north winds. If there be any dif-

ference our heart warms for them in proportion as the earth cools. As soon as the frost comes we make every effort to transfer the garden to the house, and put our vines and plants inside our home windows instead of outside. In this way we keep the summer, or a pleasant bit of it, always in sight, and bid defiance to the snow storms.

To supply this boundless need and to gratify this universal love for flowers,

God has Covered the whole Earth with them.

Flowers grow everywhere. There is no soil too rich nor too poor for them. What traveler ever found a flowerless country? If we visit Italy, Egypt, Syria and Greece, the people seem foreign and strange, but many of the flowers are familiar like those we have seen all our lives at home. The lilies of Palestine wear the same soft and brilliant costume they did when Christ was there and preached about them, the same they do here in America; the pansies of France and England turn on us the same pensive faces that are seen in our own gardens. The

“Wee, modest, crimson-tipped flower,”

of Burns, and which Woodworth called “the poet’s darling,” and which seemed to him whenever he met it “like a pleasant thought,”—the daisy has come over with the emigrant to live in this land. The poet I have mentioned greets the daisy by exclaiming

“Bright flower! whose home is everywhere!”

The almost human qualities of flowers are manifested therefore in the fact that they can adapt themselves so easily to different places and climates and modes of culture. The fringed gentian that seems in our fields to have borrowed its blue from the sky, colors the sides of the Alps, and the morning glory, that greets the early sun at our windows, climbs to the roofs of Swiss and German cottages. Hence, go where we will, in wood or field, in our own or in foreign lands; wander where we may, in valleys or on mountain tops, we shall meet the smiling faces of flowers. The Scotch hills may be too barren for trees, too barren for human life, but they are never too barren for the purple heather, whose bloom turns the brown rock into a garden. Climb Mount Blanc, ascend where the woods dwindle to scattered shrubs, even higher, to where lichens and mosses and rocks have undisputed dominion, higher still, to where the sterile ground is belted by perpetual snow and ice, and here as the last sign of life, as the lingering symbol of the great summer world below, clinging to its forlorn patches of soil, you shall find flowers. If ever the North Pole is reached, it will be found, I think, with a crown of flowers on it.

So, as God has given to all a love for flowers, he has made their enjoyment and cultivation possible to all.

There is hardly any condition in life we can imagine which denies to one the possession and even the cultivation of a few flowers. Does one live in a city where houses are crowded so thickly together that there is no room for a garden, nor even a foot of front yard? Let him fill his win-

dows, and balconies, and piazzas with flowers. Is one too poor to buy a rod of land? He can easily beg enough soil to fill a few pots, and with these lay out a garden in his kitchen, or dining-room, or parlor. Air and water are cheap, and these are nearly all flowers need.

Cases must be very rare in which poverty is a reasonable excuse for a flowerless home. Cultivating flowers, on the other hand, is one of the blessings of which the poor can be sure, and one of the ways in which they may successfully compete with the rich. They cannot buy diamonds and silks, and elegant furniture; let them decorate themselves and their homes, then, with flowers. They cannot spend the winter in Florida; let them invite the flowers of Florida, then, to come and spend the winter with them.

Although we all love flowers,

Our taste for them can be cultivated,

making the pleasure they afford us immensely greater. They are scattered everywhere so abundantly that their influence is diminished by familiarity. After all, how few of us appreciate them as we should, how few of us study them until we thoroughly understand their construction and realize their loveliness. "Behold," said the Saviour, "the lilies of the field, how they grow." How many heed this suggestion and stop to see "how they grow," to treasure up the wonderful lesson they teach of nature and of God. And this leads me to say, finally, that

"Flowers are Moral Educators."

They serve as a perpetual stimulant to the moral sense; they exalt our feelings and tastes. Horace Smith exclaims, "Your voiceless lips, O flowers, are living preachers—each cup a pulpit, and each leaf a book." We naturally think of Napoleon as one whose stern and hardy nature was developed, at last, by rugged experience, into something like iron, and yet what tenderness and delicate sentiment was still left in him, when we read that he once made this remark: "Where flowers degenerate man cannot live." He who stops to notice a flower, to pluck it, to admire it, be he ever so bad a man, gives at least one proof against his total depravity, one sign that his heart is yet in sympathy with the great world of beauty. The traveler in Europe and other Eastern lands, sees here and there, exhibitions of wretchedness and poverty, and uncleanness, at which he stands appalled, but the picture has always this one redeeming character—the lowest of the people cultivate flowers. The love of flowers is the one uncorrupted and unfallen angel that flies with white wings among every class of people. Homes from which almost every nameable comfort has been driven: where hunger, and nakedness, and want of all kinds, hold sway, can still afford a vine for the shattered window, and a lily, or pansy, or daisy for the ragged children to hold in their dirty hands. Peasant children often come running out of their homes with bouquets of flowers for sale, seeming confident, always, that they will find a way, through these, to the stranger's heart and pocket, while the purchaser feels he has received something better than his money; that rays of beauty have been transferred to him from places where he would have seen no

other light and felt no other pleasure. It was a garden in which the first human beings were placed, and from which their first sins expelled them, and, in finding his way back to the lost paradise, man must enter into the garden again, pure and beautiful as the flowers that grow there.

DISCUSSION.

Mr. Harris proposed to pass over the discussion for want of time, if no objections were made.

Mr. Tuttle should like to hear something about the money value of flowers. Think that might be urged as a consideration in favor of their cultivation.

Roses.

Mr. Elliot:—Why have we lost so many of our hybrid perpetual roses this spring? Have lost 14 or 15 varieties notwithstanding the usual covering.

Prof. Peckham:—The late freezes in the spring after the covering was removed are likely to have killed them. When the mercury falls below zero it makes little difference to the plant whether twenty or forty degrees.

Mr. Elliot:—They appeared unimpaired when the growing season commenced and promised to grow and bloom, but then withered and died.

Richfield Pansy.

Col. Stevens:—Would like to hear from Mr. Hoag concerning the Richfield Pansy exhibited a few years ago.

Mr. Hoag:—I do not know whether or not an inquest was held over it, but if so, the coroner is the man to ask. It died the summer after exhibition. This pansy come from seed obtained by planting four varieties closely side by side, and it combined all the colors of these four varieties. I protect with covering of straw.

Mr. Baker:—A pansy bed must be young. It runs out about every two years. To obtain large plants they must be so grown as to prevent flowering until July or August.

Mr. Harris:—Such is my love for flowers that I would rather live on three meals a week than do without flowers.

Reports.

The Secretary moved that members of the General Fruit Com-

mittee be requested to hand their reports to the Secretary, and that the same be published in the Farmers' Union, and incorporated in the Transactions of the Society. Carried.

Winter Meeting.

Mr. Elliot moved to recommend the Executive Committee to appoint the next winter meeting at Winona. Carried.

Pomological Society.

Mr. Harris spoke of the need of being represented at the meeting of the Pomological Society in September next.

Mr. Hoag moved that the President, Secretary, Mr. Harris and Mr. Elliot be requested to attend the meeting.

The Secretary moved to amend by adding that the President and Secretary be instructed to issue delegate credentials to any members of the Society who may request them with a view of attending.

Special Apple Premiums.

A motion to sustain the Executive Committee in offering special apple premiums in current premium list of the State Agricultural Society was carried.

Life Membership.

A resolution relating to life membership was here introduced and passed, but the Secretary is unable to furnish the substance.

DISCUSSION ON CURRANTS.

Pruning.

Mr. Elliot:—Has any one had any experience in pruning currants to improve the fruit or prolong the bearing age?

Mr. Grimes:—Do not prune, but manure, to bring up to bearing a full crop of good fruit.

Mr. Brimhall:—Would renew old bushes by cutting out the old wood, and by manuring. Red Dutch is about the best bearer.

Varieties.

Mr. Baker :—Will the President name the best three varieties?

Mr. Smith :—Prince Albert is one of the best, but late. Victoria is one of the best bearers. Bailey's Sweet is the best white. La Versailles is also another good red currant. Could not be hired to set Red Dutch.

Col. Stevens :—The Red Dutch is the best and surest we can raise, while all other varieties soon run out.

Mr. Smith :—Have had good success with Victoria set between apple trees. Two rows of currants between two rows of trees standing twenty feet apart.

Mr. Harris :—Does the aphid, which causes currant leaves to curl and fall, do any injury?

Mr. Smith :—It does; after the leaves fall the fruit merely colors and does not ripen. (In answer to a question.) The White Grape is larger than the White Dutch.

DISCUSSION ON RASPBERRIES.

It was then moved and carried to take up the discussion of raspberries.

Varieties.

Mr. Harris moved to recommend the Doolittle for general cultivation.

Mr. Brimhall moved to amend by substituting Seneca Black Cap and Mammoth Cluster.

Mr. Smith :—The Seneca is superior to the Doolittle—hardier. The fruit is larger, better flavored, less seedy and a little later.

Mr. Grimes :—I agree with Mr. Smith. The Seneca is the best of all the black caps. The Doolittle is a great bearer, and I would not throw it out entirely, but it sometimes kills to the snow line. Think it would be a good idea to throw some straw over them. The Seneca is an enormous bearer. Would throw out the Mammoth Cluster. It bears well if it gets through the winter.

Mr. Harris :—Have plowed mine up. They are not prolific and ripen late. The birds take them all.

Mr. Brimhall :—Have discarded the Doolittle, and now cultivate the Seneca, Davison's Thornless and Mammoth Cluster. The difficulty with Mammoth Cluster is the cones grow too large. The Thornless is sufficiently prolific to raise for market.

Mr. Harris :—I do not find it so.

Mr. Smith :—I find it prolific, and the earliest black cap.

Mr. True was asked to name the best red varieties, but declined.

Mr. Smith :—I would name the Turner, Philadelphia and Clarke.

Mr. Elliot moved to amend the first motion by recommending as first, for general cultivation, the Seneca, and adding the Doolittle and Davison's Thornless.

Mr. Grimes :—Am not growing red raspberries to any extent now ; can do better with the black caps.

Mr. Elliot :—Have a few of the Philadelphia. They have killed back badly for the last two years, but three years ago they bore a great crop.

Mr. Smith :—Mine also have killed back, and I have heard of others whose vines have done likewise. I have the Turner, which bears better and sells higher than any other red variety. It came through in good condition last winter.

Mr. Harris :—Mine also came through in good condition last year.

Mr. Smith :—Does any one know anything about the Herstine?

Mr. Harris moved to recommend the Turner red raspberry for trial. Carried.

Also moved to give the Philadelphia one more year of trial before rejection, but strong objection being made, the motion was withdrawn.

Mr. Brimhall :—I have thrown out the Kirtland.

Mr. Smith :—I have the Ontario black cap, but not in bearing.

Mr. Harris :—Has any one had any experience with the Harkness black cap? I received six plants from Mr. Sias, of Rochester, and they gave such a yield as I never saw from any others.

Mr. Baker :—Is the same soil equally suited to all varieties?

Mr. Smith :—The red varieties like more moisture than the black caps. All like moisture, but not stagnant water.

The action of the Society on raspberries was therefore as follows :

Recommended for trial :

Turner's Red.

Col. Stevens moved that members of the Society be requested to send to Mr. Lacy, Professor of Agriculture, specimens of all new varieties of grains, fruit trees, &c., for trial on University farm. Carried.

A vote of thanks was tendered the University authorities for their cordial reception, their hospitality, and the use of rooms for this meeting.

Pres. Folwell invited the Society to make use of the rooms at the University, and to feel welcome there at all times, and to appoint meetings there whenever convenient.

Judge Baker moved that Col. Stevens, Gen. Nutting, and the President of the Horticultural and Agricultural Societies, be appointed a committee to apply for a room at the State Capitol for the two societies, and to be open at all times. Carried.

The Society adjourned to take another look at the articles on exhibition, and thus closed the first summer meeting of the Society that has been held for several years. Few or none will venture to call it a failure, though the number present was not large. Many are enthusiastic over its success, and it is hoped that it is the pioneer of a series of summer meetings which shall gradually increase in size, importance and usefulness, and give the Society a reputation which shall establish it on a firm basis.

To the success and interest of the meeting the exhibition added in no small degree, and though we speak of this last, the fact must not be taken as an index of its importance. The articles were arranged on two rows of tables flanking the sides of the floor of the new chapel.

Articles on Exhibition.

Gracing the Secretary's table were three handsome bouquets received from Mr. Wm. King, of St. Paul. They contained of roses two varieties, pelargoniums two varieties, fuschias five varieties, heliotrope, verbenas, rose geraniums, and several other varieties of choice flowers.

Perhaps the most striking and beautiful collection was that of Mr. J. C. Fleischer, of St. Paul. These plants were in pots. They made a truly fine appearance and the thanks of all are due Mr. Fleischer for his labor in placing these on exhibition. The collection comprised geraniums, 11 varieties; begonias, five varieties; fuschias, five varieties; pelargoniums, and other flowers.

Mr. C. M. Loring had one basket bouquet and two bouquets of roses.

Mr. J. C. Booth, a beautiful Yucca and two bouquets.

President Smith, St. Paul—Roses, 20 varieties; peonies, 10 varieties; fuschias, 5 varieties; calycanthus, feverfew, pinks, dielytra, perennial phlox, verbenas, a Mahonia, green currants, 5 varieties; asparagus, 4 bunches; Chas. Downing strawberry, 2 baskets; leaves of bloodroot under cultivation.

J. S. Harris, La Crescent—Two varieties of sweet potato, Red Bermuda and Southern Queen.

Wyman Elliot, Minneapolis—Peonies, 8 varieties, and some giant specimens of pie-plant.

Mr. Elliot gave some figures, as follows, relating to his pie-plant: One stalk weighed one pound and $14\frac{1}{2}$ ounces; 9 stalks from one hill weighed 13 pounds and $4\frac{1}{2}$ ounces; the entire hill, stalks and leaves, weighed 78 pounds.

Mr. J. T. Grimes, Minneapolis—Bouquet of mock oranges and roses; peonies, 11 varieties; roses, 12 to 15 varieties; currants, 4 varieties; gooseberries, 2 varieties; transcendent crabs.

Mr. W. E. Brimhall, St. Paul—Cauliflower, three heads; Golden Russets; Soulard crabs; Charles Downing strawberry; large specimen Early Rose potatoes; pie-plant; asparagus, for table and for hanging; rose bouquet, of six varieties.

PROCEEDINGS AT THE WINTER MEETING HELD IN WINONA,
JANUARY 18TH TO 20TH, 1876.

Pursuant to notice given through the public press and by the distribution of programmes, the Society convened in the rooms of the city council of Winona, January 18th, 1876.

WINONA, January 18th, 1876.

The meeting was called to order by President Smith at 11:25

A. M.

Welcoming remarks by Rev. Edward Ely:

I am glad to see the fruits growers of the State in Winona. Winona is one of the first counties in successful fruit growing in the State, especially in apples. I am glad that you have come from other parts to give encouragement toward raising apples. We have not been very successful for two or three years past. The last two or three winters have ruined bearing trees. I recently made a visit to the poor farm, where last year hardly a barrel of fruit grew on 300 or 400 trees. I hope with the advice and experience of this Society we shall have better success. We have succeeded well with small fruits, strawberries, blackberries, raspberries and grapes. We bid you welcome here. I hope you will be

hospitably entertained, and will feel at home in the city. I close with the hope that the attendance on your meeting may be all that can be desired.

Reply of President Smith.

We are as happy to meet here as you are to see us. Hope to see your fruits on the table here at our meeting. Hope to meet the apple growers of this section, and, as they are the oldest in this branch of horticulture, they ought to teach us. I congratulate you on the progress this place has made since the first time I saw it, broad fields of waving grass. If thus much has been accomplished in the last twenty-five years, what may we not expect in the next twenty-five years! And may not horticulture advance with the other improvements? The interest we see you taking in your streets and cemeteries, shows the interest you take in horticulture. Winona wants not so much the frequent meeting of this Society, as a local society to work for itself and with the State Society. Minnesota, though not the largest State in the Union, is hardly surpassed in variety of soils and climates, and what we want is local societies, which shall search out the varieties and methods suited to each locality. Let us put our hands to the wheel, and work together with a will.

Committee on Appointment of Committees.

A motion to adjourn was made and seconded. On motion of Mr. Elliot a committee was appointed to report on the appointment of committees and the men to serve on them. The President appointed W. Elliot, N. Buck and P. A. Jewell, but Mr. Buck asking to be excused, Mr. Ely was substituted.

Motion to adjourn until 2 o'clock was then carried.

TUESDAY AFTERNOON.

Meeting called to order at 3:05 P. M.

Appointment of Committees.

The committee on appointment of committees made its report. On motion of Mr. Grimes it was accepted and adopted. The Pres-

ident proceeded to appoint the committees in accordance with this report, as follows :

Committee for the solicitation and collection of fruits for the Centennial Exhibition to report to and be in correspondence with its chairman :

- Chas. Y. Lacy, Chairman, Minneapolis, Hennepin county.
- J. S. Harris, LaCrescent, Houston county.
- S. Bates, Stockton, Winona county.
- John Hart, Winona, Winona county.
- Geo. W. Clark, Winona, Winona county.
- Dr. J. Q. A. Vail, Homer, Winona county.
- P. A. Jewell, Lake City, Wabasha county.
- Barrett Taylor, Forestville, Fillmore county.
- E. B. Jordan, Rochester, Olmsted county.
- B. F. Perry, Rochester, Olmsted county.
- R. B. Hathaway, Pleasant Grove, Olmsted county.
- E. H. S. Dartt, Owatonna, Steele county.
- Dr. Twitchell, Chatfield, Olmsted county.
- T. G. Carter, St. Peter, Nicollet county.
- Robert Goodyear, Mankato, Blue Earth county.
- J. B. Swan, Garden City, Blue Earth county.
- W. W. Pendergast, Hutchinson, McLeod county
- O. F. Brand, Faribault, Rice county.
- R. C. Judson, Farmington, Dakota county.
- Ditus Day, Farmington, Dakota county.
- F. G. Gould, Excelsior, Hennepin county.
- P. M. Gideon, Excelsior, Hennepin county.
- J. W. Boxell, Afton, Washington county.
- J. I. Salter, St. Cloud, Stearns county.
- M. C. Bunnell, Money Creek, Houston county.

At a meeting of the Executive Committee, held March 5th, it was resolved not to exhibit at the Centennial, but to exhibit with the Pa. State Hort. Soc. at the same place some time in September, when there will be an *ad interim* meeting of the Am. Pomological Society. The above committee was respectfully requested to perform the same services under this slight change of programme.

Committee to report on summer meeting :

- J. T. Grimes, J. S. Harris, D. A. J. Baker.

Committee on cataloguing fruits, shade and ornamental trees :

- P. A. Jewell, Wyman Elliot, A. W. Sias.

Committee to report on the condition and progress of horticulture in the agricultural department of the University of Minnesota: Col. J. H. Stevens, E. H. S. Dartt, Wm. Cannon.

Committee on Finance, whose duty it shall be to solicit aid for the promotion of the best interests of the Society: C. M. Loring, Norman Buck, A. W. Sias.

Roots for Market.

Several members being absent so that the regular order of the programme could not be followed, the paper of Mr. P. C. Sherren, St. Paul, on the "The Cultivation of Roots for Market," was read by the Secretary. At the close of the reading it was ordered incorporated in the Transactions. The following is the text:

CULTIVATION OF ROOTS FOR MARKET.

From my not being at St. Paul for a week I did not receive yours of the 30th ult. until a few days since. I beg to state that I raise no early vegetables that require a hot bed to grow the plants, and only a small quantity of other kinds, as I do not regularly attend any market during the summer, but I will give you a brief account of what I do grow.

Onions.

I have been a grower of onions in Minnesota every year for fifteen years, and for many years in much larger quantities than what I do now. I consider my average crop has been from four to five hundred bushels to the acre, but in the year 1861, I had about eight hundred bushels to the acre; it was considered by all who saw them to be the largest crop of onions ever raised here. My usual method of cultivation is as follows:

Soil and Care.

I generally grow onions on the same piece of land from year to year, and if possible prepare the land in the autumn by manuring it heavily with well rotted barn-yard manure, plow it in, and early in the spring plow again and work the land until it is as fine as it can be made, then drill in about four pounds of seed to the acre, with a garden seed drill, in rows fourteen inches a part, and as soon as the onions can be seen in rows, commence hoeing and weeding, and all the wood-ashes that have been saved during the winter are strewn on the rows.

Varieties.

The kind of onions that I have raised are the Large Red Wethersfield and Yellow Danvers, which I consider the best keepers.

Cabbage.

I also raise my cabbage plants for autumn and winter cabbage in my onion bed by mixing a small quantity of seed with the onion seed which are drilled in together, and have never had the cabbage plants destroyed by the small fly, which is often the case when grown in a separate bed. I attribute my success in raising cabbage plants to having them with the onions.

Parsnips and Carrots.

I make rule to grow parsnips and carrots on land that has been heavily manured the previous year, by so doing I get no forked roots and am sure to get a large crop. I sow both in drills fifteen inches apart.

Beets.

I select a piece of land that has been well manured the previous year for my early beets also, and the sort I raise for the early is the Bassano, and the second early, Dewing's Extra Early Blood Red Turnip. Those two kinds I prefer to all others, and for winter beets the Long Smooth Blood. I sow the two early kinds as soon in the spring as the season will permit, and the late not before the end of May or beginning of June—by sowing late they are of better quality. I sow in drills fifteen inches apart, and thin to about six inches.

Roots for Stock.

The roots that I grow for winter feed for my cows are Long Red Mangel Wurzel, White Sugar Beet and Yellow Globe Mangel Wurzel, and can raise from eight hundred to nine hundred bushels to the acre; the land must be heavily manured to raise a large crop. I sow in drills two feet apart, and thin the Long Mangels and Sugar Beets to about a foot apart, but the Yellow Globe can be grown closer together than the others. I consider these roots excellent for milch cows and of great value to feed during the winter.

My land is a sandy loam with a little clay mixed with it. I consider it must be an excellent soil for roots and vegetables. By manuring I have never failed to raise good crops.

Should you think the above on the cultivation of roots, &c., be worth producing at the meeting of the State Horticultural Society you are at liberty to do so.

My health has been bad the whole winter. I seldom leave home and cannot venture to take the journey to Winona, but should have been pleased if able to attend the meeting.

I am sir, yours respectfully.

P. C. SHERREN.

Floriculture.

The Report of the Committee on Floriculture, by Mrs. Van

Cleve, Minneapolis, was then read by the secretary, and on motion of Mr. Jordan ordered incorporated in the Transactions. The following is the paper in full :

REPORT OF THE COMMITTEE ON FLORICULTURE.

One who does not know Minnesota by experience, cannot realize the exhilarating effect of a winter ride in its clear, keen atmosphere, so full of the life-giving principle that every inhalation is like a draught of the "wine that maketh glad the heart of man."

What if the mercury is nearing the bulb? there is no dampness to make one shiver; one's blood is so thoroughly purified and circulates so healthily, that he can laugh at the cold; he is alive all over, and, instead of being chilled and uncomfortable, he feels like shouting for joy and thankfulness that his lot is cast in this glorious clime.

On the afternoon of January 13th of this our new-born year, after such a ride, which filled my soul to overflowing with a sense of God's goodness, I found myself, as if by magic, in the midst of lovely flowers and tropical foliage, where the air was soft and warm, the sun shone brightly, and summer reigned in wonderful beauty.

Bright crimson and creamy white camelias opened their lovely cups among dark, glossy foliage; exquisite carnations bent low their fringed petals, heavy with aromatic fragrance; the slender passion vine looked in and out on pretty primroses of various hues, very charming in their graceful simplicity.

Geraniums, heliotropes, myrtles, and many other beautiful things, flourished in luxuriance all about us; great begonias, with rich variegated leaves and bright blossoms, interspersed with endless varieties of mosses, graceful ferns and delicate water ivies, formed an elegant setting to this bower of beauty, while the slender, shining smilax made wreaths and festoons over all, and vigorous English ivies, with their dark-green leaves, so suggestive in their firmness and durability of the practical common sense of the land of their birth, wound their strong arms around the pillars of this floral temple, giving the air of solidity and security to what seemed so like fairy land, that I almost feared to breathe or speak aloud, lest, like a lovely dream, it might vanish out of my sight. Only a short time, however, could be spared from imperative duties to enjoy this beautiful vision, and as we took a lingering look, and passed out into the keen air and the snow, I thought what a blessing, and how much real enjoyment the study of floriculture has bestowed upon humanity. During our short summers we enjoy the prairie and forest beauties, and never tire of studying and cultivating the wonderful and lovely things which God scatters so bountifully about us; and the christian delights to look up from all these beautiful creations to Him who made them, and say, with a sense of ownership, "My Father made them all." Shall we not then praise and magnify His holy name, that he has put it into the hearts and minds of men to study the habits of the floral world, so that our enjoyment of them may not cease, when this same dear Father, for wise and kindly purposes, "commandeth and raiseth the stormy wind, when He giveth snow like wool,

scattereth the hoar frost like ashes, casteth forth His ice like morsels, and who can stand before His cold?"

It seems a thing impossible that a horticulturist should be a sceptic, or a wicked man. There are such wonders constantly revealing themselves to him, that not only must his mind acknowledge a God in all these things, but his heart must be softened and warmed to Him, who taketh such thought and tender care for, even inanimate objects.

As proof that the study and culture of flowers affects the heart, as well as the mind, let me give you an extract from a letter from the South :

"The *Euonymus*, which is valuable either singly or as a hedge plant, has also the silver-leaved variety. Its leaf buds are very conspicuous in winter, and have a size and vigor that somehow gives one a sense of courage. It is the plant of all others I would choose, to illustrate two points in botany that often escape the eye of a superficial observer, but which are full of interest, even to young children, when pointed out, viz., the formation and careful packing away of young leaves in the leaf bud, and the existence of the embryo in the seed. The fruit of the *Euonymus*, in mid-winter, before drying, is a lovely study. The pericarp opens and discloses from one to four egg-shaped orange-colored seeds. Beneath this pretty seed-coat, and the inner, thinner one, lies, embedded in pure white starch, an embryo of bright green color, its two leaves elliptical in shape, so easily separated and so exactly like the large leaves growing on the shrub, that one feels a sort of awe in looking upon the wonder, followed by an impulse to caress softly the sleeping baby plant."

There are heart lessons, as well as great enjoyment to be drawn from this beautiful science, and from the healthy moral influence it exerts, it becomes the duty of Christians and philanthropists to encourage it. All cannot have a greenhouse filled with tropical beauties, but all can cultivate one or more window-plants, and the gentle humanizing influence of these lovely silent teachers, much more than compensates for the care bestowed upon them. One never feels alone where there are flowers. They seem like sentient beings, and to the old, the feeble, and infirm, they are especially dear. We all know their blessed effect in a sick room, and some of us have seen a feeble, suffering invalid shed tears of joy over a single geranium leaf, hugging it to his heart as if it was a living friend.

If I could convey to the wards of a hospital my graceful fuchsias, my scarlet geraniums, my pretty twining smilax, and my precious calla, now blooming in all her queenly purity in my window, I am sure they would do more good to the weak and sorrowing ones than the doctor's visit. And this leads me to speak of the great good accomplished by the flower missions, now so much in vogue, and to suggest that we in Minnesota, who love flowers so well, should make a move towards supplying our hospitals and asylums, our alms-houses, aye, our jails and State prison, with these beautiful gifts of God.

Any one who has read the very interesting and instructive story of Picciola must be convinced of the benign influence of flowers on those unfortunates who are shut out from their fellow men.

God gives these blessings to us so liberally, not from our deservings, but out of His own great love: shall we not share them with those who

have them not? Love and unselfishness are among the lessons they are designed to teach; let us learn these lessons. As a Society let us manifest that we recognize science as the handmaid of religion, and in humble imitation of the God of nature and grace "who maketh His sun to rise on the evil and on the good, and sendeth His rain on the just and on the unjust," let us inaugurate a plan whereby the wilderness of sin and suffering, and the solitary place of the criminal shall be made glad, and the desert of poverty and wretchedness shall blossom as the rose.

C. O. VAN CLEVE.

To the Horticultural Society of Minnesota:

If these thoughts of mine, written in great haste and in the midst of onerous cares and duties, are deemed worthy of acceptance as a report of our committee, the Society is very welcome to them. I regret that lack of time put it out of my power to send anything better. I love the culture and study of flowers so dearly that when I attempt to write of them, I hardly know where to begin, and a hurried essay or report is always unsatisfactory to me.

Very respectfully,

C. O. VAN CLEVE.

DISCUSSION.

Mr. Harris confessed to being half crazy on flowers. They ought to be grown more, especially by farmers. When horticulture has its proper place, every farmer's house will be adorned with flowers and furnished with fruits. Hoped that other ladies would follow the example of Mrs. Van Cleve, and give us papers on the subject of flowers.

Varieties for Cultivation.

Mr. Jewell hoped Mr. Harris would name some flowers and shrubs for cultivation. How flowers inspire humane sentiment we all know, but we want the names of flowers and shrubs for this State.

Mr. Harris:—That ought to be left to a committee. There are, however, a few that all can get. Would name for annuals Mexican ageratum, china asters, mignonette, petunias, larkspurs, balsams, antirrhinums or snapdragons. For biennials, pinks, hardy herbaceous phlox, which is perfectly hardy unless on sandy soil. There are a hundred varieties; they begin to bloom early in July or last of June, and continue till after frost. When necessary to protect plants, would use strawy horse manure.

Roses.

Hardy roses are the Cinnamon, Blush roses, Harrison rose, Persian Yellow rose, and Queen of the Prairie for a climbing rose; this needs protection with litter from the horse stable. The same protection answers for Hybrid Perpetual, and even tea roses.

Bulbs.

Peonies are easily grown and any one can grow them. For tulips only the slightest protection is needed. They should be taken up once in three or four years and the surplus bulbs given to poorer neighbors.

Shrubs.

Of shrubs easily propagated and perfectly hardy there are the Snowball and Lilacs, and if one has no money with which to buy, he can get the common Wahoo or Burning-bush, which is very fine, but blooms at a different season. The berries, of a crimson color, give the plant the appearance of a burning flame. The High-bush Cranberry is still another fine wild shrub, easily obtained.

Bedding Plants.

Mr. Elliot:—The wahoo grows commonly on bottom lands. The verbena, geranium and pyrethrum, or fever-few, are fine bedding plants, left out by Mr. Harris. The verbena is not excelled, and gives continuous bloom from early till late. The geranium is likewise very fine. The fever-few is much used in cemeteries, and gives agreeable variety. The gladiolus should be classed with the tulip, as one of the finest bedding plants. Of lilies there are the Japan, tiger, blackberry, and white day lily. The wahoo we should all go into the cultivation of, more than we do. The berries are of the shape of bittersweet berries, and the foliage turns crimson after frost.

Preservation of Plants.

Mr. Harris:—I practice a method of keeping geraniums by which any one can handle them. I dig them up before frost, cut back the tops pretty close, set in a box of such size as can be handled easily, and put them in the cellar. No matter how dark it may be;

if the cellar is dry they will need watering once, but if moist not at all.

Mr. Cannon:—Prefer leaves for protection for all kinds of plants, especially where they can be obtained plentifully.

More Varieties.

Mr. Jewell:—There are several varieties of peony of great beauty. Tartarian honeysuckle and the syringa are perfectly hardy. Weigela rosea is also hardy.

Mr. Elliot:—Hydrangea paniculata grandiflora, a shrub bearing white flowers, is fine. Mr. Smith had one that bore 250 blossoms last year, perfectly hardy, easy of propagation, reliable, and can be grown by everyone without protection.

Mr. Harris:—The American cowslip is another plant worthy of cultivation. The common aquilegia is another hardy perennial. The hyacinth needs only a little protection. Those are costly. I meant to name only cheaper and at the same time beautiful kinds.

Mr. Smith:—I have a yellow jasmine that stands well.

Hybrid Perpetual Roses.

Mr. Grimes:—Would name hybrid perpetual roses. Had grown many varieties with good success. Grew the first grown in Hennepin county. Protects with straw. Had at one time 42 varieties. The white ones are tender but the colored varieties stand better. His method is to cut back severely, cover roughly with straw, throwing the same over the plant. They need high cultivation and manure. They bloom on new wood, and if kept growing all summer they will bloom all summer. They are of all shades of color, and there is nothing equal to them for beauty. The older varieties are hardier than the new ones. Gen. Washington and La Reine, Baron Prevost and Gen. Jacqueminot are all hardy. Mrs. Elliot is pretty hardy. La Reine is one of the best of bloomers.

Mr. Smith:—Had one five feet high, blossoms bright rose color.

Mr. Harris:—Knew of one that grew in Brownsville nine or ten feet high, trained on a trellis, and in June it bore a wagon-load of flowers. They are difficult to propagate. This man propagated by layers.

Mr. Grimes:—All are propagated by layers or by cuttings. La France is another fine variety.

Mr. Cannon:—Madame Charles Wood is another good variety.

Mr. Smith:—Madame Smith is a good rose.

Mr. Jewell:—Have grown a good many roses. I protect only with straw, but use it freely and apply it with care. If the plant is set where the snow stays, and straw is used also, nothing can be better.

Horticulture in Anoka County.

This discussion concluded, the report of Lewis Martin on the condition and prospects of Horticulture in Anoka county was read by the Secretary, accepted by the Society and ordered incorporated in the Transactions.

It is as follows :

CONDITION AND PROSPECTS OF HORTICULTURE IN ANOKA COUNTY.

ANOKA, MINN., Jan. 12th, 1876.

Chas. Y. Lacy, Esq., Sec. State Horticultural Society :

DEAR SIR:—Yours of the 10th inst. requesting report of horticulture and horticultural prospects in this locality, received. In reply will say. I have been interested in horticulture for about forty years; have lived in four different States.

Climate.

For the last twenty years I have resided at this place, and I think all who have had experience with our trying climate will agree with me that the place is yet to be found that presents so little encouragement to the enthusiastic horticulturist as the northern portion of Minnesota.

Hard Winter.

For the last few years preceding the memorable winter of 1872-3 our winters had been comparatively mild. We had commenced planting many of the semi-hardy varieties, such as Haas, Ben Davis, Fameuse, Perry Russet, &c. I was propagating and had on hand a large stock of young trees, from our new seedling apple trees. The most of these seedlings, had been raised by Mr. R. Woodward, William Evans and S. Hawkins, of Hennepin county. All of these trees had borne fruit for several years, and to all appearance, were as hardy as an oak. Mr. Woodward had an orchard of 25 or 30 trees in bearing, all seedlings of his own raising, of which he was justly very proud. These seedlings, together with all of the semi-hardy varieties, were found to be dead in the spring of 1873, and I am sorry to say my

Wealthy

apple trees, together with Gen. Grant and several others of the new hybrids, shared the same fate. I am glad to know, however, that the origi-

nal Wealthy stood the test, and that others are having better success in propagating it than I have had.

Duchess.

In this section the Duchess of Oldenburg now ranks as our most hardy apple, but is far from being an iron-clad—they die or give out after bearing two or three crops of fruit.

Prospects.

Some may differ with me, but I venture the assertion that this portion of the State can never be made profitable for apple growing unless there is a radical change in the climate. I do not allude to the extreme cold, but to our clear dry atmosphere and the scorching effect of the sun's rays.

Cause of Injury.

That the injury to our apples and some of the crabs was due to the sun, is proven by the appearance of the trees in the early part of the season. The bark is always injured or killed on the south side. Another fact—I found in the spring of 1873, that the Duchess of Oldenburg, where they were protected from the sun by buildings were only slightly injured, while those protected on the north by timber and exposed to the sun were either killed or badly injured. That much of the damage is due to the dryness of our atmosphere is proven by the fact that varieties which pass the winters uninjured near large bodies of water, the temperature being about the same, will kill in the interior. This would seem to prove that the humidity of the atmosphere tends in a measure to counteract the clearness of the atmosphere, thus preventing injury from the sun. Drouths undoubtedly injure the vitality of vegetable life to a certain extent and render it more susceptible to injury. Nevertheless, the direct cause of the damage was heat, and not cold. We may search Norway, Sweden, Iceland and Russia for hardy varieties of the apple, but it will not avail unless we can find varieties iron-clad against the effects of a clear, dry atmosphere and the scorching rays of the sun.

Siberians.

The Siberian family of crabs are at home in all localities and under all circumstances, whether or not protected from the blasting wintry winds, or our scorching summer suns.

Transcendent.

The Transcendent is the standard variety here. Our farmers are planting them by the hundred, five hundred and thousand, for the purpose of making cider and cider vinegar. One of our farmers raised about three hundred bushels the past season, which he manufactured into cider. I once saw a prominent member of our horticultural society from the southern portion of the State, rise in his place and declare the Transcendents were not worth raising; said he had so many that after using all he could in his

family, selling all he could and giving away all he could, that he commenced giving them to his hogs, and that he gave them so many that they would not eat them. That is the very reason why they are so valuable—they are such abundant bearers, so thrifty and so hardy. The man who would try to sell our farmers anything else in the shape of apple trees would meet with a poor reception. Some of the new hybrids may prove valuable, but the Transcendent is the tree for “the million.”

Planting.

A very common error in planting has been to plant in low places or sags, protected on the north by rising ground or timber. I have seen Duchess of Oldenburg and Hyslop that were killed dead, and Transcendents injured in such places, while those planted on high ground unprotected on the north would escape uninjured.

Pears, Plums and Cherries.

Pears and tame plums annihilated or killed to snow-level. Cherry trees about the same as the Duchess of Oldenburg. They live a few years, bear small crops of fruit and die out.

Small Fruits and Grapes.

Small fruits and grapes do well here, and I hope the day is not far distant when our people will give increased attention to their culture.

Recommending Varieties.

In conclusion, I would suggest that the Society in recommending a list of fruits (particularly apples) should divide the State east and west, at or near Minneapolis. Such varieties as the St. Lawrence, Red Astrachan, Price's Sweet, Fameuse, and the Saxton or Fall Stripe may answer for amateurs in the southern part of the State, but I would as soon think of planting peaches for profit.

Very respectfully yours,

LEWIS MARTIN.

DISCUSSION.

The discussion which followed this paper was ordered appended to the paper on Methods of Propagation to Secure Hardy Trees, and will be found on page 68, and following.

TUESDAY EVENING.

Meeting called to order at 7:25.

Pomological.

Mr. Hodges being absent, and his paper not at hand, Mr. Elliot read the report of the delegates to the meeting of the American Pomological Society.

On motion of Mr. Jewell the report was ordered incorporated in the Transactions. It is as follows:

REPORT OF DELEGATES TO THE MEETING OF THE AMERICAN POMOLOGICAL SOCIETY.

The biennial session of the American Pomological Society, held at Chicago in September last, was a grand success. The many attending appreciating the fine exhibition of fruits, from British America to the Mexican Gulf—from the Pacific Slope to the extreme limit of fruit culture in New Brunswick. Here were mingled the fruits of tropical and temperate zones. It is said to have been the finest exhibition ever held on this continent.

Apples.

The king, the apple, was here large, rosy red, blushing like a maiden's cheek, lustrous and spicy, full of the nectar that our boys and girls enjoy of a long winter evening. Varieties too numerous to mention. Many new seedlings of great promise were shown that mayhap will swell the already large list.

Pears.

Pears were presented in great variety, some exhibitors' lists numbering among the hundreds. Marshall P. Wilder had a fine collection of 270 varieties, which deserve the highest honors. Seedlings were numerous, and one collection from B. S. Fox, San Jose, California, was considered extremely fine. Specimens from historical trees, collected by Robert Manning, Salem, Mass., including the Endicot, planted about the year 1630, an orange pear tree 285 years old, a Werder grafted April 19, 1775, and a tree planted by Anthony Thatcher in 1840, were exhibited.

Plums.

Plums from western New York were exceedingly fine, reminding us of our boyhood days, when in Maine we had Gage, Damson and Purple plums of rare excellence.

Grapes.

Grapes were immature for the most part, and showed the want of sunshine. Seedlings were quite abundant, those of J. H. Ricketts, of Newburg, N. Y., deserving the most attention.

Peaches and Blackberries.

Peaches in great variety, blackberries enormous in size, presenting a temptation to handle and taste hardly to be resisted, and a collection of semi-tropical fruits, including oranges, lemons, pomegranates, bananas figs, pineapples, &c.

Discussions.

It was a rare treat to hear those solons of pomology discuss the merits of the different fruits. The cataloguing of fruits was one of the best features of the convention. It gave every one the benefit of the Society's experience in a nutshell. Each variety had its poor as well as its good qualities ventilated. There were but few varieties recommended for trial, adapted to this climate. One new variety, the Wealthy, was considered worthy of general cultivation.

Awards.

The committee on award of the Wilder medal, reported the collection of fruits was much better than had been expected, and recommended the awards as follows: 1st, Michigan State Horticultural Society, for the splendid display made by the different horticultural associations of the State. 2d, Iowa State Horticultural Society, for collection of apples beautifully displayed by Mr. James Smith, of Des Moines. 3d, Wisconsin State Horticultural Society, for general collection of fruit. 4th, Nebraska State Horticultural Society, for collection of apples. To the following individual collections: John Saul, Washington, D. C., for pears; Elwanger & Barry, Rochester, N. Y., for pears and for plums; E. Moody & Son, Lockport, New York, for general collection; J. H. Ricketts, Newburg, N. Y., for a large collection of seedling grapes of great promise; Isidor Bush & Son and Masner, of Basherry, Mo., for a collection of native grapes; D. Redmond, Ocean Springs, Miss., for an interesting collection of semi-tropical fruits; Edward Daniels, Ganston Hall, Va., for pears and grapes; A. Fahnestock, Toledo, Ohio, for pears; Fand. L. Clapp, Dorchester, Mass., for seedling pears and a fine dish of "Clapp's Favorite;" J. W. Manning, Reading, Mass., for pears; Hovey & Co., Cambridge, Mass., for pears; S. E. Chamberlain, Waterford, Va., for apples; B. S. Fox, San Jose, California, for seedling pears.

Resolutions.

Resolutions were passed designating Baltimore as the place for the biennial meeting of the Society in 1877. Also a resolution, by W. C. Flagg, denouncing the present postal law relating to third class matter, declaring it a nuisance and urging its repeal.

South Park.

The drive to South Park, tendered to the delegates by the park commissioners, who escorted them in carriages along their fine avenues and streets (to Grand Boulevard, down to Oakwood Boulevard, on to Drexel Boulevard, down Drexel to Bayard avenue) revealed what had been accomplished in the short space of two years, under the guidance of one of the best landscape architects of the age, Prof. Cleveland. The planting of immense elm trees on the outside, the laying out of flower borders and beds, the planting of ornamental trees and shrubs, and not least, the lawns, more like velvet than mere grass-plots, to one who has an eye for the beautiful, was a treat long to be remembered. The Botanical Garden, though still in its infancy, had growing some 3,000 plants. This park is the largest in the country, and doubtless will in a few years become a place of much renown. No one visiting Chicago should leave before admiring the beauty there portrayed by that great architect.

Minnesota's Display.

An old adage says, "the truth should not be spoken at all times," but the present requires plain speech; though it may not be agreeable, or look well in print, yet facts are stern realities, and should be presented at times when inactivity and indifference take possession of a Society. Your committee cannot look back on our display of fruits at Chicago with any but feelings of regret, having signally failed to make such an exhibition as we might have done had our fruit growers responded to our solicitations with the enterprise we expected.

Your committee blushed with shame when interrogated by Minnesotians as to the exhibitions from our own State. We could point to only a few specimens of apples, crab-apples, native plums, grapes, and a few specimens of bottled small fruits (collected by Prof. C. Y. Lacy, for the use of the State University.) I fear the "almighty dollar" stood in the way of that encouragement from our friends that we desired. A few of the answers received to our cards of solicitation may give you some idea of how much this splendid opportunity for exhibiting the fruit resources of our State was appreciated, viz.: "I think I shall not send any fruit to the Exposition as I have no apples but Tetofsky, Duchess, and Haas, and can use them to a *better purpose*. There are but few apples to be had, and I cannot spend time to gather an assortment of any account." Another says: "I cannot get any fruit worth sending you. I have but few specimens of Wealthy, and those I cannot spare. The trouble is no one will *make a present* of any fruit." Yet another: "I have no fruit to send to Chicago." A fourth gentleman says: "I have but few grapes that are ripe; not enough to do any good." Here is the whole secret of our failure, and I, for one, am not willing the blame should be ascribed to the committee. The exhibition, to be sure, was early for many of our fruits, some of the apples being immature, our late plums not ripe, and our grapes needing at least two weeks' more time to ripen. The few bunches of grapes on exhibition compared favorably with those from farther south. To show you how we missed a golden opportunity for advertising one of our best seedlings, I will give you an example:

There was exhibited a Wealthy apple about the size of a Transcendent crab, the only one on the tables. This stunted specimen was shown as a fair sample of the Wealthy, and no explanation on our part could dispel the idea from people's minds that *it was* the best we could produce. A certain reporter who visited the Exposition, returning home and seeing the fruit exhibited at our State fair, said in no very complimentary language "that we made a failure; it would have been better to have staid at home." The year was acknowledged unproductive, but some from favored localities could have added materially to the collection if they had desired. Winona had some very fine fruit on exhibition at the State fair, but I think not a single specimen at Chicago. Lake City exhibited, for two days only, a few plates of crabs and hybrids. W. E. Brimhall, Truman M. Smith and J. T. Grimes, sent a few specimens of Duchess, Transcendents, Hyslops, &c. John S. Harris, as usual, exhibited a number of varieties of standard apples, the best he had. If others had done likewise, we should have had, if not a gorgeous, a *creditable* display. I desire to impress upon the members of this meeting the necessity of early and active measures for an exhibition at the Centennial.

Exhibitions in 1876.

The American Pomological Society, at its last meeting, resolved to accept the invitation of the Pennsylvania Horticultural Association to meet for a social reunion in September, 1876, at the Quaker City. We should mature plans as soon as possible, and it would seem advisable now, while together, to discuss this all-absorbing question. This year is fraught with many benefits to our great Northwest, if we but improve the opportunity of exhibiting to the world in a presentable form the varied products of our soils, not the least among which is the fruit interest. We cannot be surpassed in the quality of such as we *do* raise, nor in that beautiful waxen appearance which all our fruits possess. In sprightly flavor our cultivated apples, crab-apples, plums, grapes, currants, gooseberries, raspberries, strawberries, and uncultivated cranberries, blueberries, huckleberries, raspberries, blackberries, &c., excel that from more southern localities. Floriculture should be represented in all its varied forms. Finally, there is *much* in the State that would be of interest to the gazing throng if we but do our whole duty in placing our resources upon the tables in the most interesting manner. Pardon me for these few suggestions. Let whoever has charge of the collection of fruits not rely upon written solicitations, but have the pledged assistance of an efficient working committee, whose hearts and souls are in the work; who are willing to contribute *time*, and money, if need be, in making collections. There are some, not many, I am glad to say, who do not take that interest they ought in an enterprise of this kind. Let us as a society make one grand effort, and send, not only what we ourselves, but our friends and neighbors raise. If a few in each county take the matter in hand, make their collections and forward to the State committee, there will be a variety from which to select *some* worthy of the object.

Never grow weary in well doing. Try to help each other over the rough road of adversity, for we all feel better for a little timely assistance given,

not grudgingly, but with a hearty good will. Our State should be more liberal to our Agricultural and Horticultural Societies. We are looked upon by many as a mutual admiration society, devoted to the interests of nurserymen and a few stock and grain growers, who have entertained the idea of turning an honest penny by having something better than their neighbors. In the name of reason and common sense, *who* is to derive the benefit from our enterprise and forethought if it be not the State at large. "There seems to be a feeling of distrust among our *members*, a fear that some one is deriving an unforeseen benefit that will not redound to the advantage of the whole. This is all wrong. We should do away with the feeling of exclusiveness and conceit which exists to some extent among fruit-growers, and substitute instead a universal desire to promote each other's welfare. That while there shall ever be a healthy and generous emulation, there shall also be more frequent and friendly consultations, a closer union, and better friendship." "There is, that scattereth and yet increaseth, and there is, that withholdeth more than is meet, but it tendeth to poverty." "In union there is strength." "Our State needs your united action. You yourselves need the stimulus of these meetings, discussions, and exhibitions. Where the wrong shall be corrected, the right strengthened, and where the experience of each shall become the property of all."

WYMAN ELLIOT.

DISCUSSION.

Mr. Jewell explained his action as stated in the report. Said when he found so many crabs beside so few apples, he thought the sooner he got out of the way the better, as people would think we could raise nothing but crabs.

Mr. Wilcox characterized the show from Minnesota as miserable, and said he was ashamed of it although Minnesota was not his own but a neighboring State.

Mr. Harris explained how the elements prevented effective action on his part by flooding railways and sweeping away bridges. He then read an invitation from the Pennsylvania Horticultural Society to take part in their exhibition and reception on the 12th, 13th and 14th of September, 1876.

Horticulture in Southeastern Minnesota.

There being no further remarks Mr. Harris read his report on the condition and prospects of horticulture in Southeastern Minnesota, and the report was ordered to be published in the Transactions. The following is the text:

CONDITION AND PROSPECTS OF HORTICULTURE IN SOUTHEASTERN MINNESOTA.

Mr. President and Gentlemen of the State Horticultural Society:

Authority.

Article 6 of the by-laws adopted for the government of this Society at the annual meeting of 1874, requires each member of the general fruit committee to render an annual report upon the fruit crop of his respective district, and present a limited list of fruits best adapted to general cultivation in the district which he represents, and in accordance therewith I present the following for district No. 1.

Adaptation.

There is not a county within our State better adapted to the raising of most varieties of fruit than Houston. The soil is the very best, clay and sandy loam preponderating nearly everywhere. There are no extensive tracts of prairie, and the uneven surface of the land furnishes ample drainage and every desirable aspect for protection.

Before Settlement.

Before its settlement by the white man, many varieties of wild fruits were abundant, and some of them of superior quality. The strawberry, black raspberry, native plums and wild grapes were growing so plentifully that the first settlers had a bountiful supply of them just for the picking. But as improvements have progressed, and stock is allowed to roam at large, these fruits (with the exception of plums) are fast disappearing, and now hundreds of families do not average to have a single quart of strawberries or raspberries per year, and with all the favorable circumstances before mentioned but very little tame or improved fruit has been produced. In my opinion this may be traced to a lack of horticultural knowledge.

First Planting.

The first settlers generally commenced planting fruit trees as soon as they could get a piece of ground broken up, and they usually selected those varieties that were favorites in their former homes, and practiced the methods of cultivation and pruning that were in use in the older States. They had no idea that one variety was hardier than another, and therefore planted largely of the early harvest, Rhode Island greening, golden pip-pin, jeniton, rambo, &c., from the Rochester, New York, Nursery. These trees planted in the virgin soil made a rank, watery and late growth, and seldom survived the second winter. They re-planted with western grown trees and fared no better, and very soon it became the universal opinion that apples could not be raised in Minnesota. This opinion greatly retarded tree planting up to the time of the organization of the State Horticultural Society, when it again began to excite attention, and within three or four years of that time almost every farm had its little orchard of iron

clads, and for a few years they were doing so well that people began to entertain hopes that we should soon have apples, and also pears, in abundance. But these hopes were of short duration.

Winter of 1872-3.

The fearful storms and cold weather of January, 1873, which swept over the whole Northwest like a tidal wave, totally destroyed all of the pear trees and more than one-half of the apple trees that had arrived at a bearing size, and greatly injured many more. The consequence was a general discouragement which resulted in the neglect of what was left, and for a time the discontinuance of replanting. The partial recovery of some varieties, the fine crop produced upon the recovering trees in 1874, and the discovery that the injury sustained was generally from root killing, has combined to awaken a new interest; but the plantations now being made are largely of Siberians.

Winter of 1874-5.

The winter of 1874-75 was long continued and of great severity, but as far as my observation goes no injury was sustained by the apple trees except such as were previously much enfeebled by disease. Last spring the trees blossomed reasonably well, but the prevailing weather at that time, and for two or three weeks following, was cold and resulted in cutting off the apple crop and materially shortened that of the Siberians. However, I am confident that this was a blessing for us, for another full crop without a season for rest and recruiting would have been destructive to many of the remaining trees.

Pears.

For a few years previous to the *hard winter* a few varieties of pears were doing very well and were being quite extensively planted. In 1872 they fruited so well that several farmers had a surplus for market, and the demand for trees was very great. In the month of June of 1872, several of my trees showed fire blight, and I also noticed it on trees in other places. As the extreme cold of the following winter destroyed all the trees of a bearing age, we are not permitted to accuse blight with having anything to do with their death, and have pronounced them too tender for our climate and but very few trees are now being planted. I do not think that a single specimen of the fruit was raised in the county last year (1875.) Trees from two to five years old are looking very well.

Strawberries.

This fruit is not as extensively grown as it should be or has been in past years. The hard winters, the ravages of the *White Grub* and neglect of cultivation has nearly ruined the old planting, and new ones have partially failed from some cause as yet supposed to be unknown. The above circumstances taken into consideration, the crop of fruit for 1875 was very good.

Raspberries.

This fine fruit is not receiving much attention. The Doolittle Black Cap, although somewhat injured by the previous winter, produced an average crop, and the fruit was of first quality. The Reds were a failure.

Currants.

Never before has there been so abundant a crop of currants raised in this county. They are a fruit that is growing in favor because of hardiness and easy cultivation. The currant worm has not yet troubled us.

Blackberries.

Blackberries are not cultivated to any great extent, and the native wild are not doing sufficiently well to merit notice.

Cherries.

But few cherries are grown. The common Morellos are the only variety any ways reliable. Crop less than average, mostly taken by birds.

Plums.

No tame plums fruited, and the trees seldom survive to come to a bearing age. The native produces an abundant crop of fruit. Some attention is being paid to the cultivation of some of the best varieties. Good plums are in demand in the markets at fair prices. The Desoto is being tried, and promises well. Doubtless the coming plum will be a seedling raised from the best native wild. [And why not? In America the greatest men have come from the ranks of the toiling masses.]

Grapes.

For the perfect development of this valuable fruit the season was unfavorable. With such weather as we usually have in August and September the crop would have been immense; but with the several weeks that we had of cool, cloudy and wet weather, the ripening progressed slowly, and the early frosts ruined a large proportion of the crop; and I have fears that with most varieties the wood has not matured sufficiently to endure this winter. The Concord is most extensively grown, and so far has proved to be the best grape for the people.

New Fruits.

I am not aware that any new fruits of special merit have been brought out during the last year.

Vegetables.

Vegetable gardens have done remarkably well, and I have never known a season in which vegetables of all kinds were better or more plentiful.

Flowers.

The love of flowers seems to be universal, and the cheapness of greenhouse plants, and the choice seeds sent out by Jas. Vick, and others, are making it very easy to gratify that love. Their cultivation is largely on the increase.

INSECTS IN 1875.

White Grub.

The White Grub, the larva of the May Beetle, has caused the most alarm both to the farmer and the gardener. Working under ground and out of sight, the damage is done before their presence is discovered, and scarcely any useful plant has entirely escaped them. Many strawberry beds are entirely ruined, and I have noticed some fruit trees seriously injured by the bark being eaten from their roots.

Borer.

The Flat-headed Borer is at work in the trees that were enfeebled by the winter of 1873, and the young and healthy trees do not entirely escape them.

Codling Moth.

The fruit of the apples and crabs was not as badly injured by the larva of the codling moth as usual. Whether their numbers were diminished by the severity of last winter, or by some insect friend that is coming to aid in exterminating them, I am unable to say.

Beetles.

In examining specimens of apples last summer, I frequently found a small beetle in them and no worm. I would ask older and more learned horticulturists if they have any knowledge of an apple-worm that changes to a beetle, or a beetle that infests the fruit. The saw worm, which was very destructive the previous year, has disappeared.

Grape Worm.

A more than usual quantity of grapes were stung by some insect, and contained a small white worm. This may prove a cause for alarm and great watchfulness should be exercised by grape growers to prevent its becoming a pest by getting numerous. The fruit grower is beset with enemies on every side, ranging in size from the microscopic insect to the six-foot vagabond boys of our villages. We have asked our Legislature to provide us an entomologist; we must ask them to make more efficient laws against fruit thieves; and in the meantime let every one remember that "eternal vigilance is the price of fruit."

FRUIT LISTS.

In conclusion, I present the following list of fruits for this district.

Apples for General Cultivation.

Duchess of Oldenberg, Haas, Fameuse. For trial—Walbridge, Utter's Red, Red Astrachan, Plumb's Cider and White Astrachan.

Pears.

Flemish Beauty.

Plums.

Best natives.

Strawberries.

Wilson, Downer's prolific. Chas. Downing for trial.

Raspberries.

Black caps, Davison's Thornless, Seneca, Doolittle. Red, Philadelphia, Turner.

Currants.

Red Dutch, white grape.

Grapes.

Concord and Delaware.

Siberian Apples.

Transcendent crab.

All of which is respectfully submitted.

JOHN S. HARRIS,
Member of Fruit Committee for First District.

DISCUSSION.

The Turner Raspberry.

Mr. Smith:—The Philadelphia killed with me last winter to the ground while the Turner stood uninjured.

Mr. Harris:—With me also the Philadelphia was killed and the Turner uninjured.

Mr. Wilcox:—With me the Philadelphia withstood the winter of 1872-3 and was killed by the winter of 1873-4.

Mr. Smith said he thought it was a general experience that where

the Philadelphia had failed the Turner had stood. Could not speak certainly about the productiveness of the Turner. It is the earliest to ripen and continues to ripen for a long time. Obtained 50 cents per quart for this when the Philadelphia did not bring 30 cents, but they were marketed with great care.

Mr. Jewell:—Have had it for two years. It is perfectly hardy, multiplies by suckers more rapidly than the Philadelphia. Got a few berries the first year and a few last year, but not enough for a picking from 200 plants. The season is long—six weeks.

Mr. Smith:—Have set all of this kind in preference to Philadelphia, but none yield so much, in so short a time, as the Philadelphia.

Mr. Bunnell:—The Philadelphia stood with me last winter on a light soil with a northern exposure.

Hart's Seedling Strawberry.

Mr. Elliot:—The Society should recognize the new strawberry of Mr. Hart. Mr. Hart has experimented with varieties of strawberries for several years and this is the best he has found or produced. The quality is as good as most of the large varieties, better than the Wilson.

Mr. Smith:—Better than the Wilson, and the finest berry I saw last summer. Mr. Hart says it is more prolific than the Wilson.

Mr. Harris:—Some specimens I received last summer were the best I ever saw.

Strawberry Cultivation.

The paper of Mr. Seth H. Kenney on Strawberry Cultivation was called for and read by the Secretary, after which it was ordered that the paper be abridged by the Secretary and published in the Transactions. It is as follows:

STRAWBERRY CULTURE.

MORRISTOWN, Rice County, Minn., Jan. 9th, 1876.

Mr. President and Members of this Society:

I received an invitation from the Secretary of this Society asking me to write a paper on strawberry culture, and without waiting for a reply, stated that he had already placed my name on the programme, and hoped I would find it agreeable and convenient, &c., leaving me no honorable chance to say no. My love for the cultivation of small fruits is so great, there is so much to learn, and I have made so little progress in this interesting branch of

horticulture, that it is with great reluctance that I present this paper to the Society. I have for some years made the cultivation of small fruits my-leading business, and shall have to confine this paper to my own practical experience.

Merits.

I think there is no fruit that will grow so well, almost everywhere and with so much neglect, as the strawberry; and I might add that with good cultivation and protection no fruit gives so general satisfaction, or better returns for the labor bestowed. Without further preface I proceed to the subject in hand.

Age of Plants.

I have always made it a point to set plants of the previous year's growth. The roots of such plants, if grown from young-set plants on good mellow soil, stirred well between the rows with a shovel plow, just before it is time for the runners to take root, will have a light color like the roots of horse radish. A plant that has borne a crop of berries and then transplanted will never yield well.

Preparation of the Soil.

I have become convinced that deep plowing is very important in the cultivation of the strawberry. To prove this I have carefully dug the roots of Michigan Seedling that had been planted one year in hills on good mellow soil, and found the roots had grown down into the earth 12 inches. I have mentioned Michigan Seedling because I raise more of this variety than of any other berry. Every one can see the advantage of having the roots go deep enough to get plenty of moisture in a dry season. I think any ground that will raise a good crop of corn will raise good strawberries. I think ground can be made too rich for most strawberries, but Michigan Seedling is an exception, as I have manured this kind highly with the best results. The best fertilizer I have ever used was wood ashes, at the rate of one peck to the square rod, sifted or spread on when the leaves got fairly to growing in the spring.

Time of Year to Set Plants.

I have had the very best of success in setting plants the last of April. I have set plants in August, September, October and November, and by careful mulching brought part of them through the winter, but I cannot see that there is much gained by setting in the fall.

The Ida.

In setting, pistillate varieties, such as the Ida, for instance, should be set in alternate rows with staminate varieties, such as the Wilson, Michigan Seedling, Early Scarlet, Charles Downing and Nicanor, which are rich in pollen. When placed beside any of these the Ida has many good qualities.

I have grown it for a good many years and can confidently recommend it to fruit growers. It is a rank grower and throws out a good many runners. I set in rows three feet apart and alternating with some one of the above varieties. I cut no runners on this variety and the next season each plant sends up one or two or more tall fruit stems which hold up their fruit better than any other variety. The berries are of fair size, and among the first to get ripe, beginning to ripen about four days later than the Early Scarlet.

They are rather sour but of fair flavor, and the latest though somewhat smaller are the best berries I ever tasted. The experience of other growers is the same in this respect. It is one of the hardiest varieties I am acquainted with and the berries last longer than any other.

Time to Cultivate.

The time to cultivate is before you can see any weeds, especially if the land has not been kept clean before. I would not wait until I could see weeds, it is so much easier to take them when small. This constant cultivation keeps the soil moist in a dry season and saves much work that would have to be done otherwise by hand. Where the plants are mulched I take no plow into them till after fruiting.

Time of Ripening.

The first on the list for four years past was Early Scarlet, a bright red berry and a very good berry. The first sent to market in 1872 was a pailful June 8th; in 1873, June 22d; in 1874, June 19th; in 1875, June 22d. This variety is a prolific bearer, and coming as it does so early, brings good prices. I will here say I have cultivated this variety for fifteen years, and it never has failed but once. One year, from some unknown cause, the vines were barren. The treatment of this variety has been different from other varieties. I set a large bed of them and do not cut any runners; let them cover the ground. The next season, after fruiting, I plow once in 12 inches, alternate strips, and drag it well, and then let them run over the new plowed ground for the next season. Then plow up the strips that were left the year before. After fruiting, I have to pull and hoe a good many weeds, but I think it pays to keep them clean. The length of the strawberry season for the past year was from June 22d to July 14th, 22 days, that I furnished the city of Faribault with berries. The season for table use was six days longer. I have looked over my books and find on June 22d we picked 60 qts.; June 24th, 79 qts.; 26th, 168 qts.; 28th, 226 qts.; 30th, 410 qts.; July 2d, 468 qts.; 3d, 16 qts.; 5th, 736 qts.; 7th, 392 qts.; 9th, 184 qts.; 12th, 177 qts.; 14th, 77 qts.; total for the season, 93 bushels. Most of first two pickings were Early Scarlet. After that the other varieties began to get ripe. The last picking was made on the same day we picked the first Doolittle black cap raspberries.

Varieties.

Michigan Seedling.—This berry tastes much like the Wilson. It is much more productive with me. I plant it for the main crop, and have for quite a number of years, and one year with another it pays the best. The ber-

ries are large and hold their size well to the last picking. It is a very rank grower, and I always plant them in hills 20 inches apart, and pick off all the blossoms the first year, as I do with all kinds when newly set. I keep all the runners picked on this variety except to produce plants. Except the first year it throws out no runners until the plants are done fruiting, which is not the case with any other variety that I am acquainted with.

Charles Downing has a short root like the Wilson. Does not stool up in hills enough to make it profitable, except in matted rows. Did well last season. A splendid berry, uniform in size, very fine flavor. Will not stand a drouth as well as some other varieties.

Downer's Prolific.—Not a large berry, quite early. A bluish bloom on the berry leads some people to say it is mouldy. This variety, on rich ground and in a rainy time is apt to mildew. This variety does best on old beds without being plowed up. If I wanted a strawberry bed and to do no work on it after the first year, I would plant this variety. I have a bed that has not been plowed for four years, that last season yielded well. A few Charles Downing mixed to help fertilize them makes do much better.

Green Prolific.—Of excellent quality, large, of fine flavor, and planted beside Wilson or Michigan seedling, have been quite profitable with me.

Kramer's Seedling.—Originated in Iowa. Quite hardy, a blood-red berry of very fine flavor, a rank grower, rather deficient in pollen. Not always a sure crop, but has some seasons done well.

Triomphe de Gand. A French variety. A very fine flavored berry. Rather tender. I have known it to kill when well mulched. Some seasons it does well, but it is a tender variety for this climate.

Hardines of Varieties.

I have never covered many plants of any kind. My experience warrants me in saying early scarlet is the hardiest of any thing I have found. The Ida next, and Michigan seedling and Wilson next. Last season I had two beds of strawberries that faced the south; one was Wilson and the other was early scarlet; the Wilsons were about half killed, while the early scarlet were not hurt in the least. One year ago last fall I mulched four rows of Michigan seedling heavily with crushed sorghum stalks. I let the mulching remain till I saw the green leaves begin to come in sight. I then uncovered the hills where I thought the plant could not get up through, and let the mulching remain till after fruiting. I never have seen as good a crop. They were larger, nearly a week later, than other rows of the same variety on the same ground. Some idea of the productiveness may be gained from the fact that the picker who gathered them picked 50 quarts in one-half day. I came to the conclusion that mulching paid.

Hills or Matted Rows.

I have cultivated Michigan Seedling, Green Prolific, Wilson, Kramer's Seedling and other varieties in hills, while the Ida and Early Scarlet as before described.

Time to Mulch

Strawberries need air till the ground is frozen, and then a light substance for mulch is much the best. When the leaves begin to look green I should open the mulch over the plants. A northern exposure, where mulching is not practiced, is much the best, as the snow, one of the best coverings, remains there longer. The best way to keep snow on large fields of strawberries is to plant raspberries every 25 or 30 feet, two rows six feet apart, with the strawberries in the wide spaces.

Crop of Plants.

Taking a crop of plants from a bed of Michigan Seedling diminishes the following crop by one-fourth to one-third. I do not think it makes as much difference with most other varieties.

Receipts.

The average price I received for strawberries in the city of Faribault, in 1875, was 15½ cents per quart. The cost of picking was 2 cents per quart, and commission for selling 15 per cent. The 93 bushels brought, therefore, \$445.95. Deducting cost of picking and commission left \$319.49. There were some other expenses, as cost of delivering, and loss of boxes, which would amount to \$30.00 more, leaving a net of \$289.49. I cannot tell the exact area but think it is about two acres.

Best Varieties.

From my experience I should say the best three varieties for general cultivation are Michigan Seedling, Early Scarlet and Ida. I would not say there are not better kinds. But I have done the best with the three above named kinds, and this result has been reached after testing over twenty varieties.

The Wilson.

There are many people that want Wilson plants. I have tried them for years. The reason I still try them is that people will buy *Wilson plants*. In the first place they have a short root, and cannot stand a drouth well. They have very short fruit stems, so that the fruit soils badly when it rains. It does not hold its size well after the first and second picking. And last of all, I never have obtained two crops on the same bed. It exhausts itself the first bearing season. I presume my views will not agree with many on this berry, but different locations make a difference.

Kentucky.

I see by the report of the Illinois State Horticultural Society this winter that they recommend the Kentucky. This same variety I tried three years, and then plowed them all up. The same with Jucunda and American Agriculturist.

Col. Cheney.

I am testing Col. Cheney. It is a pistillate and did not fertilize well. After fruiting I wrote to A. M. Purdy, who advised planting the Wilson beside it. Had a few berries that were very fine from this variety.

Soil.

The soil where I have grown strawberries is on a northern exposure, except the beds of Wilson and Early Scarlet, already mentioned. It is a rich loam with a clay subsoil, and was formerly covered with Sugar Maple.

One word more and I have done. If you would make your homes attractive, if you would have good health, plant a good bed of strawberries. It will cause smiling faces and help to overcome many of the ills of life.

Respectfully yours,

SETH H. KENNEY.

DISCUSSION.

Varieties.

Mr. Grimes:—He has not the Downer's prolific.

Mr. Smith:—He evidently has the Colfax.

Mr. Harris:—I never saw a good Green prolific.

Mr. Grimes:—They are good to sell, to fill the basket.

Mr. Smith:—Mr. Brimhall has the Charles Downing, and it has done well with him. It sold in St. Paul at five cents per quart more than the Wilson.

Mr. Brand:—I have a few Michigan seedlings. Set 500 two years ago, and last summer they were the only ones I got fruit from. Also set Charles Downing and —— at the same time, and got no fruit from them. The soil was a black vegetable loam.

Mr. Smith:—I get different reports of the Charles Downing from different localities according to the soil.

Mr. Jewell:—I know only what I have seen on other places. Mrs. Brand told me a year ago last summer that the Wilson gave the best crop.

Mr. Brand:—I had then no bearing plants of the others.

Mr. Smith:—Have Boyden's No. 30. The plants made a good growth last summer, but as it was the first season, gave only a few berries.

Mr. Smith:—Have discarded the Col. Cheney and Col. Wilder.

Mr. Bunnell:—The Col. Cheney is a wedge-shaped and fine looking berry.

Mr. Grimes:—We should guard against recommending varieties

from sample, as the berries may be large but the vines not productive. For example, I bought three plants of the Dr. Nicaise for \$1.00, took good care of them, and the second year the three plants produced one berry.

Mr. Wilcox:—I will report from the other side of the river. I used to get from the strawberry king at Knoxville many varieties and try them. I got the Col. Wilder and others. Finally I quit trying and got down to the Wilson, and I now raise nothing else. Would report the yield of Mr. Smith, of Green Bay, who obtained over 400 bushels of Wilson's Albany from an acre. Got myself \$450 from one acre of Wilson's Albany last year.

Mr. Jewell:—Every man who grows for profit has got down to the Wilson. Until the new ones are tried, we will retain the old ones.

Mr. Grimes:—The Charles Downing has been spoken of highly to me by several persons.

Mr. Harris:—I pretend to keep the weeds from only the Wilson and Downer's Prolific, but since I saw the Charles Downing have been favorably impressed with it. I doubt the genuineness or value of the Michigan Seedling, as it was introduced by a villainous-looking individual.

Mr. Pearce:—Mr. Cook is the best cultivator in Rochester, and he considers the Charles Downing the best.

Mr. Smith:—I can't sell Early Scarlet at five cents per quart in the St. Paul market when people can get larger ones. •

Mr. Harris:—They are unsaleable after the Wilson comes.

Mr. Elliot:—It is the common experience that the Wilson brings double what the Early Scarlet does. The Wilson is the hardiest and most productive strawberry we have.

Mr. Grimes:—The Early Scarlet is good for preserves, and good to stand neglect.

Mr. Wilcox:—The Charles Downing is a good berry, but too soft for marketing.

The list of strawberries as it stood before was then adopted, with the amendment that we recommend Downer's Prolific for home use, Charles Downing for general trial (14 for and 5 against,) also Michigan Seedling for trial, (9 for and 0 against.)

Varieties Recommended.

The action of the Society on strawberries is therefore as follows:

Recommended for general cultivation :
Wilson's Albany.

Recommended for cultivation by amateurs :
Green Prolific, as an abundant bearer.

Recommended for cultivation for home use :
Downer's Prolific.

Recommended for general trial :
Charles Downing. (14 for, 5 against.)

Recommended for trial :
Michigan Seedling. (9 for, 0 against.)

Hart's Seedling.

A number spoke in favor of recommending Hart's seedling.

Mr. Smith explained that the action of the Society in passing it over was in accordance with Mr. Hart's wishes, who desired to exhibit it at the summer meeting before it was recommended.

Prof. Phelps then invited the Society to hold sessions at the Normal School building, and to be present at the morning exercises of the school the following morning.

The invitation was accepted by a unanimous vote.

WEDNESDAY MORNING.

The meeting was called to order by the President at 10 : 25.

The Normal School.

The members of the Society had previously witnessed the morning exercises of the Normal School. The order, discipline and training displayed in these exercises delighted every one and called forth expressions only of satisfaction. At a given signal the pupils of the Normal Department found their seats without noise or confusion. At another signal the pupils of the model school entered in three divisions, each headed by its leader. On entering the room each division formed fours, halted, faced about and remained in the aisles during the exercises, after which they formed

twos and marched away under the leadership of their captains. The Normal classes were then dismissed in order to their class rooms. When the hall was cleared the Principal, Prof. Phelps, remarked that to show what could be done in case of fire or other accident, he would bring the pupils all back to their places in the hall inside of two minutes. The signal was given and the pupils appeared, taking their places easily and naturally, and within the time specified. After these exercises the visitors were shown into some of the class rooms, where both teachers and pupils showed a modest confidence and self-possession not easy to assume before a crowd of critical strangers. Had every school in the country a teacher trained in such a school as this, the superintendent in his visits would not find teachers too diffident to answer his questions, or go on with classes in his presence. Order, system and neatness were apparent in the movements of each pupil, and in everything about the building. It is only to be regretted that the means at command are not sufficient to put the surroundings of the building in keeping with the interior management.

Statistics.

A paper or circular from the Department of Agriculture was read and explained. The circular asked for statistics of fruit trees and fruit products. A committee of Messrs. Brand, Grimes and Jewell was appointed to collect and prepare such statistics.

Plums.

Mr. Boxell's paper on the improvement, propagation and cultivation of the Plum was then read by the Secretary, and ordered published in the Transactions.

IMPROVEMENT, PROPAGATION AND CULTIVATION OF THE PLUM.

Secretary Minnesota State Horticultural Society:

DEAR SIR:—Much to my regret, I shall not be able to attend the meeting at Winona, and although I do not think I have any special knowledge of the subject, I shall, in compliance with your request, give you a few notes at random, on the "Improvement, Propagation and Cultivation of the Plum."

Trees.

First get your trees. My first plan was to take sprouts in the spring from trees growing in the thickets which we had marked when the fruit was ripe. Selecting some for extreme earliness, some few for lateness,

and many for large size and fine flavor. I also got sprouts from the cultivated native trees in my neighborhood, which I thought valuable. In this way I started my plum orchard, which I hope to improve by obtaining choice varieties from the fruit growers of our State.

Cultivation.

As to cultivation, plums seem to do tolerable well with or without it on most soils. I think they prefer a rich soil and high culture. A neighbor of mine has a fine plum tree which bears a fine crop of fruit only when he digs about it and manures it the preceding spring. I know plum orchards however, sodded over with grass and uncared for which do quite well.

Planting.

Plum trees may be planted quite close, or as far apart as you like. I have a small orchard planted in the spring of 1871, in rows 12 feet apart, the trees 6 feet apart in the rows. I intended it for a wind break as well as for fruit. I cultivated well and they have done well, and already begin to crowd one another in the rows. I shall remove half of the trees and plant the best of them elsewhere, leaving the remaining trees 12 by 12. I have taken bearing plum trees from the woods, with trunks two inches in diameter and covered with rough bark and moss, cut off the tops close, scraped off the moss and planted them early in the spring, and they soon made fine symmetrical tops and have borne fruit abundantly.

Propagation.

Choice kinds of native plums may be propagated rapidly as follows: Take up roots in the fall the size of a man's finger, greater or less, pack them in dry sand and keep them in the cellar till spring, then cut them in pieces three or four inches long, and plant them three or four inches deep. The roots may also be taken up early in the spring and planted immediately. If the soil is light and dry press it well and mulch. I have not yet grafted any plums myself.

Improvement.

For the improvement of our native plums, I propose that we allow no plum trees bearing poor fruit to grow in or near our orchards. Let them be destroyed utterly. Then let us plant the seeds of our best plums, aiming at largeness of size and sweetness of flavor, and aiming to get rid of that harshness, astringency, or "pucker" that nearly all native plums have, in a slight degree at least, when cooked.

Black Knot.

Now let me tell you what I know about "black knot." Well I don't know anything about it, except that it is hereditary and incurable by any means known to me, but not at all contagious. I could give my reasons for this belief, but I fear the length of my paper is already greater than its importance.

Uses.

In conclusion I mention some of the uses we make of our plums besides eating them from the tree and pared with cream and sugar. We eat them stewed and in pies. The very best develop but little harshness in cooking. We use them pickled and spiced, and in plum butter, jellies and preserves, and for canning. We seal up large quantities in stone jugs, using about one-third enough sugar to make them palatable when first cooked. They improve by keeping, and when opened the next spring they are about sweet enough. In this paper I have spoken only of our native Minnesota plums.

J. W. BOXELL.

DISCUSSION.

Mr. Harris:—The roots should be cut up only in the spring.

Mr. Elliot:—Some varieties require manuring. Harrison's Peach is a shy bearer, but by manuring heavily it produces fair crops.

Black Knot.

Mr. Carter:—I think the "black knot" is contagious.

Mr. Smith stated that Mr. Boxell had set a healthy tree in a grove affected with "black knot" and this tree remained healthy.

Mr. Carter:—Have seen a grove of healthy trees affected over a considerable intermediate space from a grove of diseased trees. Cutting off branches affected does not help the matter.

Keeping Roots.

Mr. Dartt:—Think if the roots are placed in dry sand they will wither. They should be put in moist sand and then they will calous by spring. Must be careful and not use the roots of grafted trees.

Mr. Elliot:—I use sand and sawdust mixed in equal parts and of natural moisture.

Mr. Harris:—By the term dry sand we do not mean perfectly dry sand, but only not wet sand.

Mr. Stewart:—I bury the roots out of doors in the natural soil, covering about a foot deep, and they do not heat or sprout.

Mr. Dartt:—I object to calling it dry sand when moist is meant.

Mr. Jewell:—The point is well taken, and not only that, but a certain degree of moisture is required. I pack in moist sand and then cover with sawdust. May saturate the sand and it will dry out, unless so protected.

Plum List.

On motion, the revision of the plum list was taken up.

Mr. Dartt called for reading of the plum list as last adopted.

The latest action of the Society was to recommend only the best varieties known as native, or belonging to the wild order.

Miner.

Mr. Jewell moved that the Miner plum be recommended for general cultivation.

Mr. Harris:—Would like to know if the nurserymen have the Miner to sell?

Mr. Jewell:—I have not, and do not know of any one who has. Seven years ago I obtained some trees and have not obtained one plum. Moved them two years ago, but they have not borne since, though in spring they are a mass of blossoms. Afterwards I got some from other sources to sell, and these trees set two years later than the first have borne for two years at least. I have spoken disrespectfully of the Miner, but now think better of it.

Mr. Grimes:—Am glad I was not the one to put forth the resolution, lest some one would charge me with ax-grinding. Have had the Miner for several years. Bought ten trees. Some are now nearly a foot thick. Have borne well. Sold seven bushels last year. Sell more readily and bring more than other varieties. Sold mine for \$2.00 per bushel. Have seen one man who wants 500 trees of them. If there is any variety of plum, native or foreign, that is valuable, it is the Miner. It is the latest, and the fruit stands considerable frost. There is no doubt but some trees were spurious when they first came around. But if mine are not genuine then I have a spurious variety that we ought all to have. Got mine of Joel Barber.

Mr. Wilcox:—I also got mine of Joel Barber, and would go a mile to cut down a Miner if they were all like mine.

Mr. Harris:—Had seen the fruit of the Miner at the State Fair, and got a poor opinion of the Miner. But last fall saw some of a different character. Have known of cases of fraud in which sprouts were sold from the roots of grafted trees.

Mr. Jordan:—I bought 200 trees, said to be the Miner, and the mildest winter they killed down six inches, and this winter two feet. Got them from Mr. Budd, of Iowa. A great many were planted in Iowa before the hard winter and they were cut to the ground. I

think I know something of the history of the Miner. On the river bottoms of Illinois there grows a small, bitter plum, that after laying away for some time, becomes agreeable in flavor. The leaf is like a peach leaf, and I think I should know the plums derived from this species by the leaf alone. All Miners here are from this species. I also have the Wild Goose, which also belongs to this species, and is as tender as a peach. Some variety of the same species stands on Mr. Gideon's place, and is called the Miner. These have stood the winter, but the fruit undergoes the same change in keeping.

Mr. Dartt :—The general reputation of the Miner is variable, and it is, therefore, wrong to recommend it for general cultivation. I move to amend so as to recommend for trial instead of general cultivation.

Mr. Jewell :—Have never known the Miner to kill after the first year. Doubt Mr. Jordan's ability to tell the Miner by the leaf alone.

Mr. Smith :—Think the diversity of opinion due to whether the tree is a genuine Miner or not. I got six trees from Mr. Sherman, of Rockford, Ill., and these six trees proved to be of six different varieties. I afterwards got some for a friend from Mr. Vail, and he showed beautiful fruit produced from these last summer. We should not discard the variety because the tree is not always genuine.

Mr. Grimes :—The Miner is from the Chickasaw plum, of which there are many varieties that cannot be distinguished by the leaf alone. It is tender only when young, and after that hardy. Mr. Gideon's are not Miners, as he himself confessed when he saw mine.

Mr. Jordan :—All the so-called Miners are similar in leaf, and so much like the Sloe as to show their parentage. I got mine from Mr. Miner himself.

Mr. Carter :—I have three old trees, and hence supposed to be genuine. The leaf is not like a peach leaf. Know no wild plum that is hardier. The best plum grown in Minnesota.

Mr. Philips :—I obtained six Miner plums from three different men, and one of them proved genuine.

Mr. Carter :—Before it is ripe the fruit is a magenta color, and when fully ripe, crimson.

Mr. Hart :—My experience is that it is worthless in Minnesota.

The Miner plum was then recommended for trial by a vote of 13 for and four against.

De Soto.

Mr. Jewell moved to recommend for trial the De Soto, which was seconded by Mr. Harris. It bears young and bears heavily, but the size is not as great as was expected, and in quality it is not as good as others, second rate.

Mr. Elliot:—Three years ago I bought four trees for \$5, and planted them. The second year they bore a few and last year they were loaded. From the four trees, I got half a bushel of fruit. The tree is extremely productive and perfectly hardy. The quality is not as high as that of the Miner or Harrison's Peach. The fruit is of good size, yellow with a red cheek. It is a soft plum. It comes from Mr. Hale, of Iowa, and is a seedling from the native plum. Expect to have twenty varieties in fruiting next year. Consider the De Soto a good plum. The Harrison's Peach, unless highly cultivated, is not productive. Mr. Wilson, of Richfield, had a seedling at the State fair that I consider of promise. Some plums have a sour pit, with an astringent skin, not noticed when first taken into the mouth.

Mr. Harris:—The De Soto originated in Wisconsin, and Mr. Hale got his stock by getting several large trees.

Mr. Brand:—We should make it a principle not to recommend a variety until we know something about it, and nurserymen should not sell it until they know it at sight.

Mr. Elliot—No spurious trees of the De Soto have been sent out. Mr. Hale is honest with it and deserves credit for it.

The De Soto was then recommended for trial by a vote of 10 for and 8 against.

Mr. Harris:—Am satisfied that better plums grow wild in every county than the Miner or De Soto.

Natives.

Mr. Dartt offered the following resolution:

Resolved, That in view of the vast number and variety of native plums of great excellence in our State and the uncertainty of getting a genuine article by importation, therefore we recommend that our people depend principally upon our own native thickets for a supply.

Mr. Buck wanted to know what some of the excellent varieties were.

Mr. A. C. Hamilton hoped to see the resolution adopted. He was impressed with the value of the native plum while driving

through the Chatfield woods last summer, and seeing fine bearing trees not over four feet high.

Mr. Dartt believed that the recommendation of certain varieties opened the door for unprincipled agents to impose fraudulent varieties upon the people.

Mr. Jewell believed that the Society should recommend approved varieties else how should any improvement be made in the plum?

Mr. Wilcox thought the resolution was just the thing, and if nurserymen were so sensitive about their honesty, why let them build up a reputation for honesty that will stand among the people. He knew to his cost that there were dishonest nurserymen. He was a nurseryman himself; had made mistakes, but believed he had done it ignorantly. When he got so that he condescended to dishonest practices with malice aforethought, why then put him down.

Mr. Jordan moved to amend the resolution to read "native plums" instead of "native thickets." The amendment was adopted and the resolution as amended was carried.

Plums Recommended.

The action of the Society on plums was therefore as follows:

Resolved, That in view of the vast number and variety of native plums of great excellence in our State, and the uncertainty of getting a genuine article by importation, therefore we recommend that our people depend principally upon our own native plums for a supply.

Recommended for Trial.

Miner (13 for, 4 against.)

De Soto (10 for, 8 against.)

WEDNESDAY AFTERNOON.

Meeting called to order by the President at 2 o'clock.

Plums.

Mr. Jewell moved the following resolution:

Resolved, That to procure better plums than we now have we recommend the planting of the *pits* of the best varieties of native plums.

Adopted.

Mr. Jordan :—Plums occupy a prominent place in my business. Am more successful with those obtained from the gardens of persons who procured them from the woods, and from the seeds of those cultivated in gardens. The Waldron plum was from a plum tree that grew in the garden of Mr. Farmer. Of Mr. Fisher's plums one is called the Peach plum. He says it is free from the bitterness of the wild plum, and has a peach flavor. I procured sprouts from these and planted the seeds. Plum butter made from the produce of these was almost like peach butter. This stands, with me, at the head of any in the State. Have fruited about fifty varieties.

Methods of Propagation.

Mr. Stewart then read his paper on methods of propagation to secure hardy trees, and it was ordered to be published in the Transactions.

METHODS OF PROPAGATING TO SECURE HARDY TREES.

Adaptation.

In all apple-growing countries we find that no one variety is valuable only in certain localities. Its value in any new location is only ascertained by years of experience.

Varieties that grow and do well in eastern States, where they have deep snows and moist atmosphere, are worthless here in our dry climate, where we frequently have no snow until the severest winter weather is past.

Root Killing.

Root killing of the apple by the severity of the cold is not known there, while here, within two hundred miles of Winona, there have been millions of trees root killed within the last fifteen years.

This should teach us a lesson. It should teach us not to use tender seedling roots to propagate our hardy varieties on. Some are recommending *Siberian crab* seedlings, which are but little better, as seventy-five per cent. of *them* will winter kill here.

Prevention.

We *have* trees that will produce hardy roots by layering or mounding, as is done with the quince or Doucin apple, or they may be had by grafting the variety wanted for stocks on seedling roots. When grown one year, most of them will have thrown out roots from the scion. They can then be taken up, trimmed back so that there will be no root left except those that have sprung from the scion.

By so doing we can have a stock to propagate our hardy varieties on,

that there is no danger of winter-killing; that can be used in grafting the same as seedling roots, or it may be planted in the nursery row and top-worked at any desired height.

A. STEWART.

DISCUSSION.

Mr. Harris:—These principles are steps in the right direction. The loss by cold is not above ground alone, but also below. This has not been admitted because some trees were killed that were covered root and branch. We must, however, have iron-clad trunk and top and root.

Mr. Wilcox:—I disagree with the statement that 75 per cent. of the seedling crabs fail. Crab roots are perfectly safe, but we use also the long scion to secure any additional safety that can be got.

Mr. Stewart:—I base this statement on my own experience and observation of my neighbors.

Crab Stocks.

Mr. Jewell:—How to get hardy roots is the question. Crab roots are not of uniform hardiness; some are tender and others hardy. Transcendent roots are hardier than Siberian crab roots. Why, then, use the tender crab root? Mr. Wilcox plants 18 inches deep, and then the scion takes root. Then why use crab roots when they are worked upon with difficulty? Why not work on apple roots, using the long scion and setting deep in the orchard. It may be necessary to use crab roots for grafting above ground, but then take a hardy crab to begin with.

Mr. Wilcox:—If we were *sure* of roots from the Transcendent there would be no use of working on crab roots, but we are not sure. So, as the crab root is hardier than apple root, we get this advantage of hardiness by using crab roots. (In answer to a question:) My soil is sandy, with a gravelly subsoil at a depth of about 18–20 inches, but it is not always reached in setting trees. We set deep, to be sure of getting roots from the Transcendent scion. We have got the result desired, and last summer the Transcendent fruited, as also some apples budded into it and making their second years growth.

Cause of Injury in 1872–73.

Mr. Pearce:—I doubt if the cold did the work in '72–3. Trees

protected by a grove, and snow drifted over them seven feet deep, so that the soil probably did not freeze that winter, all were killed. Duchess, Haas, Tallman Sweet, standing under these conditions, were killed.

Mr. Hart :—Slow growing roots cause slow growth of the top, and this makes the tree hardy. Had the same experience as Mr. Pearce. Would shovel away the snow if it were four feet deep about the trees.

Mr. Jewell :—Not one of those who believe the destruction due to some unknown cause believe that the trees root killed. In December, 1872, at one time the thermometer was 30°—40° below zero before any snow fell, and then it was that the injury was done. Hardy roots is our text. The root should be short and the scion long. Facilitate getting roots from the junction by letting the scion be larger than the stock, and projecting beyond it at one side.

Mr. Hart :—Snow fell November 10th, 1872, and did not all go off until spring from where it drifted behind fences.

A Member :—Deep planting is the correct principle.

Mr. Jordan :—I know of no case in which trees died when the ground was not frozen.

Mr. Jewell here introduced Mr. Tuttle, President of the Wisconsin State Horticultural Society, who had just entered the room.

Mr. Dart :—Some scions are more difficult to root than others. The Tetofsky fails. Have set it 18 inches deep for the express purpose of getting roots. Trees have been injured in the top more than the root. In the former case the tree hangs along, but in the latter it dies at once. It is easy to protect the root by mulching. With this precaution we need not be so much troubled about hardy roots. We want hardy tops, which will not injure in the fruit buds. Some will do well so far as the tree is concerned, but the fruit buds kill.

Mr. Hart :—In the spring of '56 I planted some trees; as snow came early there was no frost in the ground that year. The tops killed but the roots lived.

Mr. Stewart :—Of my own crab seedling roots on loamy soil only one in 50 lived.

Mr. Brand :—95 per cent. of the crab roots live in my experiments. It was the cold and dryness of December that killed the trees in '72-3. The last of December there was no moisture in the soil, and the day before Christmas the thermometer stood 40° below zero.

Mr. Pearce :—Fuller, of New York, says it makes little difference

whether the mercury be 10°—15°, or 35°—40° below zero. A root that will stand in the one case will stand in the other, and therefore I am not so particular about what roots I graft on.

Deep Planting.

Take nature for my guide as to depth to set trees. Set a little deeper than they stood in the nursery. Don't want to set down in coarse, cold soil. There the roots spread near the surface, while only in loamy soil do they strike downward.

Mr. Jewell:—We do not follow nature in most respects. It is by a departure from nature that we attain desirable results.

Moved by Mr. Elliot, and carried, that no one be allowed to speak more than five minutes on any one question.

Mr. Scott would like to have the sense of the meeting as to his question, deep and shallow planting. Would like to know also, any one has noticed the difference in this respect between trees growing naturally here and in the Eastern States?

Mr. Tuttle:—At the root is one form in which trees kill. In 1869 the trees were injured by cracking of the bark near the surface of the ground. In '72-3 trees were killed at the root, and in '73-4 at the top. It is desirable to set deeper than we now do, but 12-18 inches is questionable. Mulching will do if attended to. A good method of protection is to throw soil up about the trunk before freezing, and mulch after ground has frozen 5 or 6 inches deep. Cannot then always secure the tree, because they sometimes kill at the top.

It was moved to recommend planting trees 6-12 inches deeper than they stood in the nursery.

Mr. Harris:—I cannot do so on my clay soil.

Mr. Dartt offered to amend so as to read two inches on heavy soils and four inches on light soils.

Mr. Jewell likes the discrimination, but four inches is not enough on light soil.

Mr. Dartt:—Two inches on heavy soil is all that is safe, and four inches will do for light soil.

Mr. Bunnell:—If the tree requires moisture, as I believe, to keep from root-killing, why not set deep where the roots will find it?

Mr. Pearce:—Would set 1-4 inches deep according to the size of the tree and support with a stake. Set as early as possible.

Mr. Jordan:—Should plant 8-10 inches deep on clay soil. Would favor recommending setting 2-18 inches deeper.

Mr. Hart:—The nurserymen want us to plant deep so they may

sell us more trees. It is no use to plant where the roots can get no heat, air, and sunlight influence.

Mr. Wilcox gave an invitation to the members of the Society to visit him next fall and see the results of his method of deep planting.

Mr. Scott:—Have not set many trees in Minnesota. Have done some planting, and some trees set 10 inches deeper than in the nursery are now worth double what they would have been set in the ordinary way. We, as a Society, need to recommend some depth.

Mr. Dartt:—Perhaps the difference is explained by the deep digging and pulverization of the soil, and not alone by setting deep. Should not overdo the thing, 2-4 inches is enough and will not bend nature too much.

Mr. Philips:—Glad I came here. Have been considered a fool for planting 3,000 trees. It is some consolation to find some one with 7,000. (This number was mentioned by a previous speaker.) With such a multiplicity of theories each man must try for himself and make conclusions for himself.

Mr. Grimes:—Think we had better recommend common sense.

A motion to lay the question on the table was lost, 4 to 11.

Mr. Brand:—Would set on clay soil 6 inches deep, and have the top of the root 10 inches below the surface on light soils. There is great carelessness among farmers in the setting of trees.

Depth to Plant.

Mr. Jewell moved an amendment recommending two to six inches in clay and six to twelve inches in light soil, which was carried by a vote of 10 to 5.

The motion was then carried by a vote of 9 to 5, and reads as follows:

Resolved, That we recommend the planting of trees from two to six inches deeper on clay soils and from six to twelve inches deeper on light soils than they stood in the nursery.

The following discussion on hardy trees was had after the reading of Mr. Martin's report, and was ordered inserted at this point:

Crab Roots.

Mr. Wilcox:—I had an orchard before 1872-3 that Dr. Stickney said was the best in Wisconsin. That winter swept away most of my orchard and 60,000 trees from my nursery, though part of the

nursery stood on clay soil. In the spring I went out one day near night, dug up several trees and found the roots dead. Iron-clads as well as half hardy trees were much injured. None escaped entirely. It was a singular fact that three Transcendents were killed while a Red Astrachan, standing in the center, lived. All this was owing to the destruction of the roots. I therefore, advocated grafting on crab roots. Dr. Stickney, however, said that of 100,000 so grafted but 60,000 grew, and only 20,000 made good trees. At the meeting of the Wisconsin State Horticultural Society one year ago, I showed good trees on crab roots. Dr. Stickney said he hoped the experiment would be continued. Recently Dr. Stickney has said "must graft on crab roots."

Root-killing Elsewhere.

In September last I met a man who lived west of Keokuk and who began to flatter me because I lived, as he said, in a place where there was snow to protect the roots. This man was going to set long scions and plant deep. I said I had no faith in it without the hardy root. Root-killing is not confined to this latitude. A man 300 miles south of us lost 200,000 trees a year ago this winter. My plan is to graft the Transcendent into crab seedlings, use also long scions and set deep. At two years from graft bud into the branches thus grown.

Blight.

M. Elliot:—What will you do with the Transcendent when it blights? The Transcendent is one of the worst to blight.

Mr. Wilcox:—True, but as long as nurserymen propagate as they do we must suffer some. The blight, however, is passing away.

Mr. Hart:—I bought of Mr. Wilcox a dozen trees eight years ago, and seven or eight of these are the only sound ones I have, and they were not worked in this manner.

Mr. Wilcox:—I have no faith in them. If not dead now, they will be dead before long.

Mr. Jewell:—Crabs, like apples, differ in hardiness. The seedlings are therefore not reliable. It is more desirable to get the Transcendent on its own roots. But still I think there are other crabs better than the Transcendent. Do not believe the blight is leaving. Have dug up or girdled all my Transcendents. All I had left was the remnants of two blocks between which stood a block of Tetofskys. The blight swept across from one block of Trans-

cendents to the other, and I lost 1,000 Tetofskys in this way. Have never seen a Tetofsky blight except in proximity to a crab. Would not encourage the using of Transcendents in any quantity. Last season was cold, and hence there was not so much blight.

Better than Transcendent.

Mr. Wilcox:—Saw the blight as bad as ever last season. Would like a better stock than Transcendent. I think perhaps Whitney's No. 20 may be such. Do not think Maiden's Blush is iron clad.

Mr. Jewell:—I agree with Mr. Wilcox about the Maiden's Blush. The Early Strawberry is, however, superior to the Transcendent in every respect.

Adaptation to Crab Roots.

Mr. Jordan:—As to top working on crabs, no one crab, as a rule, will answer as a stock for apples; but some varieties of apples will work well on some varieties of crabs. Only one is a success on the Soulard, and that is the Red June. The Red June on the Transcendent grows much larger than the stock. The Orange Crab works well on the Soulard. We shall not find a crab stock suited to all apples. The Wealthy works well on the Transcendent, as also does the Melinda and Rollins' Russet. But a majority of apples fail on the Transcendent because they grow much larger than the stock. We must find a variety of crab for a stock for each variety of apple.

Mr. Wilcox:—I would not be understood as recommending the *Transcendent* for double working.

Mr. Dartt:—My experience confirms Mr. Jordan's; there is no general crab stock for working all varieties of apples upon. We must find out what variety of crab is best suited for working certain varieties of apples upon. The Tetofsky works well on the Transcendent.

Mr. Jewell:—The stock should be hardy and free from disease.

Agricultural College Farm.

The report of the committee to visit the Agricultural College Farm was then read by Mr. Harris and ordered to be incorporated in the Transactions. It was as follows:

REPORT OF COMMITTEE ON CONDITION OF AGRICULTURAL COLLEGE FARM.

Mr. President and Gentlemen of Minnesota State Horticultural Society :

The University.

On the first day of July, 1875, the undersigned as a committee of this Society, paid an official visit to the State University and University Farm. We find the University to embrace a number of schools so planned and arranged as to form a very compact University system and each school to be headed by enterprising and efficient professors.

We had the pleasure of being conducted over the buildings by President Folwell and some of the professors. The library contains more than 10,000 volumes and is continually receiving additions, and is so well arranged that any work called for can be found without delay. The museum contains a great variety of useful inventions, interesting specimens of mineralogy, &c., and is fast becoming a valuable feature of the Institution, and in the Agricultural department, under supervision of Prof. Lacy, a fine collection of seeds, grains, grasses and woods are being made.

Agricultural Department.

The buildings to be used for the Agricultural College were not entirely completed but would soon be ready for occupation and the use for which they are designed. This department is designed to give the students special training in the sciences pertaining to agriculture, including their practical application. Chemistry, botany, landscape gardening, horticulture, arboriculture and entomology are among the studies to be pursued, and reduced to practice. A convenient glass structure has been erected for the propagation and growing of plants, flowers, &c.

Farm.

The farm is not very convenient to the University, not because too distant but because of the quantity of loose sand that must be traveled over to reach it. No doubt the farm may be a good one for agricultural experiments, for when a student has become so well educated that he can make it produce paying crops he is safe to make a living at farming upon any part of the habited globe, but it does not strike us as being a favorable place for the successful pursuit of horticulture. The soil that is being used for horticultural purposes is mostly a light sand, and we were informed had been cropped for fourteen years without the use of fertilizers of any kind, and had become so impoverished that it would not produce good weeds.

Garden.

The garden department is under the supervision of W. T. Scott, and from the system, neatness and good cultivation that is seen on every hand, we are inclined to pronounce him to be the right man in the right place.

Nursery.

A small nursery has been started for the purpose of growing trees for the farm, and scions of every new variety will be tested with a view to their hardiness and other desirable qualities. The enterprise is a worthy one, and we trust that those who are fortunate enough to raise good seedlings will have them tested here before throwing them upon the market. We found a great variety of strawberries, raspberries, blackberries, currants and grapes growing in the Experimental department, some to test their hardiness and others to test the virtue of various fertilizers and methods of cultivation, but they have not been out a sufficient length of time to enable us to come to any definite conclusions about them, but if the finale will no doubt be the gaining of much valuable information for the State. Considering the soil and location and short time since the experiments were commenced, the prospect is encouraging. It is in the vegetable garden where the greatest advance has been made and the best results attained. From the numerous labels and number of stakes that are seen on every side, we infer that hundreds of experiments are being carried along with system, and that almost every edible vegetable known to the gardener had a place there, and the value of various fertilizers is being tested. Enough has already been accomplished to determine the best and most profitable varieties for growing in the Northwest, and also to prove that fertilizers applied to the soil, and thorough cultivation given, increases the yield and improves the quality of vegetables; also, that vegetables grown from seeds raised here are of better quality and come to maturity earlier than those from seeds raised in a more southern latitude.

We most heartily approve of the efforts that are being put forth by the officers and professors to place the University in a condition to rank with the first in the Union for the scope of instruction given, and recommend them to the confidence of the citizens of this great and growing State.

Our thanks are due Professor Lacy for conducting us over the farm and entertaining us with descriptions of the experiments that are being tried and we recommend that this Society pass a resolution pledging aid and encouragement in donations of seeds, plants and trees for the experimental gardens and greenhouse, and that the superintendent be requested to make a report in abstract at each annual meeting of this Society.

We further notice that at the last State Fair, held at St. Paul, Sept. 14th to 18th, 1875, the exhibition made by the University was remarkable for being the fullest and most complete show of vegetables ever made in this State. The laws of the institution debar them from receiving any premium except *honorable mention*, which is well deserved.

JOHN S. HARRIS,
Chairman Committee.

Garden Vegetables.

The report of Mr. Scott, as chairman of the Committee on Garden Vegetables, was called for and read and ordered to be published in the Transactions. It was as follows :

REPORT OF COMMITTEE ON GARDEN VEGETABLES.

MINNEAPOLIS, Jan. 15th, 1876.

To the President of the State Horticultural Society, St. Paul :

Horticultural Literature.

DEAR SIR :—If some one would gather from horticultural literature all that has certainly been known, in the theory and practice of gardening, the work would be of immense value. The attention of the Society is called to the fact that we have not a work of this kind. It is, to say the least, not pleasant for a committee to report what they may think to be new and find that it is like a tale twice told, and yet the fact is, it must be new to many of us, or we should not hear so often the query, “ what kind of soils are best adapted to various kinds of fruits and vegetables; what the best mode of cultivation, and the varieties best adapted to our soil and climate.” That we hear these and similar questions almost every day—we gladly report as an increasing interest in new and improved varieties of vegetables.

Object.

The object of gardening is that we may have pleasure and profit thereby. The chief source of pleasure is to attain the highest perfection, to assist nature in the process of furnishing food, and the instruction we receive while thus engaged. If we fail to realize the importance of the first, gardening for profit must and will be a failure.

Statistics.

We are unable to give the exact amount of garden seed imported and raised in our State; neither can we give the amount of vegetables grown, but we do find that each year the demand has increased, and the present year the increase has been beyond the average of any of its predecessors, while a visit to the St. Paul and other markets show that the quality has improved with the demand, and are now supplied with vegetables equal to, and in some respects superior, to the eastern markets. Together they represent a cash value of thousands of dollars.

Transplanting.

The remarkable effect of transplanting on the growth and habits of some kinds of vegetation is worthy of notice. In a small flower garden on the Experimental Farm the third transplanting gave a greater number, and more perfect flowers. The effect was even more remarkable in the cultivation of vegetables. In the Experimental Gardens on our State Farm the third transplanting increased the size of *head lettuce* one-half over one transplanting, and the corresponding varieties were improved in that respect—cabbage, celery, cauliflower, broccoli, each showed a marked improvement by the third setting.

Peas.

New peas continue to attract attention. Messrs. Carter, Veitch, and others, in England, as well as in our own country, seem to have exhausted the superlative, and the end is not yet, and in truth, the improvement is simply wonderful. In a trial on the above named garden of twenty varieties, mostly new, and, we add, good, the Kentish Invicta and Blue Peter, as early peas, are worthy of notice; while Eugenie, Blue Imperial, Carter's Surprise, Veitch's Perfection and McLean's Premier, have so many good points, that we feel like responding to the cry of our English cousins, "Eureka!" Whether they will continue to maintain their good qualities, time will determine.

Crossing and Selection of Seeds.

We present with this report two specimens of evergreen sweet corn, with all the fixed characters of standard varieties. No. 1, the product of a cross of the common field sweet corn and white dent, one cross, time six years. No. 2, common field sweet corn crossed with early sweet corn; seed selected; time seven years; result, inferior to none on the list.

Potatoes.

Results of experiments commenced in seventy-three. Perhaps there is more interest felt on this subject than that of any other connected with the farm or garden. We are all of us acquainted with the name of some variety that has run out, or, in other words, failed to produce a reasonable amount of large potatoes in proportion to the number of small ones. From the lists, containing hundreds of names, said to be of wonderful value, we have but a few left that are worthy of recommendation.

In an ordinary field of potatoes, some are found to be coarse and of inferior quality, and will not transmit the original quality. Others are immature, and cannot be expected to produce the best results. A few only in each hill are fit for seed. Eyes planted from seed and stem ends show a marked difference when planted separately, for three years, in favor of stem ends; yet the experiment shows a far greater difference and improvement, where an equal proportion of eyes are planted in each hill, from stem and seed ends; the result shows that while the potatoes from the seed end are inferior in quality to those of the stem end, that both grow small by degrees and beautifully less each year, and give the first signs, viz.: (a greater number of small ones and less of large ones) of *running out*. Imperfect seed, poor soil, and the usual way of cutting and selecting the seed, will cause, in time, any variety to be branded as worthless. A change of location, the very best conditions of soil, together with a judicious *selection of seed*—cutting lengthwise if cut at all—will, we believe, not only maintain and improve the good qualities of the Early Rose, Peerless, Late Rose, Compton's Surprise, Early Ohio, Extra Early Vermont, Brownell's Beauty, Snowflake, and other valuable kinds, but that the Neshannock, Fox Eye, Carter, and many others, said to have run out, may be made equally productive and good. In this connection the

Peerless and Early Rose potato seem to be adapted to all kinds of soils; both seedlings from one seed ball, from an inferior potato, the first named—not the best—but one of the best—is a better potato at this time than five years ago, in every respect; the latter, in some localities, is equally good; in others the never failing sign shows that our main dependence in past five years, may fail.

Early Bush Beans.

The White and Black Wax are recommended for quality—Early Six Weeks and Early Rachael for general cultivation; the last named is also an excellent bean when ripe.

Pole Beans.

Having carefully tested fourteen varieties we would recommend Marblehead Champion and Giant Wax as being the two best pole snap beans—the former very early, the latter an evergreen. The Concord and Sieva or frost bean are, at least, equal, if not the best, to any of the others; while the Cranberry will be found to be a keen competitor of the Concord. We would add here that we hope in time to place the Lima at the head of the list.

Early Cabbages.

Little Pixie—the earliest, very small solid heads. Jersey Wakefield and Winningstadt—excellent in all respects, we find nothing better in the list of early cabbage.

Late Cabbage.

In the large list of names, the Premium Flat Dutch, Stone Mason, Fother's Improved Brunswick and Drumhead give general satisfaction.

Sweet Corn.

Early Minnesota—earliest. Early Selected—best. Crosby's Early and Moore's Early Concord—good.

Cucumbers.

Earliest—Early Cluster. Most productive—White Spine.

Onions.

In a list of six varieties, the Large Red matures first, Yellow Danvers, second; White Portugal, third.

Squashes.

For early summer squashes, the Early Scollop Bush is perhaps equal to any other. The new squashes, Butman and Marblehead, may improve on closer acquaintance. So far, we fail to discover any superior qualities on comparison with the Hubbard.

Tomatoes.

Having tested twelve varieties—including nearly all the new *very best*—we believe the Canada Victor, Hathway, and Gen. Grant will be found equal to, if not superior to all others for table and cooking purposes, while the pear-shaped Yellow will be found to be the best for canning and preserving.

Sweet Potatoes.

That sweet potatoes may be grown of good market size is true. That the quality will not always be satisfactory is also a fact. To those who wish to succeed, the Southern Queen is most desirable.

Cauliflower.

Our climate and soil seems especially adapted to the late varieties of cauliflower. We would recommend a northern exposure or slope for this crop as well as late cabbage.

Celery.

Of all garden products we find this the most difficult to grow successfully. As a rule clay subsoil is essential to success, sandy soil the exception. In eight varieties, we find Boston Market the favorite.

Egg Plant.

Early Purple, best.

Lettuce.

Early Butterhead, Hanson and large India give universal satisfaction. In a large list of names we find others equally good, but none better.

Beets.

Egyptian, Early Bassano, Dewing's Blood Turnip and Bastian's Blood Turnip, are known to be among the best for early varieties, and equal to any for late or winter use, when planted for that purpose.

Melons.

Perhaps, all things considered, Phinney's watermelon is the most profitable, for home as well as market purposes; of good quality and early.

Special Fertilizers,

commercial especially and otherwise, adapted to various kinds of vegetables. Very little attention has yet been paid to the application and results of the different fertilizers so extensively used in Eastern States. We believe it to be a well established fact, that well rotted stable manure supplies in a great measure the essential elements required by vegetables to produce

the best results; at the same time we are well assured that the supply is limited, and to some other source we must look for plant food.

Judging from the immense amount of fertilizers manufactured and used in the older settled States, and in Europe, together with the thousands of tons of guano, we are justified in the assertion that they must be our main dependence in the future, as aids indispensable in successful gardening.

W. T. SCOTT,

D. A. J. BAKER,

Committee on Market Gardens.

DISCUSSION.

Mr. Harris:—As a Horticultural Society we have not given enough attention to vegetables. We need a garden book for the masses which is not yet published. Henderson's "Gardening for Profit" is three times out of four a damage to the man who uses it. For example Mr. Kramer, of LaCrescent, followed it in manuring very heavily for cabbages. The consequence was they grew all to loose leaves instead of forming heads. But a couple of years later the ground so manured produced a splendid crop. In another case, a hotbed was prepared by mixing rich pig manure with the soil and the man bought his plants that year. Let us devote more attention to garden vegetables hereafter.

Cutting Potatoes.

Mr. Scott:—There is not much poetry in gardening but a good deal of solid comfort. I have found that, by using seed from the seed end of the potato they run out in about three years, and are also inclined to rot. I have found, also, that potatoes cut for seed are better than whole ones. This is contrary to the experiments of others where the best results were obtained from whole potatoes. The explanation is to be found in the difference in the soils upon which the two experiments were made. The selecting of seed is a very important point, for we can get in this way almost any characteristic we want.

Early Tomatoes.

Mr. Elliot:—This is a subject I have been interested in for twenty years. There are several points of importance connected with it. The selection of seed is one of them. When new kinds come around they are often adulterated with poor kinds, the vitality of which has been destroyed. The potato is a subject of interest and I would

like to see the manner of cutting, as mentioned, explained by Mr. Scott.

Have been informed of the discovery of a new way of growing and ripening tomatoes to get them into market 10-15 days earlier than by any other way, but the details were a secret. Earliness is a very important consideration and forcing will yet become an important branch of business about our cities.

Mr. Grimes:—Glad to see the vegetables placed on the table. It is a subject we cannot afford to overlook. Vegetable gardening stands intermediate between fruit growing and farming. Would like to have a committee to report on the vegetables as well as upon fruits. Potatoes I cut first lengthwise, and then cut down to one eye to a piece. Have been interested in potatoes, and have tried many varieties. Was first to get the Early Rose in my section.

Varieties of Potatoes and Peas.

Mr. Scott:—(In answer to questions.) There is not much difference between Extra Early Vermont and Early Rose, in value. The Early Ohio gave no small ones, and is of great promise. Late Rose promises to be good for late. Veitch's Perfection pea is very productive, and a good late pea. Early Caractacus was the earliest of all, and Blue Peter the best early pea, considering all points.

Mr. Hart:—Is the Snowflake potato of good table quality? It is not so with me. I got one pound and grew $11\frac{1}{2}$ bushels from it.

Mr. Scott:—The quality of the Snowflake is good. Canada Victor tomato was earliest. Hathaway's Excelsior was a little later than Victor, but best in several characteristics.

Mr. Dartt:—I had a variety of potato called the White Rose, which was great on the yield, but not of good quality.

Mr. Smith:—I got the Late Rose from Mr. Campbell, of Ohio. It produced great vines, but cannot say as to yield.

Mr. Scott:—(In answer to question.) Hathaway's Excelsior and General Grant tomatoes are more productive than Canada Victor.

Lima Beans.

Mr. Harris inquired about the improved Lima Beans advertised by Dreer. Had grown Lima Beans and raised a great many. (No one knew about them.)

Mr. Smith gave his experience last summer in raising Lima Beans.

Etna Bean.

Mr. Hart inquired if any one knew anything about the Etna Bean, represented as something new.

Mr. Jewell:—The Etna I suppose to be the same as Hale's Eureka bean. It sometimes produces very heavy and sometimes does not. It is a small white bean.

Transplanting.

Mr. Harris asked if any one had observed benefit from transplanting cabbages in the seed bed before setting in the open soil.

Mr. Elliot:—Have done so with early cabbage with good results. With tomatoes the benefit is more marked still. The care and management of tomatoes after they are planted out is also of importance. One method is to set early, train to stakes four feet high, and prune off all vine outside of the blossoms. In this way we get a great crop for the space occupied.

Asparagus and Cauliflower.

Mr. Smith:—Asparagus ought to be planted more generally among the people.

Mr. Harris:—I sometimes get the best heads from Extra Early Erfurt cauliflower, sometimes from Early Paris, and sometimes from Le Normand's, according to the weather at the time of heading. Asparagus is not more generally planted because the planting as generally described is such a difficult operation. A good enough bed need not be so much work. When I came to Minnesota I sowed seed on soil with only ordinary preparation for crops, and afterwards gave a dressing of manure to the surface, together with rubbish from the house, and now the bed is about four inches above the general level and it is just as good as one made later and dug deeper.

Mr. Smith:—I dug two feet deep and applied 800 loads of manure to my first bed. I cut it closely and late in the season. Next planted one-eighth acre, dug it three or four feet deep, and applied 300 or 400 loads of manure. From these beds I sold last year 1,206 doz. bunches. But they had been dressed with manure, gypsum and ashes, and six barrels of salt. It paid as well as anything. Would not be without an asparagus bed if I had only 50 feet of land. Would plant in that case 2x3 feet and manure in the ordi-

nary way. It will not, however, cut so long each season. Cut last year up to 16th of August. Must, however, feed the roots if you cut so close and so long. Have sold from one-third acre \$600. Cut under the ground so that the stems are white. My customers want it so, most of them. In this way the ground must be kept light. I dug it in the spring, and hacked it with a pronged hoe after every rain. The largest cut was 125 dozen bunches in one day.

Mr. Elliot:—Have a bed 50x60 feet, on which I put 40 loads of the best manure. It did well till within a few years, when I quit manuring it. Have another field set by ploughing furrows four feet apart and setting plants three feet apart in the row. I cut to suit customers. Most of them want it cut at, or just under the surface. The bunches weigh about three to the pound. Brought 50 to 75 cents per dozen last year. No vegetable produces so much per acre as asparagus. This field cultivation is the best for farmers.

Mr. Smith:—Have heard of a bed 125 years old, which is good yet. Can't get it out of the land. But a plat only ten feet square is required for a family.

Mr. Elliot:—Can get it out by plowing three or four times.

Mr. Scott:—Have yet to see when any one wanted to plow it up. Those in Minnesota who follow Henderson word for word will fail.

Mr. Hart:—Would as soon think of plowing up a row of Duchess trees as my asparagus bed.

Mr. Smith:—I cut as regularly as I would milk, Monday, Wednesday and Friday mornings, and Saturday night. Cut when it is one-half or one inch above the surface. When cut in this way the roots must be set deep, or it may injure the crowns. Deep cultivation and digging, not alone for continuous and heavy yield, but also to enable it to withstand drouth. Asparagus is very sensitive to heat, and in hot weather it grows very rapidly, while a cold day or two will check its growth very materially.

WEDNESDAY EVENING.

Meeting called to order at 7:30.

Horticulture in Meeker County.

The report of G. W. Fuller, on condition and prospects of Horticulture in Meeker county, was read by the Secretary, and ordered by the Society to be published in the Transactions.

CONDITION AND PROSPECTS OF HORTICULTURE IN MEEKER COUNTY.

LITCHFIELD, Jan. 18, 1876.

C. Y. Lacy, Secretary:

DEAR SIR:—Being the only nurseryman on the open prairie west of the "Big Woods," my experience may not be unprofitable to fruit-growers throughout the State.

The Hard Winter.

Four years ago the coming spring, I put in all kinds of apples that were then grown in the State, both root-grafts and orchard trees, such as Duchess, Tetofsky, Haas, Ben Davis, Saxton, St. Lawrence, Tallman Sweet, Price's Sweet, Perry Russet, Fameuse, Red Astrachan, White Astracan, Walbridge, Utter's Red, Pewaukee, Peach Apple, and all kinds of crabs, old and new. The following severe winter (that of '72-3) swept away all my orchard trees except Duchess, Tetofsky and the crabs, and all my nursery trees except the crabs, and the Haas, Ben Davis, Saxton, Price's Sweet, Peach Apple, and a few of my Perry Russets, Red Astrachan and Fameuse, that were somewhat protected.

Notes on Varieties.

The Ben Davis seems to be hardy until it is three or four years old. This is the case also with the Gen. Grant. The Tetofsky lives, but easily root-kills, and does not look healthy or grow. This is the case also with the Saxton and Price's Sweet. I have had Stewart's Sweet in both orchard and nursery for two years, and while they prove thus far perfectly hardy, I question their value, if they do not bear till eleven years old, and are no larger and no better than the crabs. The Wealthy I have had but one year, and it stood well through last winter. The Peach apple seems nearly as hardy as the Duchess. Some Duchess trees in this vicinity are beginning to bear, and are looking fine and healthy. I have now, as the result of my four years' experience, cut down my list of large apples for general planting to Duchess, Wealthy, Peach Apple and Haas; and crabs, to Early Strawberry, Orange, Beech's Sweet, Minnesota and Transcendent. Quaker Beauty, Maiden's Blush and Meader's Winter stand pretty well, but I am afraid of them. I think we should be very cautious in adding to the list of apples to be sold for general planting.

Small Fruits.

The past season was favorable for strawberries, currants and gooseberries, but not favorable for raspberries, either red or black. I grow Doo-little black cap and Philadelphia red.

Blight.

I have had no blight in my nursery nor have I seen any in this part of the State, with a single exception. This was a Transcendent, in Forest City, three years since.

Borer.

The "borer" is doing bad work in some places. Near Kingston some very large trees were entirely ruined by them. Nothing was done to stop their ravages. In fact, I do not think the owner knew what the trouble was. We must fight everything of this kind from the start.

Very respectfully,

G. W. FULLER.

Horticulture in Winona County.

The report of W. K. Bates on Horticulture in Winona county was then read by the Secretary, and ordered by the Society to be published in the Transactions. It was as follows :

REPORT ON CONDITION AND PROSPECTS OF HORTICULTURE IN WINONA CO.

C. Y. Lacy, Secretary State Horticultural Society :

As the programme for the meeting to be held at Winona, January 18th, 1876, came to hand last evening, I will try to dot a few lines on the prospects for fruit for this, our centennial year.

Prospects.

From my own observations and inquiries, I think our county will have a very large crop of apples as well as small fruits. The last season proved to be a very good one for small fruits, but a limited crop of apples. But the raspberry crop was cut short by the dry, warm weather coming on just as the crop was being gathered.

Varieties.

Of raspberries, the Davidson Thornless proved itself to be a number one fruit both in quality, quantity, hardiness and being early—the first berry to get ripe. The standby of course, in strawberries in our county has been the Wilson Albany, but its days for the supremacy are about gone, I think, in Minnesota at least.

Hart's Seedling.

As our good horticultural friend and neighbor, Mr. John Hart, of Stockton, has succeeded in raising a strawberry from the seed that can be justly designated as the coming strawberry.

A strawberry we long have sought,
And mourned because we found it not.

It will be found to be all that is desired and will be a great acquisition to our list of choice fruits. To insure better crops of small fruits I think we must mulch with rotten straw, so that in case we do have dry weather just as the fruit is getting ripe the mulch will keep the ground cool and damp.

Grapes.

The last season was an unfavorable one for the grape, the fruit being tardy in getting ripe. I like the Concord best, with the addition of the Delaware, Janesville and Martha. I tried the Concord, Chasselas and White Delaware, but they both proved tender.

Pears.

Under Thursday's discussions I see that the pear comes in. I have the Flemish Beauty; also two kinds that I got of Mr. H. B. Waterman, of Minnesota City. The two kinds seem to be very hardy, the trees being some six inches in diameter, and some 20 to 25 feet high. They stand in a sort of sandy black loam, or rather creek-wash land—near the creek. The trees came from Michigan, I believe, but cannot say what kinds they are.

Faith in the Future.

I have faith that on some soils, with the land being high, sloping to east or northeast, that we may succeed with the pear. I am a believer, also, that we shall, at no distant day, raise plenty of the apple. As I heard a man say the other day, when he had to pay \$2.00 for a half bushel of apples, as he had the day before, he thought it time to commence to raise his own; and I think as much, when we can raise such as Duchess, Wealthy, Fameuse, Tetofsky, Haas, Price's Sweet, and our larger list of Transcendents, Oranges, General Grants, Hyslops, and others too numerous to mention, as we have in the past and can in the future. What if we did lose some trees in '72 and '73? did we not lose the corn crop in '74? and who of us will say "I shall stop planting corn," because the season failed to ripen the crop? But if the seasons kill the apple tree, the key note is then that Minnesota is not the place for fruit growing; while at the same time, if any of the other crops are hurt, it is soon forgotten. I, for one, shall still *keep planting*, and in time shall reap the reward.

Yours,

W. K. BATES.

ANNUAL ADDRESS.

President Smith then read his annual address, at the conclusion of which there was applause.

The address was accepted and a copy requested for publication.

The following is the address in full:

PRESIDENT'S ADDRESS.

Gentlemen of the Minnesota State Horticultural Society:

Our Purposes.

We have met again to compare notes and consult each other on our experience and experiments of the past year with its successes and

failures, its fruits and flowers. Now the question naturally arises, what have we new to offer, and what have we learned in the past year that will add to our horticultural knowledge, and be of lasting benefit to ourselves as individuals, and to our Society, or the future welfare of Minnesota. This is the great question of to-day and for this meeting to discuss, and if possible, after a full comparing of notes and experiences with the different fruits, flowers and vegetables, and different soils and modes of cultivation to answer by selecting the best, so that all may gain some knowledge or get some hints that may be of use to ourselves as well as others in the future. It is for this purpose that we meet here to-day, and it is for this purpose that the Legislature of the State of Minnesota have published two thousand copies of our Transactions from year to year, so that our experience, our success and our failures, and our experiments may be made known to the public and not forgotten by ourselves. Consequently you do not come here to listen to lengthy addresses or flowry speeches. If you have any such expectation you will be sadly disappointed if you expect anything of the kind from me. I do not propose to take up your valuable time in that way, but to throw out a few hints in regard to our Society and our calling, both of which I hold to be not only of great importance to ourselves, but also to our State, and to those who shall occupy our places long after we are called to other, and may I not hope, better spheres, by the Great Author of our being and

Our Calling,

for, as I have before remarked to you in a former address, the Almighty planted the first garden, and planted man therein to tend and take care of it; so that we can see ours is not only the most ancient, but the most exalted and honorable of all occupations man can perform. God not only planted the first garden, but has by His sunshine and showers warmed and watered all that have ever since been planted. Now when we give this a serious thought, and that God is on our side, who shall prevail against us? And when we take into consideration that fruit is the only food that is prepared by nature ready to be consumed by the human family, who can doubt but that horticulture is not only the first but best employment of men. And is it not a duty as well as a pleasure to do all in our power, both as individuals and as a Society, to improve and advance horticulture in all its branches?

That advanced horticulture tends to elevate and enlighten, and

bring to a higher state of civilization, to give more and purer enjoyments than any other science or occupation, none can deny, that have sought its enjoyments or witnessed its effects upon others.

Flowers.

Flowers are admired and sought by all, from the cradle to the grave. There is a demand for them everywhere, in all enlightened nations. The higher and better the standing of the city or nation, the greater the demand for flowers and other horticultural products.

Even in drinking saloons they are used to attract the passer by, and to in some manner add or lend a respectability to their calling. The wild and untutored savage will stop to look and admire them. They adorn the wedding feasts. They are occupants of the sick room and hospital. They grace the pulpit and parlor alike, and go with us to the house of mourning, to render our sorrows less keen. They are everywhere present and everywhere welcome, where the skill of the florist or the possibilities of nature will permit their growth; and who can say that we are not the better and more elevated for them, in every sense of the word; that life is not purer, our joys more, and our sorrows less, for having an abundance of flowers. Then let us add to and encourage their culture by every honorable means within our power, until each and every home and school-house in our land shall have its shade trees and flower garden, and until our cemeteries shall each and all be furnished or planted not only with shade and ornamental trees and shrubs, but also with an abundance of the choicest flowers our soil and climate can produce.

Fruits and Vegetables.

Now, what has been said of flowers, is equally true of fruits and vegetables. But they appeal to us in a different form. They appeal to our palates, our health, and last, but not least, our wealth. Our fruits, even at the present time, amount to quite a sum in dollars and cents, not only to those who grow them, but in saving and keeping money in our State, whereby all are benefited. And when this Society, or some other or individual members thereof shall have solved the great problem of what kinds of fruits will withstand the severity of our cold, dry climate, and what is best adapted to our soils, and what is the best method of cultivation, horticulture will not then stand in the background, and horticul-

tural products will form no small share of our commerce and our food.

Be Cautious.

Now, to aid in bringing about this good time is what we are here for, and in order that we may accomplish this in the shortest possible time let us go slow. Be careful what we recommend for general cultivation until well tried in different soils and locations, believing that such a course will tend not only to advance horticulture and fruit-growing, but give the public confidence and show them that we at least have no axes to grind and no rings to support.

Agricultural Society.

To the officers and members of our State Agricultural Society let us one and all return our thanks for the very satisfactory and liberal manner in which, under their many difficulties and extreme bad weather, during not only the week of State Fair, but the whole fall of 1875, that tended to make the State Fair a failure, paid not only our premiums, and fulfilled their obligations not only to this Society and its members, but to all others. It is true that they were not able to pay the old premiums of 1874; but as I said last year, let us take hold with a will and do our level best to make the State Fair of 1876 a great success in every way that we, as horticulturists, can add to the attractions, and to furnish the very best display of fruits and flowers, and other products, ever made in the State of Minnesota, and thus enable them to pay all premiums and expenses, and to pay our old premiums; for I believe all that stands in the way of our getting our premiums, as the State Agricultural Society is now organized and officered, is their ability to do so. I do not think they will keep us out of our money long after one successful State Fair. Give them all the support we can, and good weather during one State Fair, or two at most, and they will not only have the means, but disposition, to pay all to the last cent, and will most cheerfully do so.

Obituary.

And here let me remark, our late Secretary, L. M. Ford, Esq., last winter was appointed to prepare obituaries of deceased persons, and in our Transactions has published three of men that I think never were members of our Society, and to which I have no

objection ; but that he should fail to notice the death of Capt. Wm. Paist, late Secretary of the State Agricultural Society and State Grange, and one of the members and incorporators, and warmest friends of this Horticultural Society, and one by whose aid and labors the State Agricultural Society first recognized this Society and its members, and was willing to give us a place and voice in its deliberations, and anything like a share in its premiums, should have been passed by in silence, looks strange to me, and I think demands attention at your hands.

1875.

The year 1875 was not a bountiful one to the horticulturists of Minnesota. Generally the fore part of the season was dry, especially during the fruiting season of raspberries, and the latter part, during the ripening of grapes, cold and wet. So they did not ripen well. In stating my own experience and conclusions, perhaps it may induce others to do the same, and thereby compare and learn something for the future. First, asparagus was a good or extra crop, best I ever raised ; but prices so low it did not pay. Straw berries, only small quantity cultivated, medium crop. Raspberries not over 1-10 of crop ; cause of failure, I think, manner of hoeing and want of mulching, together with drought at time of fruiting. Grapes, well loaded, but did not ripen well ; still I had a fair crop, over six thousand pounds ripe grapes. But last year's experience teaches me that to grow grapes and have them ripen in this northern climate every year, we cannot cultivate too well, and keep too free from weeds. I believe had I put double the amount of labor upon my grapes, judiciously expended, in the early part of the season, I would have made more than double the money. And here let me remark, do not fruit growers, especially growers of small fruits, cultivate too much land for the labor they have to bestow? Would not better cultivation be more profitable?

State University.

Our State University is now doing something to aid and assist us, and can we not soon look to them for assistance in this vexed question of entomology as well as pomology, botany and other sciences that will aid horticulture. Whoever visited that institution five or six years ago and last season will see a marked improvement in the right direction, and cannot this Society make arrangements to hold our annual summer meeting at the University, and thereby gain a

constant knowledge of what is going on and what improvements are being made, and by our presence show them that we take an interest in their success, and also show them by our displays what we are doing as individuals and as a Society.

Progress.

Can any one look back 25 years and see the prospects of fruit culture as I then saw them in Minnesota, and look at the crops of small and large fruits and vegetables of 1870 to 1875, and say that even in Minnesota we have made no progress? I think not, and have we not something to encourage us to move on and make an extra effort to make more improvement in the next 25 years than we did in the last, and shall we not, as a Society, make an effort through our able and efficient Secretary, together with our incoming President, to make a display of our horticultural products next September at the reunion of the American Pomological Society in Philadelphia, that will be a credit to our State, our Society and to ourselves individually. In conclusion, let me return my heartfelt thanks for the kindness and courtesy you have shown me as well as honors conferred by three times electing me your President, and hoping you will forgive and forget my short comings, and believe me as ever devoted to Minnesota horticulture and the interest and advancement of the Minnesota State Horticultural Society. While I surrender my office to other and abler hands soon to occupy it, I remain as firmly devoted to the interest of the Society as ever, and that I may still be of some advantage and in some manner help the cause, will ever be my prayer while life shall last.

DISCUSSION.

Mr. Harris:—On behalf of the State Agricultural Society, I tender thanks for the encouragement and assistance received from the Horticultural Society the past year. But for it we should not have been able to meet our difficulties and to succeed as well as we did.

Summer Meeting.

Am in favor of the State University for holding a summer meeting. There is a place to keep and to show fruits and other products. The State has made great progress in horticulture. There were

only twelve men at the first meeting. We shall yet command the respect of the Union.

In Memoriam.

Mr. Elliot offered the following resolution :

WHEREAS, Our Secretary for 1874, from oversight or neglect, did not furnish in our last year's Transactions, an obituary notice of our late worthy brother horticulturist, Capt. Wm. Paist; therefore

Resolved, That an obituary notice be prepared for publication in our Transactions for the coming year by J. W. McClung, of St. Paul, and that Mrs. William Paist is hereby elected a life member of this Society, entitled to all the rights and privileges pertaining thereto, including a copy of the Transactions annually.

The resolution was adopted.

Floriculture.

The Secretary attempted to read a report on Floriculture, by Mr. J. E. Booth, of Minneapolis, but owing to the difficulty of reading some of the specific terms, he asked and was granted leave to finish the paper at another time. The following is the report in full :

FLORICULTURE.

MR. PRESIDENT :—The love of flowers is almost universal; but, though it is so general, I find that very few people have the patience to try to cultivate them, and, of those who make the attempt, there are very few who succeed. Most, after repeated trials, and as many failures, give up in despair. Some few, indeed, of the unsuccessful ones, are content to go on year after year, making repeated failures, and yet persevering in spite of all. But those who succeed, and those who persevere despite their non-success, are very few as compared with the larger number, who, having met with nothing but disappointment, become discouraged, and give up the attempt in disgust; being content, either to do without flowers altogether, or to buy them, if wanted for any particular occasion. I might say a great deal in praise of the cultivation of flowers, and its refining influence; showing how it adds to the beauty and pleasures of home, improving the mind and expanding the ideas of the cultivator; but I take it *we* are all agreed on that point, so I will not say much about this. My object is to point out some of the causes of failure, and to show how it may be best avoided, confining my remarks almost entirely to that department of floriculture which comes under the head of window-gardening—I will merely observe, that plants and flowers are the cheapest ornaments and decorations we can have in our homes. Whether they be the shanty of the poor, the mansion of the rich,

or the dwellings of that numerous class between those two extremes—they never clash with the richest surroundings, or look out of place amidst the most elegant and costly appointments. On the other hand, they give an air of elegance and refinement to the poorest abode, without making the furniture look shabby by contrast, even though it be of the roughest and scantiest description. Of one thing we may be assured, that where we find flowers in any abode, whether of rich or poor, there we shall find cleanliness, and a natural refinement which prompts to the making of home comfortable and attractive. Perhaps it would be in vain to look for plants in the homes of our laboring classes during the winter; and, indeed, it would not be fair to expect it, on account of the impossibility of excluding the frost, without keeping up a fire at night—an expense which their means will not warrant them in incurring. But there are numbers more fortunately circumstanced, who, having houses thoroughly warmed both day and night, would run no risk of having their plants frozen.

Window-Gardening.

Window gardening is especially and emphatically the province of the ladies, and is one of their rights which none will dispute, or attempt to debar them from exercising. What a relaxation they would find it, to turn from the worries and cares of their household duties—from the “*res augusta domi*”—to their plants; and I may say that the satisfaction to be derived from their cultivation, would be in proportion to the judicious care and attention bestowed upon them. Though it not infrequently happens that, in spite of all the care and attention lavished upon them, the plants, after doing well for a time, go back on their cultivation, and die. But with proper care and judicious attention, barring accidents, success is nearly certain; and my object is to show some of the causes of these disappointments, and point out how they may be avoided. In the cultivation of pot plants several points should be observed. First in importance comes *watering*, on the proper performance of which, perhaps, more than on anything else, the health and prosperity of the plants depends, and from want of a proper appreciation of which fact arise most of the failures which amateurs incur. In the great majority of cases where plants are not healthy and thriving, the cause lies here: either they over-water, or they do not water sufficiently. Many people keep their plants standing in saucers full of water, by which means the soil gets completely saturated, and turns sour; the plant consequently becomes unhealthy, and loses its leaves. Soon the plant dies, much to the surprise of the owner, who cannot think what could have ailed it, little imagining that it was her mistaken kindness that did the mischief. Pots often dry out on the surface, while the soil is sufficiently moist below, and to water while in this condition only does harm. This surface drying often happens in warm rooms. The best way to ascertain when a plant requires water is to rap the pot with the knuckles. If it gives a hollow sound, water is required; but if the sound be dull, the plant is wet enough. In some instances, as when pots have become very full of roots, they will not sound, when struck, even though the soil be dry. When this is suspected, lift the pot with the hand, and judge from the weight. On the other hand, plants

often suffer from being kept too dry, either from not being watered often enough, or not getting sufficient water to reach all the roots. When such cases occur, the only plan to save the plants is to immerse the pots in a pail of water, and keep them there till the bubbling ceases. This will insure that the water reaches all the roots. They should then be taken out, and afterwards watered in the usual way, as required. The soil in the pots of plants exposed to the full blaze of the sun often get thoroughly dry and hot, and when this occurs, the plants should be plunged in water till the soil is thoroughly saturated. It is useless to water them in the usual way, as the water only runs down the sides of the pots, without getting to the roots, and the soil in a short time becomes as dry as before. Again I say, be careful with the watering.

Soils and Potting.

The health of plants also depends a good deal on the quality of the soil, on the drainage, and on the size of the pots used. If the pot be too large the soil is liable to sour before the roots reach the pot sides, and the plant suffers in consequence. In shifting plants they should be put in pots one size larger. Soft-wooded plants require re-potting oftener than hard-wooded plants, as their root-growth is more rapid. For drainage of such plants a piece of a broken pot over the hole in the pot bottom will be sufficient. For a larger plant more drainage is required. In potting plants the pots should not be filled within half an inch of the top for small pots, or an inch for large ones, so as to have plenty of room for water. Some people fill up to the rim, but when this is done the water runs over the sides of the pot instead of getting to the roots. All newly-potted plants should be kept from the wind and sun till the roots get hold of the soil. About the best compost for soft-wooded plants consists of three parts of good loam, a little well rotted manure and some leaf mould, with a little sand, well mixed together. For hard-wooded plants a mixture of good loam and peat. Plants should be shaded from the sun on hot days, and frequently syringed to clean their leaves from dust, but this must not be done when the sun shines on them. I will now give a list of plants most suitable for pot culture. For summer I would recommend geraniums, Zonale, Bicolor, Tricolor, Bronze; and the various sorts of scented geraniums, such as Rose, Nutmeg, Lemon, Cinnamon, Apple, &c. Fuchsias—*Light, single*, Madame Correllison, White Lady Schiller (the best,) Diadem; *Dark Single*, Elm City; Pure White Arabella.

These I consider the best. There are many newer ones, but they have not been sufficiently long before the public to warrant me in recommending them: Lillies, Alba, Lancifolium, Rubrum; lobelias; mignonette, planted in boxes and thinned out; Tradescantia; myrtles, English ivy, German ivy, smilax; Lycopodiums. For winter and spring the same except fuchsias.

Bulbs.

For winter and spring the various kinds of bulbs, as hyacinths, tulips, crocuses, &c., may be grown to advantage and make a fine show. Hy-

cinths I would especially recommend, for the ease with which they may be grown and for the beauty and fragrance of the flowers. They may be raised either in pots or glasses. For glasses the single varieties are the best. Colored glasses are preferable, as the roots do not like a strong light. Fill the glasses with clean rain water so that the base of the bulb but just touches the water. A few pieces of charcoal in each glass will keep the water pure. The glasses should be put in a dark frost-proof place, such as a cellar, till they are nearly filled with roots before the bulbs make any top growth. On this point the production of fine flower-spikes depends. The glasses may then be removed to the living room, keeping them near the light, but avoiding strong sunshine and a dry scorching atmosphere. As the water in the glasses evaporates, they should be filled up with water of the same temperature as the room. Hyacinths may also be grown in pots. For this purpose a rich light soil is necessary. A good compost may be made of two parts sandy loam to one part well rotted manure and sand. In planting, the soil should be pressed firmly in the pot, leaving the crown of the bulb uncovered. A single bulb may be planted in a four-inch pot, or three bulbs in a six-inch pot give a fine effect. After planting, the pots should be watered and then set away in a cool, dry place and covered with sand, ashes, or sawdust, about six to eight inches deep, till the pots get filled with roots. They may then be brought out to the light, but if the flower buds are forward and of a pale color they should be shaded till they assume their natural color, when the full light may be admitted; but here, as with glasses, strong sunshine and dry, hot air must be avoided. They will require a good deal of water. The bulbs should be planted from September to the last of November or beginning of December for a succession. Tulips may also be grown in pots, treating them in the same manner as hyacinths. I believe these are all the essentials of successful window-gardening.

J. E. BOOTH,
Minneapolis Greenhouse,
Minneapolis, Minnesota.

Raspberries.

Mr. Grimes then read his paper on the propagation, cultivation and varieties of the raspberry. It commanded general and close attention, and at the close was ordered published in the Transactions. It is as follows:

PROPAGATION, CULTIVATION AND VARIETIES OF THE RASPBERRY.

Mr. President and Gentlemen of the State Horticultural Society:

It cannot be denied that our climate is a rigid one, especially for the fruit grower, who must be possessed of a degree of intelligence and perseverance not absolutely necessary in a more congenial climate.

With us, success is the exception, and it is only by repeated experiments and trials. We wait and watch, standing, as it were, on the balance

between hope and despair, while some favorite pet of ours is undergoing the ordeal that must determine its value or worthlessness. No wonder some have gone back, after repeated failures, and left the field and the reward for them that know not what failure is. By such, progress has been made, horticultural science advanced; old varieties of fruits have been tested and brought out, new varieties introduced and disseminated, suited to the soil and climate of Minnesota.

In the list of fruits none stand higher, with us, than that class generally denominated small fruits, of which the grape, currant, gooseberry, raspberry, and strawberry are the most prominent. Of these none perhaps are more certain, or yield a better return for the labor required in their cultivation, than the raspberry, the subject assigned me for my present essay. First—

Varieties.

The foreign Red Raspberry (*Rubus Idaeus*) has been long tried in the Eastern States, but it has been found that there are few localities where its cultivation has been attended with good results. The Red Antwerp is a type of this class, and if the fruit could be grown here with any degree of certainty, it possesses all the good qualities which one would expect to find in the raspberry.

Our native Reds (*Rubus strigosus*) are more hardy, some varieties entirely so, but like their foreign cousins, throw up such an abundance of suckers, that where once introduced, seem determined to remain, whether you want them or not. The Turner and Clark are perhaps the best of this class.

There is also a sub or hybrid class, derived from crossing the foreign with our native red, but I have failed to notice any marked improvement in them.

We proceed to notice the black cap family (*Rubus occidentalis*) an entirely different class from the others, producing no suckers, but propagating only from the tips. Now it is well known that this species is not only hardy and prolific, but produces abundantly without extra care in cultivation, and will succeed in a greater variety of soils, and over a wider range of country than any other. It is, in all respects, says a horticultural friend, a first rate berry, except in one, it isn't good to eat. It is, however, an excellent berry to raise, and it is good to give away, at a reasonable price. It stands pre-eminent in the same relation as the Wilson among strawberries, or the Concord among grapes.

There are some thirty or more varieties of the black raspberries in cultivation, but the difference between most of them is very slight indeed, so much so, that when you select some half dozen, you have all the qualities included in the whole list.

The Doolittle is the one best known, and has been the market raspberry for more than ten years. It is an early variety, carries well, and is in all respects one of the most profitable.

Davison's Thornless will ripen a few berries a little earlier, but is not so productive as the Doolittle; its chief recommendation, "it don't scratch."

The Seneca is from a week to ten days later than the Doolittle, equally

productive, is less seedy, more juicy, better in quality, and carries well to market. In fact, it is one of the very best of the black caps.

The Miami, or Mammoth Cluster, as it has been rechristened, is the latest, as well as the largest of all the cap varieties, but the fruit is coarse, dry, sour, and seedy; even the birds do not seem to relish them, after eating better sorts. They are only palatable when well sugared up. The canes grow very stout, and generally winter-kill to the snow line in this latitude.

The Garden raspberry is a variation from the blacks, in that the fruit is purple, with more of the flavor of the reds. It is a valuable berry for family use, but too soft to carry well to market. The canes are perfectly hardy.

There are also yellow caps, but the fruit is inferior to the black, and can be recommended only for variety.

There are also new red fruited sorts of this class being brought into notice, and I think we may soon look for a berry combining all the good qualities of the red, with the habit of growth and hardiness of the black.

Perhaps it would be proper in this connection to notice certain varieties called ever-bearing, which are said to produce a full crop early in the season, and afterwards upon the tips of the new growth of wood to produce fruit ripening at intervals until the close. In this we have too much of a good thing. I have sometimes during the fall season found ripe fruit enough for a taste, but nothing for the market or the table.

Varieties to Plant and time of Planting.

One of the most puzzling things to a beginner is to make a good selection of varieties, and the more he consults standard authorities, the worse is the confusion, and even when his inquiries are directed to some nurseryman or fruitgrower, the chances are that some special pet of his, of which the inquirer has never heard, comes recommended as being superior to every thing of the kind, and the wonder and admiration of all who have seen it. Of course it is held at a high price, but who cares for that, when we are getting something better than can be found in our neighbor's grounds, and likely to supercede everything of the kind?

While I would not discourage the planting of new varieties for experiment, I say touch lightly until they have been more fully tried. Better follow in the old channel, if you can realize from \$200 to \$500 per acre for your crop, than risk your chances on something new, even though it promises double that return.

The black caps thrive well everywhere, and in their wonderful natural habit of adaptation to all soils and climates, they are a perfect blessing to both grower and consumer. The Doolittle and Seneca will be quite sufficient for those beginners, who cannot afford the high prices for new and untried sorts. Of the red raspberries, public opinion seems to point out the Philadelphia as the surest to grow.

The raspberry may be planted out with good success, either in the fall or spring, but I prefer the latter, as the ground is always moist at the time, and if the plants have been handled with care, so as not to expose the fibrous roots to the drying winds, are very sure to grow. I have planted

at various times, from the middle of April to the middle of June, when the plants had made growth of a foot or more, with equal success; indeed, I prefer to have them well started if they can be removed in a moist time, with some dirt attached to the roots.

Soil and Location.

The raspberry cannot be grown successfully in any place under the sun, without a good, rich, moist soil, such as you would select to grow a premium crop of corn or potatoes, and if those requisites are wanting they can only be remedied by abundant manuring, frequent cultivation, and deepening of the soil. Moisture is a partial fertilizer, but low moist grounds are to be avoided, as producing too much wood of a weak succulent growth, which is sure to winter kill.

The best location that can be found for a raspberry plantation is high, level lands, sheltered well from the cold, sweeping winter winds. Many trees and plants exposed to the full sweep of the winds and sunshine of winter, perish, that otherwise would have been perfectly hardy. The next best location and one that will ripen the fruit a little earlier is an eastern or southern slope, and if there should be a lack of moisture in the soil it may be remedied by mulching.

Cultivation and Protection.

Good cultivation consists in keeping the soil mellow and free from weeds; and no crop will give better returns for a little extra labor and care. The plow should be started early in the season, followed by the cultivator at frequent intervals, until the fruit is about half grown, when mulching may take its place. Perhaps no part of the culture of this fruit is so important, and has so great an influence on the success of the crop, as a careful mulching. It should be applied invariably during the fruiting season. It can afterwards be removed, the ground carefully cultivated, and then replaced for fall or winter protection.

Pruning may be considered a part of the cultivation necessary in the management of a black cap plantation. The young canes should be shortened in just previous to the ripening of the fruit; this removes them out of the way of the pickers, and checks their rambling growth by causing the plant to branch out and grow more stocky, thus making it stronger to sustain itself and its load of fruit. It also stands the winter better, being nearer the ground.

After the fruiting season is over, the old canes should be removed, as they are then entirely worthless, and tend to check the growth of the new. If the work has all been properly done the rows of plants at the end of the growing season will present a broad top bending over toward the ground; and now a little dry straw placed on top of the rows, just enough to shade the plants from the sun, will bring them through the winter all safe.

Marketing, &c.

I am not going to load down your ships for the market, nor guarantee a

\$1,000 an acre for the crop, as some fruit growers have claimed, and perhaps have succeeded in some instances to obtain; but if you are near a good market, and attend to the handling and marketing of the fruit yourself, there is no crop that will pay better. The fruit should be picked as it ripens, for if left on the vines too long it becomes too soft to handle. The better way is to divide the plat in two equal parts, (as the fruit ripens in succession) and go over one part each day, picking all the ripe berries clean as you go. Never use buckets or tubs for gathering or carrying, unless you intend the fruit for jam.

For marketing, pint baskets are preferable to quarts, and a flaring basket is better than a straight or upright one, as the weight of the fruit rests more against the sides, and presses less at the bottom. The baskets should be well filled, and the fruit placed upon the market in the best possible condition, as ultimate success depends very much on our reputation for honesty and fair dealing. If near enough to a large city, and you have no more fruit than you can handle, it would be better to select your customers and supply them from day to day, saving the commission of middle men, who frequently absorb all the profits. In engaging in a business of this kind certain conditions are necessary: First, a good market; second, one that is easy of access; and third, quick and cheap transportation, without which no certain calculations could be made, as the business may be overdone, and we should not be able to compete with those having advantages over us.

But there is a market that I have never seen glutted, and the prices are always remunerative; I mean the *home* market. How many of you farmers and mechanics have even a scant supply of those health-giving fruits? and yet how easy it would be for every one owning a few rods of ground, to cultivate enough for family use, not only while fresh, but to can, and preserve, and dry to supply the table the whole year round.

Twenty years ago I came to Minnesota in poor health,—my family's health was poor, but we are all living, and now we have eight children, and since we have had plenty of fruit to supply the table, no physician has entered our door (professionally) in the past eight or nine years; not since our last baby was born.

The Birds.

And now one plea for the birds and I am done. Some persons say that they would plant out more of those small fruits, but the birds always get the largest share. True, if you plant no more than the birds ought to have, for they are co-laborers with yourself, protecting and saving the fruit from devouring insects, while you only do your part in cultivating the crop. Are they not worthy of their hire?

Long before you have left your dreamy couch, they have sung their morning hymn, and gone forth like angels of mercy upon their errand to save, and with microscopic eyes search out and destroy those small insects that are just ready to devour the crop. But man comes sneaking out, creeping, and crawling, and crouching beneath the hedge with murderous gun in hand, brings down the fluttering birds, bleeding and dying, at his feet. What wonder if the earth is cursed for man's sake?

I never miss what fruit the birds take from my grounds, and they are welcome, thrice welcome to the little pittance they claim, and have so nobly earned. I believe the same birds come back to me every year, and seem glad to find the place, for scarce have the snows of winter gone before I hear the familiar greeting song, and then with cheerful hop from branch to branch, and tree to tree, down in the furrows, along the fence, and through the grounds, gathering up the seeds of noxious weeds, and swarms of insects yet in embryo, they still pursue, and watch and work, as with a will, the summer through, asking nothing in return except a little fruit for dessert; just that and nothing more: God clothes them.

J. T. GRIMES.

DISCUSSION.

Mr. Harris:—Feel modest about speaking on this subject. Good fruit is easy to raise, but farmers hardly know how it tastes. If they did they would raise more of it. The Doolittle is the most commonly cultivated, and the black caps are the most profitable. We fruit growers do not wish to monopolize the cultivation of fruits. We want the farmers to grow fruit and the nurserymen will sell them the plants. The Seneca will yet take the place of the Doolittle. Davison's Thornless is hardier than the Doolittle and would cultivate a few for early. Red berries, however, sell better than black in the market.

Mr. Pearce:—I consider the raspberry the most important fruit crop of the State. I cultivate only for family use. (The speaker here described his fruit farm of about half an acre.) I manure with soap factory sediment and this makes them produce wonderfully. Some pines on one side cause the snow to lodge and cover up the vines. Mr. Cook cultivates two rows of corn and two rows of raspberries alternately throughout the field; the cornstocks hold the snow which protects the vines.

Yields.

Mr. Smith:—The best yield I have heard of is that of Mr. Boxell, whose Philadelphia yielded at the rate of 2,800 quarts per acre, and the Kirtland at the rate of 1,600 quarts per acre. He sold at wholesale at an average of about 25 cents per quart. He intends putting out ten acres of raspberries. He grows the Philadelphia, Seneca, Doolittle, Kirtland, and Turner. He is a grower also of onions; sometimes raises 3,000 bushels, but generally about 1,500 bushels.

Mr. Bunnell:—The farmers at large are becoming more interested in setting raspberries. They should be well cultivated in garden

soil and thoroughly mulched in summer. For varieties would plant Davison's Thornless, Doolittle, and Philadelphia.

(Mr. Brand made some remarks which were lost by the Secretary.)

Training.

Mr. Jordan :—Have now about ten acres of raspberries, largely of the Red, Purple Cane or garden variety. Davison's Thornless is not a favorite with me. Have two acres of Philadelphia which have produced half a crop for the last two years. As to training I find a difficulty. If I cut back the branches, the wind blows them about and breaks them, and if I let them grow they trail on the ground.

(Inquiries were made about the Ontario. Some had it but had not fruited it. The Herstine was also inquired about.)

Mr. Sias :—Hoag's seedling is the best I ever tested.

Mr. Hart :—As for the Herstine, have seen them and called them the best I ever tasted. Know of a man who has half an acre of them.

Mr. Tuttle was called for, and finally rose. He remarked in substance as follows :

I see quite a change since I last visited your Society. Then you were recommending fruits found difficult to grow in Wisconsin. Now I perceive more caution. Success will first be reached with hybrids, and finally we will grow the apple in Minnesota and Wisconsin to supply our home demand. The territory of Russia is similar in climate and soil to ours, and as they grow fruit there, so we can here. I have faith in Russia as a source of varieties, and think attention should be turned in that direction.

Blackberries.

Mr. Smith :—(In answer to question.) I have tested nearly everything of promise in the blackberry line, and everything has been a failure. But the trouble is, my soil is too rich to grow blackberries.

Secretary's Report.

The annual report of the Secretary, Chas. Y. Lacy, was then called for and made, and was ordered to be published in the Transactions. It was as follows :

REPORT OF THE SECRETARY.

GENTLEMEN :—I find neither in constitution nor by-laws anything that requires me to report anything more than matters of business interest. Custom may perhaps demand something more—some display of eloquence. Gladly would I conform to both law and custom, but pressing duties have not left me the time to prepare a written report of the most ordinary things. I therefore beg your indulgence while I make a verbal report of such matters as may be of interest and not already generally known.

A meeting of the Executive Committee was held March 24th, 1875, when it was decided to hold a summer meeting of one day's duration at the State University. It was also decided to offer special apple premiums in the premium list of the State Agricultural Society for 1875, as follows :

Special Apple Premiums.

The Executive Committee of the Minnesota State Horticultural Society pledge said Society to the payment of the following premiums when awarded :

For the best seedling Winter Apple raised in Minnesota.....	\$100 00
For the second best.....	50 00
For the best seedling Autumn Apple raised in Minnesota... ..	30 00
For the second best.....	20 00

Entries for these premiums, naming and describing tree and fruit, to be made by the originators only, on or before January 1st, 1876.

No premium to be awarded until the Autumn Apple shall have been exhibited at the State Fairs, and the Winter Apple at both the State Fairs and Winter Meetings of the State Horticultural Society, for five years; nor until the tree shall have been in bearing in each Congressional district of the State of Minnesota for five years; nor unless the tree shall be as hardy as the Duchess of Oldenburg, and the fruit of good quality.

Entries for special apple premiums must be filed with the Secretary of the State Horticultural Society.

Summer Meeting.

The summer meeting was held June 30th, and though the attendance was small, the meeting was highly interesting and successful. Among other features of interest was a visit to the University Farm, a report of which you have already heard. There was also a very fair display of plants, fruits, flowers and vegetables. It is hoped that these summer meetings will grow in interest and the exhibitions in size with each succeeding year. At this meeting the action of the Executive Committee on special apple premiums was approved, and other business transacted as follows :

A committee consisting of J. S. Harris, D. A. J. Baker, Col. J. H. Stevens and Wm. Fowler, was appointed to report at this meeting on the condition of the University Farm.

A permanent committee on obituaries, consisting of Messrs. Stevens, Loring and Nutting, was appointed.

Messrs. Smith, Harris, Elliot, Jewell and Lacy, were appointed delegates to the meeting of the American Pomological Society.

Col. Stevens, Gen. Nutting, Pres. Smith, of the Horticultural Society, and Pres. Fowler, of the Agricultural Society, were appointed a committee to apply for a room at the State Capital, for the use of the Agricultural and Horticultural Societies, and to be open at all times.

Another meeting of the Executive Committee was held January 6th, when the programme for this meeting was adopted, and 300 copies ordered to be printed and distributed.

Library.

The following books have come into my possession. They are now placed, and will hereafter remain, subject to the order of the Society:

- Transactions Illinois Horticultural Society, vol. 2, 1868.
- Transactions Illinois Horticultural Society, vol. 3, 1869.
- Transactions Illinois Horticultural Society, vol. 4, 1870.
- Transactions Illinois Horticultural Society, vol. 5, 1871.
- Transactions Illinois Horticultural Society, vol. 6, 1872.
- Transactions Illinois Horticultural Society, vol. 7, 1873.
- Transactions Illinois Horticultural Society, vol. 8, 1874.
- Entomology of Missouri, 6th report, 1873.
- Transactions Wisconsin State Horticultural Society, 1872.
- Transactions Wisconsin State Horticultural Society, 1875.
- Pomology of Maine, 1873-4.
- Proceedings Nebraska State Horticultural Society, 1872.
- Transactions Nebraska Horticultural Society, 1871; paper.
- An Address before the Nebraska State Horticultural Society, by James T. Allan; paper.
- Address of Dr. H. Latham, at State Fair of Nebraska, 1872; paper.
- A Speech at Neb. State Fair, 1873, by J. Sterling Morton; paper.
- An Address, The Foes of the Farmers, at Neb. State Fair, 1874, by A. L. Perry; paper.
- New Constitution of Nebraska of 1875; paper.
- Prize Essay on Forest Growing, by J. T. Allan; paper.
- An Address, Farmers' Wives and Daughters, at Neb. State Fair, 1873, by Matilda Fletcher; paper.
- Fruit List for Province of Quebec; paper.
- Address at 15th Session Am. Pomological Soc., 1875, by M. P. Wilder; paper.
- Proceedings First Annual Meeting Minn. Hort. Soc., 1869; paper.
- Rep. Minn. State Hort. Soc., 1866-73.
- Transactions Minn. State Hort. Soc., by John S. Harris; paper.
- Trans. Minn. State Hort. Soc., by L. M. Ford; paper.
- Thirteen volumes in cloth.
- Thirteen volumes in paper.

Expenses.

The expenditures of the Secretary for the past year have been as follows :

For envelopes	\$1 75
“ 25 St. Paul Presses sent to various Agricultural Papers.....	65
“ 25 one cent stamps.....	25
“ Postage on 5 copies Transactions	30
“ Postage on 12 notices.....	36
“ Four hours writing notices.....	80
“ Postage on 17 letters.....	51
“ Postage on 2 Reports.....	17
“ Printed Programmes and Envelopes.	6 50
“ Postage on same.....	1 60
“ Printing R. R. Certificates.....	1 75
	<hr/>
	\$14 64

Respectfully submitted,

CHAS. Y. LACY,
Secretary.

Treasurer's Report.

The annual report of the Treasurer was then read, accepted, and ordered to be published in the Transactions.

Treasurer Minnesota State Horticultural Society :

	<i>Dr.</i>	<i>Cr.</i>
1875.		
Jan. 21st, To balance on hand.....	\$7 33	
Jan. 21st, To membership dues.....	24 00	
	<hr/>	
	31 33	
Jan. 21st, By cash paid out on order of Pres. and Sec'y...		\$23 97
1876.		
Jan. 19th, By balance.....		7 36
		<hr/>
		31 33

The Society then adjourned to 9 o'clock to-morrow morning.

THURSDAY MORNING.

Meeting called to order by the President at 9 : 25.

The election of officers for 1876 was the first business taken up.

The election was by ballot, without nominations, and the following are the results :

For President.

First ballot—

Dartt, 5; Harris, 1; Loring, 2; Smith, 9; Jewell, 3; Elliot, 2. Whole number, 23.

Second ballot—

Dartt, 5; Loring, 1; Smith, 14; Jewell, 3. Whole number, 23

On motion of Mr. Grimes, Truman M. Smith was declared unanimously elected.

For Vice President from First Congressional District.

Dartt, 12; Harris, 3; Buck, 3; Jewell, 2. Whole number, 20.

E. H. S. Dartt was declared elected.

For Vice President from Second District.

Carter, 19; Blank, 1. Whole number, 20.

T. G. Carter was declared elected.

For Vice President from Third District.

Elliot, 11; Grimes, 6; Loring, 4; Blank, 1. Whole number, 22.

Mr. Elliot declined, and, on motion of Mr. Brand, the rules were suspended and the Secretary directed to cast the vote of the Society for Mr. Grimes; which was done, and J. T. Grimes was declared elected.

For Secretary.

Lacy, 20; Harris, 2; Brand, 1. Whole number, 23

Chas. Y. Lacy was declared elected.

For Treasurer.

First ballot—

Elliot, 4; Sias, 9; Stewart, 9; Brand, 1; Harris, 1; Rollins, 1. Whole number, 25.

Second ballot—

Elliot, 2; Stewart, 8; Sias, 13; Rollins, 1. Whole number, 24.

A. W. Sias was declared elected.

Executive Committee.

On motion of Mr. Jordan, the President was empowered to appoint the Executive Committee, and the following were appointed: Norman Buck, Wyman Elliot, P. A. Jewell, O. F. Brand and J. S. Harris, the President and Secretary being members *ex-officio*.

Delegates to Meeting of the State Agricultural Society.

Mr. Jewell moved that the President appoint the delegates. The motion was carried, but afterwards rescinded, and on another motion, Pres. T. M. Smith was appointed chairman of the delegation with power to appoint co-delegates.

The President appointed as co-delegates, E. H. S. Dartt, A. C. Hamilton, Col. J. H. Stevens and Chas. Y. Lacy.

Mr. Dartt declined and, on motion, the delegates were empowered to appoint substitutes.

New Siberians and Hybrids.

The election of officers concluded, Mr. Jewell gave the substance of his paper on Crab-apples and Hybrids verbally, promising to prepare a written paper in time for printing in the Transactions, as ordered by the Society.

The following is the paper :

NEW SIBERIANS AND HYBRIDS.

The peculiarities of the old Siberian sorts are clearly defined, but their improved descendants present no unvarying characteristics of either fruit or tree by which their Siberian parentage can in all cases be determined.

Seven years ago I sent the fruit of the Maiden's Blush crab to F. R. Elliott, of Cleveland, Ohio. In acknowledging its receipt, he expressed the opinion that it was not a crab, and mildly cautioned me against imposing on the public by sending it out as such. And yet this condemned variety was from Siberian seed, and the same lot of seed as a half-dozen other varieties sent him at the same time, the Siberian character of which he did not question. The fruit of the Maiden's Blush does not resemble the old Siberian sorts, except in size. The stem is very short, the texture fine, and the flavor very pleasant. But the tree in texture, ripening of the wood, and glossy appearance of both twigs and foliage, is clearly Siberian. Chase's Winter Sweet, on the contrary, is in tree apparently a common apple and in fruit a crab. As the result of much observation, I conclude that none of the improved Siberians retain all of the characteristics of the old sorts, and that there are few if any that do not either in tree or fruit exhibit some Siberian peculiarities. I must therefore regard it as slightly

presumptuous for any pomologist, however eminent, to attempt to settle positively the relationship of every variety by the fruit alone. After a careful examination of both tree and fruit it may not be possible to determine in every instance whether or not a variety is of Siberian origin. Any tree grown from Siberian seed is known to be either a crab or a hybrid. But it is a mooted question whether the choicest Siberian sorts are improved crabs or a cross between the crab and common apple. If a cross exists it is not the result of careful experiment, but of accident. The circumstantial evidence, however, is strongly in favor of their being hybrids. It is not probable that from the seed of the red and yellow Siberian should spring at once an apple as large as the Small Romanite and much superior to it in flavor, unless the seed from which it was derived united in itself the initial forces of both the *Pyrus baccata* and *Pyrus malus*, for gradual, rather than abrupt improvement is the order of nature. The greatly modified character of both tree and fruit, and the strong resemblance they sustain to the common apple and the crab, justifies the inference that they are of mixed parentage, and should be regarded as hybrids rather than crabs. But as it is not certainly known that any of the Siberians are hybrids, I shall not attempt to draw a line between Siberians proper and hybrids, or indicate to which of these supposed classes any particular variety belongs, but shall treat them all under the common head of improved Siberian sorts. It is not my purpose to describe in detail each variety that may be worthy of cultivation, for several of them were thus described two years since, but to compare them with the old Siberian sorts and the common apples, with the view of determining their respective value for planting in our State.

The great objection to the common apple is its lack of hardiness. Since the winter of 1872 and '73 our Society has recommended but three varieties for general cultivation, Tetofsky, Duchess, and Wealthy. Even these approved varieties are looked upon by those most familiar with the result of the experiments at orchard making in different portions of the State, as unreliable in many situations. This admission may touch our State pride unpleasantly, but it is always best to look the situation squarely in the face while we hope and labor for better things. By planting the seeds of the most hardy sorts, we may and probably shall have at some future day kinds that can be set with safety and profit on every quarter section.

We are not dealing with the more or less remote future, but with the present. To-day every farm needs an orchard. How can it be made? The most thoroughly iron-clad of our apples are not to be relied on in all situations. The Siberian, Transcendent and Hyslop crabs afford fruit fit only for culinary uses, and the trees are often sadly injured by blight. For an immediate and satisfactory solution of this important question we must look to the improved Siberian varieties. In the worst situations they are the sole reliance, and in more favorable situations they are still worthy of a prominent place, for the reason that they combine to a large extent the excellencies of both the crab and the common apple. They are perfectly hardy and free from fire-blight; early and abundant bearers, and the fruit equal in quality to the common apple. It is not every variety included in the list recommended by this Society that possesses such a fortunate combination of qualities. For the excellence and defects of the different kinds,

I refer you to the article prepared at the request of the Society two years since. There are some varieties not included in the list, to which I invite the attention of the Society as worthy of cultivation: Whitney's No. 20, a September fruit of large size and fine quality. Blushing Maid, hardy; fruit large and handsome; season, autumn. Orion, an early and free bearer, fruit quite large, handsome and of fine quality; season, October to January. Honest John, a strong growing tree and profuse bearer, large size, quality good; season, October to February.

There are several seedlings originated by Peter M. Gideon, quite remarkable for beauty, and some of them pleasant for eating. They are all fall varieties. I have on my own ground eight or ten seedlings of promise, but cannot speak with assurance of their value until they have had further trial. The extent to which the common apple can be planted with safety can be considerably enlarged by top-working the more hardy kinds on the Siberians. This process of making orchard trees is somewhat expensive, but it enables us to grow valuable varieties that otherwise we would be compelled to discard. I have tried the Red Siberian, Transcendent and Hyslop for this purpose, and the result with most varieties has been quite satisfactory. In a few instances the union of the scion with the crab stock was imperfect, and occasionally an instance has occurred of the Hyslop and Siberian body being killed by blight. I would recommend the Early Strawberry and Quaker Beauty as being quite as well adapted to top-working as any of the crabs.

Sufficient attention has not been given to the roots of orchard trees. The fall of snow in our State is less than in the States farther East. Not unfrequently for several weeks the ground is entirely bare, the cold intense and protracted. Unless the orchards are heavily mulched in the fall, the roots of the trees are apt to be killed. As usually, mulching is attended with considerable expense, and from the pressure of work, liable to be neglected, it is desirable that our trees should have roots of such a hardy nature as to make mulching quite unnecessary. The most certain method of securing this result is to root the tree from the scion. With this object in view, in grafting, a long scion and a short root should be used. When the tree is transplanted to the orchard, it should be set eight to twelve inches deeper than it stood in the nursery, according to the nature of the soil. Before planting, two upward incisions should be made near the roots of the tree, cutting through the bark and slightly into the wood, forming a tongue one-half of an inch to an inch in length. At the point where the incision is made new roots will be formed of the same character as the top of the tree. Thus we shall have in every instance each variety on its own roots. If the top is iron-clad the root will be equally so. In other words, our trees will be iron-clad at both ends, and mulching can be dispensed with without risk of injury to the roots of our trees, however severe the winter may be.

Summing up in a few words the practical lessons included in what I have said:

The Tetofsky, Duchess and Wealthy should be planted in most situations, and if top-worked on the crab, may be planted successfully everywhere. Several other varieties less hardy, valuable for their productiveness and quality of fruit, if top-worked may be planted quite extensively.

The improved Siberians are worthy of a place in every orchard, and in many situations must constitute the main reliance for some years to come. Whatever varieties are planted the precaution should be taken to have them on hardy roots.

If these suggestions are faithfully carried out, the farmers of Minnesota will soon find that it is both cheaper and more pleasant to raise fruit on their own grounds than to grow wheat and buy it.

P. A. JEWELL.

After the paper was read the following discussion was had:

Hyslop and Transcendent.

Mr. Tuttle:—Three years ago I shipped Transcendents to Chicago, where they brought \$5.00 per barrel. Last year and year before they brought \$3.50 to \$4.50. I sent Hyslops also, and these brought \$8.00 when the Transcendents brought \$5.00, but they came after other kinds, when the Transcendent was gone from the market. Still the Hyslop will bring more than other kinds under the same circumstances. Showy apples sell best.

Mr. Smith:—The Hyslop brings 50 cents to one dollar per bushel more in the St. Paul market than the Transcendent.

Mr. Elliot:—The Hyslop markets in better condition, while the Transcendent bruises and shows bruises badly. The price of the latter varies with the condition. Transcendents brought in by farmers last season sold for 50 cents per bushel, while those marketed with care and in good order sold for \$1.50.

Mr. Jewell:—If I could have but one variety, and that the Transcendent or Hyslop, would take the Hyslop, for the fruit keeps longer.

It is a slow-growing tree, and hence not extensively propagated, because nurserymen want to get a tree in the shortest possible time. Threw away the Badger State because of its slow growth.

Early Strawberry.

Mr. Brand moved to recommend the Early Strawberry for general cultivation.

Mr. Sias:—It is sufficiently hardy.

Mr. Jewell:—It has succeeded finely in Litchfield. It is everywhere the finest tree in the orchard, and quite productive.

Mr. Harris mentioned one tree dead from blight.

Mr. Jewell:—The first propagated were grafted on Siberian Crabs, and many of these failed.

Last Year's List.

The President read the action of the Society on crabs last year. Mr. Dartt moved that the action be reaffirmed, which was seconded.

Mr. Harris :—Meader's Winter is very fruitful, but blights.

Mr. Hart :—Think the list is too long, as it will be confusing to farmers.

The motion was carried, with the amendment that the General Grant be stated least hardy on the list.

The latest action of the Society on crab apples stands therefore thus :

Recommended for general trial :

Early strawberry.

Orange. (Unanimous vote.)

Beecher's Sweet.

Minnesota. (Seven for, none against.)

Conical.

Quaker Beauty.

Maiden's Blush.

Woodlawn Red. (Tie vote, 3 for and 3 against.)

Recommended for general trial for favorable localities :

Aiken's Striped Winter. (Five for, none against.)

Recommended for general trial in localities not subject to blight :

Meader's Winter. (Four for and three against.)

General Grant.

General Grant is the least hardy of the list.

Recommended for planting in small quantities :

Hyslop. (Ten for, three against.)

Soulard. (Six for, three against.)

Recommended for general planting for those not afraid of blight :

Transcendent. (Fourteen for, one against.)

Passed over without action :

Hutchinson's Sweet.

Hesper Blush.

Aiken's Green Winter.

Apples.

The list of apples adopted last year was read.

Saxton.

Mr. Dartt:—I move that the action of last year on apples be reaffirmed. Would not, however, vote so strongly for the Saxton as I did last year.

The motion was seconded.

Mr. Tuttle:—The Saxton, while young, does well, but becomes tender as it grows older. Will not in the end give satisfaction.

Duchess and Wealthy.

By common consent it was decided to take up one variety at a time.

The Duchess was placed first on the list for general cultivation by a unanimous vote. The Wealthy was placed second on the list by a vote of 14 for and 1 against.

Melinda.

Mr. Brand moved that the Melinda be placed third on the list, which was seconded.

Mr. Jordan asked for its history and the estimation it held in the mind of its introducer, Mr. I. W. Rollins. It kept in good condition last year till June with me.

Mr. Rollins:—It has been grown in three counties but only in one district. Some trees are injured in the crotch. Its keeping qualities are as stated, and the flavor is not lost by keeping. The quality is second rate. In hardness it is third, the Duchess and Tetofsky being first and second. It is a good bearer, bears heavy every other year, and some every year. One year I obtained seven barrels from 15 trees. It bears small. The buds stood better last winter than those of any other except the Duchess and crabs. Have had it in bearing seven years, and the oldest I have were planted 14 or 15 years ago. It stood three or four years before bearing.

Mr. Harris:—Under the rule we cannot pass the motion. I move to amend by recommending it for trial.

The amendment was seconded.

Mr. Brand:—The Melinda has not been fairly treated. The rule

was made to keep out this variety. The wood may not be so perfect as the Duchess, but none give more fruit.

Mr. Jewell:—Mr. Rollins' location is more favorable than the average of the State, though not *most* favorable. It is high prairie. The trees in Mr. Rollins' orchard, I would say, are from one-fourth to one-half dead. One side of the tree has made no growth. I think the trees died at the top as well as at the root. It is hardier than the Haas but not hardy enough to recommend for general cultivation. Have been told that the quality begins to deteriorate in March. It is never first rate. Have examined the Duchess and Melinda in the same orchard in three cases and found the wood of the Duchess always in the best condition.

Mr. Wilcox gave some history of certain varieties, and said that, in one orchard with the Duchess he saw the Melinda in pretty good condition.

Mr. Sias:—Have grown it for seven or eight years. Have fruited it for three or four years. The tree is hardy but not as hardy as the Duchess.

The amendment of Mr. Harris was then carried by a vote of 13 for and 3 against. The motion as amended was carried by a vote of 13 for and none against, by which the Melinda was recommended for trial.

Adjourned till two o'clock.

THURSDAY AFTERNOON.

The meeting was called to order by the President at 2:25.

Test for Varieties.

Mr. Harris moved that the rule for the government of the Society in recommending fruits be amended so as to read:

Resolved, That we do not recommend for general planting in large quantities any variety that is not generally known, that has not stood a test of five years in a variety of soils and situations, and that has not passed through at least one winter of great severity.

Carried by a vote of 10 for and 6 against.

Mr. Brand moved that the action of the Society on the Wealthy be reconsidered.

Lost by a vote of 4 for and 10 against.

Tetofsky.

No other action being taken, the Tetofsky was left on the list for general cultivation.

Stewart's Sweet.

Mr. Harris moved to strike Stewart's Sweet from the list for general cultivation.

Mr. Grimes:—It is hardy enough.

Mr. Jordan:—Some are dying in Rochester, and it is a crab.

Mr. Brand:—A crab without question.

Mr. Grimes:—It is an apple because the fruit has a short stem.

Mr. Jewell:—The long stem is not an infallible characteristic of crabs. I know of no uniform characteristic of crab apples.

(A question was asked concerning its productiveness, to which no answer was made.)

Mr. Dartt:—A want of knowledge as to its productiveness is proof that it is not generally known. It may be hardy while young, but not when old like the Saxton in this respect.

Mr. Stewart:—The trees are scattered from Minneapolis to Manitoba, and I hear good accounts from it. It is my opinion it will bear enough to make it profitable. It has had a hard chance because of the grasshoppers eating them up in many regions.

Mr. Harris mentioned a Transcendent that at 15 years bore 18 bushels.

Mr. Harris' motion to strike from the list for general cultivation was carried by a vote of 9 for and 1 against.

Mr. Harris moved to recommend for trial, which was carried by a vote of 11 for and none against.

Haas.

The Haas recommended for trial by a vote of 13 for and none against.

Price's Sweet.

Price's Sweet was allowed to stand on the list for favorable localities, no objection being made.

Saxton.

It was moved to strike the Saxton from the list for favorable localities. Lost by a vote of 5 for and 5 against.

Mr. Dartt:—I would retain it because of its earliness in bearing.

Mr. Hart:—Would as soon dig up my Duehess.

Mr. Brand:—I have planted 100 trees of it.

Mr. Jordan:—I fear we would be considered changeable if we should strike it off. We are going to have a change of climate, we have been having a series of severe winters and now we may have something different.

Mr. Jewell:—Its good points are that it bears young and bears well, and if so trained as to have it bear while young it will pay to plant.

The vote was reconsidered and the motion to strike from the list was again made and lost by a vote of seven for and nine against.

Fameuse and Plumb's Cider.

The Fameuse and Plumb's Cider were allowed to stand where placed last year on the list for "most favorable localities."

Walbridge.

A motion to take the Walbridge from the list for "most favorable localities," and recommend for "trial" was carried by a vote of 10 for and none against.

St. Lawrence.

The St. Lawrence was taken up and Messrs. Wilcox, Pearce and others said good things of it.

Mr. Jewell moved to recommend it for "favorable" instead of "most favorable localities."

Messrs. Brand, Hart, and others also spoke favorably of it and the motion was carried by a vote of 14 for and none against.

Utter's Red, Talman's Sweet and Alaska.

Utter's Red was allowed to stand where placed last year on the list for "favorable localities," as also Talman's Sweet on list for "most favorable localities," and Alaska on list for "trial by amateurs and pomologists."

Red Astrachan.

Mr. Harris moved to recommend the Red Astrachan for general trial.

Mr. Grimes :—It has never borne with me.

Mr. Smith :—Have one on Paradise stock, and it has borne well enough so as to pay.

Mr. Jewell :—Not more than one tree in twenty that has been planted in this State is now living. It fails in so many cases and succeeds in so few cases that we had better let it alone.

Mr. Dartt :—In Wisconsin it lives, but does not bear.

Mr. Tuttle :—It bears sparsely for many years, but when it gets older it bears heavy alternate years, and proves profitable.

Mr. Wilcox :—Have had it stand where the Transcendent was killed. Has done as well with me as the same number of any other kind of trees.

Mr. Harris :—It has stood as well as any, the Duchess excepted, since the hard winter.

Mr. Pearce :—I would recommend it only top-worked. Mr. Barry says should not use it on his own stock. It is a shy bearer but a profitable tree.

Mr. Carter spoke unfavorably of its bearing.

Mr. Hart :—Would not recommend it as a standard, but as a dwarf it bears enough in one year to pay its cost.

It was moved to recommend it for trial in favorable localities when top-worked, which was carried by a vote of 8 for and none against.

White Astrachan.

Mr. Harris moved to recommend the White Astrachan for "general trial" throughout the State. Carried by a vote of 8 for and 1 against.

Peach Apple.

Mr. Brand moved to recommend the Peach apple for trial.

Mr. Brand :—It is later than the Duchess and entirely hardy. The motion was carried by a vote of 5 for and 1 against.

List Recommended.

The action of the Society on apples was therefore as follows :

Recommended for general cultivation :

- 1st. Duchess of Oldenburg. (Unanimous vote.)
- 2d. Wealthy. (14 for, 1 against.)
- 3d. Tetofsky.

Recommended for trial :

- Melinda. (13 for, none against.)
- Stewart's Sweet. (11 for, none against.)
- Haas. (13 for, none against.)
- Walbridge. (10 for, none against.)
- Peach Apple. (5 for, 1 against.)

Recommended for favorable localities :

- Price's Sweet. (10 for, 1 against.)
- Saxton. (9 for, 7 against.)
- St. Lawrence. (14 for, none against.)
- Utter's Red. (4 for, 4 against.)

Recommended for most favorable localities :

- Fameuse. (14 for, 3 against.)
- Plumb's Cider. (7 for, 5 against.)
- Talman's Sweet. (12 for, 5 against.)

Recommended for trial by amateurs and pomologists :

Alaska.

Recommended for trial in favorable localities when top-worked :

Red Astrachan. (8 for, none against.)

Recommended for general trial throughout the State :

White Astrachan. (8 for, 1 against.)

Winter Fruit.

Mr. Sias then read a paper on Winter Fruit which was accepted and ordered incorporated in the Transactions. The following is the text in full :

WINTER FRUIT.

ROCHESTER, Minn., January 17th, 1876.

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

Where shall we find hardy, reliable winter varieties, of good quality, of the common apple (*Pyrus malus*?) You need only refer to the last annual report of this Society to convince you that right here is the great want of the State. Hence, the question of where shall we find desirable winter varieties of the common apple, will, I think, be acknowledged by all to be a pertinent one, and unless we can add something to this very meager list for general cultivation, it will certainly count us but very little as an im-

migration document to set before the great Centennial Exhibition, soon to be opened at Philadelphia. As it now stands it would do Minnesota great injustice as a fruit-growing State. And I will say in this connection, that doubtless the chief reason why our winter list is so very small, is owing partly or wholly to the fact that the men who are now foremost in this noble work of making Minnesota Seedlings a specialty, are men of taste, refinement, and rare modesty. Had they possessed a hundredth part of the "cheek" of some of those unscrupulous fellows who have been flooding the country with untried, half-hardy varieties of distant origin, and of little or no merit, they would have had several of their promising new seedlings that are destined to add millions to the wealth of the Northwest, *fairly* and squarely before the public years ago. And meanwhile these public benefactors have been struggling along, in some cases through sickness and great tribulation, sewing together old vests and rags for raiment, to enable them to save a little money to buy seeds to continue this grand work, that is one day to make us all "wealthy." Such heroic enthusiasm, under peculiar and most trying circumstances, contains all the elements of great and final success. Now how have these great horticulturists been treated or appreciated by what is sometimes termed a generous public? For an instance, what great encouragement have they derived from our institutions, gotten up for the so-called purpose of encouraging agriculture and horticulture? Since the time that Horace Greeley made the ill-advised, or careless remark, that "you can't raise apples in Minnesota," the croakers appeared to take out a new lease of life, and to put on all the self-assurance and dignity of a man who knew just what he was driving at! At our county agricultural fairs in some cases they offered the liberal premium of three dollars for the best exhibition of fruits, and when the lucky man, who had been watching this fruit for three long days, called for his money, he was very politely informed that the institution had "busted," and that it would be utterly *impossible* for him to pay over ten cents on the dollar, while at the same time this "busted" society could pay three hundred dollars for the best exhibition of *cruelty* to that *noblest* of all animals, the horse! And I am inclined to think that this is just about a fair exhibit of the public generally towards these most useful tillers of the soil. And now to go back to our subject of where shall we obtain winter varieties of the common apple. Thus far we have depended chiefly on the Eastern and Middle States, and as this is known to be one of the leading causes of so many failures, you will not of course be very anxious to invest anything further in that direction. Then again, some say we should look to Russia, or Northern Europe, for the best results. Now let us consider this for just a moment, as to winter fruit. My experience in shipping trees south makes me skeptical in regard to finding good keepers, that originated as far north as St. Petersburg, Russia. (We may import varieties from there that originated far south of that point.) And out of one hundred varieties that I am now testing of Russian origin, I should be disappointed if a single variety proved a good keeper. November 6th, 1860, the memorable day of Abraham Lincoln's first election, found me distributing trees to our rebellious brethren, on Green River, in the southern part of Kentucky. These trees originated mostly in the Eastern States, and were the best keepers and most suc-

cessful varieties in those States, (we can profit by their experience if we will,) viz., Baldwin, Boston Russet, Northern Spy, Porter and R. I. Greening. While no farther south than Glasgow, Ky., I found these long keepers (with us) decaying badly in October, and was informed by old citizens there, that the best keepers that originated as far north as New England, were nothing but fall varieties with them, and they had always been disappointed in trying to get good keepers from the north. Now the difference in latitude between this place and St. Petersburg is some fifteen or sixteen degrees, while the difference between Boston, Mass., and Bowling Green, Ky., is less than one-half this distance.

Therefore, judging from the long experience of fruit growers in the older States of the Union, and from my own limited knowledge of the business in this State, I am forced to the conclusion that our greatest success with long keeping, heavy bearing, and with varieties of superior quality, and trees of large size and longevity, will of necessity be with Minnesota seedlings. And this doctrine of seedlings will not only apply to the apple, but also with equal force to the pear, when propagated from seed of such hardy varieties as the Flemish Beauty. Seedlings also of our best native plums, and so on through the whole catalogue of our different fruits. I wish to say in this connection that I very much admire the action of this Society, especially since the severe winter of 1872-3, in ruling out everything not *positively* known to be hardy.

And now in conclusion, I suppose every man who owns a rood of land will want to plant something to commemorate the great centennial event of 1876, and by planting Minnesota seedlings he will not only do the very best thing *possible* to mark this great event, but what is of far greater importance to Minnesota at the present time, he will also mark an important epoch in the development of Minnesota as a fruit-growing State.

A. W. SIAS.

DISCUSSION.

History and Characteristics.

Mr. Sias was then called on to give the history and characteristics of these varieties. He said they were started on Greenwood Prairie, a part of them 19 years ago. The seed was brought from Northern Vermont. The location in which they grow is "favorable," but not "most favorable." It is in the valley of the Whitewater and only a few feet above the water's edge. Rollin's Russet stands at the head of the list. The parent tree was killed three or four years ago by the borer. The year before that I cut scions from it and found them healthy. That tree has produced several barrels of apples. The fruit keeps till June or even July. The parent tree of Rollin's Prolific produced over three barrels in one season. It is a pie apple. The Elgin Beauty is fully as hardy as the Duchess.

None have had any root protection. All are winter varieties. Rolin's Pippin and Wabasha are first class eating apples.

Mr. Jewell:—Have seen these apples. Of the six varieties only two fixed my attention. The Wabasha is nothing remarkable. The Elgin Beauty is as fine as any Duchess I ever saw. It never lost any growth in consequence of the winter of 1872-3. The apple is of fine appearance. The tree is in better condition than the Melinda. (A full description of these apples will be found in the appendix.)

Centennial.

Business arrangements for the Centennial Exhibition was the next order taken up.

Mr. Grimes:—It will require some one to be there to receive, display, and take care of the fruit, and this Society must send some one.

Mr. Elliot:—There should be a committee of three to confer with the State Centennial Board.

Mr. Harris:—The State Agricultural Society is intending to make an exhibition of the products of Minnesota, and depend much upon the Horticultural Society to aid them.

Mr. Dartt moved that this Society exhibit in connection with the Agricultural Society. The motion was carried.

Mr. Dartt moved a committee, consisting of Messrs. Elliot, Harris and Jewell, be appointed to confer with the Agricultural Society or its Executive Committee.

Mr. Harris suggested that it might not be policy for him to act on that committee as he was a member of the Executive Committee of the Agricultural Society.

Speeches were made by Messrs. Hart, Jewell, Dartt and Elliot.

Mr. Jewell moved to amend by dropping the name of Mr. Harris and substituting Mr. Lacy. The amendment was accepted and the motion carried by which Messrs. Elliot, Lacy and Jewell were appointed such committee.

A motion was made by Mr. Harris that the Horticultural Society sustain the committee just appointed in whatever they may do after conference with the Executive Committee of this Society.

The motion was disposed of by instructing the committee to report to the Executive Committee of the Society.

Mr. Pearce moved a resolution pledging the efforts of the Horticultural Society toward making an exhibition at the Centennial, but no action was taken on the motion as it was considered best to await the action of the Legislature.

Mr. Dartt in the chair.

Final Resolutions.

Mr. Elliot moved that a committee of three be appointed on final resolutions, which was carried, and the chair appointed Messrs. Elliott, Jewell and Grimes.

Insect Enemies.

The next order taken up was a discussion on insect enemies.

Twig Pruner.

Mr. Harris showed a twig pruner which he had raised. It did considerable damage a year ago last summer. Oak branches from one inch in diameter to the size of a twig were cut off by it. He had found the larva in a twig which it had cut off and which had fallen to the ground. The larva then goes into the ground and comes forth the next season as a perfect insect, lays its eggs in the branches where they hatch into larva, which repeat the injury.

Beetle in the Apple.

Another insect, belonging to the beetle tribe, he found in the apple. He got the larva of this instead of the larva of the codling moth. He put into the bottle with the beetles hatched from these larva, some larva of the codling moth, and the beetles ate them up. The question raised was whether we have in these beetles an enemy of the larva of the codling moth. Another beetle he found in a rose bush. The rose broke down, and digging into the ground, he found the bush girdled.

Borer.

Mr. Sias showed beetles about an inch long. On a tree which had died suddenly he found them. The insect he had observed to bore its whole length into the tree in 2 to 5 minutes.

Grape Curculio.

Mr. Harris spoke of the grape curculio which left its eggs in the

grape. Prof. Riley says these should be watched and the stung specimen picked off and destroyed to prevent the multiplication of the insect.

Summer Meeting.

The committee on summer meeting then reported as follows:

We submit that we think it expedient to hold a summer meeting and exhibition some time between the 15th of June and 10th of July, at the State University.

The report was accepted and adopted.

Grape Borer.

Mr. Smith mentioned a square headed beetle found in the grape vine. It entered above a bud and worked down inside the vine, killing it. A neighbor had two hundred killed in this way.

Communications, &c.

The Secretary moved that all communications prepared for and not read at this meeting be submitted to the Executive Committee for approval before insertion in the Transactions. The motion was carried.

Blight.

It was then moved to take up the subject of blight but the Society resolved to defer it.

Co-operation of County Societies.

Mr. Elliot moved to take up the discussion "How shall we secure the more active co-operation of County Societies," which was carried.

Mr. Smith:—We can only do it by each member being a committee of one to organize a local society in his own county. The members thereof will at the same time learn much from each other, while they increase the usefulness of this Society.

Mr. Elliot:—Each county society is entitled to fifty reports of the State Society, and if a county society can't be formed at once then let some neighborhood form a society and call it a County

Society, and gradually gather in all around until it represents the whole county.

Olmsted County.

Mr. Pearce:—Our County Society has met with reverses, but we still meet.

Mr. Sommerville:—I have not met with them for the last year on account of business. Am sorry for it, and hope we shall restore the society, and will try to do so. Have been in the State nineteen years. Am a farmer with no ax to grind. Have derived benefit from my visit here. Know better what to plant from notes taken here. Will try and reorganize our society and help along the State Society.

Mr. Sias:—Am a member of the same society. We had two meetings last year.

Winona County.

Mr. Hamilton:—Our society failed to report for two years because the interest was diminished by the winter of 1872-3, and because farmers do not come in and take an interest in the proceedings.

Mr. Harris:—Think it would be a good plan for the State Society to get up a circular with a sample constitution and other information. Some of the best information and results come from small local societies. He instanced what the Lemon Weir Valley Society had done to improve the taste of the neighborhood and increase the cultivation of flowers and shrubs.

THURSDAY EVENING.

The meeting was called to order by the President at 7:25.

Pear Culture.

A verbal report on pear culture, by Mr. Hart, was called for. Mr. Hart reported as follows:

Seedlings from seed sown on sod all died but one. This is an excellent pear. It has been sold in Winona for the past six years.

Now have 75 trees, which look healthy, and from which I expect fruit next year. I see no reason why we should not raise pears. They like our soil and will not root-kill if we can keep the tops. Would recommend every man to raise a few. When I can't raise pears I will leave the State. I buy the trees and do not propagate. They require high, dry situations, but not poor soil, unless we wish to kill the tree. Have the Flemish Beauty and Louise Bonne de Jersey and others, all on pear stock.

Mr. Grimes inquired about the Birkett Pear.

Mr. Jewell:—The Flemish Beauty is the hardiest. There is no soil so poor that it will not live if it does not freeze out. Up to '72-3 many trees were in fruiting. One in La Crosse bore four bushels one year. Our experiments in pear culture have not proved a success. We can't recommend it for general planting. In a few very favorable localities it may succeed. There are some fine pear trees of the Flemish Beauty over back of the lake, in Winona, but there is not one place in a thousand like that. Would recommend to try it if you have a very favorable place on not very rich soil. If it has not protection from the sun on the south, had better protect with an evergreen.

Mr. Sias:—I have some pears on the Juneberry and Thorn. Has any one had any experience with it thus worked?

Mr. Jewell:—Have it on the Mountain Ash, but not long enough to tell anything about it. Barnett Taylor had several on thorn stocks.

Mr. Smith:—It succeeded on the Thorn in Vermont.

Mr. Hart:—I planted in a shaded place, and there it failed. Then gave it a southern exposure and it succeeded.

Mr. Dartt:—I concur with Mr. Jewell in doubting our ability to raise pears successfully in Minnesota. Raised them before the hard winter, but not since. Where we can raise tender varieties of apples we can raise hardy pears. In recommending for trial in most favorable localities would also make the provision that the experimenter have plenty of money to experiment with.

Mr. Brand gave two cases to prove that protection from the sun is needed. In similar cases when the trunks were wrapped with straw rope the trees lived. With protection from the sun, we can raise the pear with success in many localities.

Mr. Harris:—In times past I have been a strong advocate of pears. But some cause has destroyed the pear trees in every part of the State. Before 1872-3, hundreds of them looked as well as the Duchess. Shall the pear be known no more in Minnesota?

The cold is not the only cause of destruction. Blight is one of them; a large proportion of the destruction is due to that. Young trees did not die at that time, and if cold was the cause of death, why did the old ones die and the young live? I still have faith that we may again have on our tables such pears as we used to have. Have had 50 to 100 trees, and never lost one from cold. If we can get protection from the sun it seems to me we can yet raise pears successfully. I do not give it up yet. I have ordered more trees.

Mr. Jewell:—Many zealous horticulturists still refuse to look the truth squarely in the face and see that the trees died because they were not hardy enough to live, that they died because they could not stand sun and cold.

Mr. Smith:—I have had the trees killed by blight.

Mr. Pearce:—Have tried pears many times, and failed every time. A neighbor graded his yard up with stones and rubbish, and put on a little soil, and planted the Flemish Beauty. They have never lost one inch of growth. I have faith that they will live and bear.

Mr. Harris announced that a letter just received, stated that Messrs. Fowler and Judson, of the State Agricultural Society, could not come to the meeting.

Celery.

The paper of Mr. Brimhall on the cultivation and preservation of Celery was then read and ordered filed for publication in the Transactions. The following is the text in full:

CULTIVATION AND PRESERVATION OF CELERY.

Seed and Varieties.

To obtain good celery, be sure to get good seed to begin with, and of the best known varieties, one of which I claim—the Boston Market—stands first for general cultivation and market gardening. It grows large, stocky, solid, crisp, tender, and nutty flavored when properly grown.

Sowing.

Seed being obtained, should be sown in a hot-bed or cold frame being prepared in time, with very light, rich, sandy loam. Time can be gained by tying the seed up in a cloth or bag, tight together, and then put it into hot water enough to cover the package, and let it remain there until down to blood heat; then mix double the quantity of dry sand with the seed and

sow in the prepared bed, and cover about one-fourth of an inch deep. It should be kept moderately warm and wet, and partially shaded during hot weather.

Transplanting.

When the plants are about two inches in height, they should be transplanted two inches apart in equally rich soil, and be kept well sprinkled with soft water every evening during bright, sunshiny weather. When the plants are from three to four inches high, every other plant each way should be taken out to another bed, or may be planted in the field where wanted to be grown. Great care should be taken in removing the plants, that all the roots be secured with a clump of earth with them. To secure this the soil in which the plants are growing should be well saturated with soft water before removing the plants at any stage of their growth. When it is desired to have the plants remain in the bed until they are six or eight inches high, they should be thinned out to about six inches apart that all may grow strong and stocky.

Soil and Preparation.

The soil in which celery is to be grown should be made *very* rich and loosened deep by double-plowing or subsolling to the depth of one foot or more, and should be plowed twice to thoroughly mix the manure and pulverize the soil; then harrow, and if lumpy, roll the land, and get it in the best possible condition to be had.

Planting Out.

I abandoned the plan of growing celery in trenches years ago, and now grow it on the top of the soil with the most excellent success, in the following manner: When the plants are very large I mark my land out in rows six feet apart with a single shovel plow, and when using small plants use the line and dibble, setting the plants six inches apart in the row. June and July are the months for planting out celery, when good strong plants are to be had. The latter part of July is the best for winter celery. Always select a cloudy day for planting out celery and remove all side sprouts or succors, and press the earth well around the roots.

Cultivation.

Hoe the plants as soon as possible after setting, to keep the ground from getting hard and crusted. Continue to cultivate it as often as every ten days. When the plants are one foot or more in height, the land being well cultivated between the rows, take a line and loop it around the first plant in the row you wish to hill, and continue to loop the line around each plant to the end of the line. This is to keep the tops or stalks close together that no earth can get in the center. Great care should be taken never to get any earth into the heart or center of the plant. In earthing up, do not get above the heart until the last earthing to bleach and protect it from frosts. This should be well done by the first of October

Celery can be grown as a second crop after early peas, potatoes, &c., &c. The earthing up can be mostly done with the plow and horse-hoe, with a careful hand to use them.

Securing.

Time of putting away varies according to the weather, but should be secured by the first of November, always selecting dry, pleasant weather in handling. The same rule in its cultivation after the plants are set out.

Preservation.

To keep celery in and through the winter season in large quantities in this climate is no small task, where the weather is so changeable, and I hardly feel competent for the task, though I have kept it until the first of April. It is very evident that it should be kept cool, not where it will freeze, with some light and circulation of air. The soil in every case should be free from clay and gravel. A moderately dry sandy loam is the best in which to put it away. One very good way is to select a southern slope, dig trenches two feet deep and eighteen inches wide to set it in; plow the earth away from one row at a time with one horse; then with a fork or spade loosen the plants and remove to the trench, setting them in an angle of about sixty degrees, and not so close but that there will be a little space between them; press the earth well on the roots and earth up nearly to the tips, and fill up the trench with dry leaves or straw. Lay some short pieces of boards across the trench six feet apart, and cover the trenches with two boards one foot or more wide, letting them lap over each other in the middle to keep out all rain or melting snow. Then spread evenly over the trench straw or hay, to the thickness of one foot or more and four feet in width, and as the weather gets colder add more straw, and cover it over with six or eight inches of horse-manure. This can be taken out any pleasant day at noon.

Another very good way for storing small quantities is to take a deep hot-bed frame, dig a pit for it two or three feet deep. Set the frame, set out the celery as before stated, fill up the top space with leaves or straw and cover over with boards. Then hay or straw with manure at the outside to keep out the frost. When one has a cool cellar or root-house, by making one floor above the other, can store quite a good quantity, and protect by dry straw.

A great deal depends upon the condition of the soil in which the celery is put away. It should be moderately dry and free from all vegetable matter. White clean sand is very good when easily obtained. Peat soil is one of the best in which to grow celery, and also for storing it away. There are numerous large tracts of peat lands in this State, and, at no very distant day, we may expect to see these very valuable lands devoted to the cultivation of celery if not to cranberries.

WM. E. BRIMHALL.

DISCUSSION.

In the discussion which followed Mr. Harris said he would re-

commend the Sandringham Dwarf, White Celery, as being solid, crisp, of dwarf habit, and of a creamy white color.

Blight.

The next in order was a discussion on blight.

Lime.

Mr. Brand stated the substance of a communication from the Hon. Charles Clark, proposing as a remedy working lime into the soil and sprinkling the trees with it when moist with dew.

A letter from Col. W. H. H. Taylor, of Minneapolis, was read by the Secretary, recommending the same remedy, and stating that several persons had tried it with the same result, namely, success.

The Secretary stated that judging from a scientific point the efficacy of this remedy was not at all improbable. That "blight" is supposed to be due to the growth of a fungus, and that the presence of the alkalies generally, such as lime, potash, soda, &c., is unfavorable to the growth of fungi. Hence the application of lime may very likely prove valuable for the prevention and cure of "blight."

Mr. Scott stated that his father used lime freely, and did not suffer from blight so much as his neighbors.

Mr. Bunnell:—First noticed the effects of blight in the valleys. Then found some on the prairies.

Root Pruning.

Mr. Jewell:—Hope future experience will prove the value of this remedy. Root pruning I have had some experience with. Whatever checks the growth of the tree checks the blight. But if we depend on root pruning we must repeat it every three or four years. I ran a plow along the rows of trees, cutting off the roots, and the blight was arrested. Think if there is virtue in alkali our soil ought to be unfavorable to blight.

Further remarks were made by Messrs. Dartt and Pearce, when the subject was dropped.

Grounds of Public Buildings.

Prof. Phelps then offered the following preamble and resolution:

WHEREAS, The general dissemination of a knowledge of horticulture is one of the most important means for promoting the interests, improving the taste and advancing the happiness of the people; and,

WHEREAS, Nothing can contribute so efficiently to these great objects as the actual *demonstrations* afforded by the cultivation, under competent direction, of the best varieties of plants, flowers, and shrubbery; therefore,

Resolved, That in the judgment of this Society it is the policy and duty of the State so to arrange, decorate and cultivate the grounds connected with its public educational institutions as not only to afford examples of the varieties best adapted to our climate, but the means for thorough and practical instruction upon this subject, to those who are to become the teachers of our children and youth.

It received a second and Prof. Phelps made some remarks in support of the resolution as follows:

Mr. Phelps:—In offering these resolutions I desire to express my high appreciation of the work which the State Horticultural Society has undertaken to perform. The first duty of a free commonwealth is to educate the people, and thus qualify them for their weighty and solemn responsibilities as citizens. I can utter no more truthful aphorism than that *the true wealth of a nation is its cultivated sons and daughters*. It is none the less true that the education of the people should be such as *best befits their condition and circumstances*. The masses and the industrial classes are identical. Hence the masses should be taught those things that most concern their daily life, and that will best minister to their enduring happiness and prosperity. Among these things horticulture, the growth of plants and flowers and luscious fruits, that so minister both to the beautiful and the useful, must ever occupy a prominent place.

What greater boon could be bestowed upon the people than the *disposition* and the *ability* to beautify their homes and surround them with that "which is pleasant to the sight and good for food." How is the tendency of our youth in the rural districts to rush into the din, the turmoil and the temptations of city life, to be checked, if not by such influences as will make them contented with their lot amid the freedom and the purity of the country that God has made? A knowledge of horticulture and of the science of cultivating the soil, is the great need of the hour, and I believe that the State should do everything in its power to diffuse this knowledge among its rural population.

As a step in this direction permit me to suggest that it should begin by a *suitable cultivation and ornamentation of the grounds surrounding its public institutions*, particularly its State University

and its three Normal Schools where its teachers are trained for the high vocation of instructing its children and youth.

I ask you, Mr. President and gentlemen, to look about this fine edifice in which you are assembled, and see what a veritable cow pasture it is. Open to the street, ungraded, unadorned, unenclosed, a disgrace to the State! Many years ago, when these apartments were planned and this building was located, it entered into the hearts of those who *looked to the future*, that here a botanical garden should be laid out, in which might be cultivated those plants, flowers and shrubbery which had been proved to be the best adapted to our soil and climate, and which might afford perpetual "object lessons" to the thousands of ingenious youth that should assemble here to be fitted for duty as teachers under our great common school system. And why not? What noble, better, more useful purpose could these premises be made to subserve? To what end more practical or beneficent could a few thousand dollars be appropriated? Think for a moment of the extent to which the practical lessons thus imparted would reproduce around the country school houses and rural homes of the people. Certain it is that the noble science of horticulture which you, gentlemen, are laboring so earnestly to promote will never be taught in our schools until our teachers can be made familiar with its theory and practice, and this familiarity can never be acquired until its objects and living illustrations are at hand to attract the senses and stimulate to earnest and thoughtful study. Not to weary you at this late hour, gentlemen, let me commend this thought to your candid attention. I know of no way in which your worthy and self-denying labors, as a society, can be made to receive a more powerful impetus. I know of none that would be more fraught with blessings to the people in the diffusion of sound information concerning one of the noblest and most useful of arts.

Messrs. Harris and Jewell in a few remarks supported the resolution very warmly, and it was then carried unanimously.

Evergreens.

The discussion on evergreens was then opened.

Mr. Pearce:—It is one of the most important subjects we can discuss. We want them for protection before we can raise fruit. The best for this purpose is the Scotch Pine. This for windbreaks. For ornament, would plant Balsam Fir, Norway Spruce, Black and White Spruce, Mountain Pine, Dwarf Pine, and Austrian Pine.

The list of evergreens last adopted was then read by the President.

Norway Spruce.

Mr. Dartt moved to place the Norway Spruce at the foot of the list.

Mr. Pearce:—That would be a mistake. It is the handsomest tree in the grounds of Rochester.

Mr. Harris:—I worked hard to get it at the head of the list, but the last two or three years proves that it is too high. If a reddish color is better than green, then the Norway is the right tree.

Mr. Jewell moved to place the White Spruce at the head and the Norway at the foot. If we can shade it on the south with a house or similar object it may answer. But the White is so near like it that most persons do not distinguish them. The White is far more hardy and satisfactory.

Mr. Elliot:—Am now convinced that Brother Ford knew best when that list was made.

Mr. Jewell's motion was lost on the first vote, by a vote of 8 for and 9 against.

A second vote was taken which resulted in a tie, 10 for and 10 against.

Mr. Pearce:—It will do well on good soil, though it is liable to injury from the sun.

Mr. Smith:—Have had them color badly, so that they were unsaleable, on clay soil and northern exposure.

Mr. Grimes:—While young they are ordinary, but when they get to be fifteen feet high they are very beautiful. It is hardy in good situations, while hardly any evergreen is hardy in very bad situations. I have evergreens unmistakably hardy, which are yet injured because they stand in a very exposed position where the wind draws round a corner.

White Spruce.

Motion was made to place the White Spruce first on the list.
Carried by a vote of 10 for and 8 against.

Norway Spruce.

Motion was made to place the Norway Spruce second on the list.

An amendment was offered to place it third on the list, which was lost by a vote of 7 for and 12 against.

Motion to place it second was then carried by a vote of 11 for and 8 against.

Scotch Pine.

Mr. Jewell moved that the Scotch Pine be placed third on the list, and in answer to the question, "for what purpose?" replied, "for all purposes for which evergreens are employed." For a vindbreak there is nothing better.

Carried by a vote of 13 for and none against.

The Balsam Fir

was placed fourth on the list by a vote of 15 for and none against.

Austrian Pine.

Motion was made to place the Austrian Pine fifth on the list.

Mr. Jewell :—It is more sensitive to the sun than Norway Spruce. I tried to raise it for six years and then gave it up. Would drop from the list.

Mr. Pearce :—It is darker and the needles twice as long as those of the Scotch Pine. It sears over but does not kill.

Mr. Grimes :—It is finer than the Scotch Pine, but the leading shoot kills back.

Mr. Smith :—Have had one very badly injured.

White Pine.

Motion was made to amend by substituting White Pine.

The amendment was carried, and with it the resolution placing White Pine fifth on the list, by a vote of 11 for and none against.

The American Arbor Vitæ

or White Cedar was placed sixth on the list by a vote of 11 for and 2 against.

The Red Cedar

was placed seventh on the list by a vote of 11 for and 4 against.

Red or Norway Pine.

Motion was made to place the Red Pine 8th on the list.

Mr. Dartt:—It is a native, which is in its favor.

Mr. Grimes:—That is not much of a recommendation, as it is better to get it as grown from the seed in the nursery than from the forests.

The motion was carried by a vote of 11 for and none against.

Austrian Pine.

The Austrian Pine was then placed 9th on the list by a vote of 9 for and 7 against.

Irish Juniper.

Messrs. Smith and Pearce:—It kills every year.

Hemlock Spruce.

Mr. Smith:—I have a specimen that has lived several years.

Mountain Pine.

The Mountain Pine was placed 10th on the list by a vote of 8 for and none against.

Siberian Arbor Vitæ.

Motion was made to place the Siberian Arbor Vitæ, for small yards, 11th on the list.

Mr. Elloit:—By pruning it can be trained into any form.

Mr. Grimes:—It grows up in fine fronds, is perfectly hardy, not injured by cold or sun.

Mr. Jewell:—Have tried it for seven years and my experience is the same. It is much finer than the native and needs no pruning.

The motion was carried by a vote of 14 for and none against.

Black Spruce.

Motion was made to place the Black Spruce 12th on the list.

Mr. Jewell:—It is worthless, not worth handling, and the list is long enough.

Mr. Brand:—Have a perfect and fine tree in my grounds.

Mr. Jewell:—They are almost invariably ragged and untidy.

Mr. Brand's looks much like a White Spruce.

M. Carter:—I have two that I call Black Spruce which are perfect and handsome.

Mr. Brand:—So many trees are ill shaped because they are brought from the forest. Mine were grown in the nursery.

Motion was made that the resolution lie on the table, which was carried.

Trailing Juniper.

Motion was made by Mr. Stewart that the Trailing Juniper be placed 12th on the list, which was carried by a vote of 13 for and none against.

The discussion on evergreens then closed.

Summary.

The action of the Society in recommending evergreens stands therefore thus:

- White Spruce, 1st. (10 for, 8 against.)
- Norway Spruce, 2d. (11 for, 8 against.)
- Scotch Pine, 3d. (13 for, none against.)
- Balsam Fir, 4th. (15 for, none against.)
- White Pine, 5th. (11 for, none against.)
- American Arbor Vitæ, 6th. (11 for, 2 against.)
- Red Cedar, 7th. (11 for, 4 against.)
- Red or Norway Pine, 8th. (11 for, none against.)
- Austrian Pine, 9th. (9 for, 7 against.)
- Mountain Pine, 10th. (8 for, none against.)
- Siberian Arbor Vitæ, 11th. (14 for, none against.)
- Trailing Juniper, 12th. (13 for, none against.)

Protection of Apple Trees.

John Hart made a motion that the Society now take up the discussion of protection for apple trees. Carried.

E. H. S. Dartt commenced the discussion. Thought there should be some kind of a windbreak, such as white willows or some kind of hedge; thought that orchard trees should be at a space of at least four rods from the hedge or windbreak. Would recommend

the Scotch Pine for a row now and then among the orchard rows, and occasionally one in the orchard row interspersed.

Mr. Bunnell would set trees upon a northern exposure; would bank up earth around the tree just before freezing weather; also protect the trees from the hot sun, head the trees low and place a board on the south side of the tree.

J. S. Harris would coincide with E. H. S. Dartt's views.

A. W. Sias would plant the evergreens among the orchard trees for protection, such as Scotch Pine and Spruces.

Mr. Pearce concurred with the others about the planting of evergreens; would not prune the trees after first year.

O. F. Brand would recommend the wrapping of the bodies of the trees with some cheap wrappings, and leave them upon the trees both summer and winter.

P. A. Jewell would not plant a tree that needs such attention, for the farmer could not be induced to take all this pains.

At this point the discussion was closed.

Next Annual Meeting.

Mr. Dartt invited the Society to hold its next winter meeting at Owatonna, and on motion it was resolved to hold the next annual meeting of the Society at Owatonna.

Final Resolutions.

The committee on final resolutions then reported the following:

Resolved, That this Society return its sincere thanks to the Chicago, Milwaukee & St. Paul, the Winona & St. Peter and the Southern Minnesota Railroad Companies, for their generous action in selling return tickets over their lines to those who have attended this meeting, at one-fifth of their regular fare; that we look upon this generous action as a recognition of the efforts we are making to develop the horticultural resources of the State, and to diffuse information relating thereto; and that we recognize in it obligation to continue these efforts with increased zeal and enthusiasm.

Resolved, That the thanks of the members of this Society from abroad are hereby tendered to the Committee on Entertainment, and the citizens of Winona, for the hospitable manner in which we have been welcomed and entertained.

Resolved, That the thanks of the Minnesota Horticultural Society are tendered to Prof. W. F. Phelps for his generous donation of the use of the hall, for the invitation to witness the opening exercises of the school and the privilege of examining the many valuable geological and mineral specimens contained in the museum.

Mr. Smith offered a resolution thanking Prof. Phelps for suggesting the change of halls for holding the meetings of the Society.

The resolution was carried by a rising vote, and Prof. Phelps acknowledged it in a few appropriate remarks.

The Secretary then moved that the Society express its entire satisfaction with the exercises of the Normal School so far as we have witnessed them.

Mr. Jewell was glad this resolution had been offered, and made some very appropriate remarks in approval of the school.

The resolution was passed unanimously.

Bill of Secretary.

The bill of the Secretary to cover expenses, as detailed in his report, was allowed.

Mr. Harris then made a few very impressive remarks, stating that this had been one of the most pleasant, harmonious, interesting and valuable meetings the Society had ever held. He compared its present condition and reputation with its condition and reputation when the Society was first organized as the Minnesota State Fruit Growers' Association, when it had but twelve members, and when these were considered insane. He concluded by encouraging the members to continue the good work, and asking God to stand by and bless them in their labors.

The Society then adjourned.

ARTICLES ON EXHIBITION.

The following is a list of the articles on exhibition with names of exhibitors.

P. A. JEWELL.

Crabs.

Orange.	Aikens Striped Winter.
Maiden's Blush.	Quaker Beauty.
Beecher's Sweet.	Minnesota.
Hutchinson's Sweet.	Unnamed variety.

Apples.

Unnamed variety.

E. WILCOX.

Apples.

Talman's Sweet.	Golden Russet.
Utter's Large Red.	Sweet Pear.
Plumb's Cider.	Willow Twig.
Haas.	Rawle's Janet.
Perry Russet.	Ben Davis.
Fameuse.	Three Unnamed Seedlings.

Crabs.

Aiken's Striped Winter.	Hyslop.
Maiden's Blush.	

Canned Fruit.

Aiken's Striped Winter Crab.	Lady Crab.
Wilcox's Seedling Crab.	Hyslop Crab.
Maiden's Blush Crab.	Fall Stripe Crab.

A. G. TUTTLE.

Apples.

Walbridge.	Red Reinette.
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JOHN HART.

Apples.

Limber Twig.	Saxton.
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Potatoes.

Snowflake.

W. K. BATES.

Apples.

Lucy.	White Winter Sweet.
Seek-no-Further.	Worthington.
Talman's Sweet.	Ben Davis.
Fameuse.	Two Unnamed Seedlings.

NORMAN BUCK.

Apples.

Blushing Lady.	Baldwin Sweet.
Talman's Sweet.	Groesbeck Russet.
	Strawberry

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JAMES HARTWIG.

Apples.

Utter's Large Red.	Golden Russet.
Talman's Sweet.	Red Romanite.
Sweet Pear.	Rawles' Janet.
Pound Sweet.	

A. W. SIAS.

Apples.

Rollins' Pippin.	Elgin Beauty.
Rollins' Prolific.	Melinda.
Wabasha.	Phoenix.
Bethel.	

Crabs.

Fameuse, (Winter.)	Meader's Winter.
Hyslop.	Soulard.

P. P. OLMSTEAD, MONONA, IOWA.

Apples.

Two unnamed Seedlings.

WYMAN ELLIOT.

Honey Sweet Crab.	Red Currant Wine.
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MICHAEL KNAPP.

Grapes.

Delaware.	Concord.
Diana.	Iona.
Eumelan.	

TRUMAN M. SMITH.

Apple Jelly.	Crab-Apple Cider.
Cider Vinegar.	3XXX Port Wine.
Delaware Grape Wine, '72 and '74.	Old Sherry.

I. W. ROLLINS.

Apples.

Melinda.	Sweet Russet.
Bethel.	Oscaloosa.

A. J. PHILLIPS.

Unnamed Seedling Winter Apple.

GEO. W. CLARK.

Apples.

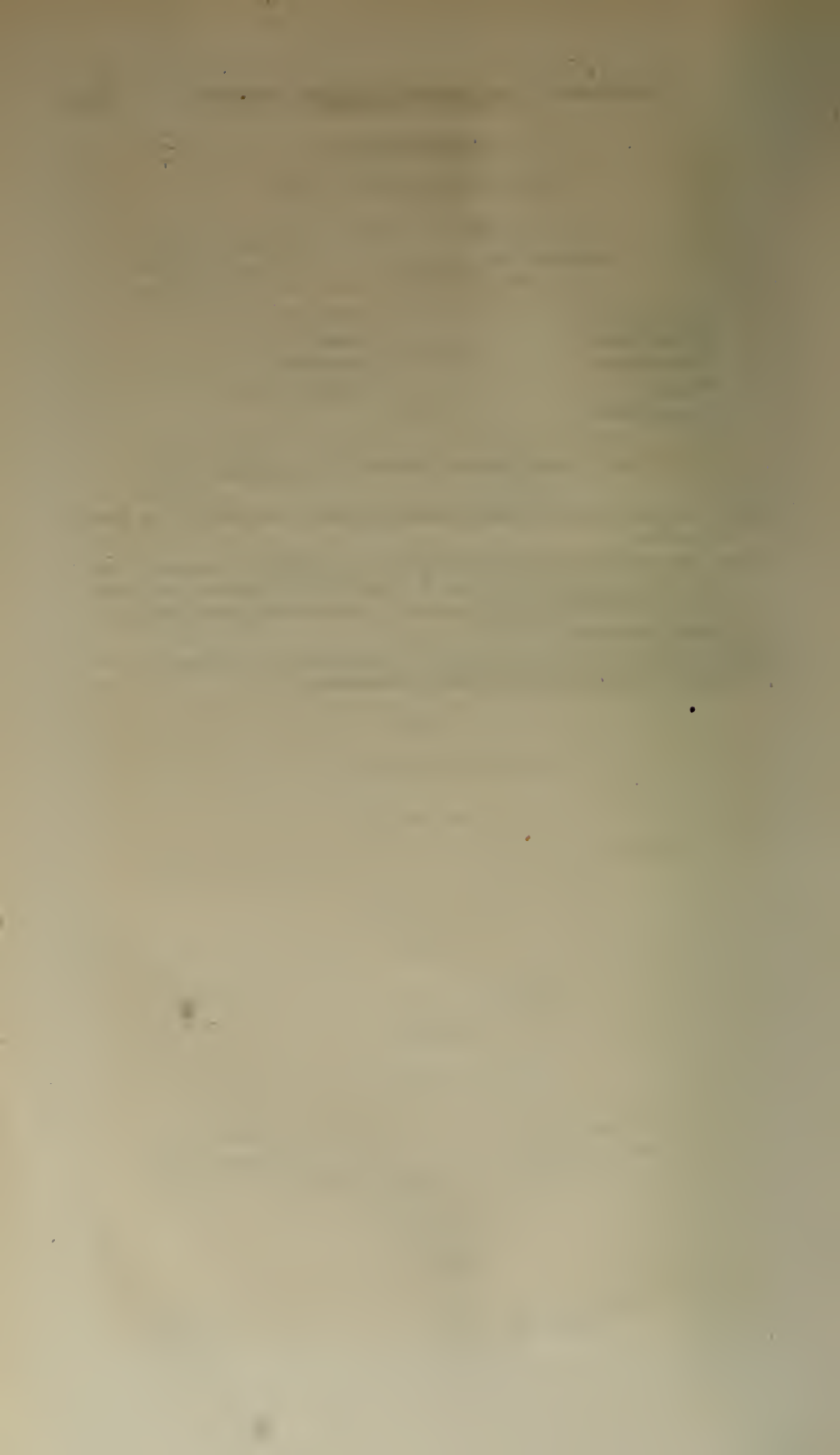
Perry Russet.	Utter's Red.
Golden Russet.	Haas.
Blush Russet.	Keswick.
Fameuse.	Rawle's Janet.
Roman Beauty.	

W. T. SCOTT, STATE AGRICULTURAL COLLEGE.

Two specimens Evergreen Sweet Corn, illustrating the value of the selection of seed.

Twelve new varieties potatoes, including the following promising ones: Snowflake, Acme, Breezee's No. 6, Extra Early Vermont, Early Ohio, White Blow French, Early Nonsuch, Compton's Surprise, Brownell's Beauty, Excelsior.

Three specimens Early Rose potatoes, illustrating the tendencies of varieties of potatoes to deteriorate and the cause.



APPENDIX A.

OBITUARY—CAPT. WM. PAIST.

Capt. William Paist died near St. Paul, Minnesota, on the morning of October 12th, 1874, in the 50th year of his age. He was born at South Charleston, Ohio, July 31st, 1825. He received a good English education, and at the age of fifteen entered his father's store and was brought up a merchant—following this business in partnership with his brother and engaging extensively in buying wool for an eastern house and packing pork. The firm did a very extensive business, and had unlimited bank credit at Springfield. Heavy losses finally impaired Mr. Paist's capital, and in 1855, he removed to St. Paul and embarked with enthusiasm in the purchase and sale of real estate, making money until the crisis of 1857. The storm which levelled so many fortunes to the ground did not spare Mr. Paist. Unable to realize upon his extensive purchases of real estate, almost everything was swept away, and he became a poor man. He struggled manfully for a living with varying success, until 1862, when he joined the army—enlisting as a private in company K, of the 8th regiment of Minnesota Volunteers. He was soon promoted to a Lieutenantancy, and accompanied his regiment, commanding his company, on the expedition led by Gen. Sully against the Indians on the Minnesota frontier. He was afterwards promoted to the Captaincy, and served with his regiment until the end of the war. At the battle of Murfreesboro, he was wounded by a spent ball which knocked him senseless. It was intercepted by the brass buckle on his belt, which alone probably saved his life. Colonel Rogers, supposing him dead or mortally wounded, ordered him carried back to camp. But he revived sufficiently to hear the order and rousing up asked, "Colonel, does it make any difference whether I go back or forward?" "Not a bit," said the Colonel. "Then I will go on with my men," replied Mr. Paist, and so he did. He joined Sherman's command and participated in his triumphant march to the sea. His unpretending modesty, kindness of heart and manner, genial social qualities and manly courage made him a great favorite with his men who would do almost anything for him.

The writer saw him when he returned with his company, covered with dust, and was welcomed back at the Capitol in St. Paul. He wore none of the insignia of his rank and could not be distinguished from the humblest man in his company, which caused a friend to remark, "Bill, you don't put on much style." This was true of him on

all occasions. His only style was the style of good fellowship and kindness.

Quitting the army with an honorable record, he purchased a small farm in the vicinity of St. Paul and embarked quite extensively in the dairy business.

He was one of the 12 or 15 original Grangers who organized the North Star Grange of Patrons of Husbandry, the first in the State, and probably the first in the United States. He was elected Secretary of the State Grange, serving the first two years without pay, and afterwards was repeatedly re-elected, holding the office until the day of his death. He was also elected Secretary of the State Agricultural Society in 1872, re-elected in 1873, and again re-elected in 1874, holding this position also until he died.

In 1873 he was Chairman of the State Central Committee of the opposition or Grange element which held a political State Convention in September, at Owatonna.

For some years prior to his death Capt. Paist's health was feeble. His disease was consumption, contracted during the hardships and exposures of the war. But his energy and indomitable spirit would not succumb. He would ride to his office in the city and personally supervise the important correspondence and other business connected with the State Fair, when unable to set up and while occupying a bed in his office. But he finally yielded when literally worn out, and on the 12th of October the fading leaves of autumn gave the signal for his departure and he quietly expired at his home in the presence of his faithful wife and affectionate children, universally lamented by his acquaintances and friends and without an enemy in the world. The large funeral procession which followed his remains to the tomb on an inclement autumn day attested the respect and esteem in which he was held, and evinced the faculty in which he excelled many abler men—that of attaching to himself the warm sympathies of a multitude of friends. His heart was as guileless as that of a child and his life illustrated that—

“The brave are the tenderest—
The loving are the daring.”

APPENDIX B.

REPORTS OF MEMBERS OF GENERAL FRUIT COMMITTEE, PREPARED FOR, BUT NOT PRESENTED AT, THE SUMMER MEETING, JUNE 30TH, 1875.

SMALL FRUITS.

REPORT OF WYMAN ELLIOT, OF MINNEAPOLIS.

The subject of small fruits has heretofore received too little attention in our discussions, but at the present time is very appropriately placed on our programme, and I hope may receive such notice as it deserves. We, as a Society, in seeking to grapple with the all-absorbing topic of large fruit; as the apple and pear, have neglected to pay the notice due the strawberry, raspberry, currant, cranberry and native plum. The small fruits of our State are quite a source of revenue to our pioneer settlers, growing wild very abundantly in many localities, and being available to nearly all living in small towns and cities along our railroads.

The cranberry in early Territorial days was considered free plunder, but now a good cranberry marsh is thought to be a profitable possession, and lands that a few years ago were looked upon as worthless, are being improved. and soon will be our most productive and profitable. Among these are many fine locations in our State for cranberry growing, and all wanted to develop them is a little Yankee ingenuity and Western enterprise. The area used for cranberry culture is added to each year, and in a few years such lands will become very valuable.

The blueberry will before long be added to our list of cultivated fruits, and we shall doubtless see many new and improved varieties. as we have already of the raspberry and other fruits.

Practical experience is what we need. Heretofore we have been experimenting singly, and have made no note of what we have learned. Each one learning something new for himself without in any way benefiting his brother horticulturist, consequently we have

all traveled the same road of bitter experience, when if we had communicated more freely with each other we might have shunned some of the failures; but now that we have an agricultural farm, and a live Professor at its head, we shall be looking in that direction for examples of practical horticulture. It has been the fortune of most of us to have experimented unsuccessfully with some of the small fruits, but our failures give many of us our best experiences.

Since the blight has thrown a shadow over our hopes of profit from the apple, we should strive to make up in small fruits what we lack in the larger. We may safely enlarge our strawberry, currant and raspberry patches without fear of overstocking the market, and we may yet regain the reputation of being a first-class fruit State.

Truly, the experience of the past two years has not been flattering, but we may derive some comfort from the fact that, while we, in cold Minnesota, have been scorched, they, six hundred miles south, have some of them been burned.

To arrive at the area covered with small fruits, in our county, is no easy task, but I should say we have, of the different varieties, as follows: Strawberries, fifty to seventy-five acres; black and red raspberries, fifteen acres; currants, fifty acres; cranberries, two hundred acres.

The prospects of a full crop of small fruits are equal to many of the past years. Strawberries are one-half to two-thirds of a crop, late rains having swelled the fruit set to a good size. Many of the blossoms blighted, from some cause unknown. Plants wintered passably well.

Currants will yield about two-thirds of a crop, the few berries setting being a good size, but bunches short. The crop of raspberries is not more than one-third of the usual amount, caused by the killing back of the canes by the extreme cold of the past winter. Plums promise to yield abundantly, having set very full. The little curculio is at work, leaving his crescent-shaped mark to let people know that the hard times did not disturb his repose.

The currant, by some, is considered the most valuable of all our fruits being used in the many forms. When green it is most excellent for sauce, pies, tarts, and canned for winter use. When ripe the wines, jams and jellies made from it help to fill the larder of every well regulated housekeeper. In its season it is used very much as a table fruit, being very healthful. The old Red Dutch is first for profit and quality.

White grape next. The rest are fancy varieties for professional nurserymen to make money from.

The soil in which I have cultivated currants has not been the best adapted to developing the largest returns, but it is such as a large majority of our horticulturists have to deal with—sandy prairie. I usually propagate by cuttings taken the latter part of September or first of October and planted in rows two feet apart and six or eight inches in the row; setting top of cutting even with the top of the ground, then by turning a furrow with a light plow on the row they are prepared for winter. After the frosty nights in the spring are passed, the ridge is raked off, leaving the top of the cutting even with the surface; cultivating clean, we are reward-

ed in the fall by fine, healthy canes. Remove every alternate row, and if the bushes in the row remaining are too thick, thin; then leave for fruiting.

Currants are usually three or four years old before bearing a full crop, and in our light soil bear but three or four good crops before beginning to decay. The past two years the currant worm and borer have made sad havoc with our bushes, but at the present time I see signs of coming off victorious with the help of Paris green and hellbore, either of which are sure exterminators of the larva of these pestiferous insects. I usually hire children to pick the fruit, paying one and one and a half to two cents a quart, using tickets as tallies, and each night taking tickets and paying for them. The most satisfactory way of selling is by weight; as, if I market currants by the bushel before the stems wilt, the purchaser, after keeping 24 or 48 hours, is obliged to resort to wine measure to sell the number of quarts bought; but by weight, every one gets proper quantity. A bushel of good plump currants weighs forty pounds.

I would like to have pruning of the bushes discussed at the next winter meeting. Some recommend tree form, single stem; others the bush, six or eight canes to a bush, some shortening of tops, others cutting out old wood each year, some spring, some fall pruning. All have their advocates; but which is best, or is there no choice between them?

Manuring, cultivating and mulching are recommended; clean cultivation has always proved most satisfactory to me—mulching with manure in the fall pays extremely well, as soil cannot be too rich for currants.

Gooseberries with me are not and have not been a success, as far as fruit is concerned, being, like the currant, subject to the gooseberry or currant worm, which eats the leaves and stems off the fruit and soon kills the bud. The same remedies are recommended as for the currant. Gooseberries are not as easily picked as other small fruit, on account of (as the children express it) the pricklers, and as a paying crop are a failure; yet I think a few gooseberries should have a place in every collection of fruit.

Strawberries, the queen of small fruits, as far as pleasure and profit are concerned, are very much sought after in their season, by both rich and poor, adorning with no better grace the sumptuously spread table of the rich than the plain unostentatious board of the working man; possessing no more delicious flavor for the rich man's lordly palate than for the undefiled taste of the humble mechanic. They are the people's choice of the small fruits, easily cultivated by amateur as well as professional gardeners. They should have a place in every garden. A small patch well tended gives a family a delicacy fit for the highest in station.

The strawberry is a native, growing luxuriantly and producing fine fruit in many localities. The Wilson Albany Seedling is generally conceded to be most productive and most successfully cultivated in all locations. In place of irrigating strawberries in fruit, mulching between the hill and rows with meadow grass or clean straw is very beneficial. I have used straw, hay, leaves and sawdust as coverings for winter protection. Hay is the best, leaves

next, and straw, if free from foul seed, is very good. Many make sad mistakes in removing the covering from their strawberry beds before the frosty nights are over. There is usually no danger of smothering the plants if care be taken to lighten the covering after the snow is off. Our fruit raisers cultivate very little in hills, preferring to let the vines run and form beds two or three feet wide. Vines are worth very little after the third year.

The raspberry is one of our most wholesome and desirable fruits. It succeeds the strawberry in season, and if grown properly is thought by some to excel it in flavor and deliciousness. Our Red and Black, as found in their native haunts, growing in the shade of the lofty maples and hickory, possess rare delicacy unrivaled by our cultivated sorts. Moist, cool locations, with northern exposures, are preferable. Doubtless many of you have seen in your wanderings localities where the wild raspberry grows luxuriantly. Such situations are well adapted to the growth of cultivated varieties. The severity of the past two winters has proved most disastrous to the raspberry, in many instances killing the canes nearly to the ground. (The best method of protection is one of the subjects needing our attention.) Many of the finer varieties, protect them ever so well, are too tender for this climate.

Raspberries are sometimes quite remunerative, giving returns of from three to six hundred dollars per acre. The bushes are not so subject to the depredations of insects as many other of our small fruits. The small borer that assails them near the root is easily destroyed by the free use of wood ashes. Doolittle and Seneca are leading varieties. Red Philadelphia for hardiness and productiveness stands first, quality of fruit is not equal to some of the new sorts.

Mulching has a tendency to increase productiveness and flavor of fruit.

I hope in the future we may be able to devote more time and attention to the nature and cultivation of small fruits. For from these are, to some, the profits of fruit raising in the State.

Query—Is the tomato a small fruit or a vegetable?

Respectfully yours,

WYMAN ELLIOT.

REPORT OF J. I. SALTER, OF ST. CLOUD.

ST. CLOUD, Minn.. June 21st, 1875.

Mr. C. Y. Lacy:

SIR:—Your favor of the 5th inst. was duly received, and in compliance with your request, I herewith return to you a very imperfect report of the condition of fruit in my vicinity. Owing to the backwardness of the spring, rendering the early preparation of the soil for the reception of the different seeds inexpedient, and in some

instances impossible, I have been so driven by my work that I have scarcely known the condition of my nearest neighbor's plants, shrubs, fruit trees, &c.; but since the receipt of your note I have taken some pains to ascertain the present prospect for a crop of Russian apples, raspberries, blackberries and strawberries, also the condition they were left in at the beginning of warm weather. The "Dutchess of Oldenburg" has stood the past winter in timbered land, in many instances very well; "Ben Davis" killed entirely with some, while with others it withstood the severe cold better than the "Duchess," and this without any apparent cause; on the open prairie they are both ruined, or nearly so. Transcendent and Hyslop Crabs have stood alike on plain and timbered land well, none being killed by cold so far as I can learn. The borer has, however, destroyed many trees.

Raspberries have been, where not protected, somewhat injured, especially the more tender varieties. Philadelphia and Brinckle's Orange badly killed. Except in some instances where ample and judicious protection has been given, not more than one-fourth, or at most one-half crop can be expected from those varieties. "Mammoth Cluster" and "Doolittle" will give from three-quarters to a full average crop, depending on past care and location. The varieties cultivated are generally the Blackcaps; the other varieties but sparingly, Philadelphia leading all others except Black Caps. As far as diseases, there does not seem to be any as yet developed. Insect enemies, but few and not yet very troublesome. The "Raspberry Maggot," and a small white worm that sometimes (but seldom) destroys the roots of new canes, being all worthy of mention. Ordinary care and cultivation, together with proper manuring, will be almost certain to give fine returns. Blackberries "Nix," all killed; same way every winter. The past winter killed nearly all the wild canes to the ground. The varieties tried here so far have been the Kittatinny and Wilson. I have been experimenting with a wild variety for the past five years, and supposed my labors crowned with success, when the past winter came and destroyed my triumph; still, I think success with us, in the blackberry line, must be found, if found at all, among the wild sorts.

Strawberries: All the varieties where not protected, have suffered somewhat; Wilsons the least of any—some beds of the Wilson passing through the winter without the least protection, and coming out this spring in brilliant style, scarcely a plant injured. "Wilson's Albany" is the variety principally grown, although "Jucunda," "Triomphe de Gand," "Charles Downing," "Hovey's Seedling" and "Mexican Everbearing," with many other varieties, are grown to some extent. "Hovey's Seedling" has heretofore been the standard sort raised for family use, but it is rapidly being displaced by the "Wilson." The "Triomphe de Gand" and "Jucunda," the former especially, seem to require a heavier soil, and more particular attention, than the "Wilson," and as a consequence are not so extensively grown by farmers, and others not making horticulture a specialty. The prospect is good for a fair crop of this most delicate of all small fruits, but scarcely a full crop. As far as my own experience goes, and from what information

growers of the fruit have given me, there seems to be almost entire freedom from disease, from the depredations of insects of this plant as yet. A few years since it was the exception to find a small bed of strawberries for the use of the family, in the farmer's garden; and when found the variety was almost surely "Hovey's Seedling," or else a variety—the name unknown to me—that was prolific in nothing but foliage. Now, however, the case is quite reversed, and almost every farmer's table is graced with luscious strawberries and sweet cream in the season. Being sorry that I cannot make my report more instructive and full, and wishing the best success to the Minnesota State Horticultural Society and its officers,

I remain very truly yours,

J. I. SALTER.

REPORT OF J. S. HARRIS, OF LA CRESCENT.

The extent of small fruits under cultivation is diminished somewhat, owing to the combined injuries of insects and of the hard winter of two years ago. Hardly enough are now grown for home use. Grapes, however, constitute an exception. These are recovering their lost favor with fruit growers.

Among insect injuries may be mentioned those of a white grub working at the roots of strawberries. The chinch bug is also sapping the stems of plants set last Fall. The currant borer is working on the bushes, but the currant worm is unknown. Grapes have at present no insect enemy.

The strawberry most extensively cultivated is the Wilson and the Green Prolific next. Currants are mostly Red and White Dutch

The raspberries are Black Caps and Natives. The Grapes are chiefly Concord, Clinton and Delaware, the Isabella discarded. The vineyards are somewhat extensive. The cultivation of strawberries in single rows is abandoned.

The blight is prevailing fearfully on the Transcendent and some other crabs, Talman's Sweet and St. Lawrence.

REPORT OF W. K. BATES, OF THE STATE HORTICULTURAL SOCIETY.

STOCKTON, MINN., June 26, 1875.

C. Y. Lacy, Sec. of Minnesota State Horticultural Society:

Yours, with notice of appointment to report to Society was received. In reply would say, as I cannot attend your meeting the 30th ult. I will send a small report.

So far as my personal knowledge goes, we shall not have a very large crop of apples. The orchards in our section wintered nicely,

and are doing finely this summer. I have not seen or heard of a case of blight this summer, the cold, backward season being the cause I think. Take a very wet, warm spell in summer and the blight developes rapidly.

Of insects I would say that I sold my neighbor a lot of trees, which after being set out started nicely until last week he noticed they showed such a lot of dead leaves and limbs that they must be dying, so he called my attention to it, and we gave the orchard a critical examination, but could not find anything until about the last tree, on which we found a large green beetle, (similar to the one spoken of on page 119, Report 1866-73, of S. H. Society,) eating away on the underside of a limb in a bud. The habit of this insect is to eat only at the base of the bud, and does not eat the leaf. The insect, on being found, drops to the ground as if it were dead, like the Colorado potato bug.

Of small fruits I can say that the prospects are good for a large crop. Mr. H. B. Waterman, Harvey Pike, Mrs. S. Pike and O. M. Lord, of Minnesota City, in this county, are large growers of raspberries. They prefer Doolittle's Blackcap to any other for profit, as it is very hardy; they are trying Davison's Thornless for early. The Mammoth Cluster is very large and nice, but winter kills some winters. I have tried all the above and like them. Mr. Eckerts, near Winona, likes the Seneca Blackcap best. The best way to train the raspberry is to prune them back when they attain to two and a half or three feet in height. This makes the plant throw out a large lot of short limbs which give a large crop the next season and does away with the trellis.

Of strawberries, Mr. John Hart, of this place, is the largest grower. His main plant is the Wilson Albany. He has a fine lot of strawberry seedlings of his own raising, some of them very promising. My own experience has been with the Welcome, (very early,) Agriculturist, Wilson's Albany and Welcome, best culture being the bed system kept free of weeds; mulch in winter with chaff. From what little I have seen of the Prouty Seedling Strawberry I think it best of all. The Kent is best to stand weeds and grass, the Albany the poorest. The Emperor, Banus Mammoth, Leming's White, and Nicanor proved worthless; the Colfax is a very sour berry, rather small but a very heavy bearer.

Of currants we find that the Black Naples, Red Dutch and White Grape are the best. Set plants 4x4 or 5 feet and mulch heavy with manure every spring and we have good crops of nice fruit,—and this applies to the gooseberry as well. I only have the Houghton which does not mildew.

Hoping you may have a good meeting, I remain yours.

W. K. BATES.

FRUIT CULTURE IN MINNESOTA.

WORTHINGTON, Minn., June 29, 1875.

Prof. C. Y. Lacy:

This is a new county, settled principally by the National Colony about three years since—consequently very little has been done in fruit culture thus far. Mr. Chas. Plumb, Mr. Boweman, Dr. E. Bedford and Mr. G. J. Hoffman are the men in this vicinity who are giving most attention to fruit. Mr. Hoffman's report, which I enclose herewith, will speak for itself. It embraces more valuable information than I could obtain from all other sources. Regretting that I cannot meet with you to-morrow, and hoping that you may have a pleasant and profitable meeting, I am

Truly yours,

R. F. HUMISTON.

REPORT OF G. J. HOFFMAN, OF WORTHINGTON.

In the following list the varieties are numbered according to hardiness 1, 2, 3, &c., 1 being the hardiest.

Apples.

Duchess.....	1
Tetofsky.....	1
Ben Davis.....	2
Fall Stripe.....	2
Utters.....	3
Plumb's Cider.....	2
Golden Russet.....	2
Sops of Wine.....	3
St. Lawrence.....	3
Rawles' Janet.....	3
Red June.....	4
Early Joe.....	4
Perry Russet.....	3
Winter Winesap.....	4
Walbridge.....	3
Pewaukee.....	4

Siberians and Hybrids.

Transcendent.....	1
Small Red Crab.....	1
Large Red Crab.....	1

Winooski.....	1
Oak Hill.....	2
Homestead.....	1
Pember.....	2
Winter Green.....	3
Lake.....	1
Marengo.....	2
Chicago.....	2
Coral.....	2
Kishwaukee.....	2
Gem.....	4
Brier's Sweet Crab.....	2
Glover's Early.....	3
Golden Sweet.....	1

Raspberries.

Mammoth Cluster.
 Purple Cane.
 Doolittle Blackcap.
 Seneca.
 Philadelphia, (stood the winter best.)

Strawberries.

Wilson's Albany.
 Ida.
 Downer's prolific.
 Green.
 French.
 Michigan Seedling.
 Nicanor.
 Charles Downing.
 Kentucky.
 Col. Cheney.

Have fruited Wilson and Ida. Sometimes Wilson does best and sometimes the Ida.

Currants.

Red Dutch.
 Cherry.
 White Dutch.
 White Grape.
 Cherry and White Grape doing poorly because of too much wind.

Grapes.

Concord.
 Clinton.
 Delaware.
 Doing well and are easy to protect.

Cherries.

Early Richmond.
 Common Morrello.
 English Morrello.
 Seedlings from Early Richmond.
 All damaged somewhat last winter.

Plums.

Natives.
 All wintered well.

Set most of the trees in the spring of 1873. Have about 400 trees set 12 feet by 16. Cultivated with corn the first two seasons. Have now seeded down every other space, while the others are devoted to small fruits; have a northern slope. All trees damaged more or less last winter, except crabs. Duchess and Tetofsky lost a few buds. Set six pear trees, which are mostly dead.

G. J. HOFFMAN.

Worthington, Nobles County, Minnesota.

REPORT OF O. D. STORRS, WINSTED LAKE.

WINSTED LAKE, MINN., June 12th, 1875.

Mr. C. Y. Lacy:

DEAR SIR:—In compliance with your request and notice of my appointment as member of State Horticultural Society, I append the following report of the condition of fruit trees and small fruits.

Standard Apples.

The varieties that have passed through the last winter uninjured are the Hebron, Tetofsky and Stewart's Sweet.

Second Hardy.

Winsted Pippin killed back 4 to 6 inches; Wealthy, 2, 3 and 4 years old, 4 to 8 inches; Russian August, 5 years old, 4 to 6 inches; Morrison's Treasure, 3 years old, 8 to 12 inches, and badly sunburnt on southwest side; Duchess killed back 6 to 8 inches and the wood is black, and some of the best 6 and 7 year Duchess are dry-

ing up and will die during the summer. Haas killed back 6 to 8 inches, and 2 out of 10 are dead, 5 years old. Fameuse nearly all dead, they leaved out and in a few days the leaves dried up, the wood is black down to the snow line. Saxton—some are dead and others in same row but little injured.

The varieties that winter killed are Pewaukee, Walbridge, Mollie, Bellflower, and Black Vendevere. These were 3 and 4 years old. I reset with hardy trees.

I have 22 varieties of crabs, all came through the winter in good condition except the Soulard. I have discarded that entirely.

I have from 250 to 300 Seedlings from 1 to 4 years old, and only four have come through without any injury, two of these are from seed of the Duchess apple 3 years old, one of the other 4 are from Transcendent seed, the other from a large Minnesota grown apple. I am experimenting with Seedings from Minnesota fruit, as I believe our horticultural success depends upon our efforts to grow trees from seed.

Plums.

The Miner plum, 5 years old, have come through with from 1 to 2 inches of tips killed—blossomed and a good prospect for a fair crop; Miner, 1 and 2 years old, killed 4 to 6 inches. I don't consider the Miner plum a *sell* at all, but far superior to our best native plums. Richland Purple killed to the ground, 4 years old.

Carnation cherry, 5 years old. This hardy cherry passed through the winter wholly uninjured—not a bud hurt—prospect for a light crop of fruit. I have an orchard of about 350 trees and about 30 different varieties. Soil, heavy clay, north slope, no protection.

Small Fruit.

Grapes came through all right when covered. I have only two varieties—Moffets and Concord.

Currants, gooseberries, raspberries, strawberries, are doing well, prospects for a crop, good.

The area of small fruit in this locality is small. Farmers do not seem to appreciate the value of small fruit sufficiently to cultivate to any extent.

I am pleased to hear that the subject of discussion at your summer meeting is on small fruit, and hope many will profit thereby, and wake up to the interest of cultivating more small fruit in Minnesota.

The mode of cultivating fruit trees in general is to plant the ground with some hoed crop, corn generally. I have noticed several orchards that have been let grow up to grass with only mulching around the roots and are doing well.

Diseases.

None except winter-killing and sun burning or bark blistering on

the south side. Cause—hot spring sun. I have never had a tree fireblight yet, and only know of one orchard within ten miles that had a few Transcendent stock with fireblight last summer, 1874.

The only insects that are injurious to fruit trees are worms of two varieties, green and brown, that unless hunted off and killed will eat the leaves entirely off.

Plum trees are infested with caterpillars that make large webs or nests in the branches. The best remedy I have found for destroying them is to smoke them with tobacco. Put tobacco leaves in an old pan with fire in and hold it under their nests and it is sure death and does not injure the tree or fruit.

I have visited the principle orchards within ten miles around and find the prospect for fruit is good. Currants full crop, gooseberries and raspberries are well loaded with fruit. Grapes, but few are in bearing.

REPORT OF L. D. MILLS, GARDEN CITY, BLUE EARTH COUNTY.

JUNE 28th, 1875.

C. Y. Lacy:

DEAR SIR:—Yours of May 29th received, informing me of my appointment as member of General Fruit Committee of Minnesota State Horticultural Society. Cannot send a report that will be of much interest, except, perhaps about grasshoppers, and the extent to which they have damaged small fruits, as you say, small fruits are the principal subjects of discussion for the meeting of June 30th.

Currant bushes are nearly stripped of both foliage and fruit. Hoppers eat off the stem of fruit, allowing it to drop; also eat some of the fruit.

Gooseberries eaten some, but not as bad as currants.

Strawberries, foliage not eaten much; fruit about one-third eaten.

Raspberries, foliage nearly all eaten, and fruit damaged to a considerable extent, but if hoppers emigrate soon (which they probably will) there will be half or two-thirds of a crop.

Wilson's Albany is the most successful strawberry cultivated here, and about the only one that is grown to much extent. Of raspberries, the Doolittle, Black-cap and Philadelphia are the ones mostly cultivated, as they are the most successful. Houghton Seedling Gooseberry is the only one grown here. It is very prolific, and is grown with good success.

Grapes do well where proper care is given them, but are not very extensively cultivated in my immediate locality. Mr. Kenworthy,

of Rapidan, raises quite a quantity each year. He is, I think, very successful with them. Am not much acquainted with the varieties he grows.

These varieties of fruits named are not troubled much by insects or diseases.

Hoping that some portions of this may prove interesting, if not instructive, I am

Yours truly,

L. D. MILLS.

APPENDIX C.

REPORTS, PAPERS AND ESSAYS PREPARED FOR, BUT NOT PRESENTED AT, THE WINTER MEETING, JANUARY 18TH, 1876.

REPORT OF THE COMMITTEE ON ENTOMOLOGY.

MINNEAPOLIS, Minn., 17th of First Month, 1876.

To the President and Members of the State Horticultural Society:

I exceedingly regret my inability to be present at the winter meeting soon to convene in Winona. And still more do I regret that my time and the state of my health will not permit my preparing a paper upon my favorite subject, entomology, that might be of interest to all horticulturists. In a few words, however, allow me to speak of that insidious little pest, the apple moth, sporting the name "*Carpocapsa Pommella*," and which belongs to the great order Lepidoptera, and of the tribe Tortricidae. The fact has to be acknowledged that this, the most beautiful moth of the beautiful tribe to which it belongs, is with us in vast numbers, and like many others of the "Insects Injurious," we have to say that their ancestors were imported, and the increase has been rapid; and wherever apple-growing has been attempted, we find the apple-worm pretty generally diffused.

Isaac P. Trimble, the distinguished Entomologist of the American Institute of Horticulture, has devoted much time, patience and labor to consideration of the habits of this moth, whose forewings are of a beautiful ash-gray and brown in wavy alternate streaks, with a large, tawny brown spot, streaked with bright bronze or gold.

In some sections of the United States this insect is two-brooded. I have not carried my investigations sufficiently far to determine whether this is the case or not. I should think, however, that there is but one brood during the season.

From the time the egg is deposited (which is done almost as soon as the apple is formed) in the calyx or snuff-end of the apple, until the larva is full-fed, is about five weeks.

The worm, or caterpillar, when young, is of a whitish color, with a black head and black, shield-like covering on the top of the first segment, but when full grown is changed to a flesh color, or quite pinkish tint, especially on the back, while the head and first segment become more of a brown color.

Each segment has eight little spines, out of which grow very minute hairs. Being now full grown, the worm leaves the apple and selects some crack or crevice, spins its little house, and in three or four days changes to a chrysalis, and in ten weeks comes out the perfect and beautiful moth. Of course the appearance of the moth varies with the latitude and the work it has before it. As it has not been ascertained as whether here the insect is two-brooded, the time that it remains in the chrysalis state cannot be accurately fixed.

There have been many devices used for the destruction of this pest, the most important of which is the band of hay, straw or rags laid in the forks or tied around the limbs and trunks of the trees. It has many natural enemies.

I also desire to call the attention of the Society to the *Curculio*—or the Little Turk, as State Entomologist of Missouri, C. V. Riley, calls him. From his name, to speak scientifically, *Conotrachelus nemophar*, you are at liberty to call him Turk or Hottentot, as you like, it will make no difference to him, for he will go for your plums the best he knows how every time.

This insect belongs to the great order Coleoptera, of the tribe Curculionidae, thus showing his name is legion. Should I undertake to tell you of this pestiferous fellow, and you were to allow me the time, there would be no other subject treated of at this meeting. My friend Riley, of whom Missouri should feel proud, gives twenty-four reasons why this apparently insignificant insect "should be dreaded as much as an invasion of Arabs; among which reasons he says the plum curculios are a most unmitigated nuisance, and though a most beautiful object under the microscope, the fruit growers of the United States, if they had their own way about the matter, would wish them swept from off the face of the earth, at the risk even of interfering with the harmony of nature. From one hundred peach trees, Parker Earl captured, in six days, six thousand five hundred curculios."

I will not trespass upon your time by going into the details of the birth, growth, maturity, mischief and death of this insect. Any one, the most casual observer, can see the imago at work with its elephant-shaped nose making the incision crescent-shaped—then *presto* depositing an egg—then *presto* again with its snout pushing the egg quite under the skin—and gluing up the wound—then off for the next plum, &c., &c.

From the egg thus carefully stowed away under the cuticle of the plum, there soon hatches out a little grub or maggot, which works around and around, when, in course of time, he growing all the while, and the fruit growing also, the mischief is done, the fruit falls to the ground, and in due time, being full fed, the larva leaves the plum and makes its way into the ground, changes his personal appearance very much, and during the next June is ready to commence operations again. And here I agree with Prof. Riley, that the plum

curculio is single-brooded. I do not know how many species there are of this insect, but they are certainly numerous. I have observed with much interest one in particular that preys upon the leaves of our common white elm. I should not say upon the leaves, but between their surfaces, in such a manner as to make the leaf to wear the appearance on portions of its surface like the combs of the chicken cock. The most effectual remedy against the curculio is the jarring process. Eternal vigilance is the price of good plums, and upon the first appearance of the crescent mark get a sheet and spread under the tree, and with a board and mallet jar the tree; the Little Turk falls off and is easily captured, for he packs his trunk and would fain make you believe he is a dead plum bud. That the tree may not be injured by the jarring, it is better to saw off one of the lower limbs, leaving a short stub to strike on.

The next insect that I shall bring to your notice is the *Bostrichus* (*Amphicerous*) *bicaudatus*—order Coleoptera, Family Ptinidae—or apple twig borer, which many of you, no doubt, have observed, very much to your disgust.

It is a very common insect, and is a dark brown beetle, not more than two-fifths of an inch long; the thorax is rounded and rough, punctured—and especially is this the case toward the front, where there are many rasp-like prominences. It is almost a cylindrical beetle, the thorax so covering the head as to be scarcely discernible, and the elytra so completely overlapping the abdomen as almost to conceal it, and terminating with (especially in the male) two little horns, from which this insect received its specific name, *bicaudatus*—*two-tailed*. In its larval state this insect is entirely unknown; observations, however, are being made with a view to ascertain its metamorphoses. You are all familiar with its work, and I need not now claim your attention further on its mode of operations.

The best method of destroying it is to watch for its presence, and with a wire inserted in the passages, crush them; or cut the infested branches off and burn them. I will mention one thing more. Dr. Le Baron, of Illinois, says that all the larva of the genus *Bostrichus* are genuine wood-borers—and this may be—but this *bicaudatus* eats through the bud into the pith, and this in its imago state.

An insect somewhat similar is often injurious to the grape vine—not so long, is not *bicaudatus*, though it has the rough thorax and imbedded head. There is certainly no one ignorant of the fact that during its season we have the squash bug, *Coreus tristis*, but amateurs must not confound this insect, which is of a dirty brown color on its upper surface, and of a dirty yellow ochre color beneath, with the striped cucumber beetle, which belongs to the sub-family, *Galerucidae* species, *Diabrotica vittata*. Insects belonging to this sub-family are for the most part distinguished by the nearness with which their antennæ approach each other at the point of insertion, often being as near together as the first joint, and the antennæ perfectly filiform, the thorax is not so broad as the elytra, and often, though not always, similarly colored.

The great family *Chrysomelidae*, of which our *Diabrotica vittata* is one species of a sub-family, forms a remarkable exception to in-

jurious insects in general by being most *mischievous* in their perfect state. But the insect under consideration does sometimes do mischief by burrowing into the roots of plants in the larva state, as no doubt many have witnessed—when they have seen a melon or cucumber vine die without any apparent cause.

We also have with us in great abundance Hemiptera Coccidae, or bark lice, etc.

There is, however, an insect, from the mischief it is doing and is likely to do unless some stringent measures are taken to stay its progress, that will force itself *unmistakably* upon the notice of all lovers of sauer kraut and cauliflower—and I refer to the cabbage butterfly—or butterflies, as there are two or three species of them.

But to give a detailed history of them would require all the time allotted to a single paper, and we must leave it for the present.

M.

ORCHARD PROTECTION.

H. M. THOMPSON.

ST. FRANCIS, Milwaukee Co., Wis.

The observations and experiments of horticulturists in the West and Northwest, covering the period of one generation, have most conclusively demonstrated that, owing to the peculiar climatic conditions prevailing over a large extent of country, the difficulties encountered in growing fruits for family and for market use, have been and are now so great as to discourage, to a considerable extent, the acreage of tree and small fruit planting necessary to supply the demand, which must keep pace with the increase of wealth and population; hence the importance of inquiring into the causes of failure and the general adoption by fruit growers of such preventative measures as are most likely to mitigate, if not to entirely avoid in the future, the disastrous results which have occurred in the past.

The experiments made in testing the standard varieties which originated in the Eastern, Middle and Southern States, have proved that the most of these varieties possess certain peculiar, undefined, constitutional characteristics in the composition and structure, which renders their existence precarious, when planted in localities containing different soils, and subjected to climatic conditions, entirely the reverse of the conditions to which those varieties were subjected in their origin; the Baldwin, Spitzenberg, and R. I. Greening may be cited as instances of proof.

On the other hand it has been ascertained by experiment, that certain varieties of apple trees which originated in localities, in which the various conditions of soil and climate were similar to the conditions prevailing in the locality to which they have been remov-

ed, do not appear to suffer by removal. As instances in confirmation of this view may be cited the introduction of the Fameuse from Canada, Red Astrachan, Duchess, Alexander, and the Currant crab from Northern and Northeastern Europe. The discovery of these important facts may be considered as the first tending to the discovery of other important facts necessary for the advancement and success of horticulture in the Northwest.

Horticulturists having ascertained one of the causes of failure, are led to the inevitable conclusion, that other causes of failure must also exist, the most prominent of which are believed to be frequent and sudden alternation of freezing and thawing, when the ground is surcharged with moisture, causing the separation of the bark from the wood structure of the roots, or the disruption of imperfect cellular formation in the roots, in consequence of late and unperfected autumn wood growth; or the cellular formation, be the same perfect or imperfect, may be injured by the sudden withdrawal of frost in early winter, mid winter, or early spring, when the earth is devoid of moisture; in this instance the interstices existing in the soil about the roots being filled with air, the withdrawal of frost has the same tendency to injure the cellular formation, as would result if the roots were above ground at the time of the withdrawal of frost. Injury may also result from an excess of exhalation of moisture, induced by cold, dry winds, when the extremities of the roots of the trees are encased in frost. Or strong winds may sway small trees from an upright position, and thereby produce a cavity in the soil at and below the collar of the tree, liable to be filled with water by rain fall. Subsequent lowering of temperature cause congelation and expansion and thereby burst the bark at or below the collar. Injuries also result from the active circulation of sap in the south and southwest portions of the stem of the tree, induced by the absorption of heat from the sun's rays, and the arrest of circulation and expansion of sap, and rupture of the cells in consequence of congelation by subsequent freezing.

Having ascertained and enumerated some of the causes which produce disastrous and often fatal results to vegetable life, we may take into consideration propositions of what will probably be the most appropriate, effective and practical means for adoption as a preventative against the recurrence of the many causes that have produced such disastrous results. And as a combination of causes seem to produce results that have a tendency to impair vegetable life, it is also to be presumed that a combination of preventative measures are required to counteract or obviate the causes that result in injury. Hence the following propositions are adduced:

- 1st. The introduction of varieties originated in similar soils and subjected to similar climatic conditions prevailing in the locality in which they are to be planted.
- 2d. Originating varieties adapted to our climatic conditions, by repeated reproduction from seed.
- 3d. Originating varieties by hybridizing, using the Siberian Crab and some of the best and most promising varieties of apples as parents.
- 4th. Winter mulching.
- 5th. Amelioration of the severity of climatic influences, by the aid of individual, corporate and State efforts, in enlarging the forest area, by forest tree plant-

ing, and the preservation of the natural forest. 6th. The adoption of the plan of protecting orchards and small fruit grounds with a belt of evergreen trees.

In compliance with the conditions in the first proposition may be noticed the introduction of the Red Astrachan, Alexander, Duchess, and the testing of numerous other varieties from similar sources. In complying with the terms of the second proposition, the process of acclimatizing by the process of reproduction is laborious, and considerable time must necessarily elapse before the desirable, legitimate results can be accomplished. In promise of its eventual fulfillment may be cited the production from seed of a number of varieties in Minnesota, Iowa and Wisconsin, possessing considerable constitutional vigor or hardiness, which may serve as the foundation for the reproduction of other varieties possessing still greater inbred constitutional adaptation to the climatic influences with which they have come in contact.

The requisite conditions specified in the third proposition have promise of fulfillment in the past and present efforts of earnest and eminent horticulturists to obtain by hybridizing, varieties of apples, the trees of which will be as hardy as the crab, and the fruit of which shall partake of the size and flavor of the best and most promising varieties of apples now in cultivation.

The requirements of the conditions of the fourth proposition may be fulfilled by the general adoption on the part of orchard growers of the cheap labor system of sowing rye, millet, Hungarian grass or buckwheat in the latter part of the month of July, and allowing it to remain on the ground through the winter, and thereby preventing the alternation of freezing and thawing which has produced so much injury to the roots of trees and small fruits.

In the fifth proposition, for the purpose of modifying temperature, increasing rainfall, and to retard the evaporation of moisture from the soil, and to break the force of winds, efforts should be encouraged for the more general planting of trees in the form of forests and timber belts upon the boundaries of farms, and at least one line of trees upon each side of the line of railways, and two lines of trees upon each side of all public highways.

The sixth proposition requires for its fulfillment the adoption of the plan of enclosing all orchards (which are not favored by natural forest protection,) with belts of evergreen trees; hence it is important that such facts as have a bearing upon the supposed advantage to be derived from such protection should be brought to notice.

It is conceded that "cold air in motion has the property of extracting heat in proportion to its velocity." In illustration of this principle we will suppose that when the mercury in the thermometer is below the freezing point, a person may emerge from a forest or place where the air is not in motion, and enter a treeless plain, or place where the air is in motion at any given velocity, and there is apparently a sudden increase of cold; the apparent lowering of temperature being attributable to the increase of the extraction of heat from the physical system, caused by the moving atmosphere. In this instance there is not only increase of loss of heat by extraction, but there is also an accelerated loss of moisture by exhalation

from the physical system, the proportions of which are in ratio to the degree of cold and the velocity of the wind, and as vegetable life is in many respects partially if not wholly subject to conditions which affect the physical system, it is to be presumed that the velocity of the prevailing winter winds, passing as they do, over a large extent of treeless plains of the northwest, must be very great, and that the extraction of heat and exhalation of moisture from exposed vegetation must be in proportion to the degree of cold, velocity of the wind and the length of time during which those adverse conditions prevail. The effect of these influences upon trees that have made so late a growth in autumn as to leave imperfect cellular formation in the whole or any portion of the trees, in combination with either a very wet or dry soil, may be partially manifested in injury to the imperfectly formed cells of the roots, or the bursting of the bark at or near the collar, or rupture of the inner bark and wood cells of portions of the stems and at the junction of branches with the bodies of the trees, or the injury may be confined to the extremities of the branches, or in extreme cases when subjected to many or all of the conditions adverse to the sustenance of vegetable life, the trees may be injured in every part of their organization. As the longevity of fruit trees is dependent upon the peculiarities of their constitutional organisms, and upon the climatic conditions to which they are subjected, and as the latter conditions are extreme—and as these extreme conditions are violent extremes of cold and heat, and as these extremes are dependent upon the velocity and direction of the wind, and as the coldest and strongest winter winds are from the northwest, and as the thermometer ranges the lowest when the wind is in the northwest and highest when the wind is in a southerly direction, and as the degree of extraction of heat and the volume of exhalation of moisture is greatest when the winter winds are in the northwest, and as the results of these dependent forces are injurious in their effects upon vegetable growth, it is, therefore, to be presumed that the strong winter winds are the principal causes of injury; and that, if by any means orchards can be so protected so as to break or impair the force of the wind, the injuries manifested in orchards will be lessened in like proportion. If this be true, tender varieties planted and tested in orchards which are to be found located in the heavy timber lands, (some of which have the original forest growth so located as to break the force of the wind upon one or more sides of the orchard,) would undoubtedly afford instances tending to disprove, or substantiate the conclusions herein deduced. The majority of, if not all the intelligent horticulturists of the State concede that many varieties of apple trees are more hardy and productive in the heavy timber counties bordering on the western shore of Lake Michigan, than the same varieties grown in the oak openings, or in the prairie sections. The productiveness of tender as well as hardy varieties in the lake shore timber counties, may be partially attributable to the influence which so large a body of water as Lake Michigan must necessarily exert upon the atmospheric currents in the summer season, but this influence is not as considerable as many might presume, from the fact that the prevailing summer wind is southwest, while in the

winter months the prevailing winds are from the northwest, and when the winds are from the lake to the land, the mercury ranges lower than at stations further inland, and the maximum extremes of cold and heat to which orchards in the lake shore counties are subjected, are greater than in orchards in the interior counties, therefore, it may be concluded that as the winter climatic conditions are so affected by the air currents or proximity to the lake, are more unfavorable to the longevity of fruit trees, in the lake counties, than in the interior counties. Neither can the supposed or real differences be attributed to differences in soil, from the fact that the soil in the timber counties are so variable that soils in various gradations from sand, gravel, and loam to the heaviest clay, are to be found in almost every orchard of considerable size. In all the timber counties that have come under my observation the healthiest and most productive orchards are those that have the original forest growth located upon one or both of the north and west sides; and, as a further evidence of the benefits derived from orchard protection, may be cited the facts that in the early settlement of Milwaukee county, the whole country, extending from the lake to the prairie, was a dense forest, with occasionally a clearing of from two to ten acres. At this time peach trees were planted that came into bearing, and produced so abundantly as to break down many of the trees, and others perished from exhaustion caused by overbearing. Since that time the land has been denuded of timber to such an extent that peach trees cannot be grown except in isolated locations and with some sort of protection.

Having determined some of the causes that have tended to produce injuries to fruit trees, and having adverted to the laudable efforts which have been, and which are now being made, for the introduction of iron-clads, originating hybrids, acclimating varieties by reproduction from seed for the prevention in the future of the wide spread disasters of the past; and having cited circumstances indicating that natural forest protection is beneficial, it remains to be seen what further conjunctive efforts are necessary to assist and forward the steps already taken for the accomplishment of the desirable results in the shortest possible space of time.

As already shown, winter winds is one of the prime causes that has contributed to produce disastrous results, hence orchardists should consider it of the utmost importance to plant belts of trees around their orchards at such a distance apart as will break or impair the force of the winds, and also to plant dense lines of trees in the orchards at distances of not more than one hundred and eighty feet. Evergreen trees are the best adapted for orchard belts and protection lines, from the fact that they retain their foliage through the winter—"Each leaf of the compact foliage tending to obstruct and break the force of the strongest wind." One row of evergreens closely planted will not only cost less but will prove more efficacious for the purpose intended than ten rows of deciduous trees, which have only their naked stems and branches to obstruct the force of the wind. Individual efforts in planting evergreen timber belts for orchard protection, although isolated, will not only prove efficacious for the purpose intended, but will be found to be practical

and effective in producing early satisfactory results, from the fact that the results will enure to the individual planter, and is not dependent upon statutory enactments, or combined public efforts. The attention of orchard planters being called to the necessity of planting evergreen belts for the purpose of preserving the vitality of fruit trees, and for the purpose of preventing the fruit from being blown off the trees, and for the purpose of beautifying the landscape and enhancing the value of real estate will not hesitate to adopt the principle that the planting of an evergreen belt is just as necessary a requisite as the planting of the orchard itself.

Orchard protection being not only *beneficial* is also entirely *practical* from the fact that small evergreen seedlings, suitable for timber belts, and forest tree plantations, are now grown from seed in America (as in Europe) by the million, which can be purchased and planted at so small an outlay of money, that the entire expense need not exceed the cost and labor of planting the fruit trees contained in the orchard.

CRANBERRY CULTIVATION IN RICE COUNTY.

Mr. President, Ladies and Gentlemen:

I am happy to report that after the lapse of many years of talk, essays, and agitations of the cranberry question by our Society and the State at large, a beginning has been made by a few citizens of Rice county, to develop the latent wealth that exists in this natural product of the State. It is estimated that there are in Rice county 800 acres of the natural beds, and about 3,000 acres of marsh which can easily be brought under cultivation. You will undoubtedly remember the prominent notice this subject received in the message of Mr. A. W. McKinstry, when President of this Society, and it is evidently owing to the valuable facts and suggestions given at that time by him that caused an investigation of the subject, and induced others to embark in the business. During the past summer Mr. McKinstry visited the marshes, and I herewith add the result of his observations in the vicinity of our small fruit friend, Seth H. Kenney:

Before leaving the Kenney neighborhood we took the opportunity to visit the cranberry marsh belonging to Messrs. C. Russell, W. A. Shaw and Chas. Lane, which lies a short distance south of Mr. Kenney's. We have long had faith in the possibilities of Minnesota in the way of cranberry culture, and this was greatly strengthened by what we saw here. We found a large marsh as level as a house floor, which had apparently once constituted the bed of a lake, but had been filled up by the gradual accretion of vegetable matter, as the soil is a spongy, fibrous peat, of an indefinite depth, and trembling beneath the tread. Trenches have been cut around the forty acres owned by Messrs. Russell, Shaw and Lane, which take off the surplus water. Two acres of this ground are now cov-

ered with cranberry vines. The history of this patch proves the natural adaptability of our peaty marshes to cranberry culture. About ten years ago, as Mr. Kenney informed us, a few cranberry vines made their appearance at a point in the marsh. The first year that he noticed them, he picked a couple of handfuls of berries from them. The next year they had spread so that he gathered a quart. From year to year the patch has since enlarged, so that it now covers about an acre of ground. The persistence with which the vines encroached upon and routed out the tough marsh grass, afforded the surest evidence that the cranberry is "to the manor born." At the time of our visit the vines were loaded with berries, and as the picking was to commence on Monday, we shall probably be able to report the yield in our next. A house has been purchased adjoining the marsh, and Mr. Lane has moved into it to be able to attend personally to the management of the patch. Last spring Mr. Russell experimented in extending the vines upon the marsh by planting. The runners were cut up in lengths of from four to eight inches and pushed into the soft ground with the end of a board. They have most of them rooted, and have made a growth this season of from four to ten inches, throwing out new roots like a strawberry runner. On some of them were cranberries. That the entire marsh can thus be brought under cultivation we have no doubt.

Another method of propagating, and one that promises to be even more effective, has been tried by Mr. Russell on an acre of marsh lying north of Mr. Kenney's place. In the spring, when about six inches of the surface of the marsh had thawed, while the mud beneath remained frozen so as it would bear the weight of a team, Mr. Russell, using a plow with a sharp coulter, turned over the tough marsh sward in smooth furrows. Where the furrows lapped, cranberry cuttings were introduced at intervals of about a foot. These have made a nice growth during the season, and having no grass to contend with, will undoubtedly cover the ground in a short time.

So far as we know, Mr. Russell is the pioneer in cranberry cultivation in Minnesota. He has corresponded extensively with cultivators in Wisconsin and New Jersey, and obtained valuable information as to the habits of the cranberry plant. It has but one insect enemy, a worm that sometimes causes serious loss. To counteract this, flowage in the spring is necessary. The marsh of Messrs. Russell, Shaw, and Lane is well situated in this respect, as by raising a dam two feet high at the outlet of the marsh, the entire tract can be flooded. Another drawback upon cranberry cultivation, which cannot be averted except as early ripening is hastened by cultivation, is premature frosts. As to the profit of cranberries, there can be little question. Fifty bushels to the acre are a poor crop, while as many as five hundred bushels have been gathered. At from \$2.50 to \$3 a bushel, this is likely to pay a pretty good interest, and if cranberry growing is profitable at the East, where from \$300 to \$500 per acre are expended in grading and covering the ground with sand, which is considered indispensable, we don't see why it shouldn't pay pretty well here in Minnesota, where so little especial preparation is necessary.

Messrs. Russell and Theopold have purchased one hundred and sixty acres of marsh bordering on French Lake, of which eighty are well situated for cranberry cultivation, being already largely covered with the vines.

O. F. BRAND.

CULTURE AND VARIETIES OF THE POTATO.

Mr. President:

The culture and varieties of the potato is one that much interests me. Of all the vegetables in use the potato should stand at the head of the list. It is food for both man and beast, and has, I think, been grown nearly to perfection. Now, as to the varieties, the Early Rose and Peach Blow seem to be the leading varieties. The Early Rose has been to my knowledge, the most popular early variety, and is, if properly kept, a good winter potato when grown on new land and planted early. I think very much depends upon their being planted early that they may get our June rains, about the time of forming sets, and they continue to grow right along until fully ripe. Whilst late planted ones are quite likely to be checked by the dry hot weather, and scarcely ever mature or give a good crop. I saw an article in the *Prairie Farmer* of December 11th, where R. P. Reed had raised one hundred and fifty bushels from one bushel of the Snowflakes, this is ahead of any yield which I ever obtained from any variety. I would inquire whether any of our members of this Society have tested or know the quality of the Snowflakes. Mr. Reed says they are dry and of rich flavor, and yielded three times as much as the Rose and ripened at the same time. The Early Vermont and Compton's Surprise are gaining in flavor. In planting and cultivating to obtain the greatest yield from a given amount of seed cut to single eyes, plant in rows, two and one half feet apart, the pieces eight to twelve inches apart, one in a place. Plant shallow so the ground will be level after they are covered, and as the potatoes begin to burst through the ground give them a good harrowing with a light harrow. When the tops are three or four inches high give them a good cultivating, and in a week or two go through between the rows with a good horse hoe with double mould boards, which slides the earth under and amongst the vines so completely that no hoeing is required to finish the crop. They should be dug as soon as they are ripe, and before the fall rains. By turning a light furrow away from each side of the row with a small plow the potatoes are easily thrown out over the ground with a good spading fork, they should be allowed to dry a few hours before gathering, and should then be pitted out so no sun nor rain can reach them and so remain as long as safe from frosts. When housed they should be kept from light and air as much as possible.

W. E. BRIMHALL.

THE TRANSCENDENT.

ST. PAUL, Minn., Jan. 15th, 1876.

To the President of Minnesota State Horticultural Society:

I am unable to attend the annual winter meeting this winter, to be held at the city of Winona (which I regret very much,) for I know the Winona people will give you all a welcome and hospitable reception. May they ever be blessed for their generous acts is my hearty wish. Should the Transcendent Crab Apple come up for discussion, I wish to say a few words in its favor. Notwithstanding it does blight in some locations, it is very easily grown, and I say if they kill down, re-plant them again. The blight is claimed to be only a disease, and not likely to last long. I think to-day that the Transcendent is the best thing in the shape of apples for profit that we in this vicinity have. Not that I am propagating them, but for the reason that I get a good crop of them, and they sell more readily than all others. They are good for sauce and pies in August, long before they are ripe, and they last till late in September, and sometimes into October. They make the best of jelly, good for canning, and dried they are the next thing to the unpared peach. They make what my neighbors call good cider, and we have no reason to doubt that it will make good vinegar. I have fifteen acres of them set in an orchard, which netted me thirty dollars per acre, less than one-half of which had been planted only four years, and the balance two years only. The four-year planted trees yielded, or netted fifty dollars per acre, the apples bringing me one dollar per bushel. Why are they not a God-send to the people of Minnesota? Hoping you will have a more happy and profitable meeting than ever,

Respectfully yours,

W. E. BRIMHALL.

PLANTING FRUIT TREES.

An Essay read before the Minnesota Horticultural Society, at its Annual Meeting, January 17, 1871, by O. F. Brand, but never before published in the Transactions.

We sometimes meet with those who say they do not care to be troubled with trees that cannot take care of themselves, or that need protection in winter, in any form. This idea would be a rational one were they to leave the trees to nature, in their natural home and under natural conditions; but as the organic conditions of all our fruit trees have been materially changed by the artificial means that

have been used to bring about the results so gratifying to us, it becomes the province of man to assist nature in producing such results as shall be deemed most profitable and useful. Those who would leave their trees to take care of themselves after having placed them in an artificial position, will find that nature will neither respect their ignorance nor reward their indolence. The cultivator must not expect that nature will undo what he has poorly done, or presume that after a tree has received an unnatural and immature growth, it will pass through the winter as safely as a tree grown entirely by nature. It appears to be an established fact that the safety of a tree through the winter depends, to a great extent, upon its condition in the autumn preceding; and it cannot be too firmly impressed upon the mind of the cultivator, that the ripening of the seasons growth is of the greatest importance, to enable us to bring our trees safely through our extremely cold and changeable winters. A few words from a celebrated writer will throw some light on this subject: "The mechanical action of frost may, however, undoubtedly be guarded against to a great extent. It is well known that the same plant growing in a dry climate, or in a dry soil, or in a situation thoroughly drained from water during the winter, will resist much more cold than if cultivated in a damp climate, or in a place affected by water in winter. Whatever tends to render tissue moist will increase the power of conducting heat, and consequently augment the susceptibility of plants to the action of frost, and whatever tends to diminish the humidity will also diminish their conducting power, and with it their susceptibility. This is an invariable law, and must consequently be regarded as a fundamental principle in horticulture, upon which success in the adaptation of plants to a climate less warm than all their own will essentially depend. The destructive effects of frosts upon the succulent parts of plants may thus be accounted for independently of the mechanical expansion of their parts; indeed, it is chiefly to that circumstance that the evil effects of cold in spring may be ascribed, for it has been found that trees contain nearly eight per cent. more of aqueous matter in March than at the end of January, and all experience shows that the cultivation of plants in situations where they are liable to be stimulated into growth, and consequently to be filled with fluid by the warmth and brightness of a mild protracted autumn, exposes them to the same bad consequences as growing them in damp places, where the wood does not ripen. The ripening process consists in the slow but gradual and complete removal of watery matter, and the conversion of fluid organizable materials into the more solid substances which are necessary to form woody fibre, and its effects are seen not only in the power conferred of resisting cold, but also in providing the secretions necessary to sustain the growth of the following spring.

Having thus clearly shown a great fundamental principle of horticulture, we must cause the operative details to harmonize with it. It is, however, unnecessary to give a minute description of the manner of cultivation to attain the object. A few general rules will suggest to us all the details necessary. First, we prefer to lay the ground off into lands 12 feet wide, and backfurrow it twice or

three times, or until the bottom of the deadfurrow is about three feet below the level. Then, if the soil is naturally wet, or has a cold, retentive subsoil, it would be well to fill the deadfurrow with small stones, then backfurrow over it until it is covered from two to three feet deep—four feet would be better. This will leave a ridge over the covered drain, six feet from an open drain. The matter of the distance apart that these drains should be, is a subject of argument, or rather, a matter of choice. By preparing the ground in this way the roots of the tree can run deep, and thus be protected from the long, severe drouths of summer, and the extreme cold of winter; for, with a loose, friable soil, the evaporation is less rapid during the long, protracted drouths which frequently occur during the early part of our summers. With such a soil the trees will make an early second growth, and mature their growth before the last of August. Any plan by which the planter can get a deeply-worked soil, thoroughly drained from below the frost, as likewise on the surface, will be sure to produce the desired result—a healthy growth and well-ripened wood.

APPENDIX D.

ABSTRACTS FROM THE REPORTS OF LOCAL AND COUNTY HORTICULTURAL SOCIETIES.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

Meeting of July 15th, 1875.

Mr. A. W. Sias being called upon, said in regard to small fruit culture, that the whortleberry had been sadly neglected in this country. He had found near the head waters of Bear creek, some whortleberry bushes growing. He had transplanted some of them in his garden and they were growing finely. He thought there was nothing to hinder every one from having, at least, a small patch of this delicious berry. Mr. Sias also spoke of the gooseberry, and recommended its more general cultivation. He said that in England these berries, by diligent cultivation, were grown as large as Transcendent, and Hyslop crabs, some of them measuring quite two inches in diameter. Six years ago he undertook to improve some varieties, taking the seeds of Houghton's and Hurd's, and from these he had now about thirty-five varieties in bearing. Some of them were larger than the original berry, and he thought that by continuing the process further improvements might be made. He had experimented with black currants in the same manner, taking the seeds of the Black Naples, planting them year after year, he had raised some fine specimens, but the seedlings were later than the original plants. He doubted whether he had any seedlings superior to the Black Naples, but he could tell better in a year or two. Of raspberries, Mr. Sias said he thought the Hoag Seedling was superior to anything which he had seen. Next to this he would place Davison's Thornless on the list. He exhibited fine specimens of the Thornless and said this fruit was doing remarkably well. He also showed fine specimens picked from the thirty-five varieties of gooseberries which he was cultivating.

Mr. Pearce exhibited a currant bush of the Red Grape variety, and also specimens of the Mammoth Cluster raspberry.

Mr. Leland asked Mr. Pearce if he would cut out the old brush every year.

Mr. Pearce replied, he would cut them out every second year, at least.

Mr. Hillman inquired of Mr. Pearce what kind of raspberries he preferred.

Mr. Pearce said that he liked the Purple Cane very well. The Mammoth Cluster is a good variety; also the Thornless. The latter was an early variety and had produced better than any other variety which he had tested. He believed in thorough trimming.

Mr. Sias asked if it was not the best time to trim immediately after the fruit is off.

Mr. Pearce thought in that case the young canes would not be sufficiently protected from the winds.

Mr. Sias said he cut out the old canes, and supports the young stalks by tying them up.

Mr. Cook favored trimming immediately after bearing, and not let them grow more than one and a half feet high. The next year they may be allowed to grow two or three feet high. By properly mulching there is no difficulty in raising raspberries.

Mr. Hall said he picked ripe raspberries at his place on the second day of July.

Mr. A. Harkins inquired if the Thornless was as early as the Purple Cane.

Mr. Cook replied that they ripened about the same time.

Mr. Harkins said he did not protect his raspberries, still they were uninjured. He had the Purple Cane and the Philadelphia. Of the former he was picking about twenty quarts a day.

Mr. Sias said he had a few of a garden variety, which seemed to be a cross between the Black Cap and some red variety.

Mr. Hall said he had two hundred grape vines rooted. He would not recommend covering grape vines with anything besides straw.

Mr. Pearce moved that Mr. Cook be requested to furnish copies of his essay for publication in the city papers. Carried.

Mr. Cook exhibited several varieties of strawberries put up in small glass jars. He preferred for family use and general culture, Downer's Prolific; next to this is the Wilson's Albany Medium. The next best is Wilson's Albany Selected. For late fruit, the Green Prolific and the Kentucky are preferable.

Mr. Hillman spoke favorably of the currant. Its season continued longer than other small fruit. It is easily raised and always sells well in market.

Mr. Pearce said currants make excellent jelly.

Mr. J. A. Leonard thought currants would make excellent wine.

Mr. Sias thought gooseberries were ahead of currants, as three times as many could be raised with the same amount of labor. He spoke highly of the American Seedling.

SMALL FRUIT CULTURE.

An Essay read before the Olmsted County Horticultural Society, July 17th, 1875, by Mr. M. W. Cook.

Mr. President and Gentlemen :

The subject of small fruit culture has been thoroughly discussed by the various horticultural societies of the different States and counties, and while there is little that is new to offer, there is much that is interesting and of great importance. Having just experienced three years of very trying, and to many kinds of fruit trees very damaging weather, the idea is rapidly gaining ground that if we would secure a supply of fruit with certainty and without long waiting, we must give more attention to the cultivation of small fruit.

Time will not permit me to enter upon a long argument to show the great importance of this branch of horticulture, but I will briefly reply to the old question, "Will it pay?" which is daily asked, by stating a few facts, and leaving each one to draw his own conclusions from them.

The yield of strawberries varies greatly according to mode of culture and varieties planted, but thirty bushels of strawberries is no greater yield than ten bushels of corn. The yield per acre varies, then, from fifty to more than two hundred bushels, and the value of these in the market from \$100 to \$1,500. They may be as easily raised as potatoes after the plantation is made, if rightly done; badly cultivated they are costly.

I am very frequently asked the questions, "How shall I prepare the land?" "How and when shall I set the plants?" "What varieties are the best?" "What care do they need?" etc., etc. I answer, any ground that will grow good corn or potatoes will produce good strawberries. Clear the ground of weeds, roots and seeds; plough or spade deeply. An application of thirty bushels of ashes, ten of lime, and two of salt per acre, although not necessary to a fair crop, is very beneficial. It should be thoroughly mixed with the soil about a week before the plants are set. As a general rule the spring is the best time to set plants, but if strong, healthy plants can be obtained early in the fall, they may be set with safety, and will produce a partial crop the following season. For garden culture the proper distance apart to set, is one foot by one and one-half feet; for field culture one foot by two and one-half or three feet, giving in the latter case a chance to do nearly all the work with the cultivator or fine tooth harrow. Whatever mode is adopted, set the rows straight. Clean culture is of the first importance.

Some varieties do well on almost any soil, while others require a particular kind of soil, and are unsafe except to test on a small

scale. For profit, plant those kinds only that can always be relied upon, and be sure that the plants are pure. I have tested on my grounds more than twenty-five kinds, and find after an experience of ten years that the sorts which it will do to recommend, are few. Downer's Prolific is unquestionably the best early variety, Wilson's Albany the best medium and Green Prolific the best late kind. These three varieties do well on all soils, and under all modes of cultivation. Among the new varieties that promise well are Boyden's No. 30, and the Kentucky, both very late. By planting these varieties we may have this delicious fruit for at least one month.

When set in the spring, the fruit stems should be removed the first season. Cover in the fall with straw or wild hay; either must be free from foul seed. In the spring remove the covering leaving it at the end of the bed; cultivate until the berries begin to turn, and then put the mulching between the rows, and wet it two or three times during the bearing season if possible. If the directions given are followed, my word for it, you will be rewarded with an abundance of this healthful and delicious fruit. Fortunately it is so easily raised that the poorest owner of a few square rods may have it in abundance. It will contribute to health, comfort and economy, save butcher's and grocer's bills, and make home pleasant. One-twentieth of an acre as well cultivated as a field of corn should be, and set with an early, a medium and a late variety would yield an average of four quarts per day for from four to six weeks. In order to accomplish so desirable a result, who would hesitate to devote even one-eighth of an acre to strawberries? Make your plans now, decide upon the number of plants of each kind you will need, make arrangements to procure them reasonably, prepare the ground at once, set out the plants in good time, and you cannot fail to be highly gratified with the result. Remember the conditions. Unmixed plants true to name, and clean culture. J. J. Thomas says if you allow them to become weedy, they will bear but little, and you will come to the conclusion that strawberries are a humbug. Do the work early and well, and the expense will be small, the labor light and the reward great.

Next in their turn, and right on the heels of the strawberry, come currants, raspberries and grapes. Thus, with small expense and proper care, our tables may be supplied with the various kinds of small fruits from three to four months.

Raspberries that have proved sufficiently hardy by proper pruning and a little protection, to warrant their culture, are, for blackcaps, Davison's Thornless, Doolittle and Mammoth Cluster; for red, Purple Cane and Philadelphia, the last being the latest and best for general culture. For grapes, the Concord and Janesville are hardy and of fair quality. Raspberries, the first year after setting, should not be allowed to grow more than one and a half feet in height, but kept pinched or cut back, which will cause them to throw out side branches, which should also be pinched off when one foot long, thus causing them to be stocky and not easily broken by the wind, and protected early in winter. The second year let them grow two and half a feet high—not higher. By pruning in this way and with a little protection, we need have no fears from winter killing.

Gentlemen, if what we may do and say shall have a tendency to awaken an interest among farmers and owners of village lots to a renewed interest in the subject of small fruit culture, we shall feel well paid. Having briefly and indirectly answered the question, in the light of dollars and cents at least, will it pay, I leave the subject to your discussions.

MEETING OF FEBRUARY 12, 1876.

A meeting of the Olmsted County Horticultural Society was held at Upman's Hall last Saturday afternoon, the 12th inst. Quite a number of members were present, and the discussions were spirited and full of interest.

The President, M. W. Leland, called the meeting to order.

Mr. M. Pearce spoke of the importance of maintaining an organization as a society. Ours was the only county horticultural society in the State; we lived in one of the best counties in the State for fruit-growing, and he desired to see their membership largely increased. The attendance at the meetings had not been large heretofore, and he proposed a reduction in the membership fee. Mr. E. B. Jordan was opposed to the motion, and would favor raising it to \$2 a member. He was willing to be one of five to pay all the expenses of the society.

The subject was laid over for future consideration.

The subject of the annual election of officers was next considered. After some discussion it was decided to proceed with the selection of officers instead of waiting until the next regular meeting.

On motion, the following officers were chosen for the ensuing year :

President—M. W. Leland.
Vice President—Wm. Somerville.
Treasurer—A. W. Sias.
Secretary—S. D. Hillman.
Assistant Secretary—G. W. Mason.

Mr. Jordan said that horticulture was not looked upon with as much favor as it should be, for, with the new varieties of apples and hybrids he was encouraged to believe that Minnesota would yet become a fruit growing district. The hybrids could be grown successfully and would yield fruit unsurpassed by Michigan standard apples. He had ten acres planted, and should set 300 more trees of the different hybrid varieties in the spring. They would grow wherever the poplar or maple could be grown, and bear excellent crops of fruit. The Early Strawberry was among the first to come into bearing, and the fruit ripens earliest of the hybrids. The Conical ripens its fruit in September, keeps till January, and is superior to the Gilliflower. He had gathered a bushel from a tree set four years. He should

plant 100 this spring. The Orange was the most valuable tree of these varieties; fruit keeps until January, prolific bearer, excellent quality, and was highly recommended by the State Society. He also spoke of the merits of the Quaker Beauty, Palmer's Sweet and Woodland Winter.

Mr. Pearce also spoke highly of the hybrids and thought they would take the place largely of standards in this country. They bore early and produced abundant crops of fruit. He spoke highly of the Orange, and said it was perfectly hardy. An impression prevailed that it was impossible to grow apples in consequence of farmers having spent hundreds of dollars on trees which had proved to be useless. He would recommend the hybrids for general cultivation, also the more hardy varieties of seedling apples. He would urge farmers and fruit growers to set them out in large quantities, and in five years the State would have a surplus of fruit. The State Society had made out a list of "iron-clads."

Of this list the Early Strawberry stands at the head. The tree is a strong and handsome grower, bearing well alternate years. Fruit the size of Transcendent. The Orange grows slower; the fruit is larger and keeps much later. The Minnesota bears fruit as large as the Russet, nearly white, good quality and keeps till February.

M. W. Cook said he could fully endorse what Mr. Pearce had said in regard to the hybrids. They were divided into three classes by the State Society, but he considered the dozen or more varieties mentioned as hardy and worthy of recommendation.

Mr. Leland said he had tried everything to get rid of blight and succeeded best by growing trees on sod ground.

Mr. Richardson thought that deep planting would secure the same result.

A discussion here followed as to the causes of blight, its nature and the remedy.

Mr. Pearce said it was a fungus growth peculiar to vegetation, and could be prevented by the use of quick lime.

GERMAN HORTICULTURAL SOCIETY OF RAMSEY CO.

ST. PAUL, April 10, 1876.

Mr. Chas. Y. Lacy, Minneapolis:

DEAR SIR:—OUR "*German Horticultural Society of Ramsey County*" consists of twenty members, all practical gardeners, engaged in floriculture, fruit and vegetable gardening. The officers of the society are:

President—J. C. Fleischer.
 Vice President—Edward Blum.
 Secretary—A. Miller.
 Treasurer—Alois Meier.
 Librarian—Ch. Bunde.

We meet every first Saturday of the month. Our dues, \$1.00 for membership and \$1.00 per year, payable quarterly.

We keep several horticultural papers on file, read them at our meetings, and discuss those articles which seem interesting to the members.

Yours truly,

J. C. FLEISCHER.

RICE COUNTY HORTICULTURAL SOCIETY.

FARIBAULT, Minn., March 29, 1876.

Chas. Y. Lacy, Esq., Secretary State Horticultural Society:

SIR:—Pursuant to instructions, I have to state, that a meeting of the Faribault Fruit Grower's Club was held in this city, pursuant to call, March 10, 1876.

On motion, it was resolved to reorganize as the Rice County Horticultural Society, with the following officers:

President, R. A. Mott; Vice President, J. P. Andrews; Secretary, A. W. McKinstry; Treasurer, Wm. Wachlin.

A discussion was held upon the subject of hardy apples.

Voted to place Duchess first on the list, Melinda second.

The subject of Cranberry cultivation was also discussed.

Adjourned to Wednesday, April 12, 1876.

Very Respectfully,

A. W. MCKINSTRY,
 Secretary.

APPENDIX E.

DESCRIPTIONS OF NEW VARIETIES OF FRUIT.

DESCRIPTION OF O. V. ROLLINS' NEW SEEDLING APPLES, AND FAMEUSE CRAB, BY A. W. SIAS.

ROCHESTER, Minn., Jan. 24th, 1876.

What is known as the Rollins' varieties were started from seed brought from Northern Vermont, and planted on a rather low, flat, open prairie, known as Greenwood Prairie, in the township of Elgin, Wabasha county. One variety takes its name from the county in which it originated, and another from the township. The name Rollins' Pippin was suggested by its slight resemblance to the well known Fall Pippin. (This, however, is a better apple in quality, and a better keeper.) The name Rollins' Prolific was suggested from its great bearing qualities, having produced over three barrels in a single season.

The four varieties above mentioned were named by A. W. Sias, Rochester, Minn., who was the first to propagate and bring them to public notice. Also the Viola, a fall variety, from Mr. Rollins' grounds, that first fruited in the township of Viola—hence its name. The other two varieties are Rollins' Russet and Spice-sour.

Viola.

Tree strong, straight, hardy and handsome; fruit about the size of Fameuse; shape and color resembling the R. I. Greening; quality hard to beat; season, September.

Rollins' Russet.

Tree a strong and rapid grower; ripens its wood earlier in the fall than the Haas, and is believed to be more hardy. Fruit, in color, size, quality, and as to keeping qualities, more closely resembles the Roxbury, or Boston Russet, than anything else with which I am acquainted. Great bearer; season, January to June (or July.)

Rollins' Pippin.

Tree vigorous, straight and hardy; fruit large, color yellow, fine-grained, flesh tender and delicious. Season, October to May.

Elgin Beauty.

Said to be more hardy than Duchess of Oldenburg; medium grower; straight and handsome, fruit medium size; color, streaked with red on yellow ground; flesh sometimes of a pinkish color, tender, moderately juicy, with a rich, sub-acid flavor; season, November to March.

Wabasha.

Tree a strong grower; fruit medium size; flesh tender, sprightly, with a pleasant, acid flavor. This variety has fruited every season since the hard winter of '72, and the tree looks remarkably well; season, December to March.

Rollins' Prolific.

Moderate grower; hardy, an abundant bearer; fruit size of Fameuse; splendid for culinary purposes, as tart as the R. I. Greening, which it somewhat resembles in color, size and quality, but hardly as rich in flavor; season, January to March.



Spice Sour.

This tree, although believed to be fully as hardy as the St. Lawrence, is doubtless less hardy than either of the six varieties above described. Fruit medium, or below; flesh moderately juicy, tender, with a pleasant, aromatic flavor; season, December to April.

The seven varieties above named all originated with O. V. Rollins, Elgin, Wabasha county, Minn.

Fameuse Crab

originated with A. W. Sias, Rochester, Minn. Tree handsome; stocky grower; apparently as hardy as Transcendent. Winter of '72-3 had no more effect upon it than the very mildest winters since it first started from the seed seven years ago. All the lower branches of this tree start out exactly at right angles with the trunk, or body of the tree, extend some ten inches, then gradually turn upward. Fruit size of Transcendent; color, bright, glossy red cheek, with shaded side nearly white; sub-acid flavor, wholly destitute of astringency; flesh white, quality good; season, December to February, (or possibly later, as it bore this year for the first time.)



TRANSACTIONS
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY,



PROCEEDINGS, ESSAYS, AND REPORTS
AT THE SUMMER MEETING,

HELD AT THE
STATE AGRICULTURAL COLLEGE. JUNE 28TH, 1876,

AND AT THE
ANNUAL WINTER MEETING,

HELD AT
Owatonna, January 16th, 17th & 18th, 1877.

Prepared by CHAS. Y. LACY, Secretary.



ST. PAUL:
PIONEER PRESS COMPANY.
1877.

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STATE AGRICULTURAL COLLEGE, JUNE 28TH, 1876,

AND AT THE

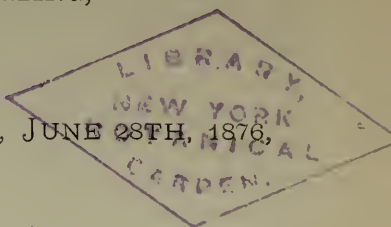
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OFFICERS FOR 1877.

PRESIDENT.

TRUMAN M. SMITH.....St. Paul.

VICE PRESIDENTS.

E. H. S. DART, First District.....Owatonna.

A. W. MCKINSTRY, Second District.....Faribault.

J. T. GRIMES, Third District.....Minneapolis.

SECRETARY.

CHAS. Y. LACY.....Minneapolis.

TREASURER.

A. W. SIAS.....Rochester.

STANDING COMMITTEES.

EXECUTIVE.

WYMAN ELLIOT.....Minneapolis.

WM. E. BRIMHALL.....St. Paul.

O. F. BRAND.....Faribault.

J. S. HARRIS.....La Crescent.

U. S. HOLLISTER.....St. Paul.

PRESIDENT AND SECRETARY *Ex Officio*.

ON ENTOMOLOGY.

HON. R. J. MENDENHALL.....Minneapolis.

J. S. HARRIS.....La Crescent.

WYMAN ELLIOT.....Minneapolis.

ON FLOWERS AND FLORICULTURE.

Miss HORTENSE SHARE.....	Rosemount.
J. C. FLEISCHER.....	St. Paul.
WM. CANNON.....	Fort Abraham Lincoln, D.T.

ON VEGETABLES AND MARKET GARDENS.

WM. E. BRIMHALL.....	St. Paul.
J. T. GRIMES.....	Minneapolis.
J. C. KRAMER.....	La Crescent.

ON TREES FOR THE FOREST AND FOREST CULTURE.

L. B. HODGES.....	St. Paul.
JOHN K. KEPNER.....	Little Valley, Olmsted Co.
J. H. BROWN... ..	Lac qui Parle.

ON CATALOGUING FRUITS AND SHADE AND ORNAMENTAL TREES AND PLANTS.

(See Page 115.)

P. A. JEWELL.....	Lake City.
WYMAN ELLIOT.....	Minneapolis.
A. W. SIAS.....	Rochester.

PERMANENT COMMITTEE ON OBITUARIES.

COL. J. H. STEVENS.....	Minneapolis.
HON. C. M. LORING.....	“
GEN. LEVI NUTTING.....	Faribault.

TO COLLECT FRUITS FOR MEETING OF AMERICAN POMOLOGICAL SOCIETY.

O. F. BRAND.....	Faribault.
J. S. HARRIS.....	La Crescent.
A. W. SIAS.....	Rochester.

ON AMENDMENTS TO CONSTITUTION AND BY-LAWS.

CHAS. Y. LACY.....	Minneapolis.
E. H. S. DART.....	Owatonna.
U. S. HOLLISTER.....	St. Paul.

ON FRUIT CHARTS.

(See Page 85.)

J. S. HARRIS.....	La Crescent.
P. A. JEWELL.....	Lake City.
O. F. BRAND.....	Faribault.
J. T. GRIMES.....	Minneapolis
— — SMITH.....	St. Cloud.

GENERAL FRUIT.

(To be appointed hereafter.)

LOCAL AND COUNTY HORTICULTURAL SOCIETIES.

(See Appendix.)

MEMBERS FOR 1877.

Anthony, David.....	Kasson, Dodge county.
Arnold, W. W.....	Clinton Falls, Steele county.
Andrew, John B.....	Faribault, Rice county.
Bernstein, Wm.....	Minneapolis, Hennepin county.
Blakeley, Capt. R.....	St. Paul, Ramsey county.
Brackett, Hon. Geo. A.....	Minneapolis, Hennepin county.
Bower, Thomas.....	St. Paul, Ramsey county.
Boxell, J. W.....	Afton, Washington county.
Brimhall, Wm. E.....	St. Paul, Ramsey county.
Brand, O. F.....	Faribault, Rice county.
Booth, J. E.....	Minnehaha, Hennepin county.
Cameron, G. W.....	Dundas, Rice county.
Cannon, Wm.....	Fort Abraham Lincoln, D. T.
Carter, T. G.....	St. Peter, Nicollet county.
Clement, J. B.....	Faribault, Rice county.
Cochrane, Thomas, Jr.....	St. Paul, Ramsey county.
Cook, M. W.....	Rochester, Olmsted county.
Dart, E. H. S.....	Owatonna, Steele county.
Day, Ditus.....	Farmington, Dakota county.
Drake, Hon. E. F.....	St. Paul, Ramsey county.
Dennerline, J. G. A.....	Owatonna, Steele county.
Elliot, Wyman.....	Minneapolis, Hennepin county.
Fox, C. F.....	South Troy, Wabasha county.
Grimes, J. T.....	Minneapolis, Hennepin county.
Gronvold, Dr. Chr.....	Norway, Goodhue county.
Hart, John.....	Winona, Winona county.
Hoag, M. J.....	Rochester, Olmsted county.
Hollister, U. S.....	St. Paul, Ramsey county.
Harris, J. S.....	La Crescent, Houston county.
Humphrey, D. W.....	Faribault, Rice county.
Hodges, L. B.....	St. Paul, Ramsey county.
Jewell, P. A.....	Lake City, Wabasha county.
Jordan, E. B.....	Rochester, Olmsted county.
Kramer, J. C.....	La Crescent, Houston county.
Kenney, Seth H.....	Morristown, Rice county.
Laing, Prof. R. W.....	Minneapolis, Hennepin county.

Lacy, Chas. Y.....	Minneapolis, Hennepin county.
Lindersmith, Orlando.....	Owatonna, Steele county.
McHenry, Wm.....	St. Charles, Winona county.
McKellup, C. D.....	Faribault, Rice county.
Middleton, James.....	Woodbury, Washington county.
McKinstry, A. W.....	Faribault, Rice county.
McClung, J. W.....	St. Paul, Ramsey county.
Morey, Prof. Chas. A.....	Winona, Winona county.
Mathews, B. A.....	Knoxville, Iowa.
Mott, R. A.....	Faribault, Rice county.
Miller, C. F.....	Dundas, Rice county.
Norquist, John.....	Red Wing, Goodhue county.
Pearce, M.....	Rochester, Olmsted county.
Phillips, A. J.....	West Salem, Wis.
Pye, S. M.....	Faribault, Rice county.
Rice, Hon. H. M.....	St. Paul, Ramsey county.
Smith, T. Tunis.....	St. Paul, Ramsey county.
Scott, W. T.....	Minneapolis, Hennepin county.
Storrs, O. D.....	Winsted Lake, McLeod county.
Sias, A. W.....	Rochester, Olmsted county.
Smith, J. A.....	Minneapolis, Hennepin county.
Smith, Truman M.....	St. Paul, Ramsey county.
Smith, C. M.....	Rochester, Olmsted county.
Somerville, Wm.....	Rochester, Olmsted county.
Thompson, Josiah.....	Minneapolis, Hennepin county.
Wachlin, Wm.....	Faribault, Rice county.
Wilcox, E.....	Trempealeau, Wis.

The wives of members are members of the Society without fee.

NAMES TOO LATE FOR 1876.

The following names of members for 1876 were received too late for insertion in the Transactions of last year :

Anthony, David.....	Kasson, Dodge Co.
Bernstein, Wm.....	Minneapolis, Hennepin Co.
Fisk, Woodbury.....	Minneapolis, Hennepin Co.
Hendrickson, W. G.....	St. Paul, Ramsey Co.
Hoag, Chas.....	Richfield, Hennepin Co.
Howe, G. H.....	Minneapolis, Hennepin Co.
Hoffman, G. J.....	Worthington, Nobles Co.
Kramer, J. C.....	La Crescent, Houston Co.
Norquist, John.....	Red Wing, Goodhue Co.

Prescott, Chas. A.....St. Paul, Ramsey Co.
 Winchell, Prof. N. H.....Minneapolis, Hennepin Co.

HONORARY MEMBERS.

A. G. Tuttle, Baraboo, Wis., elected.....1873
 O. S. Willey, Madison, Wis., elected1873
 Wm. W. Folwell, Minneapolis, Minn., elected1873
 George Peffer, Pewaukee, Wis., elected.....1874
 Miss Hortense Share, Rosemount, Minn., elected.....1877
 Mrs. C. O. Van Cleve, Minneapolis, Minn., elected.....1877

LIFE MEMBERS.

Mrs. Wm. Paist.....St. Paul, Minn.

FRUIT LISTS,

AS APPROVED OR REVISED AT THE ANNUAL MEETING AT OWATONNA, JAN.
16TH TO 18TH, 1877.

NOTE.—It should be remembered that negative votes are not always unfavorable ones. Those casting them may be in favor of placing the variety in a higher list or in a lower one.

APPLES.

(See page 116 for discussion.)

Recommended for general cultivation—

Duchess of Oldenburg.

Wealthy.

Recommended for planting in limited quantities—

Tetofsky.

Recommended for general cultivation in favorable localities—

Haas.

Price's Sweet. 5 for and 2 against.

Plum Cider. 7 for and 1 against.

Saxton. 6 for and 2 against.

Recommended for favorable localities—

St. Lawrence.

Fameuse. Unanimous vote.

Utter's Red.

Talman's Sweet. 4 for and 1 against.

Recommended for general trial throughout the State—

White Astrachan.

Elgin Beauty.

Recommended for trial—

Melinda. 8 for and 1 against.

Walbridge. Unanimous vote.

Stewart's Sweet. Unanimous vote.

Peach. Unanimous vote.

Recommended for trial by amateurs and pomologists—

Alaska.	Queen of Elgin. Unanimous vote.
Julia. 7 for and 1 against.	Rollin's Pippin. Unanimous vote.
Molly. Unanimous vote.	Rollin's Russet. Unanimous vote.
Clayson. Unanimous vote.	Rollin's Prolific. Unanimous vote.
Kimball. Unanimous vote.	Wabasha. Unanimous vote.
	Hart's Seedling, No. 7. Unanimous vote.
	Hart's Seedling, No. 11. Unanimous vote.
	Viola. Unanimous vote.

CRAB APPLES.

(See page 123 for discussion.)

Recommended for general trial—

Early Strawberry.	Minnesota.
Orange.	Quaker Beauty.
Beecher's Sweet.	Conical.
Meader's Winter.	Maiden's Blush.
	Hesper Blush. 3 for and 1 against.
	Woodlawn Red. 3 for and 3 against.
	Meader's Sweet Russet. 5 for and 2 against.

Recommended for general trial in favorable localities—

Aiken's Striped Winter.

Recommended for general trial in localities not subject to blight—

General Graut. (The least hardy on the list.)

Recommended for general planting by those not afraid of blight—

Transcendent.

Recommended for planting in small quantities—

Hyslop.

Recommended for trial by amateurs and nurserymen—

Whitney's No. 20. Unanimous vote.	Virginia. Unanimous vote.
Alaska. 7 for and 2 against.	Brier's Sweet. 6 for and 1 against.

Passed over without action—

Hutchinson's Sweet.	Aiken's Green Winter.
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GRAPES.

(For discussion see page 55.)

Recommended for general cultivation—

Concord. Unanimous vote. Delaware. Unanimous vote.

Recommended for planting in limited quantities—

Hartford Prolific. Unanimous vote.

Recommended for trial for its earliness—

Janesville. 4 for and 1 against.

STRAWBERRIES.

(For discussion see page 86.)

Recommended for general cultivation—

Wilson's Albany.

Recommended for cultivation by amateurs—

Green Prolific, as an abundant bearer.

Recommended for cultivation for home use—

Downer's Prolific.

Recommended for general trial—

Charles Downing.

*Recommended for trial—*Michigan Seedling. Countess de Haricourt.
Prouty's Seedling.

RASPBERRIES, BLACK-CAPS.

(For discussion see page 88.)

Recommended for general cultivation—

Doolittle. Seneca.

Recommended for trial—

Ontario.

RASPBERRIES, RED.

Recommended for general cultivation—

Philadelphia. 9 for and 1 against. Turner. 9 for and 1 against.

CURRENTS.

(For discussion see page 93.)

Recommended for general cultivation—

Red Dutch.

Victoria.

White Grape.

Recommended for general cultivation as a black variety—

Black Naples.

Recommended for trial—

Stewart's Seedling.

PLUMS.

(Action of 1876.)

Resolved, That in view of the vast number and variety of native plums of great excellence in our State, and the uncertainty of getting a genuine article by importation, therefore we recommend that our people depend principally upon our own native plums for a supply.

Recommended for trial—

Miner. (13 for, 4 against.)

De Soto. (10 for, 8 against.)

GOOSEBERRIES.

(For discussion see pages 94, 95.)

None were recommended.

EVERGREENS.

List adopted 1876 and approved 1877. The votes recorded are those of 1876.

- White Spruce, 1st. (10 for, 8 against.)
Norway Spruce, 2d. (11 for, 8 against.)
Scotch Pine, 3rd. (13 for, none against.)
Balsam Fir, 4th. (15 for, none against.)
White Pine, 5th. (11 for, none against.)
American Arbor Vitæ, 6th. (11 for, 2 against.)
Red Cedar, 7th. (11 for, 4 against.)
Red or Norway Pine, 8th. (11 for, none against.)
Austrian Pine, 9th. (9 for, 7 against.)
Mountain Pine, 10th. (8 for, none against.)
Siberian Arbor Vitæ, 11th. (14 for, none against.)
Trailing Juniper, 12th. (13 for, none against.)

PROCEEDINGS AT THE SUMMER MEETING.

ANNOUNCEMENT.

MINNESOTA HORTICULTURAL SOCIETY,
MINNEAPOLIS, June 15, 1876.

This Society will hold a summer meeting and exhibition at the State Agricultural College, Minneapolis East, on Wednesday, June 28th, 1876, beginning at 9 o'clock, A. M. The following subjects will be introduced for discussion:

Insect Enemies of Fruit and Ornamental Trees, Small Fruits, Flowers and Vegetables; Effects of last winter on Fruit and Ornamental Trees, Shrubs, Plants, &c.; Fruit Prospects for the Present Year; Exhibition of Fruits at the Centennial; General Interests of the Society; Transplanting and care of Evergreens, Larches, &c.; Planting and Cultivating the Strawberry.

At 12 o'clock the citizens of Minneapolis and vicinity will invite the members and guests of the Society to partake of a Basket Dinner on the University grounds. At 1 o'clock P. M., Prof. Chas. A. Morey, of Winona Normal School, will deliver a lecture on the "Nature and Growth of Fungi," treating, in this connection, of those diseases of plants supposed to be caused by fungus growth, as Blight, &c.

All, including wives, sons and daughters, are cordially invited to be present, and to contribute to the exhibition of Fruits, Flowers, Plants and Vegetables, for which ample accommodation will be provided. Those bringing or sending specimens will please notify the undersigned when and how shipped. Efforts will be made to obtain reduced return fare on the railways.

CHARLES Y. LACY,
Secretary.

WISCONSIN HORTICULTURAL SOCIETY.

In accordance with the above notice the Society met at the place named and at 10:30 A. M. the meeting was called to order by Pres. Smith.

The Secretary first made some explanations concerning the programme.

Mr. Harris mentioned the meeting of the Wisconsin Horticultural Society at Tomah this day, and proposed sending a message of greeting.

A motion that the Secretary be directed to send a message of greeting was carried, and the message immediately sent.

DISCUSSION.

The Effects of Last Winter.

This subject was taken up for discussion.

Mr. Wilson. I suffered more last winter than ever before. Lost strawberries that were covered with leaves and straw. Lost also Black-cap Raspberries that had been exposed for years. They killed to the ground. Hardy lilies were killed last winter with ordinary protection.

Mr. Grimes. Had the same experience. Lilies slightly protected are all dead. Wild lilies in the marshes were also killed. My theory is that the winter commenced early and was unusually severe. The thermometer stood 30° below in November. Some plants considered hardy are dead while others considered less hardy came through. The Carnation Cherry is an example of the last, while the Leib is dead to the ground. Trees and plants that ripened up were able to sustain the first cold, but the others were not. Grapes are alive but putting out feebly, and we shall have but little fruit.

Mr. Harris. The destruction was due to the events of the spring. In February there was a severe thunder storm. Then snow fell 2 or 3 feet deep. One week we had a great thaw and then another freeze and the beds were covered with from 3 to 15 inches of ice. I think there was no injury done up to that time. The Philadelphia shortly before that was alive to the tips but afterwards found dead. Strawberries where the ice was deepest suffered least. Roses protected partly with sods but chiefly with coarse litter are dead. One Queen of the Prairie left unprotected is now loaded with buds. Two or three Hybrid Perpetuals unprotected are in good condition. My soil is heavy, some black prairie but mostly clay.

Mr. Elliot. Strawberries are pretty much killed out. Currants are a better crop this year than last.

Mr. Wilson. We can protect against cold but do not know how to protect against a thaw. My soil is sandy loam on gravelly sub-

soil. We must give protection but sometimes we give too much, when we have mild winter with heavy snows.

Mr. Gould. In September there were ten days or two weeks of wet, cold weather, when we wanted it warm and dry, so that grapes even if well protected are subject to rot. Strawberries are, however, as well fit for winter one year as another. Have one bed on a Northern slope and another on a warm exposure. The former will give a good crop, the latter none. Apples matured well last fall for they have blossomed well and set well. I consider the causes of the destruction of plants to have been: First, they were kept growing when they ought to have been ripening, and Second, they were not properly protected.

Mr. Brimhall. My soil is heavy clay. My strawberries on low land where the water stood, froze and were killed. Where the water ran off they are all right. Raspberries on low rich soil were badly injured and are growing feebly. On higher drier land they are all right. Of trees more were injured than ever before. Sour-lards that have stood for ten or twelve years are nearly killed. Some standards counted hardy are growing but are feeble. The Carnation Cherry has generally wintered well until last winter when they were killed. The same is true also of some pear trees. The Duchess (in reply to a question) were badly injured.

Mr. Smith. Strawberries were much injured. Charles Downing stood the best except the Champion. It was done by ice. Grapes never wintered better. Currants came out well, and most apples as well as could be expected. I have a hazel-bush soil for my small fruits. Where my grapes are it is heavier. Of roses I had a few killed, General Washington for one. A few of the Black-cap raspberries killed. The Turner came out perfect though not protected.

Mr. Harris. My Green Prolifics killed out last winter. I think the ice absorbed heat from the plants.

Flowers.

Mr. Wilson. Here is a moss rose that has a peculiarity. The flowers are supposed to be white, but here on the same stem is a pink rose, and on another different colors are found in the same flower. I would like to hear an explanation. Another thing is the transplanting of lily-bulbs. The catalogues say transplant in the fall. I did so, and all were killed, whatever the soil might be. All those bulbs should be transplanted here in the spring. Roses mainly came through well with me, but Baron Provost was killed

with some others. (Mr. Wilson here showed some beautiful roses of several varieties.)

All manure, however well rotted, should never touch the stems, but be dug in around the roots. My man covered roses with manure, because it was easier to obtain, and the next spring they were killed.

Mr. Harris. We all know that manure is filthy, and the worst thing for winter protection, but not for a summer mulch. Flowers sport, and it is not uncommon for flowers to show such variations as those mentioned. Most people say that it is because of their proximity to other kinds. I doubt this. I think it is because the variety is not a *pure* variety; that there is something besides pure white in the blood, so to speak, of that white moss rose. The names of flowers should also have the names of the dealers with them, because otherwise you cannot depend on the names of the flowers being true, and different dealers call the same plant or flower by different names.

Mr. King was called for, but declined to say anything.

Mr. Wilson showed a winter *Gladiolus* which was a beauty. He said it was perfectly hardy, as it was planted last fall and came up this spring.

Mr. Abernethy. I have been using iron around my bushes, and it has produced a deeper color in foliage and flowers.

Mr. Harris. I have been told of a woman who put around a *Geranium* on sandy soil leached ashes. This became more thrifty than any of the others. The leaves were twice as large. I would like to know the best season and method of layering to get rose bushes.

Mr. King. The best time is from the first of July till the middle of August. Take cuttings when the wood becomes older.

Mr. Elliot. I layer by twisting the shoots and pegging them down and get very strong layers.

Insects on Currants.

Mr. Elliot proposed to discuss the currant worm. He uses Paris green to destroy it.

Mr. Gould. I use unleached ashes about the roots.

Mr. Elliot. To destroy the borer I prune out and burn the old wood. I have been told of a man that got rid of cut worms by the use of Paris green. I have used it myself for the currant borer, spreading on the ground under the bushes.

Mr. Elliot. (In answer to a question.) The Paris green does

no harm. The currants are so small when it is applied that it is washed off before the fruit is ripe.

Mr. Smith. I practice thorough cleaning of the ground, and have no trouble with the currant worm.

Mr. Harris. I think the application of Green to the ground can do no good, but think its application to the leaves will be effectual with the currant worm.

Training Raspberries.

Mr. Elliot. Is any method of growing raspberries better than to let them grow without training?

Mr. Grimes. I think it is better to head them down and cause them to branch low, and then cover with straw slightly—not much is needed. The best time to head back is just before picking. Cut back to the top of the fruiting canes, then a new and spreading growth will begin.

Fruit Prospects.

Mr. Harris. They appear very slim now for this year.

Mr. Brimhall. I have noticed some puff-balls on some kinds of trees, and have noticed that in such seasons the fruit crop is light.

The Secretary here read a letter from Ernest Meyer, Esq., of St. Peter.

REPORT OF MR. MEYER.

JUNE 18, 1876.

Truman Smith, Esq., St. Paul:

DEAR SIR.—Knowing your disinclination to answer letters I should not attempt the second time to trouble you with a letter, but having received notice of a summer meeting of the State Horticultural Society, to be held at Minneapolis, and not being able to attend, I will state to you a few facts of my experience in raising fruit since we met before. This business looks to me more discouraging now than it has ever done before. Commencing with the apple, I am sorry to say that my whole orchard is going to be ruined this summer by the blight. All the crabs, and many of the other trees are badly affected, and, having commenced so early in the season, I fear that a great many trees will be killed. The same trouble I find through this and adjoining counties. It is now the third time that this disease has appeared among my trees. In raising small fruits I have not succeeded much better. The black-cap raspberries are badly injured, and will not give half a crop; and, as this is the third year in succession that they have

failed, I have made up my mind to throw them aside. I have tried hard to save them by trimming early and covering the tips, but all in vain. They are not the variety for this country. My red varieties—one from my native country, the Philadelphia, and a wild one taken from my woods—came out with the prospect of a full crop. These were killed down last winter, with the exception of the wild one. Can nothing be done to prevent this killing down? My black raspberries are on the east side of my garden, and well protected. Currants and gooseberries have done well with me. I sent you last fall a box of Miner plums, raised in my garden. Do they compare with the description given in circulars of nurserymen? There are not many of them this year. My cherry trees came out in full bloom, but fruit blighted; will give some crop if birds are not too greedy.

I would like very much to be at the meeting in Minneapolis, but in this grasshopper country people have to avoid all unnecessary expenses. We have to buy our bread, and have the prospect of another visit of that insect, for they deposited their eggs within fifty miles from here. Our crops look splendid, and I hope they will not be destroyed. Hoping to hear from you this time, I remain,

Yours Respectfully,

E. MEYER.

Mr. Wilson. What kinds does he refer to? The Brown Thrush and Robin are the worst on strawberries, and the Baltimore Oriole on grapes.

Mr. Harris. I have lost raspberries from a little white grub. I dug up and destroyed the old bushes and planted again beside the old patch. They are now beginning on that side next to the old patch.

Mr. Wilson. Such cases as Mr. Meyer's are simply exceptional and not general.

Small Fruits.

Mr. Perry. I have had some experience with raspberries. I have considered the Doolittle a success for ten years past, and this year it will give the greatest crop I have ever had. I believe that a slight covering of straw to keep off the sun is all that is required. I have had the Davison's Thornless, but it is not so good. But the best of all is the Philadelphia. I have had currants for ten years. The worms cut off the crop, and then I commenced anew and kept the ground clean and had no further trouble. Cherries are doing well. I have 50 trees that are bearing well. I have the best strawberry in Minnesota or the United States. It is the *Coleur de Chair* (Color of Flesh). It is as hardy as the Wilson, larger, and in general superior for family use, but not so firm for shipping. I plant new every third year, setting the plants two feet

apart. Keep clean of weeds, but cut no runners. I have had a sad experience this year. The plants largely killed by a grub.

Mr. Elliot said use lime on the soil. Another recommended salt. He (Mr. P.) had used ashes.

Imperfect Strawberries.

Prof. Morey. I have noticed many deficient strawberries, and would like an explanation.

Mr. Smith. I think it is the dry hot weather.

Mr. Harris. We did not get that down where I live. I think that it is due to hoeing and cutting off the roots, and if this is found where they are not cultivated it is probably due to the work of grubs cutting off the roots.

(It was proposed to read further communications if they were of a more cheerful character, some favoring the reading whatever the character might be. But the discussion was resumed.)

Uncovering Plants.

Mr. Wilson. I would uncover plants when the weather is warm enough to warm them, and not before.

Mr. Gould. I would uncover when there is not much danger of the ground freezing. The fruit can be kept back by leaving the covering on longer; but then it may be left on too long, and the plants will not blossom at all.

Mr. Wilson. The dry winds of April are the trouble about uncovering too early. They take the life out of the plants. It is so with the Montana Verbena and also the Snapdragon.

Mr. Grimes. I find it well not to throw off the covering and expose at once to sun and wind. The best time is a cloudy or cool day, and if a gentle rain is falling it is better still.

Mr. Harris. I let the chickens uncover my strawberries. They do not do it too early. They should not be covered too early in the fall, but only after the ground is frozen. Uncover in cool, cloudy weather. I use straw or tan bark for covering.

Mr. Abernethy. Will shavings do instead of straw?

In reply, it was stated that they are pretty heavy, but if light ones are used they will answer.

Mr. Elliot. I have used them once, and do not want to do so again.

Mr. Gould. Marsh hay is the best covering.

Mr. Chatfield. Pine shavings are injurious to all plants, especially

is the sawdust so. I have used manure with shavings in with injury. I have seen, however, that Mr. Stewart uses them about his peach trees; they keep away mice. I have noticed that wherever water stood the plants were killed last winter.

The Society and the ladies and gentlemen present then repaired to the grove west of the University, where an ample repast, prepared by the ladies of Minneapolis, awaited them.

AFTERNOON SESSION.

PROF. MOREY'S PAPER.

At 2:30 P. M. the meeting was again called to order.

Prof. Charles A. Morey, of Winona, was introduced by the Secretary, and gave his address on "The Nature and Growth of Fungi," at the conclusion of which a vote of thanks was tendered, and a copy requested for publication.

The following is the address in full:

NATURE AND GROWTH OF FUNGI.

All of us recognize the broad distinctions between plants, animals and stones. We see, as did the ancients, that stones grow, that plants grow and live; and that animals grow, live and move. But when we come to study each kingdom closely, we are sometimes confounded by the apparent exceptions to this broad rule. We find minerals which strangely resemble plants, and plants which seem to cross the line and take on the motor powers of an animal. Nothing could puzzle a young student more than the statement that the sponge is an animal. To him, it seems to have all the characteristics of a plant, and no others. However, he can content himself by thinking that *old* students thought so before him; and not only thought so, but tenaciously held to their belief after the more venturesome had announced the classification which now obtains.

This seeming lack of distinctions runs through all science. It eludes precise definition and causes some trouble in fixing terminology; but the student soon comes to understand it, and to accept recognized limits without contradiction. In these modern days, when scientific men are rapidly going over, dissecting, classifying and labeling all the known material in the world, these minutæ of detail upon which the general scientific distinctions are based, are studied with an eagerness that is astonishing. It is a hard matter to find a class of minerals, a family of plants, or a single species of animal to which special and careful study has not been given by somebody. "Men spend their lives," as Carlyle says, "upon a single Greek root;" and

in science the narrow field of a single species is sometimes so broadened by study and comparison that the work of one lifetime only clears the way for an intelligent beginning. It is a curious thought that one day the human mind will find itself out of material. All will have been pushed to the limits beyond which Tyndal vainly attempts to pass, and which he so eloquently described in his Belfast address. Men will understand *how* all matter mingles and combines to produce the objects and phenomena of the universe. Perhaps they will then be able to see *why*. I am afraid they will never be satisfied if they do not.

The student of Botany is very soon brought face to face with the perplexing lack of definite characteristics between the plants he studies. He will even be in doubt many times as to whether a specimen is a flowering, or a non-flowering plant, the broadest distinction in Botany. But these troubles will gradually melt away, as he studies more, and he will learn to recognize points of difference which are only appreciated by the educated eye and mind. It is wonderful to what extent the power of observation may be cultivated. There are a hundred who can talk, to one who can think; but there are many who can think to one who can see. The educational world is just discovering this truth. It is only within a few years that it has been thought necessary for a student to use his eyes for any other purpose than to pore over text-books. It is no wonder that science did not thrive, and that classical studies predominated. But the tide has reached its ebb, and we everywhere see evidences of a strong flow in the right direction. The kindergarten system which twenty years ago would have been thought the height of absurdity, is now liberally employed in teaching target-practice to the young idea. There is an increasing demand for science in our public schools, and an increasing willingness to supply the apparatus with which to illustrate it. In colleges, the reaction is still more marked. We see its effects in the well-stocked laboratories of the university in whose halls we meet to-day. In these laboratories text-books are secondary, while habits of observation are carefully inculcated. Students see the actual conditions of the materials in the different stages of chemical and physical operations, the mere description of which could give but a vague idea.

Fungi have been universally admitted into the vegetable kingdom. Of the two great classes, they belong to the Cryptogamia, or flowerless plants. The ordinary fern, or brake, of the woods, the various forms of moss, and the lichens, also belong to this great class of plants. They are the lowest in their organization of the vegetable kingdom. Many of them have no leaves; some consist of but a single cell. The name is from two Greek words meaning concealed marriage. It was first used by Linnæus. They are the most difficult plants to study, because of the great variety of structure in the different groups. They are not propagated by seeds, but by small bodies consisting of but a single cell, called spores. On the under side of the leaves of common ferns, along the curled edges, these spores may be found in abundance. The process of fertilization is not yet well understood, but there seems to be nothing like chance in their growth. The same species occur regularly in the same places. A large number of fungi are parasites, i. e. growing upon other plants. Smut in corn, rust upon grain, and the ordinary mould, are examples. A still greater number grow from decaying vegetable matter; others are found upon animal matter, as leather or bone;

and still others select such unpromising soils as gravel, fragments of rocks, or even iron and lead. So far as our present knowledge goes, they are never produced in any other way than from the spores of the same species. These are infinitesimally small. The air is full of them, of all kinds and descriptions. They are deposited everywhere, and are excluded with the greatest difficulty, if indeed, they can be excluded at all.

The mind is like the eye; it can only grasp the middle ground of vision. In that beautiful band of colors, the solar spectrum, there is more heat towards the red, and more chemical power towards the violet end. They extend far outside the visible colors. Light, heat and actinism are all produced by the same kind of waves, differing only in size. Heat and the red are produced by larger waves than actinism and the violet. Green is the medium. The eye recognizes only those wave lengths between and including the red and violet. Outside these the waves are too large or too small to produce the sensation of light.

So with the mind: We can have no definite idea of infinite space or of endless torment. The figures \$1,000,000,000,000 give us no conception of the amount represented. In the opposite direction it is the same. With our powerful microscopes we view wonderfully small things; but it is only a step towards the minute. Rub your hand over a bar of soap and rinse it in a tub of pure water. The whole will take a blue tinge. The color is distinct, but the particles of soap which produce it are far beyond the power of the best microscope. Another experiment will push the question still farther. When a match is burned, a pungent, poisonous gas is produced. It is sulphurous acid. It consists of one part of sulphur vapor by volume, and two parts of oxygen, chemically combined. Light destroys the chemical force, and loosens the two elements. In a dark room fill a large glass tube, having glass ends, with this gas. Through the tube pass a single ray of light from any source. At first, nothing will be seen. The particles of the gases are not large enough to reflect light. At the end of fifteen minutes, a slight blueish tinge will appear, increasing until the particles of sulphur are all released. Now the light began to act upon the compound gas immediately, and the particles of sulphur have been growing for fifteen minutes. But with the best microscope in the world they cannot be seen separately. The mind can form no conception of them when first liberated.

Many experiments have been tried, to prove spontaneous generation. All sorts of solids and liquids have been sealed up and carefully watched for signs of life. They are generally found in the form of some kind of fungous growth, but there is always a doubt about the *total* exclusion of all germs. Fungi are always rapid in growth, and rapid in decay. In a night a small army of dwarf umbrellas will appear in a door-yard. In as short a time they disappear. They are vastly more important than is generally supposed. We favor their growth as the yeast plant, the vinegar plant, and the mushrooms which we eat; we oppose their growth as smut, rust, potato and timber rot. Many of them are indirectly useful to us in hastening the decay of organic matter. New life is supported at the expense of the old, and together both are returned to the original soil. They are the scavengers among plants. It is not yet proven that such infectious diseases as diphtheria, cholera, &c., are due to growth of fungi. They are frequently present, almost always in diphtheria, but bad cases of both have occurred where no traces of fungi could be found. One thing is certain; the best

preventive of such diseases is absolute cleanliness, both of person and premises. When in the room with a person having diphtheria, the handkerchief should be held over the mouth and nostrils. It will filter the air, keeping out a majority of the spores of the disease.

Very few fungi are eaten in this country. Foods of all kinds are so plenty, that nobody thinks of resorting to "toadstools." During the war they were eaten by soldiers, sick, or tired of army diet. The ordinary mushroom is sometimes found in restaurants in large cities. But of the hundreds of species of edible fungi, some of them making the most delicious dishes known to the gourmand, scarcely half a dozen are ever eaten in the United States. Besides the reason given, there is the other one, of danger from poisoning if a wrong species is selected. One very frequently hears the inquiry, "How can I tell the edible from the poisonous?" There is no brief rule that will fit all cases. The edible species must be learned. We all know the difference between the woodbine and poisonous ivy, aconite and sorrel, nettles and pigweeds; we must become as familiar with the "toadstools" as we are with the weeds. A few general cautions can, however, be given. All fungi having an acrid taste, should be avoided; all those which turn blue when broken, those growing upon wood, and those having a strong, unpleasant odor, are open to suspicion. The common mushroom (*Agaricus campestris*) may be known by the following characteristics: The gills or divisions of the under side, are first pink, then purple. There is a permanent ring or collar around the stem, (see figure,) and the spores are purple.* They may be obtained by cutting off the head of the mushroom and tapping it gently over white paper. Mushrooms must not be sought in woods. The meadow mushroom (*Agaricus arvensis*) is found in open fields and pastures. It is larger than the common mushroom. Enormous quantities of these are eaten in England, France and Germany. In England, also, a species growing underground, called truffles, is much esteemed. In reality most of the fungi which are commonly known are edible. Tons of them are marketed daily in all the large cities of Europe. They are dried for winter use, and are made into ketchup in large quantities. At one establishment in London, twenty tons each week are received from different parts of England and made into ketchup. In times of commercial depression in England, when thousands of men, women and children are out of work, and therefore out of food, truffle hunting and poaching is their last resort. Fields in which they grow have to be guarded as closely as the game preserves. Truffles (*Tuber aestivum*) are found in loose soils, about a foot below the surface. They vary in size from that of a plum to that of a large potato. They are nearly black, with an irregular surface like a blackberry, which they may be said to resemble. The gathering of them gives occupation to many people. Dogs, and sometimes pigs, are trained to find them. These peculiar fungi have a very agreeable flavor, which is not destroyed by cooking in any way. There is another very odd fungus found in Europe, called the "beefsteak fungus" (*Fistulina hepatica*.) It is fleshy, juicy, and looks more like beet root than beefsteak. They are sometimes very large, and they are much esteemed by salad makers.

Beside the use of fungi for food, several of them are useful in materia medica. The most common one is Ergot. This is the diseased condition of the seeds of grains and grasses. Ergot of rye is most commonly used. It

* See Popular Science Monthly for May, 1877.

begins to show itself when the germ is young. The flower itself sometimes mildews, or becomes covered with a whitish coating. A clear, yellowish fluid is exuded, which afterwards hardens and turns gray or black. A large part of the kernel thus formed is a peculiar kind of oil, called oil of Ergot. The spores of this fungus may come from the seed sown, carried to the flower through the juices of the plant. Beside its specific action on the womb, ergot also acts as a sedative, quieting the circulation, and checking hemorrhage. Ergot when taken in large quantities is poisonous. The large spongy puff-ball was formerly used to stop the bleeding of wounds, and also as an anodyne. Surgical operations of considerable importance have been performed under its influence. Many fungi are used medicinally by the Chinese. A fungus called amodou (*Polyporus fomentarius*) is used by the Germans as tinder. It is also cut into slices, dried, beaten until soft and made into warm caps and chest-protectors. The same substance is used as snuff by others. Some of the poisonous fungi are used in making fly and bed bug poisons. Still others are used in staining wood. Taken together, the fungi are the most useful of all the cryptogamous plants. They cannot compare with the ferns in elegance and beauty, nor with the delicacy and brilliancy of the mosses and lichens; but for real utility, (combined, perhaps, with real injury,) they stand next to the flowering plants.

There is so great a variety in the structure of fungi that a description would fill a volume. That of a single species will here suffice. Let us take the mushroom. We at once see three distinct parts; 1. the roots or slender fibers at the base of the plant, called the *mycelium*; 2. the stem and cap, together called the *hymenophore*; and 3. the plates or gills underneath the cap, which bear the *hymenium* or spore-producing surface. The first condition is that of the mycelium, which is a collection of vegetating spores or cells. It is generally found in the form of slender threads, which at certain points become centers of growth. At first there is only a small knob about as large as a mustard seed; but it grows rapidly and other knobs or buds appear at its base. This is the young *hymenophore*. As it comes up through the earth it becomes elongated, and a close examination reveals the position of the future gills. As yet they are only a pair of dark spots on opposite sides of the apex. The edges of the cap are bent down and enclosed in the skin of the plant until it arrives very nearly at maturity. Then the cap expands, breaking the skin and exposing the gills. At the point where the skin is broken from the stem, the collar or ring (see figure) is formed. It is easy to find mushrooms in all these stages of growth. A slice of the stem or cap under the microscope is seen to be made up of slender, tubular cells. The gills are covered with the delicate membrane, or spore-bearing surface, *hymenium*. If spread out upon a flat surface its size would be something astonishing. If the spores be shaken from it as before directed, and examined with the glass, they will be found in groups of four. If the hymenium itself is examined, each spore will be seen upon a slender stem, four of these stems proceeding from a single, thicker stalk, called a *basidium*. The basidia are mingled with other similar stalks, larger, but bearing no stems or spores. They are called *cystidia* (see figure 2.) The function of these latter stalks is not well understood; they are supposed to be the male organs of the plant. When the spores fall off the basidia, others are produced, until the contents of the basidia are exhausted. The largest spores are microscopic, and the smallest are not visible under the best microscope. They

are of various shapes, (see figure 3) all more or less irregular. If the head of a fungus be laid upon a sheet of paper, the gills downward, and left over night, a perfect print will be found in the morning. It shows the great number of the spores, and the facility with which they are given off. The subject of sexual reproduction in these plants is being carefully studied. Few results have yet been obtained.

Of all the edible fungi, only two are cultivated, and one of these but very little. The mushroom is regularly grown for the market all over Europe. Truffles are cultivated with moderate success, and upon a small scale in England only. As an experiment, some fine mushrooms were grown in the following way: Spores were collected and sown upon a pane of glass covered with wet sand. When they began to grow they were transferred to a damp soil in a cellar. The bed was watered with a dilute solution of nitrate of potash, and in a week the plants grew to a fine size. Large quantities of them are grown in caves near Paris. In one there are twenty-one miles of beds, sending 3,000 lbs. to market daily. The temperature is so equal in these caves that the plants grow the year round. It is very easy to cultivate mushrooms, even to an inexperienced person. During the summer let some fine horse manure be collected and mixed with one-third the quantity of sandy soil. Keep it in a place where it will be much trodden if possible. It will heat a little, but the more it is trodden the less it will heat. If it gets above blood heat it must be worked over. The heap must be kept dry, in a shed or hole, and in a short time it will be full of the spawn or *mycelium*. Begin the bed in the cellar or root house by a foundation of strawy manure; then put on the contents of the heap, and over that four inches of rich mold. The whole should be trodden down firmly with the feet, and carefully watered. Smooth it all down with the back of a spade. In a few days the plants will appear. Others besides mushrooms will sometimes come up, and must be removed. As fast as the mature plants are removed, others will appear, and the bed will keep up the crop for several months. It must be kept moist. To all who have eaten these delicious plants, the labor implied in the above description will appear trifling. It will not always succeed. Sometimes the plants will be small and flabby, or covered with warts and mouldy spots. Other fungi are at work upon them, and the whole must be smoothed down for a new trial.

Some of the fungi are very brilliantly colored. From white through all the tints of brown and yellow, purple and red to the deepest black; these are the predominant colors. But there are also occasional blues and greens. The larger number of the colored fungi belong to one genus (*Peziza*.) Nearly all have the peculiar odor of a damp, close cellar; an odor of mouldiness and decay. Some are very fetid, especially when decaying. Most of the fleshy fungi have a peculiar nitrous odor when decaying. It is like a faint sniff of old nitric acid. As before mentioned, many of the poisonous fungi turn blue when bruised or cut. One of the edible species (*Lactarius deliciosus*) changes whenever broken to a dark green. It seems to be filled with an orange-colored fluid which is turned green by the air.

The most striking phenomena connected with fungi, however, are those of luminosity. Every school-boy is familiar with the substance known as "punk," which is nothing but pieces of rotten wood which have been penetrated by the mycelium of certain fungi. The light is due to phosphorescence, and in some varieties is very strong. It is produced by the rapid

combination of organic matter with the oxygen of the air. It is in reality a kind of slow combustion. I have seen the stump of an old tree which gave so much light that it appeared to be actually on fire. Ordinary print could be read by it. Spruce and pine logs frequently are covered by a phosphorescent fungus growing underneath the bark. I once saw a log in a raft which was plainly visible in a dark night, at a considerable distance. The light in all cases is the same, resembling that of the glow worm, or of a match rubbed in the dark.

Of the fungi which by their growth injure growing crops and trees in this country, unfortunately, but little can be said. This branch of botany has been so little studied that the field of knowledge is very limited. It seems to be pretty well established that rust, smut, &c., may be propagated through the seed sown. Care should be taken, for instance, not to sow wheat threshed from musty straw, or to plant corn from fields where smut was prevalent. Rank manures also produce or aggravate rust. There seems to be no other way of regulating the matter in these cases. A wet season always produces more of these fungi than a dry one. This is true of all fungi. There also seems to be close connection between the amount of fungi upon grains and grasses and cattle diseases. The year of the cattle plague in England was one in which more red rust was found than ever before. Graziers, however, seem to think that the rust does not injure cattle. They all agree in saying that in seasons when ergot is plenty, very many cattle slip their young.

The potato rot has been studied more carefully than most of this class of fungi, but the results are very meager. It is known to be due to a certain species of fungi (*Peronospora infestans*); that it also may be produced from diseased seed, and that manuring makes it worse. But no preventive or cure has as yet been devised.

Of mildew, blight, fireblight, and black knot, still less is known. They are being carefully studied by the best botanists of England, and some results may be looked for soon. For ordinary blight and mildew, sulphur has been successfully used. The fireblight so common to crab apple trees in Minnesota is still an unsolved puzzle. A careful study of the branches affected fails to show a single sign of the cause. The fact that it begins at the tip and works downward, as well as the fact that root pruning in a measure stops it, seems to show that the disease is in the circulation of the tree. Almost invariably the roots of affected trees are covered with minute fungi. These are upon small roots near the tips. What it is I am not yet able to say. The best microscope at my command does not show fungi in the branches killed, or in the sap of the tree. In a late paper is an article recommending liquid stable manure for trees affected with any of these diseases. It is to be worked into the soil about the roots freely, and also applied to the trunk of the trees. A farmer in Iowa told me that he saved a few fine trees from it entirely, by sponging them and watering them with strong soap suds. He also said that the black knot upon plum and cherry trees, could be prevented by the same treatment. He had a fine plum orchard, of both native and cultivated varieties, and it was singularly free from these unsightly knobs. It is well known that the spawn of most fungi is destroyed by alkaline substances, and it appears that he has made good use of this fact. There is no better preparation for the teeth than pure soap and water. It not only removes

the dirt, but destroys the germs of a fungus which does much to cause decay.

In conclusion, it is to be hoped that students in Botany will hereafter pay more attention to these interesting plants. There is a field for much original investigation and discovery among them. As yet no manual of the fungi of this country has been published. What has been written upon them is scattered through the scientific periodicals and the reports of societies. Dr. Curtiss, of South Carolina, has published the most complete paper, but it is local in character. In the study of these plants, very careful manipulation is needed, and they are preserved with considerable difficulty. Most of them are fleshy and watery, and only a thin slice can be dried so as to show the structure. There is not a creditable collection in this country. Much can be accomplished by careful observation on the part of members of societies like this.

Discussion.

Mr. Wilson mentioned a trouble with his roses, saying that while an inch or two at the end of the branches was alive and nice, below this the leaves were dead.

Prof. Morey replied, that the rose fungus would be visible under a moderate power of glass, while the apple fungus cannot be discovered under any power of the glass.

MR. GRIMES' PAPER.

Mr. Grimes then read his essay on "The Influence of Horticulture in Education," for which a vote of thanks was tendered.

The following is the paper in full:

THE INFLUENCE OF HORTICULTURE IN EDUCATION.

MR. PRESIDENT, LADIES AND GENTLEMEN OF THE STATE HORTICULTURAL SOCIETY: We have a work to do, a mission to fulfill, that will require all the energy and perseverance of which we are capable. Nor will it do for us to halt or even falter until our influence shall cause the public grounds around our institutions of learning to correspond with the culture and refinement taught and exemplified within; nor until every home shall be made a place of beauty and a paradise to its possessor.

Who does not feel the refining influence of flowers? And shall the beauties of the landscape go unheeded? "Behold the lilies of the valley!" "Solomon in all his glory was not arrayed like one of these." I feel when I come into a hall like this, and look upon the flowers that are placed here, fresh from the hand of the Creator, that no human skill can imitate, whose colorings no artist's pencil can draw out, and whose perfumes have not been extracted from this earth, that I am nearer heaven than I was before. Fruits and flowers are said to be immortal, and to constitute one of the highest sources of enjoyment in that city where every horticulturist expects to enter;

while gold (that narrows down the heart of man into pure, sordid selfishness, and creates so much misery, oppression and inhumanity in this lower world,) is only used to pave the streets!

I have always had a passionate fondness for flowers; in fact, I was born immediately after the crowning of the May Queen, with a flower in my hand as well as I can now remember. I think that I must have inherited that fondness from my mother, who kept a flower garden which she cultivated with her own hand, for her own pleasure and that of her friends. It was separated from the front yard, and also from the vegetable garden, by a nice fence, and nothing was allowed to roam there except the honey bee; in fact, it was kept sacred from everything else—sacred to herself. I was always glad when the weeds would get a little the start, and I should be called in to help subdue them. Her flowers were the handsomest that ever were seen, at least I thought so. I'm speaking now of fifty years ago, before Bliss, Hovey, Washburn or Vick had ever sent out a seed, or the art of hybridizing was known. I remember those old-fashioned flowers with reverence still, and their names are indelibly stamped upon the tablet of my memory. I remember how the beds were laid out and planted. There were her roses, tulips, snowdrops, peonies, lilies, flags, sweet-williams, pinks, bachelor's-buttons, coxcombs, morning glories, china asters, larkspurs, marigolds, holyhocks, chrysanthums, four-o'clocks, forget-me-nots, old-man, thyme and devil-in-the-bush, with snow-balls and lilacs in the background, and a few honest, old-fashioned sun-flowers placed as it were on picket duty around the camp.

We had no botanical names for our plants in those days, and if any one had come to us and asked—Have you the *lilium candidum* in your ground? We should have said no. *Delphinium*? No. *Centaurea*? No. *Convolvulus*? No. *Helianthus*? No. *Mirabilis*? No. *Tragetes*? No. *Ipo-mea*? No; we have not anything which you have named. And then if they had pointed out those very plants, and told us that they were the identical ones which they had named, we should have doubted their sincerity or sanity; and yet who of us would even now say, that our fathers and mothers were not as wise in their generation as we are in ours? The poet Pope in view of this, once said:

“ We think our fathers fools, so wise we grow ;
Our wiser sons, no doubt, will think us so.”

When I look back upon those old-fashioned flowers, and compare them with the gardens of the present time, and see the improvements that have been made by crossing and hybridizing, thus producing new varieties from seed superceding the old in splendor and glory, together with thousands of new varieties that have been collected throughout all lands, many of which are of great excellence and worth; I feel like Campbell once expressed himself, when looking over the old fields of England, where his feet in boyhood had brushed the early morning dew in search of buttercups and daisies:

“ Ye field flowers, the gardens eclipse you 'tis true,
But, ye wildlings of nature, I dote upon you,
For ye waft me to summers of old—
When my heart was filled with fairie delight,
And when daisies and buttercups gladdened my sight
Like treasures of silver and gold.”

We must not cast too long a look behind, but with one retrospective glance pass on; the time is short and shall not our hands and minds improve it, shall we not spread the lawn with trees, shrubs and flowering plants, and tell their names, their language and their uses; shall we not labor for the benefit and advancement of the rising generation as others for us, have done before? Let us adorn and beautify our homes and make them pleasing and attractive, and our children will grow up around us contented, virtuous and happy; let us fill our libraries with volumes of useful knowledge and wisdom, honor and blessings will crown our efforts.

Next to the influence and instruction imparted at home comes in the State as the great educator of her people. Her system of schools is made complete, as far as liberal endowments go and it only remains for our legislature to carry out, exemplify and perfect.

We have in operation the common, graded, and normal schools and our State University—all working together in training up the child from the first rudiments of learning to the highest attainments of knowledge. The cause of general education is one that lies very near my heart, but I shall only discuss it at this time in a horticultural point of view.

Books cannot furnish all that we should know, and feel; to educate alike the head, the mind, the heart, is but to *rise* from nature's study, up to nature's God. There is a benign influence above and around us, that:

"Warms in the sun, refreshes in the breeze,
Glow in the stars, and blossoms in the trees.
Lives through all life, extends through all extent,
Spreads undivided, operates unspent."

Botany is taught in most of the advanced schools of learning in this State, yet how many of those institutions have their collections of plants, as specimens to illustrate its teachings and define its truths? Not one, so far as I know. As well teach astronomy without the aid of the telescope, or theology without the Bible.

But aside from this, plants, and flowers more especially, have a refining influence, that softens down the harsher tendencies of our nature, creates within us nobler and more refining sentiments, instills kindness into our affections, and warms our hearts with true devotion to the interests and welfare of those around us, fitting us to enjoy the social intercourse and friendship of the world. There are many such families in our land, whose sons and daughters have been reared beneath the enobling and endearing influence of flowers and home, who look upon everything as sacred that has received the touch of a mother's hand, and whose hearts have been moulded to the nicest degree of sensibility and refinement; when they leave home to complete an education, and go to our free institutions of learning, whose bare walls and surroundings are barren of all the beauties of nature, they feel as if they had been thrust out upon the cold charities of a naked world.

Last winter this society visited the Normal School at Winona, by invitation of Prof. Phelps, the official superintendent. We found about three hundred pupils in attendance, of all grades, from the highest, who were nearly ready to receive their diploma, to the lowest who were just beginning. Some of them were boys of but three feet high, whom the State with noble

generosity had taken upon herself to educate in the place of him, the once fond father, who now rests in hallowed memory beneath a soldier's tomb.

Within its walls system and order reigned supreme; whether in the assembly or class room, each one seemed to know his place and work, and all went on as if by some magic rule or mechanism; it seemed as if a wink or nod was understood and with alacrity obeyed, so perfect was the discipline in all its parts; and I felt proud, that these young men and women were to be the future instructors of our children. But when I looked around I thought that something might be lacking still to fit them out, and make them all that we could wish. The grounds are not enclosed, the lawn was but a public square where cows do congregate, without a tree to shade, a plant or shrub to beautify, not even a plat of grass to hide the face of mother earth from view. And this is but *one* example of the whole. Thought I, the pride of this great State lies not in this direction. And what have you better here to adorn this temple of learning, except a few majestic oaks that nature's hand had planted there in her great park, long before the foundation stones of this building were removed from the silent quarry?

Not only have the grounds around our public institutions of learning been neglected, but the wheels of education itself are now clogged for want of the usual and necessary appropriations. Shall we excuse the State? We might as well, it was no free act of hers that did it, but it was done through the neglect of servants. Let the State once educate her children up to a proper standard, and then our representatives would not dare hold back the means as they now do, seeming so willing, yet so slow, for if they then refused to act, it would be well they should know if there is a power behind the throne, and we hold the lever in our hands.

If once the grounds about our State institutions of learning were made what they should be, how soon would the example be followed and carried out by all the other institutions, even down to the common schools in every district of the State, and how much better could the cause of education be maintained where knowledge and beauty are combined. Let us elevate our standards high, and cultivate and educate to all that is noble, pure and good.

If you have no room for trees and shrubs, then let us plant our plat of ground in flowers. I would strew them around with a liberal hand. I would plant beside the humblest cottage of the poor as well as the stately mansion of the rich, in all our cemeteries and public grounds, about our charitable and benevolent institutions, and especially would I plant them purposely at the reform school, to improve the hearts of those little novices in crime, and I would even plant them where they could be seen from within the prison walls.

But some will ask, what benefit have we in the cultivation of flowers? I answer, much every way, socially, morally, and intellectually. Flowers portray the poetry of the heart; they educate to neatness and propriety, and elevate the mind above the common things of earth. Flowers always teach the language of love, and we would not enjoy them alone if we could, we would distribute them among our friends while living, and weave them into wreaths and immortelles to place upon their caskets when the last farewell was said; we would also make them into bouquets to place as incense upon the altars of our devotions, and especially would we give them to the poor to gladden their hearts, and also as mementoes of affection to place

upon the graves of their departed ones; and thus we could rejoice with them that do rejoice, and weep with them that weep.

And now brothers and sisters let us go on to fulfill our mission, learning, ever learning to cultivate the fraternal spirit of love and forbearance toward each, with charity to all. . And when the work of the day is all done, and we have laid aside our implements for the night, may we enter that rest prepared for the faithful ones, in the paradise above, where flowers ever bloom, and trees and fruits immortal grow, and where we shall be made welcome,—welcome in the enjoyment and presence of Him, who is the center of attraction, and light of the Celestial City.

DISCUSSION.

State Fair.

Mr. Harris introduced the following :

Resolved, That the State Horticultural Society will put forth its best efforts to assist in making the next State Fair a success.

Mr. Hoag spoke in favor of the resolution, enumerating the advantages enjoyed by the Horticultural Society, and alluding to the efforts of the Agricultural Society to place itself on a good basis. The Secretary made some remarks on the same subject, as did also Prof. Morey.

The resolution was passed without dissent.

Centennial Exhibition.

The Secretary called up the matter of exhibiting fruits at the Centennial Exhibition, and Mr. Harris spoke upon the same subject. Saying that sending even one delegate would be a good thing for the State, and that a delegate could be sent at little expense to the Society.

Mr. Smith moved that credentials be issued to Mr. Grimes and such others as will attend the Exhibition free of expense to the Society. The motion was carried.

The Secretary offered the following :

Resolved, That this Society will exhibit with the Pennsylvania Horticultural Society, and that the committee appointed last winter for the collection of fruits be requested to perform the same services for this purpose.

The resolution was carried.

Thanks to the Ladies.

Mr. Harris offered the following :

Resolved, That we tender the sincere thanks of this Society to the ladies of Minneapolis for their kind reception, and for their presence at our meeting.

The resolution received a unanimous vote.

County Horticultural Societies.

Mr. Scott asked for some action with reference to the organization of County Horticultural Societies. He said it was discovered in Winona last winter that youth and beauty cannot hold their own with the ladies against a knowledge of flowers, and that they would be warm in the support of such societies.

The discussion was continued by Messrs. Scott, Elliot and Harris, the latter saying that the only effective way of organizing such is to send out a lecturer for the purpose. He had thought of doing this himself, but had not found time.

Prof. Winchell introduced the following :

Resolved, That the Secretary and Mr. Scott be a committee to draft a general plan and constitution with by-laws suitable for the organization of County Horticultural Societies, and that they take such measures as may to them seem necessary for the encouragement of such organizations.

The motion was carried.

The Society then adjourned.

PROCEEDINGS
AT THE
WINTER MEETING,

HELD AT OWATONNA, TUESDAY, WEDNESDAY AND THURSDAY,
JANUARY 16, 17 AND 18, 1877.

PROGRAMME.

TUESDAY MORNING.

1. Preliminaries.
2. Discussion.*

TUESDAY AFTERNOON.

1. Announcement of Committees.
2. Paper on Grape Culture, F. G. Gould, Excelsior.
3. Discussion on above.
4. Discussion.*

TUESDAY EVENING.

1. President's Address.
2. Report of Delegates to Centennial Exhibition.
3. Discussion.*

WEDNESDAY MORNING.

1. Essay on Cultivated Plants; influence of cultivation, hybridization, selection of seed, etc., W. T. Scott, Minneapolis.
2. Discussion on above.
3. Revision of Strawberry and Raspberry lists.
4. Discussion.*

WEDNESDAY AFTERNOON.

1. Paper on the Propagation of Trees by Cuttings, L. B. Hodges, St. Paul.
2. Discussion on above.
3. Revision of Currant, Gooseberry and Grape lists.
4. Discussion.*

WEDNESDAY EVENING.

1. Paper on the Laying out, Planting and Care of small Dooryards.
J. E. Booth, Minneapolis.
2. Discussion on above.
3. Paper on "Annuals," Miss Hortense Share, Rosemount.

THURSDAY MORNING.

1. Reports of Secretary and Treasurer.
2. Election of officers, by ballot without nomination.
3. Discussion.*

THURSDAY AFTERNOON.

1. Report of Committee acting with State Agricultural Society.
2. Revision of Apple and Crab-apple lists.
3. Discussion.*

THURSDAY EVENING.

1. Miscellaneous Business.
2. Paper on Blight.
3. Discussion on above.
4. Discussion.*

The following subjects have been proposed for discussion, and may be taken up wherever in the above programme the word "discussion" is distinguished by a star:

1. Orchard Protection.
2. Use of Evergreens.
3. Planting of Streets and Roads.
4. Early Potatoes for Market; varieties, cultivation, etc.
5. The Cranberry; its propagation, cultivation, etc.
6. The Garden Pea; its varieties, cultivation, etc.

The following persons have been invited to prepare papers and reports which may also be substituted where the word "discussion" is marked with a star:

K. N. Giteau, Farmington; Hedges.
Judge L. R. Hawkins, Maple Glen; Dwarf Apple Trees.

- F. M. Finch, St. Paul; Cacti.
 R. J. Mendenhall, Minneapolis; Entomology.
 J. S. Harris, LaCrescent; “
 W. Elliot, Minneapolis; “
 Wm. King, St. Paul; Flowers and Floriculture.
 J. T. Grimes, Minneapolis; Vegetables and Market Gardens.
 W. E. Brimhall, St. Paul; Perennial Garden Vegetables.
 M. Pearce, Rochester; Vegetables and Market Gardens.
 E. H. S. Dart, Owatonna; Trees for the Forest, and Forest Culture.
 W. K. Bates, Stockton; Apple Culture.

Reports of General Fruit Committee.

Papers on other subjects or by other parties will also be accepted.

The exhibition of fruits and vegetables has been an interesting feature at former meetings, and it is hoped that all who have new or meritorious specimens will bring them with them.

The citizens of Owatonna will give free entertainment to members of the Society. Members who prefer it, and visitors, will find excellent accommodations at the Arnold House, at the reduced rate of \$1.50 per day.

Efforts will be made to secure the usual reduction in railroad fare.

The annual membership fee of the Society is \$1.00, but all are cordially invited to attend the meeting.

CHAS. Y. LACY, Sec'y,
Minneapolis, Minn.

TUESDAY MORNING.

In accordance with notice given in the public press, and the above programme, the Society met at Chambers' Hall, and was called to order by President Smith at 11 o'clock A. M.

Agricultural Society.

Mr. Dart was called upon to make some remarks, but declined to speak. A letter from J. S. Brockelhurst, Esq., of Princeton, was read, which opened a discussion on the conduct of the State Agricultural Society.

Pres. Smith. No premiums have been paid except to horse-men, and no satisfaction is given by the officers in answer to inquiries.

Mr. Grimes. I was surprised that they took in so much money as they did at the fair. The President told me that the premiums must be paid *pro rata*.

Pres. Smith. It is time we cut loose from the Agricultural So-

ciety, and we had better hold our own exhibitions if we exhibit at all. I think that, if the Society preserves its dignity and reputation, the State would build us an exhibition hall on the grounds of the University, State Reform School or some other suitable place. If we only gave awards of merit, it would pay us in the information we would get, and we might, perhaps, be allowed to sell articles to help pay expenses. We ought to have an exhibition of some kind. It is of more use than all the newspaper puffs. But it is expensive to exhibit with horses and stock. They draw a crowd, but it is doubtful if that kind of a crowd appreciates horticultural productions, except to steal them. A small fee for entrance would be sufficient, as expenses would be light. The Agricultural Society is extravagant in its expenditures.

A motion to adjourn to 2 o'clock P. M. was carried.

TUESDAY AFTERNON.

COMMITTEES.

The meeting was called to order by the President at 2:30 o'clock P. M.

The first business was the appointment of committees.

Finance Committee.

Messrs. Dart, Grimes and Elliott were appointed a committee to report at this meeting on all bills presented against the Society.

Obituary.

Pres. Smith asked if there had been any deaths of former members of the Society during the year.

Mr. Grimes replied that James Hoffman, formerly of Minneapolis, had died a few weeks since. Mr. Grimes was requested to call the attention of Col. Stevens, of the committee on obituaries, to the fact.

Committee on President's Address.

Messrs. Kenney, Lacy and Brand were appointed such committee.

Committee on Amendments.

The Secretary moved that the President appoint a committee to report on amendments to the constitution and by-laws, to provide for the election of life and honorary members. Motion was carried, and Messrs. Lacy, Dart and Hollister were appointed such committee.

Committee on Articles on Exhibition.

Messrs. Grimes, Brand and Kenney were appointed.

The Committee on Final Resolutions was announced later in the meeting.

GRAPE CULTURE.

A paper on Grape Culture, by F. G. Gould, Esq., of Excelsior, was read by the Secretary, accepted and ordered on file for publication by the Society.

The following is the paper in full:

Introduction.

The cultivation of grapes is attracting more and more attention every year among the people of Minnesota, since the fact has been established that our climate will admit of the growth and ripening of grapes of excellent quality. Where dent corn will ripen, there grapes may be expected to ripen.

Location.

There are many localities where they may be profitably grown. Among the best situations are those near lakes or rivers—lying south or east of them. The early frosts in the fall come with a northwest wind, when the water is not very cold: the air is warmed during its passage over the water sufficiently to prevent any damage to vegetation by freezing for a considerable distance beyond.

Varieties to Plant.

In making a selection of vines to plant, it is better to choose those varieties that are fruitful, healthy and early, than to waste labor on short-lived or unfruitful varieties. This mistake is too often made by beginners, who are led astray by fine specimens of fruit, exhibited perhaps in pickle in a glass jar.

The Delaware and Concord are the universal favorites at present, and are worthy of the position which they enjoy. The Concord is not a fine flavored

grape, but its good size, and fair flavor, earliness, fruitfulness and health of vine entitle it to the first or second place on the list for Minnesota.

The Delaware, a much smaller grape is equal to the very best in flavor, an abundant bearer; fruit begins to ripen before Concord; healthy vine and hardy. This variety bids fair to outstrip the Concord in popular favor.

Starting Plants from Cuttings.

Most varieties of grapes will grow from cuttings without the aid of bottom heat or extra labor. Among the most difficult to start is the Delaware. By following these directions it may be successfully accomplished. Take well ripened wood of one years growth and cut into lengths of 8 to 10 inches so that there will be two buds at least six inches apart on every cutting leaving half an inch at least of wood outside of the buds at the ends of the cuttings, tie them in bundles and cover them with earth or leaves or any other material that will keep them from hard freezing and wetting; take them out in the spring by the 20th or 25th of April and cut the lower ends off in the lower edge of the enlargement or joint at the lower bud; tie in bundles, have the butts even, dig a hole in the ground in some warm corner where the sun will shine (when it shines at all) and stand them in bottom up; pack the earth firmly around them and then cover with about two inches of loose soil or sand. Keep this covering wet by sprinkling on it warm water as often as every other day or oftener. In about ten days or two weeks they ought to be ready to be taken out, if they are, a white line will be seen around or part way round the ends of the cuttings at the junction of the wood and bark; when this stage is reached they had better be taken out and planted in deeply worked, rich, mellow soil. They may be planted with a dibble, the lower ends should be six or seven inches below the surface standing upright or on a slant, they will grow as well one way as the other, one bud at least should be above ground; the soil should be stirred frequently, especially if the weather should be dry.

Setting in Vineyard.

Vines in the vineyard should be at least eight feet apart each way. A stake should be set near each plant to tie to. But one shoot should be allowed to grow the first and second year. The side shoots should be pinched off after they have formed one leaf, and in the fall of the second year two or three feet of the cane may be left at pruning time for fruiting the next year, when a trellis should be made.

Pruning.

The ends of the shoots on bearing vines should be pinched off as soon as the grapes are formed, and this pinching should be followed up persistently in the early and growing part of the season.

A dense mass of foliage is a nuisance on a grape trellis, but to remedy this the leaves should not be removed from bearing canes opposite clusters of grapes or below them.

At the fall pruning the most of the present years growth should be cut away, enough should be left though for the next year's crop of fruit, for the old wood gives no grapes. Pruning should be done between the 15th of October and the 15th of November, say the 1st of November.

Protection.

In two or three days after, the vines may be laid down and covered three to six inches deep with earth, and a few inches in depth of straw or litter over this, will prevent damage by freezing.

This should be taken up and tied to the trellises about the 5th or 10th of May.

F. G. G.

Excelsior, Jan. 13th, 1877.

DISCUSSION.

Depth of Covering.—Propagation.

Mr. Brand. I would like to know if the President approves the depth recommended in the paper?

President Smith. I cover with two or three inches of soil; just enough so that it will not wash off. In the propagation of the Delaware, I use a shorter growth with the buds as close as possible. Last year I made cuttings from the ripest wood, buried them through the winter, and from the 5th to the 10th of May planted in trenches, and tramped the earth solid around the bottoms. I filled the trench till the top bud was just covered, or about level with the surface. I got three feet of growth last year.

Mr. Brand. Is a vine from a cutting as good as from a layer?

President Smith. It makes a better shaped and more healthy vine. Grown from a layer it bears a little sooner. I would cultivate thoroughly or else mulch. Drought often uses up the vines just when they are forming roots.

Mr. Grimes. I prefer cutting at a joint to the proper length, in the fall, and letting them callus through the winter.

President Smith. The Delaware is the best variety, but it is a long time in coming to bearing.

Cultivation.

Mr. Kenney. What implement do you cultivate with?

President Smith. The ground is clean now. In the spring I take up the vines and let lie on the ground till the buds start. I spade over with the spading-fork when the weeds start. Some-

times I spade a second time, but generally use the hoe after the first spading. I take good care to clear off the ground entirely, so that the sun can ripen the fruit in the autumn.

Mr. Kenney. Cannot the horse be used to save manual labor?

President Smith. On level ground, and where the vines are planted deep, it might cheapen the cultivation, but mine are on a side-hill and the land is valuable, so I do not want to leave land to turn the horse upon.

Mr. Grimes. How late do you cultivate?

President Smith. Up to the picking time, if necessary.

Mr. Grimes. Aside from the weeds, how long is it necessary to keep the ground mellow?

President Smith. I keep it loose and mellow up to the time of picking. I prefer ashes and lime for fertilizers to farm-yard manure. I like the potato-hoe for loosening the soil.

Distance.

Mr. Kenney. How far apart do you set?

Pres. Smith. Eight feet each way. If land were plenty, would set ten to twelve feet each way.

Quantity of Fruit.

Mr. Kenney. How much fruit do you allow to each vine?

Pres. Smith. To the Delaware, not more than ten pounds. I have grown fifteen pounds on the Delaware, and twenty-five on the Muscadine. Overbearing injures the crop for the following season. From a certain number of vines I got 3,000 pounds last year; this year only 500 pounds, and no ripe ones.

Messrs. Grimes and Kenney had had similar experience.

Pres. Smith. After fifteen years' experience, I do not want a vine to bear over ten pounds of fruit.

Mr. Dart. Was not the difference in the two years due to difference of season?

Pres. Smith. I have had the same experience several times, and sometimes the Delaware has been killed by overbearing. A Boston grower limits his vines to seven pounds each, and gets the best price in market for these.

Pruning.

Mr. Kenney. What average length of vine do you leave in the fall?

Pres. Smith. I prune according to no rule, but cut according to circumstances. My object is to get strong, healthy wood near the ground. The weaker the vine the closer I cut. Young vines I cut to one or two buds. It requires but little wood to produce ten pounds of fruit. I cut in the fall, and not much in the growing season. I do not aim to get new wood each year. There is only one system of pruning, as laid down in the books, that can be followed where we lay down the vines.

Delaware.

Mr. Kenney. Has the Delaware ripened every year?

Pres. Smith. Every year except one, when wet and cold weather came on when they were beginning to ripen.

Mr. Brand. Do you prefer the Delaware?

Pres. Smith. I can get more money from it because it brings a better price and gives a more uniform yield.

Mr. Kenney. How old must the vines be to bear ten pounds?

Pres. Smith. Five or six, or if weak, eight years old, according to their strength.

Training.

Mr. Kenney. Is there no danger of breaking the vines when taking from the stakes?

Pres. Smith. I do not tie to stakes and tie to trellises obliquely. They will not break if trained right, but you cannot do it according to the book systems without breaking. I always leave more buds in the fall than are required to grow and when they have started I rub part of them out. We cannot grow grapes without labor and expense.

Mr. Brand. How many vines are there in the largest vineyards you know of?

Pres. Smith. Not over 2,000 or 3,000. I have 1,500 and Mr. Miller about the same. I have the Delaware planted twelve years ago. It needs a richer soil than the Concord, and if you leave too much wood and let it get too thick they will mildew.

Mr. Brand. The largest vineyard I have been in contains 1,500 vines and 800 of them are Delaware. This is over on the Minnesota River. The owner considered the Delaware the most profitable.

Soil and Elevation.

Mr. Kenney. It is necessary to be on high dry ground to grow grapes.

Mr. Smith. The ground must be well drained and if it does not contain lime it should be applied. The soil should be worked deeply.

Mr. Hollister. I have grown grapes on level land and without lime. Trained to stakes and cut away the old wood each season on the renewal system. I got 25 to 40 pounds a year from each vine.

Pres. Smith. Mr. Knaupheide grows much on the same plan that I do, but his land is nearer level and he uses a horse more. Mr. Miller grows on about the same plan that I do.

Mr. Hollister. If the ground is rich enough, and the vine strong, you can ripen more than ten pounds per vine?

Pres. Smith. You cannot ripen much more with a good flavor.

Varieties.

Mr. Kenney. Has any one grown Chase's Seedling?

Mr. Brand. That was originated by Mr. Chase, in Iowa, who has since died. Mr. Harris says it is so much like the Israella that it is not worth while to propagate it.

Pres. Smith. I have had a grape on private terms that is very promising. Mr. Sylvester, of Lyons, N. Y., claims that it will keep all winter, till the middle of April. I have not yet fruited it, but probably shall the coming season. If this is true, it will be an acquisition. The Concord must be marketed at once when ripe. Of Roger's Hybrids, No. 6 and No. 9 are good. The Agawam and Salem are also good, but the vines are rank and will mildew. No. 9 is pronounced by some superior to the Delaware, having a larger berry. The Janesville is hardy and early, but the flavor is not agreeable to my customers.

Janesville.

Mr. Hollister. The Janesville is hardy and very early, but the flavor is like that of a grape that has been buried in the ground.

Mr. Grimes. The flavor is not the best, but it is ripe about the time the Concord begins to color.

Mr. Kenney. A gentleman in Iowa whom I know had Champion, and it ripened two weeks earlier than the Hartford Prolific.

Pres. Smith. I want a grape of good quality as well as early ; because, if not of good quality, the Southern grapes coming into market at the same time will take the preference. Our markets demand a good fruit, and if we grow a poor one we come in competition with everything shipped in. I would not recommend the Janesville.

Mr. Brand. Will it make wine ?

Pres. Smith. It may ; but it is no object to make poor wine.

Mr. Hollister. It grows with more neglect than any other and has become, therefore, quite a favorite.

Mr. Brand. I invested in a few and in 1872-3 they were all killed root and branch.

Mr. Hollister. I tried to kill mine by leaving them on the trellises all winter and did not succeed.

Mr. Brand. It is not best to recommend a thing because it has one good quality.

Pres. Smith. One groceryman in St. Paul bought the Janesville because he could get it cheap, and he sold them but he sold his customers at the same time. The Ives is also recommended in Ohio but it is not worthy, in my experience. The Iona, if well and carefully propagated, would also be worthy.

Other Varieties.

Mr. Kenney. It is late for our climate.

Pres. Smith. Late and needs extra care but a good keeper. The Eumelan has done poorly with me, but Sylvester claims to have obtained 75 pounds per vine. The Croton did well but the hard winter killed it out. The Lady is the only really good white grape I know of. I have had the Northern Muscadine since 1860. If it did not drop its fruit it would be one of the most profitable. Many of my customers will have it. Taken green it is the best variety we have for jelly. It should be picked for this purpose just when it begins to color.

Mr. Kenney. The flavor is excellent when fully ripe. I found some last year that were left till late and they were most delicious. The vine is very hardy but requires to be covered. None but the Oporto will survive without covering.

Concord and Delaware.

Mr. Brand moved to recommend the Delaware for general cultivation placing it first on the list.

Mr. Hollister. I am in favor of placing the Concord first.

Mr. Dart. So am I, on account of the vigor of the vine and the size of the berry.

The motion was amended so as to read: Recommend the Concord and Delaware for general cultivation. The motion was carried unanimously.

Pres. Smith. I would not recommend others at present, even for trial.

Hartford Prolific and Janesville.

Mr. Kenney. I have grown the Hartford Prolific, fifteen or twenty vines, for seven or eight years. It has done well, the only fault is that the fruit falls from the vine.

Pres. Smith. It is not so good in quality as the Concord, the bunch is loose, and dropping from the stem injures them; but they sold higher, by two or three cents, than the Concord, in the Boston market last year.

Mr. Grimes. Some prefer the Hartford Prolific and some the Concord, and some the Concord to the Delaware, and some like the Northern Muscadine above all others. Tastes differ. I move to recommend the Hartford Prolific for planting in limited quantities.

Mr. Dart. I move an amendment so as to include the Janesville for its earliness.

Mr. Brand. It is not best to recommend any that kills like the Janesville.

Mr. Dart. Its earliness and hardiness are, so far as we know them, sufficient to recommend it; and I believe it is found as profitable as the others.

Mr. Kenney. In the hard winter of 1872-3 I lost no Hartford Prolific or Northern Muscadine.

Motion carried unanimously.

Mr. Hollister. I move that the Janesville be recommended for trial for its earliness.

Motion carried; four for and one against.

It was then moved and carried, that this conclude the grape list.

Mildew.

Mr. Hollister. Are grapes very liable to mildew in Minnesota?

Pres. Smith. Not very; but where too much wood is allowed to grow and the vines become matted on the trellises, during long

spells of rainy weather, and during sudden changes from hot to cold nights, the Ives, Iona, Roger's Hybrids, and some others, are liable to be attacked.

Mr. Hollister. I have had mildew with vines on trellises, but none with them on stakes.

Pres. Smith. How long did you leave the vine in the fall?

Mr. Hollister. I had the stakes five feet above the ground and let the vine grow to the top, and then pinched off the end and the laterals.

Pres. Smith. It is important to attend to the laterals, but do not pull out the lateral buds.

Mr. Dart. I move that when we adjourn we adjourn to meet at 7 o'clock this evening.

Motion carried.

REPORT OF O. D. STORRS.

The report of O. D. Storrs, Esq., of Winsted Lake, of the General Fruit Committee, was then read and ordered on file for publication. The following is the paper in full :

WINSTED LAKE, MCLEOD Co., MINN., June 24th, 1876.

Prof. C. Y. Lacy :

DEAR SIR:—As I cannot meet with you the 28th inst., I append the following report :

Insect Enemies.

Since my report for 1875, several varieties of insects have made their appearance. A small green louse that appears on the under side of the leaf, which causes the leaf to curl up. Many apple trees are covered with them and they seem to be on the increase. The borers are more numerous this season than ever before, doing much damage to orchards not under cultivation. Worms are very numerous on newly set trees and even on trees that have been set for years; if not attended to and kept off will eat the leaves entirely off, especially from trees planted this spring.

No insects on ornamental trees. Small fruits not infested.

Strawberries.

The Wilson is the principal variety cultivated. Crop fair; berries smaller than previous years.

Gooseberries.

But few Gooseberries cultivated. I have a Swedish Gooseberry that is hardy and the berries very large.

Raspberries.

Doolittle Blackcap, Seneca and Mammoth Cluster are the varieties in cultivation. Doolittle and Seneca stood the winter best, the Mammoth Cluster badly injured; canes killed down to the ground but sprouting again from the root. Fruit, none; Doolittle, half crop.

Currants.

Red Dutch, White Dutch, White Grape, Cherry and Black Naples are the varieties cultivated. I would recommend the Red Dutch and White Grape. The Cherry Currant is a large fine berry but does not bear well. White Dutch are good bearers, but the branches are inclined to grow too much on the ground, the fruit gets covered with dirt and grit. Crop large; currant worms, none.

Grapes.

There have been more Grapes planted the past spring than ever before. Concord and Delaware are the principal varieties planted. I have the Concord, Delaware, Moffats, Clinton, and two new seedlings that prove to be very hardy, not in bearing. I consider the Concord and Delaware the best, Moffats the hardiest and largest. Prospect of crop fair.

Crop of last year, '75, badly injured by wet weather.

Plums.

The plum crop will be light this season. Trees wintered well and blossomed full, but the fruit has nearly all dropped. The curculio is very bad this season; none on the Miner. Native plums are generally cultivated. I have Harrison's Peach, Trask's Native and Newton's Egg, with several other choice natives. Miner wintered well; prospect for fair crop.

Evergreens.

I have had good success with evergreens. The varieties I have planted are: Spruce, American and Norway, Balsam Fir, Arborvitæ, Scotch Pine, White Pine, Prostrate and Savin Juniper; all doing well and making fine growth. Larch is the hardest tree to make live of any variety I have attempted to grow. I have procured European Larch from the nurseries several years in succession, and never had one to live, until last fall I was at the nurseries of Mr. Grimes and A. Stewart and procured more Larch; brought them home and buried them in the same manner I did apple trees. This spring planted early, and three out of twelve are growing.

Apples.

But few varieties of the Apple show any signs of health. Wealthy, Winsted Pippin, Tetofsky and Duchess are the hardiest. Haas, Russian August and Fameuse are second hardy. The Haas are badly injured in the forks.

Price's Sweet, White Astrachan and Peach Apple I have not tested enough to report their condition, although they came through last winter in good condition, and all came through in the best condition except a few that root killed. No blight.

Crab-Apples.

I have a great variety of crabs. The Transcendent, Hyslop, Hebron, Early Strawberry, Minnesota, Orange Crab, Conical, Beecher's Sweet, Hesper Blush, Stewart's Sweet and Honey Sweet, are among the best for general cultivation. Stewart's Sweet proves to be perfectly hardy and a good bearer. My trees at this time are loaded with fruit. I would not dispense with Stewart's Sweet any sooner than I would with the Transcendent. The prospect for a full crop of apples is good; many trees bending to the ground under their load of fruit. I have the Wealthy in bearing for the first time; trees set two years, three years old when set; been cultivated with corn each year since planted. I believe in good cultivation with some hoed crop.

Deep and Shallow Planting.

I wish to give my experience in deep and shallow planting. Four years ago I planted out a lot of trees, some in the following manner: I dug a hole about five feet in diameter about $2\frac{1}{2}$ feet deep; filled in the top soil to within one foot of top and set the tree in and filled around with mellow soil, so that when the tree was planted it was from ten inches to one foot deeper than it stood in the nursery. The trees planted in this manner, are doing well; never one of them has root-killed; not affected by drouth or heavy winds.

I planted some six inches, and others four inches deeper than they stood in nursery. The shallow planted trees are nearly all dead. The trees planted six inches deep are doing a little better, but not in a healthy condition. My soil is a clay loam, with heavy clay subsoil, and yet I shall in the future plant my trees from ten to twelve inches deep. The roots, then, are below the dry surface, and heavy winds do not sway the tree to and fro and loosen the roots or let the air in to dry the roots. I have put well-rotted manure in the bottom of the hole before planting, and covered with eight or ten inches of top soil. These are also doing well.

Flowers.

The past winter proved the hardest on roots and shrubs I have seen in Minnesota. Perennials that I considered hardy were entirely killed. Peonies, Pinks, Sweet Williams, Pansies, Dycentra and Lilies came through all right. Of roses, I lost some of my choicest varieties. Larene, Madame Elliot, Baron Provost and Leon-des-Combat were entirely killed. Bour Sault, African R., Cabbage Rose, Damask, a blush June rose, and a variegated rose, the name I do not know, all wintered well.

I will mention a few Annuals that should have a place in every garden and yard: Phlox, Verbena, Portulacca, Zinnia, Petunia, Ten-week's-stock and

Balsams. I might mention many other varieties that might and ought to be cultivated in every garden. I love flowers and could hardly keep house without them.

O. D. STORRS.

DISCUSSION.

Larches.

Mr. Hollister. I disapprove of what is there said about the Larch. Treated in the right way there is no trouble with it. It starts to grow very early and must therefore be planted early. I have planted 1,000 each year for several years and lost not over five in a thousand.

Mr. Dart. I agree with Mr. Hollister. There is no trouble if the planting is done in time. It is an excellent tree. Can get almost as large trees as of the cottonwood.

Mr. Grimes explained why his (Storrs') trees did not live. They were planted too late in the spring or else got too late in the fall to be removed successfully.

REPORT OF G. W. FULLER.

The Report of Geo. W. Fuller, Esq., of Litchfield, of the General Fruit Committee, dated January 15th was read and ordered on file for publication.

The following is the report in full:

LITCHFIELD, Jan. 15.

C. Y. Lacy, Sec. Minn. S. H. Society:

Apples.

DEAR SIR:—The past year has been very favorable for all kinds of fruit in this part of the State. The most of the trees bearing are the Transcendent, some Hyslop and a few Duchess just beginning to bear. Also a few Early Strawberry, Beecher Sweet and Minnesota Crabs, and I know of one Peach Apple tree which fruited last year. This tree seems about as hardy as the Duchess. The Wealthy I have had but two years, but thus far it does well. Stewart's Sweet has stood three years on my grounds and seems perfectly hardy but is slow in fruiting.

Are there two kinds of Duchess Apple? We have two apples decidedly different in size and color if not in quality under that name.

Blight and Insects.

The Blight has shown itself a little on the Transcendents and Hyslps.

The "flat headed borer" has begun his work on our apple trees, and last spring I found a good many small limbs with a small hole bored in, usually beginning in a crotch of the limb, running down from three to six inches, in which was a small grub. It was evidently his bed for the winter. I did not succeed in catching the fellow after his change in the spring.

The "Canker Worm" appeared quite thickly on our currants and gooseberries last spring. Some tried White Hellebore with indifferent success. The most effectual remedy I found to be a preparation of lime and sulphur as recommended in the transactions of the Illinois Hor. Soc. (Can give you this receipt if wished.)

Effects of Last Winter.

The winter of 75-6 was very hard on the roots of all trees. The previous summer and fall were very dry, and there was but little moisture in the ground when it froze up without snow. All fruit trees not thoroughly mulched were more or less injured, or entirely killed.

Evergreens.

The Balsam Fir, Scotch and Austrian and White Pines, are my best evergreens. Norway Spruce does well, except its sun-burning in the spring. The Austrian Pine does remarkably well with me thus far.

Respectfully,

G. W. FULLER.

P. S. I am sorry I cannot be with you, but circumstances forbid.

ANOTHER REPORT FROM MR. FULLER.

The report of Mr. Fuller, dated June, 1876, was also read and ordered on file for publication.

The following is the report in full:

LITCHFIELD, June 27th, 1876.

PROF. LACY: Your notice of the summer meeting of our Horticultural Society came duly to hand. I am sorry I cannot be present, but business forbids.

Effects of Last Winter.

Last winter was very hard on the roots of trees in my grounds, owing to the exceeding dryness of the soil last fall. All young trees that were not mulched were root killed. But everything well mulched came out nicely and is doing well.

Small Fruits.

Currants and gooseberries and raspberries—Doolittle and Philadelphia—

are full of fruit, but the "currant worm" has found its way here and is at work.

Pears.

A few days since I was in an orchard about 15 miles northwest of this, and was surprised to find a Flemish Beauty pear tree, which I sold to the gentleman four years ago this spring, alive and doing well. I did not suppose such a tree in the State that has lived through these four past winters.

Insects.

I find some kind of insect boring into the small crotches near the ends of the limbs of my apple trees. This was evidently done last fall, and the fellow hatched out very early in the spring, as it was only very early that I found him at home. What are these fellows?

I trust you will have a pleasant and profitable meeting.

Respectfully yours,

G. W. FULLER,
Litchfield, Minn.

DISCUSSION.

Peach Apple.

Mr. Brand. Does any one here know about the hardness of the Peach apple?

Pres. Smith. Mr. Martelli has it, and recommends it.

Two Kinds of Duchess.

Mr. Kenney. I should like to know if there are two kinds of Duchess?

Mr. Brand. I have seventeen trees of the Duchess, on two of which the fruit is much darker than on the others. A neighbor has some that show the same differences, but there is no difference in flavor. Those trees with the darker apples are not so thrifty as the others; they are trained higher, and four years ago they were somewhat injured but not badly. I think this makes the difference.

Pres. Smith. Among my Duchess there are some with the fruit of a different texture from the others.

The Secretary suggested that the stock may have something to do with these differences, and this view was supported by others present.

Mr. Hollister mentioned others who held the same view. Have seen similar differences in the Snow apple.

REPORT OF MR. BOXELL.

The report of J. W. Boxell, Esq., of the General Fruit Committee, was read by the Secretary and ordered on file for publication. The following is the report in full :

AFTON, Washington Co., Jan. 10, 1877.

Prof. C. Y. Lacy:

I send a brief report for the meeting at Owatonna next Tuesday, which I regret I cannot attend.

The Past Crop.

The fruit crop in this county was good, with the exception of the strawberry crop, which fell short, I think, nearly one-half. The currant crop was excellent. The raspberry crop up to the usual average, or perhaps above it. Grapes, I believe, generally did well and ripened well. An unusual number of young plums were blasted, puffing out to the size of a man's thumb, yet the crop was a fair one. Apple trees, crabs and hybrids were loaded with fruit.

Strawberries—Wilson and Charles Downing.

Among strawberries, the Wilson and Charles Downing are the most popular here. The Charles Downing is not so great a bearer as the Wilson, but the berries are somewhat larger and of more uniform size through the season; they are less harsh and acid than the Wilson, and most persons will pay a little more for them by the quart. The plants cover the ground well, and stand the winter well, and a patch that I planted in 1873 shows no signs of running out yet. The Charles Downing has failed almost with me, on very rich soil, and I know of several such instances. On a light or somewhat sandy soil in good condition the crop in this vicinity has always been a fair one.

Currants.

The red Dutch currant is the most reliable and profitable, as none but red currants can be sold in large quantities. Next, a few white grape or white Dutch currants, for variety; and the black Naples currant should not be forgotten. Though hardly eatable from the bushes, they make the best of jam, and when canned, or kept in sealed jugs till spring, they make the richest of pies.

Raspberries.

I have spoken of the raspberry crop as a large one. My own black

raspberries were an exception. They suffered worse last winter than ever before—Doolittles, Senecas, Mammoth Clusters and Davison's Thornless. They were all so badly winter-killed, that I had not much over a third of a crop. With this exception, the Doolittle and Seneca, have never failed with me. The ground being nearly bare of snow much of the time, I think, explains the matter. Several rows of the Doolittle, with plenty of snow drifted among them, came out much better. My red raspberries all wintered through well. Even the Clarke, too tender for our winters generally, came through without injury, and bore a fine crop. The Turner and Kirtland are thoroughly iron-clad. The Kirtland is not very prolific, yet a few are desirable on account of earliness.

The Turner.

The Turner, for delicious flavor of fruit, is the king of red raspberries. Though very prolific, a single picking will not equal a picking of the Philadelphia, yet the bearing season of the Turner is very long. The Turner raspberry throws up a great number of young plants from the lateral roots in the fall, which winter over. Even tender plants, from six to ten inches high, set out in June, will throw up many plants the same season, that will winter over. In fact they spread so rapidly, and are so very hardy, that they will soon become too thick and the berries will be small, unless they are properly thinned and cultivated.

The Philadelphia.

The Philadelphia raspberry has always done well with me. The tops kill down some, every winter. After the buds start in the spring, I cut off all dead tips and cut off all dead wood, and cultivate. I planted my first Philadelphia in the spring of 1871, and they have borne a good crop every year since. This little patch is on a slope facing the west, and exposed to the northwest wind. My other Philadelphias are on level land, and in the lowest spots and little depressions they winter-kill most. I may mention that they have been injured most during the mildest winters. The cold winters of 1872-3 and 1874-5 did not injure them. As I have seen much complaint of the winter-killing of the Philadelphia raspberry, I will mention that for four years, including 1876, my lowest yield was over 2,200 quarts, my highest over 2,800 quarts, per acre. The flavor of the Philadelphia is by no means equal to the Turner.

Grapes.

Grapes are not so largely cultivated in Washington county as strawberries and raspberries, yet many are doing well, on a small scale, with Concords, Delawares and Clintons.

"Black Knot."

A word as to the contagion of "black knot" in Plum trees. Eight or ten years ago my children planted a dozen or more Plum trees in and around a

native cluster left in clearing the land. This native cluster bore good plums, but was badly affected with black knot. My sons cut all the tops entirely from these trees, and burnt them. They also dug the dirt away from the roots and left them exposed for some time; then put a considerable quantity of fresh ashes, sulphur and salt about the roots of each tree and replaced the dirt. They soon had fine tops again, but the black knot was as bad as ever. They are still standing, but ruined and worthless. The trees planted in and around this cluster are now large, and bear fine fruit, and although their roots and branches intertwine or interlock with the diseased trees and touch them in many places, not one of these trees brought from a healthy cluster has a particle of black knot.

DISCUSSION.

Raspberries.—Varieties.

Mr. Kenney. In the spring of 1873 my Philadelphias were badly killed. Last spring they were killed again, after they had started to grow.

Pres. Smith. I have had a similar experience. They were killed in 1873, and again last spring. Before this they had been considered tolerably hardy, but not so hardy as the Turner. The Turner is the hardiest raspberry.

Mr. Kenney. I fruited the Turner last summer for the first time. It is very hardy; has a long bearing season and large berries. I am very favorably impressed with it.

Pres. Smith. The suckers of the Turner must be kept out in order to get a crop of fruit.

Mr. Brand. The Turner has another good point: it is nearly thornless. The Philadelphia is hardier, however, than any black-cap raspberry.

Insects in Canes.

Pres. Smith. In the Turner, Philadelphia, Kirtland and Clarke I found last spring the burrow of a grub, which appeared to kill the cane above it.

Mr. Brand. I have found spots on the canes two or three inches long, which were punctured with numerous small holes, in each of which there was a grub.

Raspberries—Blackcaps.

Mr. Kenney. The Doolittle and the Seneca are the best of

the blackcaps. Some like the Mammoth Cluster, but it is too tender. The Seneca is the richest flavored blackcap.

Pres. Smith. I think the Ontario has an equally good fruit, and is about the same as to hardness.

Other Insects, and Remedies.

Mr. Kenney asked concerning certain insects, especially the lice on tender shoots of apple trees.

Mr. Brand. Mr. Barry's receipt is tobacco-water, dipping the branches into it.

Pres. Smith. A solution of soap-suds is an effectual remedy for most insects. It fixes the Tent Caterpillar.

Mr. Hollister. Is the term "Canker Worm," applied to the "Currant Worm," correct?

It was decided not.

Plant Lice.

The Natural History of the aphides or plant lice was here discussed, relating to which the following is copied from "Harris' Insects Injurious to Vegetation:"

"The winged plant lice provide for a succession of their race by stocking the plants with eggs in the autumn, as before stated. These are hatched in due time in the spring, and the young lice immediately begin to pump up sap from the tender leaves and shoots, increase rapidly in size, and in a short time come to maturity. In this state, it is found that the brood, without a single exception, consists wholly of females, which are wingless, but are in a condition immediately to continue their kind. Their young, however, are not hatched from eggs, but are produced alive, and each female may be the mother of fifteen or twenty young lice in the course of a single day. The plant lice of this second generation are also wingless females, which grow up and have their young in due time; and thus brood after brood is produced, even to the seventh generation or more, without the appearance or intervention, throughout the whole season of a single male. This extraordinary kind of propagation ends in the autumn with the birth of a brood of males and females, which in due time acquire wings and pair; eggs are then laid by these females, and with the death of these winged individuals, which soon follows, the race becomes extinct for the season."

Ants.

Mr. Sias. Are ants friends or foes to the horticulturist?

Mr. Dart. When they loosen up the ground into a mound they may do injury, but I think not in any other way.

Mr. Sias. Do they affect the blight? I had one Transcendent, among others, that did not blight, and this was covered with ants. I could see no other reason for this difference.

Mr. Dart. I think it was because they checked the flow of sap, by loosening up the soil around the roots, thus favoring the drying of the soil.

Adjourned to meet at 7 o'clock P. M.

TUESDAY EVENING.

THE ADDRESS OF PRESIDENT SMITH.

The meeting was called to order by the President at 7:30.

The regular programme was proceeded with, the President's Address coming first. It was accepted and ordered on file for publication.

The following is the address in full:

*Ladies and Gentlemen, Members of the
Minnesota State Horticultural Society:*

Since our last annual meeting, the centennial year of this great republic has passed, never to return to any of us now living. A year of pleasure and profit to very many, and a year of sorrow and loss to some, I have no doubt, and a year in which *all* have had occasion to pause and take a look at the past, and to note the progress and improvement, not only within the United States of America, but to glance over the whole civilized world, and compare notes with them, and see the advance and improvement made within the last one hundred years. And in so doing, shall we find that horticulture and horticultural improvements have kept pace with other arts and sciences? In answer to this, the report from the able delegates of this Society at the Great Centennial Exhibition and meeting of the American Pomological Society's reunion, will be much more instructive and satisfactory than anything which I can say on this subject. But while the Centennial Exhibition is supposed to show the improvements and progress of one hundred years, we here in Minnesota, and especially the horticulturists, have not had one-sixth of that time to prepare and start for the race and competition with the whole world, and yet our State Horticultural Society, only in its tenth year of existence, in this cold, dry climate, where they say neither fruit nor corn can be grown, have, through the energy, pluck and perseverance, under difficulties, and at the individual expense, of such men as Wyman Elliot, J. T.

Grimes, J. S. Harris, John Hart, Norman Buck, and many other members of our State Horticultural Society, been enabled, not only to secure mention and attract special notice at the exhibition, but to be one of only six or eight horticultural societies to receive an award of a medal on apples, as reported among the lists of awards given in January number, 1877, of *Gardeners' Monthly and Horticulturist*, and this, too, without State aid for collecting and paying expenses of such exhibition. While other States' societies had not only years the start of us in fruit culture, besides the advantages they claim as to climate and soil, added to which most of them had liberal State aid or appropriations from legislatures, shall we not justly feel proud of our humble efforts under such adverse circumstances, and may we not well feel encouraged to persevere and "try, try again" in the future; hoping that when the next Centennial Exhibition shall come around, that the Minnesota State Horticultural Society may so have made itself known, and its influence so felt for the good of the public, that the State Legislature of 1876 will not fail to make a small appropriation to assist in making the best and fullest display of fruits possible for her to make. Although you may think this is looking far into the future, is not the future what we are working for?—not the past. And in what manner can we better work for the future, and be likely to be known and honored years hence, than by helping to aid the State and its future residents to have a full supply of the very best fruits, flowers and vegetables? What better fortune can we leave to follow after us than the knowledge of how to most successfully grow horticultural products in the State of Minnesota, and what will best succeed therein? When we consider the immense advantage to ourselves and the State at large our experience and experiments have been in the last ten years, what shall we not gain if we only do our whole duty, and work with a will and with an eye single to the best interest of the citizens of the whole State? and give all to understand, so that we shall not be misunderstood, that the Minnesota State Horticultural Society is not the place to bring any axes to grind. We are not in that business. Neither is it to be run in the interest of a few nurserymen, but on the broad principle of justice to all; and while we do not propose to run it in the interest of any one class, we hope to aid all honest efforts of our nurserymen to supply all citizens of our State with trees and plants suitable for our climate and soil, and by helping to teach the masses how to plant and care for them, so that they may grow and produce fruit profitably; and thereby increase the business and profits of our nurserymen, and help to keep the money in the State that is now paid out to foreign nurserymen and tree-pedlars—at the same time help the producers to get value received for money paid, and obtain trees and plants that will be of some use to them.

Such is my idea of a few of the labors of our Society and what it owes the public, and believing that when it becomes known that such is our object and aim, the public will help and sustain us in our humble efforts until every school house in our State shall have its shade and ornamental trees and its flower garden, and until every farm and village lot shall have its shade, ornamental trees and shrubs, flowers and vegetables, and plenty

of them, and we can all live like sensible beings and in a manner that will elevate and enlighten us and bring us nearer to nature, and nature's laws, and nature's God. I cannot close this hasty address without a reference to our late State Fair, which was called a failure, and so it was, as far as dollars and cents were concerned, to all except those inside the ring, if I may be so allowed to speak. No doubt the Fair was set too late in the season, and I think all Horticulturists will agree with me, that in this State, October is too late to have a successful State Fair as a general rule, but I must compliment the Society upon the display made last fall under such adverse circumstances and lateness of the season, and too much praise cannot be given to such men as John S. Harris and Bates & Son, W. E. Brimhall, Moulton & Co., and many others for their magnificent display of apples, and Rudolph Knapheide, F. G. Gould, Eggleston and others for equally as fine a display of grapes, and to J. C. Fleischer, State Reform School, and others for display of flowers, and for which they deserve the especial thanks of this Society, considering the extreme weather and risk that they run of losing all on exhibition by frost; then the display of vegetables and other Horticultural products, including display of home grown seeds by Busch, Hollister & Co., was enormous and would compare favorably with those of older States; and the display from our northern county of Mille Lacs by J. S. Brockelhurst, deserves especial mention, and I must say did credit to himself and county he represents, and how much would it have made the hearts of those men and women glad, and how much would it have encouraged them to try again to do as well, or better, if they could have received the small premiums offered and so honestly earned, and not have been told by the President of the State Agricultural Society that we were exhibiting under the National Rules of the Trotting Association and the purses offered for fast horses and base ball must all be paid whether the Society paid expenses or not.

Now, I for one would have been satisfied if the affairs had been properly and economically managed, to say nothing more, and then, after paying all just and honest expenses, have divided the balance, whatever that amount might have been, *pro rata*, among those who were awarded premiums; and I think all reasonable persons would have been perfectly satisfied with such a result fairly made, even had it not have paid 10 cents on the dollar. Now is it not a proper time for us to commence a new deal, as the boys say, and have a change of some kind in our fall exhibitions, as we begin on the new century of our common country? Can we not devise some plan for an exhibition or fair to be run by the horticultural, farming and mechanical and other interests of our State, that will turn special purses and pool selling and things of this kind, under National rules, out of the list, and each bear its share of the expense and receive each its share of the profits, if any there should be. I merely throw this out as a suggestion, hoping it may have the attention of this body, if it deserves any, and not without, as I have no ax to grind, and do not propose to help grind one for any one else; and believe me as ever devoted and willing to join hands in any and all plans that I can

see will be for the best interest of Minnesota Horticultural Society and Minnesota horticulturists.

PAPER ON APPLE CULTURE.

The report of the delegates to the Centennial Exhibition, J. T. Grimes, Esq., chairman, came next on the programme, but his colleague, Mr. Elliot, being absent, the report was deferred till the following forenoon, and a paper on Apple Culture, by W. K. Bates, Esq., was read and ordered on file for publication.

The following is the paper in full :

C. Y. Lacy, Secretary Horticultural Society :

Seeing by the programme for winter meeting, received last evening, that I was assigned "Apple Culture," I will *try* to tell what little I know about it. First, I would say if you are a stranger in our State, see to it well that you have a proper selection of site, soil, and hardy varieties of trees.

Site.

First, for orchard site I would choose an eastern or northeastern exposure. Or, in other words, where a site could be chosen and not have it raked by our southwest, west and northwest winds. The southwest wind is most to be dreaded, as it is too warm in late winter and early spring, and causes the sap to start too early. If our farms do not contain such a location, we must do the next best thing, and that is, to protect our orchards by an evergreen belt of the *best* of evergreens, the Norway Spruce and the White Pine.

Soil.

2d. For a soil, I would select a clay soil; or, at least, a soil with clay subsoil.

Varieties.

3d. In regard to selecting varieties, I may say our State Horticultural Society furnish us yearly a digest of all that seem to do well in our different localities. But in this part of the State bordering on the rivers and valleys there are varieties that may not do as well back in the prairie counties, but can be planted here and prove profitable. Amongst these I may mention Duchess, Fameuse, Wealthy, Utter's Red, Jefferson Co., Haas, St. Lawrence, Tetofsky, Plumb's Cider, Saxton, Seek-no-further, and some others. All the above are common apples, and I may say that in all our old orchards, set out in an early day, by the sales of Mr. N. Stevens and A. W. Sias to our early settlers, none has given such returns in real cash as the Fameuse. It has

stood the blast, and in our markets finds ready sales. Trees last fall bringing in \$12.00 to \$15.00 per tree, or at the rate of \$1,200 to \$1,500 per acre, as much as an acre of wheat in a lifetime; and to our members I can say, what a return in golden fruit after our watching, working and waitings; and if one variety can do as well, what will be the result when that superb of apples, the Wealthy, comes into bearing. We raised some of this last fall of '76, and were more than pleased with it. But I am digressing, and I would still further say we have our Siberian family to fall back on. All good, and I think the day not far distant when they will be bettered by being hybridized, so that they will not be met in the markets as crabs.

Planting, Training and Pruning.

4th. I prefer low headed trees. Buy them in the fall and heel them in with proper care and set them in spring about the time the Oaks are putting forth their leaves and not earlier is my rule, as the tree will start and not stand still and be dried by the cold spring winds.

In setting I dig out a hole large enough for the roots without cramping them and deep enough to set the tree 6 to 9 inches deeper than it stood in nursery row, and on sandy soils I set twelve to fifteen inches deep, and after setting I generally mulch with rotten straw and cover it with little earth to hold the mulch in place. After planting I cut back a portion of the top of each tree to help form a better head and balance the loss of roots. But in after pruning I prune but little, and go most decidedly against seeding down orchards to timothy-grass.

Plant the ground to hoed crops or buckwheat. In closing I can say our county again redeemed herself by a large apple crop, several parties having some 200 or more bushels. There was a glut of Crab-apples in our markets, but a large amount were made up into cider with good returns.

Other Fruits.

A large crop of Raspberries, Strawberries and Currants, with those that had plants. My trial of Prouty's Seedling Strawberry and Janesville Grape were of such a good success I would recommend them to all. One of my neighbors raised with common bed culture four bushels of Strawberries to the rod of ground or at the rate of 640 bushels to the acre at 10c. per quart would net him \$2,048.00 per acre. I mention this to show what can be done in Minnesota.

Hoping you may have a good meeting and being circumstanced so that I cannot attend by being hurt, I remain,

Yours truly,

W. K. BATES.

STOCKTON, MINN., Jany. 12th, '77.

DISCUSSION.

Deep Planting.

Mr. Hollister. Deep planting has been mentioned twice, and as it is contrary to the laws of vegetable physiology, I would like to hear it explained.

Mr. Jewell. There are two reasons for deep planting. The trees are less affected by winds, and get more moisture. They get hardier roots by the formation of a new set above the root grafted on. There are only two ways to get hardy roots: one is to set deep, and the other to graft on crab-roots. The latter is seldom done, and the former is most practicable; but you lose by it about half a year's growth, because the tree does not start quite so soon.

Pres. Smith. Is not a slow growth preferable for Minnesota?

Mr. Jewell. If the tree is hardy, the more rapid the growth the better for the owner. A moderate growth for the half hardy kinds is, however, better.

Mr. Dart. I have not been in favor of deep planting. Hardier roots are the only advantage, and these are not needed if people will only mulch and cultivate thoroughly. Deep setting needs to be adopted with caution in a wet sub-soil. In that case, it is best to set near the surface and to mound up around the tree.

Mr. Jewell. But few will mulch regularly, and hence hardy roots are needed as well as hardy tops.

Mr. Dart. I set about the usual depth and mound up, because I fear my soil is too wet to set deep.

Mr. Hollister. Do any members know of deep-planted trees that have stood for many years?

Mr. Jewell. My experience is recent, but Mr. Wilcox, of Trempealeau, Wis., began four years ago, and his trees were all right one year ago. I also planted some Haas eight inches deeper than usual at that time, and have not had any trees do better than these have done.

CRANBERRY CULTURE.

A paper on Cranberry Culture by S. H. Kenney, Esq., of Morristown, was read and ordered on file for publication.

The following is the paper in full:

MORRISTOWN, Jan. 3d, 1877.

MR. EDITOR: Your article last week on cranberry culture suggested to me that a few items about that branch of business in Rice county would be of interest to your readers.

About eighteen years ago, in crossing a marsh, near my residence, I found a few cranberry vines; they were very scattering, not occupying more than one rod of ground, and mingled with what is termed wire grass. I picked one-half a pocket full of berries; there the marsh is what is termed a peat formation, and was then very wet. It was, after the discovery of those few berries, burned over from time to time, which retarded the growth of the vines, till six years ago, when there were seven bushels of berries from that small lot of vines, which had spread so as to cover a number of rods. About 12 years ago, we dug a ditch to a pond of water that had no outlet, and kept the whole marsh very wet. Since that time the spread and growth of the vines has been very rapid. Five years ago, I helped pick the berries; we gathered 60 bushels. The marsh was then sold to another man, who picked not less than 150 bushels three years since. The rapid spread of the vines and their productiveness, attracted the attention of Calvin Russell, and the late W. A. Shaw and Charles Lane, of your city; two years ago last spring they bought the marsh; they dug small ditches once in ten rods, to intersect with the main ditch, which was the outlet to the pond above mentioned. They also built a dike to hold the water in the spring. The following summer the marsh gave good promise of a crop, but the cranberry worm put in its appearance in the beginning of August, and did considerable damage; a frost the same month froze most of the berries, and injured the vines by freezing the tender shoots (as explained in your last week's article on cranberry culture.) A careful examination of the vines a year ago last fall, after the berries were harvested, failed to show any promise of fruit for the following seasons. About September 12th, the ditches were closed so as to flood the marsh, but there being less rain than usual that fall, the vines were not flooded till the snow melted in the spring, when they were nicely covered, and remained so till the 27th day of June, at which time the water was drawn off; what fruit buds there were blossomed and bore fruit, and the next fall Mr. Chas. Lane picked about 30 bushels of the finest berries I have ever seen. The vines are at present full of fruit buds, and if there are not any of them under the water the ditches are all full and the surface of the ground is covered in places.

The growth and spread of the vines in the last two years is something surprising. Mr. Russell set plants and cuttings over a number of acres two years ago; early in the spring, partly by scalping the turf with a bog-hoe, and rolling the turf and sticking the vines down in the scalped place. These also grow in an upright position the first season; last season they run along near the top of the turf, in some cases 30 inches, and then took root in the turf. The ditches were 12 inches wide and 12 inches deep, and the vines, in some cases, run into the ditch and crossed to the other side. Some vines were set also by cutting through the turf with a spade, and pressing in the vines with a piece of board sharpened on the end. These made nearly as good growth as the others, and look very promising. Still another way: the turf was scalped and piled, and the ground plowed when the frost had come out of the ground four inches deep. The vines were pressed in between the furrows. About an acre was planted in this way.

These vines made considerable growth the first season, and had a few berries on them. Last season some of the runners grew nearly three feet. The grass has grown considerably on this plat. Early last summer, the grass was carefully pulled out of three square rods of the ground to ascertain whether the vines would do any better without the grass. It was found, however, that the best growth was obtained where the grass was not pulled. The vines seem to require the shade that grass gives them. These vines were all set early in the spring, as early as the frost would permit. A few vines set the 16th day of June, and the date carefully noted by me, grew, but never have made such fine growth as the early set vines. Still another piece of ground was set out, and sand spread on to the depth of three or four inches. The vines look well.

It will require considerable time to determine the best mode of culture, but from careful observation of peat lands that have been drained in this vicinity, I should say care must be taken not to drain the peat dry enough to cause it to rot, as then it becomes good grass land, and the grass makes such rank growth as to choke the vines. The vines do not thrive where water stands on them through the growing season. Flowing the vines prevented the ravages of the cranberry worm the past season. The flowing of the marsh in the spring brought many berries to the surface which the wind and waves washed in all directions. From a careful experiment with the seeds of some of these berries planted, we obtained in one season from 1½ to 2 inches growth of vine. We found not ten rods from where the original vines grew, three distinct varieties of berries, which evidently must be seedlings; one a very dark colored berry—almost black, and ripe about two weeks sooner than the most of the crop; the vines in many places have almost entirely occupied the ground, and look as near perfection as one could imagine. The thorough system of drainage, enabled the fruit to be gathered immediately after heavy rains, the berries were much larger than ever before, and they would command one dollar per bushel more than any berries I saw in the St. Paul market, last fall. The vines set two years have not had time to develop yet. I hope in the future to be able to report great success in this branch of industry. Calvin Russell deserves much credit for the experiments detailed above. The prospects of success in this enterprise look to me very encouraging.

SETH H. KENNEY.

DISCUSSION.

Importance of Cranberries.

Pres. Smith. This is an important subject. The fruit can be kept the year round, shipped to all parts of the world and is healthful; hence its importance. I consider it one of our most important fruits. I have kept it from one season till the following October in a cool cellar. Few fruits keep like this. Several years

ago 7,000 barrels were shipped from St. Paul, and I see no reason why we cannot sell 70,000 barrels, and thus see less of hard times.

Mr. Kenney. The vines spread rapidly, and altogether it is an easy fruit to grow.

PERENNIAL GARDEN VEGETABLES.

The paper of Wm. E. Brimhall, Esq., of St. Paul, on Perennial Garden Vegetables was then read and ordered on file for publication.

The following is the paper in full :

Asparagus.

This is justly esteemed one of the choicest vegetables of the garden.

Indeed it possesses every quality to recommend it—flavor for the palate, hardihood of constitution, facility of culture and it brings profit to the grower.

Although few plants demand so little trouble, no others are so well worth a great deal of trouble. This it will be our object to prove while explaining the method by which it is cultivated.

Propagation.—In forming new beds it is customary to use two year old plants, because they may be safely removed at that age and will come into bearing in two years. May is the best time for planting; but having produced beds from seeds, we prefer that method of propagation.

Too much pains cannot be taken in preparing the ground before planting, as nothing can be done after the plants are started except by topdressing. If the soil is stiff and unpleasent to work, mix with it some lighter earth, and about a wagon load of well rotted manure to every ten feet square.

When the land is fit for planting sow the seed in drills eighteen inches apart. When the plants appear, thin to one foot apart in the row. For the first year the ground should be kept free from weeds and the soil light by frequent cultivating.

The following spring cover the ground with about three inches of finely pulverized manure, and during the season cultivate as before. Remember you are preparing a bed that will last twenty years.

In the autumn when the stalks have turned yellow, cut and burn them.

Before the ground freezes, cover with a good coat of good manure. In the spring fork it in and cultivate as before. If your work has been well done, the next spring you may have asparagus for market.

Cutting.—At every cutting cut the bed clean, leaving no thin spindling shoots. But do not cut later than the first of July, for if every shoot be taken off a crown, to the end of a long season, that root will be destroyed.

To prevent the crowns from being too deeply buried, on account of the fall dressings, the ground should be forked late in April, and the rough earth raked off.

Manuring.—A dressing of salt and ashes is very beneficial; about one pound of salt to the square yard.

Forcing.—With respect to forcing, it is very easy, with narrow beds, to bring the plants forward by digging trenches eighteen inches wide and a foot deep, on each side of the beds, and fill them with warm stable dung, raising the dung six inches above the level, but not covering the plants. If the nights are cold, the beds should be covered to prevent freezing.

Planting.—If plants are to be set out, the ground must be prepared by digging trenches two feet deep and filling them with equal parts of light soil and well-rotted manure mixed together. The plants should be set six inches deep, with the roots spread horizontally. Care should be taken to set the crown two inches below the surface. When the plants are started, they should be treated in the same manner as those raised from the seed.

Marketing.—When the crop is successfully raised, only one step has been accomplished towards turning it into money. When cutting, do not leave it long exposed to the sun, for it soon wilts; but, as soon as possible after cutting, wash, assort and bunch, making two sizes, and of equality throughout. Cut the butts neatly and square, and tie very tight at both ends.

If obliged to keep the bunches a day or two before sending to market, stand them in a tub with an inch or two of water, and keep in a cool place. Always, in handling, keep the heads one way; and when it is bunched the bunches should stand upright. It is desirable that asparagus should appear well in market.

Varieties.—The oldest favorite variety is “The Giant.” “Conover’s Colossal” is a mammoth variety fast coming into favor. It bears cutting a year sooner than any other sort.

Rhubarb.

Rhubarb, although a native of Asia, is so hardy as to resist the frosts of our severest seasons. And of all esculents, for culinary purposes, it is the most easily prepared.

Within a few years its cultivation has increased, so that immense quantities are annually sold in all the large markets. It has become so common, and is so easily produced, that little need be said in relation to its culture. But in this, as in everything else, nothing less than the *best* results should satisfy the gardener.

Propagation.—Any one of the many varieties may be propagated from the seed. But as the seed does not *always* produce the same variety as that from which it grew, the better way is to take offsets with one or two good eyes and set them, either in the spring or fall.

Soil.—The soil must be moist and rich, for upon the strength and quickness of the soil depend the desirable qualities of the stalk—crispness, flavor and succulence.

Care.—Plants from offsets should not lose a leaf or stalk, except by natural decay, until the second year; and in time of drought they should have a plentiful supply of water.

The plants should stand in rows three by four feet apart, and be well covered with manure in the fall, which must be forked in around the roots in the spring. The seed stalks must be pulled whenever they appear, and if the leaf stalks are kept moderately thin good rhubarb may be gathered until the time of frost.

Varieties.—The “Linnæus” is the earliest variety, very high flavored and prolific. We consider it the best for family use.

The Victoria is a larger variety, less acid, but coarser grained than the first mentioned.

Horse-Radish.

This has long been a favorite garnish for roast beef and other fresh meats; it eminently possesses some of the properties which prevent or correct the bad effect of an excess of nitrogenous aliments upon the system. It possesses valuable medicinal properties in cases of hoarseness, dropsy, rheumatism and paralytic affections.

As a condiment, it finds a ready market in all large cities, and no kitchen garden should be without its bed of horse-radish.

Soil.—It succeeds best in a damp, rich soil; it never has large roots in poor or dry or shallow soil; or in a shady place or in the drip of trees. It thrives in the trenched bank of a ditch, where the ground maintains a constant, regular, considerable moisture.

Preparation.—Where large beds are to be made the soil should be prepared the year before by subsoil plowing and working in a good coat of very old manure, if the manure is new or newly applied, too much top and too little root will be the result.

Propagation.—As seed cannot be relied upon, it is better to use sets, which may be had by cutting the roots into lengths of two inches, planting in the fall or spring in rows eighteen or twenty-four inches distant each way. They should be dibbled into freshly trenched ground, covering slightly. If the ground has been well prepared, there will be fine large roots by the second year.

Planting.—Good roots may be made to grow the first year in the following manner: Throw the ground into ridges about eight inches high by turning two furrows together, leaving the ridges two and a half feet apart. Into these ridges, set, with a dibbling stick, fine roots about the size of a pipe-stem and as long as can be procured, say from eight to sixteen inches. The best way to get such roots is to save them when digging for market, trimming off all the long slender ones and packing them in dry sand or sawdust; keep until the following spring. These rootlets should be set at an angle of forty-five degrees so that they may not be too deep in the ground.

Dressing.—But the most important part is what is called “dressing the roots.” When the plants are well started the earth should be thrown away from them first with a plow; following with a hoe until the roots are bared, then with a garden trowel scrape all the fibers and rootlets from the main root leaving it smooth except at the lower end.

When the roots have been well dressed they should be earthed up again.

This dressing should be repeated about the first of August, again the first of September. Using this method we have raised roots weighing one pound each and they were smooth, strait and solid; if left in the ground until the second year they become hollow and woody.

Horse-radish raised in the above manner, sells for from ten to fifteen cents per lb.

DISCUSSION.

Asparagus.

Pres. Smith. I trench deeply for my bed, and plant the roots deeply, and cut white for the St. Paul market; cut from five to six inches under ground.

Horse Radish.

Mr. Jewell. I doubt the good effects of horse-radish, mentioned in the essay. In the case of a man whose stomach was open, and could be looked into, it was found that horse-radish retarded digestion. We are likely to ascribe good effects to whatever pleases our palates.

Pres. Smith. The Germans put it into liquors for the rheumatism.

Mr. Kenney. It was recommended by a physician for a neighbor of mine who had fits.

MR. HART'S LETTER.

A letter from John Hart, Esq., of Winona, was read and ordered on file. The following is the part that relates to the discussion which followed the reading:

WINONA, Jan. 10th, 1877.

Mr. C. Y. Lacy, Esq.:

DEAR SIR: Your note of — was duly received, asking me to suggest some topic for discussion at your next annual meeting. There is nothing should call our attention more than the protection of our trees against insects. We have watched closely for the last year. Whenever we found a tree blighted, we examined it close and found that insects were the cause. We took a limb from a Transcendent tree which was showing blight, and, examining the leaves, we found them covered with small insects. It will appear strange that some varieties will escape, while other varieties are

nearly destroyed, all in the same row. We suppose from this that those little insects are like other living beings, and go for the food that suits their taste best. We remember when we first planted apple trees here, our trees were entirely free from insects, and our apples free from worms. At that time our small birds were very numerous, which I think protected our orchards.

Respectfully yours,

JOHN HART.

DISCUSSION.

Cause and Cure of Blight.

Mr. Jewell. Our friend Hart is mistaken. Scientists have not found any such insects. Some think it is a vegetable fungus, and probably they are not far from the truth. I used to be troubled with the blight, but have now got rid of those trees which blight the worst. I concluded I had no use for the Transcendents, and dug them up and have not suffered seriously since. Mr. Cook, of Rochester, lost heavily from blight, because he did not get rid of his old Transcendents before the blight came. Mr. Jewell detailed another case in which Transcendents had been the cause of great loss. Mr. Pearce believed that the ammoniacal emanations from a manure pile would prevent it, but the blight is beginning on trees subjected to these conditions. We can stop it because a tree is never attacked when not growing. So, if when beginning to blight, we stop the growth by root-pruning, or other means, we stop the blight. Last summer my trees began to blight, so I girdled them, taking off a narrow ring of bark nearly or quite around the trunk, and covered with wax. It stopped the blight.

Mr. Pearce. I saw a German last summer who thought that the sun scalded the sap to produce blight. He thought so because the leaves began to wilt one very hot day. I think the ammonia theory plausible, at least. I have no blight to speak of. I got rid of my Transcendents some time ago, but there are other trees also very liable to blight.

Mr. Grimes. Thus we see how liable we are to be mistaken. Mr. Harrison and others, some years ago, took a magnifying glass and found some insects on blighted trees, and concluded that they were the cause of the blight.

Mr. Jewell. What advice shall we give to the man who has Transcendents? This is a serious question. Perhaps he has bought them of you. Shall you tell him to make a brush-pile of

them? I think the straightforward course is the best. He probably will not follow the advice, but will yet wish he had.

Mr. Sias. I object to that plan. We should be obliged to throw out the best crab or hybrid we have—Meader's Winter. Mr. Hart's paper is the best we have had on the subject of blight for some time. I believe it is due to insects, not to one but to several.

Mr. Jewell. I meant to throw out those kinds which blight the worst, and are most likely to cause an orchard to be infected. I do not attach any importance to Mr. Hart's paper on that subject.

Mr. Kenney. I have many Transcendents, and would not like to dig them up. I consider them valuable, and my neighbors do likewise.

Mr. Jewell. I would dig them up only when they blight, and not before.

Mr. Pearce. I propose to put them by themselves and let them blight. I believe they will pay the best of any, notwithstanding their liability to blight.

Mr. Grimes. Mr. Jewell is not consistent in his treatment of the Transcendent. An ounce of prevention is worth a pound of cure.

Mr. Jewell. A man is consistent in refusing to endorse what he endorsed a few years ago, if the interval has shown him to be wrong. I will still sell Transcendents to nurserymen at wholesale, but not at retail, and I will not recommend them to any one.

Mr. Kenney. I still have faith in the Ben Davis under particular treatment.

Adjourned to meet at 9 o'clock A. M. Wednesday.

WEDNESDAY MORNING.

PLANTS UNDER CULTIVATION.

The meeting was called to order by the President at 9:30. An essay on Cultivated Plants was read by W. T. Scott, Esq., of Minneapolis, and ordered on file for publication, after which Mr. Grimes introduced the following, which was carried unanimously:

Resolved, That the thanks of the Society are due, and we hereby tender the same, to W. T. Scott, for his well written and intelligent essay on Cultivated Plants.

(Mr. Scott's paper has not reached the hands of the Secretary. If received in time it will be placed in the Appendix.)

A short discussion on the above subject was had in which Messrs Scott, Hollister and Lacy took part.

REPORT OF DELEGATES TO CENTENNIAL EXHIBITION.

On motion the report of the Committee on Centennial Exhibition was called for. Mr. Grimes asked leave to make a partial report since the report of the Committee on Awards had not yet come to hand which would enable them to make a complete report. The request was granted and the partial report was read by Messrs Grimes and Elliot. After the reading it was ordered to be placed on file for publication when complete, and the following resolution carried:

Resolved, That the thanks of the Society are due and are hereby tendered to those persons who contributed fruits to our exhibition at the Centennial Exhibition and that they are tendered especially to the members of the committee whose report we are to receive.

(The report of the Delegates will be found in the Appendix to this volume.)

DISCUSSION.

Fruit Charts.

The subject of fruit charts, suggested by the report, was taken up for discussion.

Mr. Jewell. I question the practical value of such a chart.

Mr. Grimes. It would be of great value.

Mr. Dart. I think it of not much practical value.

Mr. Grimes. It would mark the northern and southern limits of each fruit.

Mr. Jewell. The weakness of the theory is that the fruit lines would not correspond to the isothermal lines.

Mr. Elliot. We want a map that will show that apples will grow in the river counties, while they will not grow in the northern or the interior counties.

Mr. Jewell. It requires too much careful knowledge to construct a good one, and a poor one would be worse than none.

Mr. Dart. We do not want one because in the regions outside of these lines people will be discouraged from trying to raise fruit.

Mr. Jewell. We want to educate the people so that soil and elevation shall be taken into account, as they must be in deciding whether fruit can be grown or not, and we can do this about as easily as to construct a chart.

Mr. Scott. We want some kind of information that shall show the elements of success in fruit growing.

Mr. Pearce. The influence of soils has struck me frequently. We have soils on which apples and grapes do well, and I think also where pears will grow. I have come to the firm conclusion that I can raise apples, but to do so will take precautions as to the nature of the soil.

A motion was made to strike the chart suggestion from the report, but it did not prevail. It was then moved and carried that the President appoint a committee to report on the plan for a fruit chart at the next annual meeting.

Messrs. Harris, Jewell, Brand, Grimes and Smith, of St. Cloud, were appointed such committee.

On motion, the Finance Committee was requested to report this evening. The Committee on Cataloguing Fruits, &c., was requested to report to-morrow afternoon. Mr. Jewell replied that they had no report prepared, but could have one by the time the transactions would be printed.

PRESERVED FRUITS.

Mr. Elliot was requested to report on the methods of preserving the fruits on exhibition before the Society, that had been kept beyond their season. He reported to the effect that the process was a very simple one; very cheap, and, so far as he had tried it, a very good one. The process is a secret one, but the materials are of common occurrence. The fruits and vegetables which had been put up in the fall appeared to be in good condition.

WEDNESDAY AFTERNOON.

REVISION OF STRAWBERRY LIST.

The meeting was called to order at 2:15 o'clock p. m.

The revision of the Strawberry list was the first business taken up. The list as last revised was read by the President.

Ida.

Mr. Kenney. The *Ida* stood better than anything else last year with me.

Champion and Charles Downing.

Pres. Smith. The *Champion* stood the best last year with me. The *Charles Downing* has been in the St. Paul market for four years now and has grown in favor. The vine is hardy, even more so than the *Wilson*, and the berries are large.

Mr. Elliot. The fruit is very showy and is going to take well, but it will not bear so much handling as the *Wilson*; none will do that, but the *Downing* has a better flavor and a brighter scarlet color.

Hart's Seedling.

Mr. Jewell. Does any one know anything more of *Hart's Seedling* than was told last winter?

Pres. Smith. It lived well last winter, and those on exhibition last summer were very fine.

Mr. Elliot. Out of twelve vines which I received, only two lived and those were much injured.

History of Hart's Seedling.

[Since the meeting, Mr. Hart has sent us the following history of his *Seedling* strawberry, which we insert here:]

While describing our *Seedling* apple trees, it may not be amiss to say a word about our *Seedling* strawberry, of which there is considerable inquiry this spring. As for ourselves, we prize it more than all the *Seedling* apples we have ever raised. We give you its history as brief as possible. About 14 years ago we commenced to sow strawberry seed, raising a small patch every year since, and finding no berry as good as the *Wilson*, we threw them away as fast as tested. About three years ago we had a small patch with several varieties of berries in it, among which were the *Agriculturist*, *Jucunda*, *Russell*, *Wilson*, *Triumph*, *Duke of Kent*, &c. We took the largest berry we could find from each of these berries, saved the seed and sowed it, and raised over 200 different varieties. From this lot we got one plant from which our present stock originated, which, we think, is the best strawberry we have yet seen, considering size and quality.

Respectfully yours,

JOHN HART.

Boyden's No. 15 and Red Jacket.

Mr. Jewell. Does any one know anything about Boyden's No. 15? With me it is better than No. 30. (Mr. J. also enquired if any had tried the Red Jacket, but received no reply to either inquiry.)

It was moved and seconded that the list of strawberries stand over as last adopted.

Countess de Haricourt.

Mr. Elliot. I want to say a word about the Countess de Haricourt. Wm. Lyon, of Minneapolis, marketed 200 to 300 quarts daily last summer. It stood last winter the best of any in our section.

It was moved to amend the motion by adding Countess de Haricourt and Prouty's Seedling for trial. The amended motion was then carried.

REVISION OF RASPBERRY LIST.

The revision of the raspberry list was the next business taken up.

Mr. Grimes. I move to recommend the Doolittle and Seneca for general cultivation for black-caps, and the Philadelphia and Turner for red. The Doolittle is the earlier but the Seneca is the better berry.

Pres. Smith. Mr. Brimhall, Mr. Boxell and myself agree on the Doolittle, Seneca and Ontario as the best black-caps. The Ontario has about the same season as the Doolittle, but it is sweeter and richer than either that or Seneca, and about the same as to hardiness. The Mammoth Cluster I have thrown over, for its want of hardiness, and the dry chippy character of its fruit.

Mr. Grimes. The Doolittle and Seneca are about equal in hardiness.

The motion was divided, and a motion to recommend the Doolittle and Seneca for general cultivation for black-caps was carried unanimously.

A motion to recommend the Ontario black-cap for trial, was carried unanimously.

Turner and Philadelphia.

A motion was made to recommend the Philadelphia and Turner for general cultivation for reds.

Pres. Smith. The Turner is hardier than the Philadelphia ; the fruit larger and better ; the yield not so good as the Philadelphia when the latter is at its best, but its season is longer ; from the 5th of July to the 5th of September last year. It is nearly free from thorns, but suckers badly, but the suckers are easily got out by the hoe or plow. Mr. Boxell is much pleased with it. In flavor it excels all others.

Mr. Grimes I thought I never saw any canes fruit so heavily, and the quality was superior.

Mr. Jewell. Three years ago I got 200 plants, and now I have a million. Mr. Stickney wrote me that it did excellently last year, but that it would not become popular because of its suckering and it will not bear unless the suckers are kept down.

Mr. Elliot. I think I prefer it to the Philadelphia. I think we generally let too many canes grow in a hill to get good crops of good fruit.

Pres. Smith. I do not want more than four canes in a hill.

Motion carried, 9 for and 1 against.

Herstine and Ganargua.

Pres. Smith. Has any one tried the Herstine ?

Mr. Grimes. It has been grown by a neighbor of mine for two years. The first year he was greatly pleased with it, but last year it was not so good. Has any one tried the Ganargua, a red berry that grows or roots at the tips like the black-caps ?

Golden Thornless.

Mr. Jewell. Has any one tried the Golden Thornless ? Some bore with me last summer, but the quality was not good. The fruit was somewhat woody.

Mr. Grimes. My experience with the Golden Thornless has been similar.

THE PROPAGATION OF TREES BY CUTTINGS.

A paper on "The Propagation of Trees by Cuttings," by L. B. Hodges, Esq., of St. Paul, was read, after which the paper was ordered on file for publication, and Mr. Jewell moved a vote of thanks to Mr. Hodges for his humorous and instructive essay, and also a rebuke for his reflection on the religious intelligence of the

members of the Society. The resolution was passed amid laughter and applause.

The following is the paper in full:

When a small boy, more than forty years ago, in the pleasant village of Canandaigua, N. Y., my attention was arrested by a magnificent great willow on the premises of Judge A——, one of the pioneers of that region. It was a tradition among the boys that this immense tree grew from a willow switch which the Judge cut in Connecticut and used as a riding whip during his horseback journey from Connecticut to Western New York, and for over thirty years of my manhood passed on the broad prairies of the Northwest, I have often seen and heard of similar willows with very similar histories. Now, this is all well enough *per se*, but when intelligent and educated gentlemen, on the strength of such occasional and isolated circumstances, affirm that all you have got to do in order to grow the willow, the cottonwood or the Lombardy is to simply stick a cutting in the ground in most any sort of a hap-hazard way, they are simply leading the multitude astray and doing harm rather than good. The object of this paper is to furnish to the people interested in the propagation of forest trees by this particular method such practical information as a long and varied experience has proved to be correct.

If this sort of experience is in conflict with tradition and preconceived notions, why so much the worse for the traditions and notions. I begin by saying that a proper preparation of the soil is not only of primary importance, but also a prerequisite condition of success.

Soil and its Preparation.

Your ground must be good ground, it must be thoroughly subdued and mellow before planting, and right here I propose to point out and expose the practical nonsense and absurdity of the proposition that a cutting will grow anyhow, so you only stick it in the ground. Acting on this absurd proposition, hundreds of thousands of all sorts of cuttings have been stuck into all sorts of ground by all sorts of people. The *results* are well illustrated in the parable of the sower.

(Before going to bed to-night, you fellows who haven't read that parable for twenty years or more had better look it over.)

Soon after the passage of the Timber Culture Act of 1873, I read in one of the most ably-conducted and widely-circulated of our country papers, an editorial showing the settler how to grow a forest under the provisions of said act. *Boiled down*, it simply amounted to this: Strips of breaking two or three furrows wide, said strips twelve feet apart and the cuttings to be stuck twelve feet apart in the strips, in the raw, unsubdued sod; no further labor or expense necessary—result, a forest. I promptly denounced the absurdity of such teachings, but for all that, a heap of fellows had to try it on. It would be a good time now for them to report what luck they have had.

In the pursuit of knowledge under difficulties, my curiosity has led me over quite a large number of tree claims which have been planted in good faith in accordance with such teachings.

Candor compels me to say that when you find a muley cow climbing a tree stern-first, it will be up one of the trees so propagated on one of those tree claims.

The Northern Pacific Railroad Co., expended a number of thousands of dollars in just about that sort of a way of propagating forest trees from cuttings, and succeeded in demonstrating that it was just as easy to drive a government mule through the eye of a needle, as to grow forest trees in any such way as that.

The idea of getting something for nothing, is a bad one. There must be an equivalent, a *quid pro quo*.

In your dealings with each other, this idea of something for nothing, may work, *occasionally*,—but you can't bulldoze the prairie with any such nonsense.

The cutting plunged full length into a deep, rich, mellow soil, under the vivifying influences of heat and moisture, soon begins to expand its buds, and throw out its slender, thread like, fibrous roots. If the ground has been properly prepared, those roots at once begin to draw nourishment for the incipient tree; the buds grow into branches, and in a few months you have a thoroughly developed forest tree, and the better cultivation you give this young tree, the sooner you get a tree that is of some use in the world.

On the other hand, the cutting stuck in the raw sod, makes a failure in trying to get its roots into the hard earth in a vain attempt for nourishment; struggles along in a feeble, quiet sort of a way till dry weather sets in, and then quietly starves to death without a struggle or a groan, and the innocent author of this miserable abortion wonders what ails his trees, and sometimes gets mad, and uses "cuss-words," about the man who sold him the cuttings.

To go back to the starting point: break your prairie in June; break shallow—back set or cross-plow last of Sept. turning up two or three inches of fresh dirt.

If in a hurry, (to save your claim) harrow thoroughly, and plant your cuttings right along up to the time the ground shuts up, and if not through, finish up the job early in the ensuing spring. If in no hurry it is good practice to raise a crop before planting cuttings. A hoed crop is best, and if well cultivated leaves the ground in admirable condition for tree-planting. If you sow small grain before planting, you can't be too careful in getting your seed *perfectly clean*.

A few grains of wild buckwheat, or, what is more to be dreaded, pigeon grass, will give you an infinite amount of trouble, and by increased labor in keeping it down, double the cost of growing the forest.

In growing a wind-break from cuttings, for a single row, I would prepare a strip of ground not less than 8½ feet wide, by deep ploughing and thorough harrowing.

I would have the ground as mellow as an ash-heap.

I would draw a line lengthwise along the centre of this strip, and about every twelve to eighteen inches would plunge the cutting in nearly or quite full length, and at once tramp the mellow earth firmly around the cutting; and then I would keep that strip of ground clean as a hound's tooth. I wouldn't allow a weed or blade of grass to grow on that strip dedicated to the wind-break; and I should keep the cultivator running up and down the margin each side the row of young trees pretty often till harvest time, after

which, if any weeds or grass had put in an appearance, would pull them up, carry them off and burn them up.

I should repeat this process the next season, and in the fall would mulch heavy with good manure.

I think by that time you will have that strip of prairie pretty well bulldozed, and a wind-break started that won't dry out or freeze out, and which will stand and grow in spite of grasshoppers or other enemies.

Time of Preparing Cuttings.

As far as the willow is concerned, most any time will do.

I have cut them nearly every month in the year, yet would prefer cutting and planting right along through the month of May, as being then liable to less loss and better growth.

I confess in my own experience to more satisfactory results with cottonwood cuttings cut and planted in October and November than in any other months.

As far as willow, cottonwood and Lombardy cuttings are concerned, good fresh healthy ones are about as sure to grow (in Minnesota) if properly handled, and under the most favorable circumstances, as either corn or potatoes. *Failure* is not necessary. Do your work intelligently and thoroughly, and at the proper time, and *success* is the rule.

Care of Cuttings till Planted.

In the fall of 1874 I caused to be cut and hauled together, enough white willow to make five hundred thousand cuttings. I reduced some of this brush to cuttings in the fall, tied them up in bunches of a hundred each, set them up on end in trenches dug about a foot deep, threw a foot of dirt over them and let them lay till spring. The balance was stacked in good shape, covered with a layer of slough hay—threw enough loose dirt over it to keep the wind out, and let the thing go till it thawed out in the spring—then uncovered it, worked it up into cuttings and planted them. They came good and grew well, and I never knew any difference between those buried in trenches, or those of the stack. Whenever in the course of human events, I found a lot of cuttings drying up and apparently worthless, before planting I would “swell ’em up” by throwing them into the most convenient lake, pond or stream. But a good way is to keep them buried in the trench until you are ready to plant.

There are plenty of cottonwood trees in Minnesota propagated from cuttings in the manner I recommend, now big enough to make a cord of wood each—17 to 20 years from the cutting.

You can grow 300 such trees to the acre. Can you grow anything that will pay better?

Is there any better way to “conquer the prairie,” or to bulldoze and intimidate old Boreas?

DISCUSSION.

Mr. Scott. I would like to know what has been the success of others with cottonwood cuttings. I have had but poor success.

Pres. Smith. Have you not tried on sandy soil?

Mr. Scott. Yes.

Pres. Smith. That is the trouble. On heavier soils there is no difficulty.

REVISION OF CURRANT LISTS.

The currant list was next taken up for revision.

Pres. Smith. I have two new ones, Bailey's Sweet White and Clinton White. They are both good.

Mr. Grimes. The Versailles is liable to kill down, and is much like the cherry, hence I am neither increasing nor diminishing my stock of it.

Mr. Scott inquired concerning Stewart's Seedling.

Pres. Smith. I consider the Victoria one of the best. I also grow one known as Smith's Seedling. Bailey's Sweet and Clinton White have stronger bushes and better flavored fruit than the White Grape.

Mr. Scott. Stewart's Seedling is a fair bearer, vigorous and very early. The fruit is of good flavor and the size of Red Dutch.

Mr. Elliot. I do not think the Victoria better than the Red Dutch. We have none yet to beat the latter. I grew 150 bushels last year. I prune freely.

Pres. Smith. Mr. Elliot may have a better strain of Red Dutch than I have.

Mr. Elliot. The Red Dutch averages a larger berry than the Victoria, but the bush of the Victoria is more vigorous. I cut out a portion of old wood each year and leave some new shoots. The borers started my pruning, to get rid of them. I cannot say that any one variety is more liable to their attacks than other varieties.

Pres. Smith. Has not Mr. Elliot his currants on sandy soil? The Victoria requires a moist, rich soil.

Mr. Elliot. Yes; mine are on sandy soil. That makes a difference, and we ought to state the nature of the soil in all our discussions.

It was moved to adopt the old list of currants, with the White Dutch stricken out, viz. : Red Dutch, White Grape and Victoria, for general cultivation. The motion was carried, 7 for and 2 against.

Mr. Dart. Why strike out the White Dutch?

Mr. Elliot. Because of its poor yield.

It was moved to recommend Stewart's Seedling for trial.

The motion was carried unanimously.

Pres. Smith. The Black Naples is popular in market, and we should recommend one black variety for trial at least.

Mr. Elliot. There was a great demand for black currants last summer.

Pres. Smith. They are only moderate bearers.

Mr. Elliot. On moist and rich soil, and well cultivated, they give a good yield.

It was moved to recommend the Black Naples for general cultivation as a black variety.

Motion carried unanimously.

GOOSEBERRIES.

Gooseberries were then taken up.

Mr. Jewell. Has any one tried Smith's Seedling?

Pres. Smith. The American Seedling is the best I have tried, a pale red in color.

Mr. Jewell. Tried the Downing for several years but it was not a success.

JANESVILLE GRAPE.

Mr. Jewell. I want the Janesville Grape to take a higher place. It is very early, very hardy, bears young and bears neglect. I left mine uncovered last year and they came through in good condition.

Mr. Pearce. It is the only one I have succeeded with. Some vines bear the same year they are set. The flavor is nearly equal to the Concord and some say better.

It was moved to transfer the Janesville to the list for general cultivation. The vote resulted in a tie, 4 for and 4 against, the President deciding the vote by voting in the negative.

CONDITIONS OF SUCCESS IN FRUIT CULTURE.

Mr. Pearce's paper on "Fall Planting and Root Killing" was called for, but the following was offered by Mr. Scott:

Resolved, That the want of due care in the selection of location is the greatest retarding influence to successful fruit culture in Minnesota.

Mr. Brand moved a substitute:

Resolved, That for successful fruit culture we should always have moist autumns and the mercury never below zero.

Mr. Jewell moved to amend by adding "and the best location is outside of the State."

Mr. Dart. I do not believe that want of proper location is the greatest retarding influence. I think variety has more to do with it than location.

Mr. Scott. In this State success is not to be obtained by the choice of varieties, but if we have not the proper location and we make one by planting wind-breaks we have a better chance of success.

Mr. Dart. We can take the best varieties we now have on the prairie and succeed with them—the Duchess and, perhaps, the Wealthy, as well as the Russian apples.

Mr. Jewell. We have a few that will live if properly planted anywhere above water. I consider selection of the proper varieties, site, and proper care in planting and cultivation, the essential points; and I consider this the order of their importance.

Mr. Jewell moved to amend by substituting the following:—

Resolved, That the greatest obstacles in the way of successful orchard culture are, 1st. Want of knowledge of the best varieties. 2d. Not selecting the most desirable locations; and, 3d. The lack of proper attention and skill in the planting and after-culture.

This substitute was carried.

GOOSEBERRIES AGAIN.

The discussion of gooseberries was then resumed.

— — — — — Does any one grow gooseberries successfully? There seems to be some demand for them at 5 cents per quart, or \$1.50 per bushel.

Mr. Grimes moved to recommend the American Cluster gooseberry for general cultivation, also known as Cluster and American Pale Red.

Mr. Scott. They have killed down when side by side with the Houghton.

Mr. Dart moved to amend so as to recommend for trial.

Mr. Brand moved to lay the gooseberry question on the table.

The motion was carried.

FALL PLANTING AND ROOT-KILLING OF FRUIT TREES.

Mr. Pearce's paper on "Fall Planting and Root-killing" was then called for and read, after which it was ordered on file for publication.

The following is the paper in full :

Fall Planting.

Since the fall of 1872, preceding the cold winter, I have planted or caused to be done from 100 to 1,000 fruit trees each fall, usually three to four years old, and in no instance where the trees were of hardy varieties, wood well ripened and trees properly set, mulched, and, if necessary, the mulching wet, have the trees died or presented a sickly appearance. I do not write this to induce others to practice fall planting on a large scale, for it is very likely many of them would fail, owing largely to the unripened condition of the trees when received from a distance, as nurserymen who have large amounts of trees to deliver in the fall commence digging before vegetation ceases, stripping off the leaves. Such trees are not fit for fall planting; they will do for spring, providing they can be kept from freezing during the winter.

Root-Killing.

It is a well-known fact, by those who have given this subject their careful attention, that the dry condition of the soil late in the fall, just previous to freezing up, is one of the principal causes of root-killing. It matters not how hardy the roots are, freezing and thawing in dry ground is sure death, and every fruit-grower who expects to make apple raising a success must pay strict attention to his soil, especially late in the fall.

Mulching at the proper time is considered a sure protection against drought, but there are times in order to make the roots of fruit trees secure against all doubt, it is well to wet the mulching. This should be done a few weeks before the ground freezes up, providing the ground is not sufficiently moist to draw the frost from the roots of the trees.

The fall of 1872 was exceedingly dry; but little moisture was in the soil. I was then in the nursery business; had several thousand trees from two to four years old, many of which were sold and delivered, some were set out and the balance heeled in. Those set out were mulched, and the mulching kept wet until the soil was good and moist. Those that were heeled in were managed in much the same way. The roots were placed in loose earth and properly covered with earth root and branch, mulching placed over the roots and that wet till the ground was well saturated with water. In both cases the trees came out all right in the spring, while those in the nursery unmoisted were nearly all root-killed in the spring regardless of varieties.

The past fall the ground in regard to moisture to protect the roots of fruit trees against root-killing was in an excellent condition, and I apprehend no

danger to fruit trees in orchard or nursery, so much so that I did not mulch last fall.

A deep snow falling early in the winter before the ground has frozen and then drifting several feet deep around apple trees, preventing the ground from freezing during the winter, if it is not removed at once from about the trees and the ground allowed to freeze, the roots of the trees will be very apt to perish. The cause is unknown to me; nevertheless, I know it to be correct.

Another item I will give a passing notice. Nurserymen are sometimes negligent or try to do more than they accomplish. Ill-shaped and forked trees are suffered to grow on their ground, and from thence to the farmer's orchard, which is always an eye-sore to an intelligent nurseryman, and a loss to the purchaser. Healthy trees, with tapering stem and symmetrical top always find a ready sale, often at double the usual price.

DISCUSSION.

Mr. Dart. I object to the phrase "always find ready sale."

Mr. Jewell. I object to fall planting. It might succeed, but sometimes it will fail utterly while in any case the trees will make a better growth planted in the spring. I object also to the manner of mulching. I am persuaded that no roots are hardy enough to stand freezing even in dry soil. Wetting requires much labor, and it is better to wet the ground and then mulch, but better still to preserve the moisture by cultivating till autumn. Straw is the best mulch except snow. The next best is coarse manure, but do not use fine manure. Straw is more useful because it catches more snow.

Mr. Pearce. Talk is cheap; facts are what we are after. I do not advise any one else to set trees in the fall. But it is well enough to set a few. I set out a hundred in the fall of 1872 and they lived through.

Mr. Grimes. I am aware that apple trees may be set in the fall but I prefer the spring. But if set in the fall, set deeply, mound up and wrap up the trunk to protect it from wind and sun, for newly set trees stand stationary while established trees still have some action, even in winter.

Mr. Arnold. Fall setting has been an old hobby with nurserymen because they want two sales, one in the fall and another in the spring to replace those set in the fall. But with farmers it is not popular. If not protected by snow they will die even though they are deeply set; deep setting is the only security in this State and fall planting is a very poor practice for Minnesota.

Mr. Pearce. I do not advocate fall setting, but as trees are

sometimes heeled in they are no better off than if set in the orchard. They must be set carefully if set, and heeled properly if heeled.

Trunk Protection.

Mr. Kenney. I have practiced protecting the trunks of trees for four years. I wind them with crushed sorghum stalks. Myself and man wind 100 in a day. I had some pear trees, all but two of which were wound in this manner. These two did not survive the first winter.

Mr. Pearce. The subject of winding is important. I shall practice it. I would wind all standards.

Mr. Kenney. Trees so wound leave out a little later than others. A German friend cuts gunny sacks into strips for this purpose. By winding the trees they do not suffer from borers.

Mr. Arnold. I have practiced it for some time. I think it should not be done too early, before the sap has all returned to the roots.

Mr. Jewell. Nothing is cheaper for the purpose than tarred paper tacked on to lath to separate it from the tree itself. I think, however, double working is a better method, because one can thus get trunks that do not need protection. To grow the Flemish Beauty pear, I think it will be advisable to wind the trunks. This is not indispensable, because we can graft on the June berry. The question is: "Is it better to have trees that need no protection, or to have tender trees and then protect?"

WEDNESDAY EVENING.

REPORT OF AUDITING COMMITTEE.

The meeting was called to order by the President at 7:45 o'clock.

The Auditing Committee reported on three bills presented by J. T. Grimes, T. M. Smith and Chas. Y. Lacy. They were reported correct and just, and the report was accepted.

THE LAYING OUT, PLANTING AND CARE OF SMALL DOOR-YARDS.

The paper of J. E. Booth, Esq., of Minneapolis, on the Laying

Out, Planting and Care of Small Door-yards was read, ordered on file for publication, and the thanks of the Society voted for it.

The following is the paper in full:

Mr. President:

I have been requested to furnish a paper on the "Laying out, Planting and Care of Small Door-yards," and it has been suggested that I should consider the subject with a view of assisting the farmer as well as the city or town resident. I am glad that this Society, largely composed as it is of agriculturists, is at length making an effort to induce farmers to improve their surrounding. This is a subject in which all farmers should take an interest, coming as it does right home to their very doors. I have often wondered why it is that they, more than any other class, should fail to surround their houses with neat, well kept lawns and cheerful flower-beds. Instead of these we generally find a bare yard or a rank wilderness of weeds. I do not mean to say that there are not some exceptions, but these are very few and far between. I hope the time is fast coming when it will be a rare thing to see a farm house without its flower garden, as well as a spacious and well-stocked vegetable garden. And why not? The requisites are very few, and these the farmers possess in ample abundance. A favorable situation, good soil, a little labor, and a very small amount of expense, properly guided and directed by good taste and judgment, would do it. And I think it is due to the want of taste that we so often see around farm houses this lamentable desolation. Of course we are not to expect farmers any more than others to lay out their grounds with the skill of a practical landscape gardener, but what little taste they have they might make use of.

Public Examples.

And right here, let me ask what the various Educational Institutions of the State are doing to improve the taste of the people? What has the State University done? I do not wish them to have a Professor of Landscape Gardening, as they have a Professor of Agriculture, whose business it shall be to teach the art, but let it be by example rather than precept. The site of the University is the finest which could be found, perhaps, in the State. Now, let the University Regents show us what art, going hand in hand with nature, can do. Let the farmers' sons, and daughters too, who attend the University, have something better to see than the present desolate and neglected aspect of the University campus, looking as if nobody owned it. Let them see lawns, and terraces, and flower-beds, and flowers, and arbors, and shady walks, and when they go back home they will not be satisfied till they have something of the same kind there. Then let the Regents do their duty, and instead of causes of complaint give us grounds for approval. Why cannot the boards of education, in city and country, lay out the lots around the school building with some little regard to taste, and instead of their present unsightly appearance, make them "things of beauty" and "joys forever." The cost need not be much, and the expense would be repaid over and over again by the refining and educating influence which could not fail to be exercised on the children; for, at their susceptible age their surroundings have a great influence on their minds.

I will now proceed to consider the laying out of a garden. And first, when the house has yet to be built.

Location and Soil.

In this case, the first thing to do is to choose a good location for the house, and in doing this any natural advantage of view, shelter, &c., should be seized upon. It is also of importance that the soil should be good, as no amount of manuring can make a poor soil equal to one naturally good, for manuring does not permanently enrich the soil, but has only a temporary effect. If possible, a soil should be chosen with a sandy or gravelly subsoil, as this would itself obviate the necessity of artificial drainage which might be required were the subsoil of a clayey nature. If a situation can be obtained which is sheltered from the north and northeast, either by trees or hills, with the proper soil and a gentle slope to the south, then we have the requisites for a good beginning. And here I would say that the way the house is placed will have a good deal to do with the general appearance.

The House and its Elevation.

Care should be taken that the house in style and architecture is suitable to the location. A house which would look well in a town might be an absurdity in the country, and *vice versa*. But whatever kind of house is chosen, if on the flat it should be raised at least three feet above the general level. If on the side of a hill, then the front should stand well up, while the hill should be excavated for the rear of the house. The amount of excavating depending on the slope of the hill and depth of the house. This will give a much more striking appearance, besides affording room for cellars and allowing for various outdoor arrangements.

The Garden.

The house having been built, then comes the laying out of the garden. And here right on the threshold, so to speak, of the subject, I am confronted by the difficulty of conveying my ideas in an intelligible manner by description alone, without the aid of plans, which, of course, the exigencies of the case prevent me from introducing. Did circumstances admit of my giving a few plans, I should be able to treat the matter much more comprehensively and exhaustively. As it is I must do the best I can trusting to your good nature to overlook any shortcomings. I would advise that the garden should consist largely of lawn, as when once well started and in good condition this is much easier to keep in good order than the same space of flower-beds and if properly looked after always presents a good appearance. If the house has been raised sufficiently a terrace should be made around the house, or if on the side of a hill, along the front. In some places the conformation of the ground might necessitate a succession of terraces. The balance of the lawn should be made with a very gentle slope, considerable pains should be taken to get the ground into the proper condition for sodding.

Sodding and Seeding.

It should be properly graded and prepared, and the walks having been staked out, the sodding may be done and for this purpose the finer and closer the grass on the sods the better. If sods cannot be obtained then recourse must be had to seeding down. In this case the preparation of the ground will involve more labor and care. The ground must be thoroughly pulverized by plowing and then harrowed till perfectly smooth and level, all stones, &c., being removed. If only a small lawn is required, then digging and raking may be substituted. Sodding may begin in the spring as soon as the ground is sufficiently thawed out to allow of working. During the very hot weather of summer the operation will have to be suspended, but may be resumed in the fall and continue till the ground freezes up.

Walks and Flower-Beds.

The lawn having been made, then the flower-beds may be cut out. The walks will also have to be made. If gravel can be obtained, then they may be made of this. The ground should be dug out some depth. Put the large stones in first, and then smaller ones, putting only fine gravel on the top. If gravel cannot be had, then walks may be made of bricks, strips of wood, or any other material that may be thought advisable. The walks must be made rather higher in the middle than at the sides, which should not be more than an inch lower than the top of the turf. Where the walks pass up the front of the terraces, steps will have to be used; these may be either of boards or stone, and must be of the same width as the walks. Of course the beds may be made of any shape and size, to suit the fancy of the owner, but I would advise that they be made of simpler form and not so numerous as to cut up the surface of the lawn too much. They may be either scattered about the lawn or made at the sides, as may seem most desirable. If large rough rocks are at hand, a circular bed of pyramidal form, and consisting of two or three small terraces edged with these rocks, would have a good effect. The lower of these may be planted with coleus and the tops with cannas.

As regards the planting of the garden, the beds may be each filled with one kind of flower, or different sorts may be mixed in the beds. The best effect is produced in small beds by massing; that is, using one sort. Where plants are mixed, the tallest growing should be planted at the back, where the beds are at the outside, and the others graded down so as to have the dwarfiest at the outside. In beds cut out of the lawn, the tallest growing plants should be in the centre and the others according to the height they grow. Beds of geraniums, verbenas, feverfews, and other bedding plants have a fine effect, as they are in flower from the time they are planted till frost comes. Coleus of various kinds also make a very fine appearance. A judicious use of peonies, dialetras, perennial phloxes, &c., is also advisable. They are perfectly hardy, and when once started improve every year. Annuals will also be found very useful, but it will be better not to depend to any great extent on these. A great objection to annuals generally is that in this climate they have scarcely begun to bloom before frost comes. If our seasons were of any decent length, much more use might be made of them.

Trees.

A few trees, principally evergreen, may also be introduced with advantage. While a small number of large growing trees may be allowed for the sake of shade, yet care must be used that there are not enough to shade the place too much.

Care of Lawn.

The lawn will require to be mown about once a fortnight. For this purpose, a lawn mower will be found to do the work much better and more expeditiously than it can be done with a scythe. Of course, a lawn mower will cost what might be considered a large sum; but with care it will last for years, and when the better work and saving in time is taken into account, it will be found to be much cheaper than mowing by hand.

Care of Plants.

When plants are first set out, unless in rainy weather, it will be necessary to well water them. In very hot, dry weather it may also be necessary to do this, but it should not be done till absolutely required, and then the ground should be well soaked. Nothing is more injurious than light, frequent waterings. These only dampen the surface of the soil, causing the plants to send up their roots in search of that moisture they cannot find lower down, and so rendering them much more liable to suffer from drought than if watered more copiously and less frequently.

When the House is Already Built.

When a farmer wishes to make a garden to an old house, then he must be guided by circumstances; but, if possible, the same general plan should be carried out here that I have before recommended. I may here observe that the farmer has the great advantage over others that he can get all he wants in way of sods and soil for the cutting and hauling, and the labor would cost him nothing or next to nothing as the work could be done by himself and his men at a time when there is no pressing work about the farm. The flower garden would also afford pleasant and healthy occupation for the spare hours of the ladies of the family.

House in Town.

In laying out the front garden of a house in a town the case is somewhat different to those we have been considering, as there is no choice of location the only thing to do is to take the lot as it is and make the best of it. Here again a lawn, either level or terraced, will look best; a few flower beds of simple design should be introduced, the remarks made above as to planting, etc., will also apply here. But in the case of town residents their time being usually fully taken up by their occupations they have no time to do the work themselves so will have to hire it done. They will probably call in some man who makes a business of laying out gardens and whose skill and taste may be safely trusted to turn out a good job.

Conclusion.

Were it not that I do not wish to take up too much of your time I should like to refer to several other matters connected with the subject. In a paper of this nature it is impossible to do more than give a few of the more prominent points without going as fully into details as might be wished. If however, what I have said should induce any one to attempt to improve his place and has given him some idea how to do it, then I doubt not that if he make a beginning he will get some sort of satisfactory result by the time he gets through.

All of which is respectfully submitted by

J. E. BOOTH, Minneapolis Greenhouse,
Minneapolis, Minnesota.

DISCUSSION.

Sodding and Seeding.

Mr. Grimes. This is the first time this subject has been before the Society. In the country, we have more space to cover and we cannot do so much sodding, because of the labor required, and because sowing seed makes a better sod. I would sow some oats or similar grain to shade the grass while young. Flowers for yards are not so difficult to get as some suppose. Many are easily grown from seed. To set them properly and with taste, is more difficult. I agree with what is said about the grounds of our public institutions, but I would not advise sodding on the University grounds, because they are too extensive and the operation too costly, and it is better to seed. When the ground is prepared to work, locate the shrubbery and then lay out the walks according to the shrubbery. At the University there should also be a fountain, and that should stand near the plant-house.

(The Secretary explained that the University grounds had not been improved because they had not been fenced, and they had not been fenced because it was confidently expected that the boundaries would soon be extended.)

Mr. Scott. It is a mistaken Western idea, that the grounds must be covered with sod to make a velvety lawn. I would rather undertake to make a lawn by seeding than by sodding. I would not recommend to sow grain with the seed. It is better to use a light mulch. White clover and blue-grass, sown in the spring, make an excellent lawn by fall.

FALL AND SPRING SEEDING.

Mr. Elliot. I would not sow in the spring. I have not suc-

ceeded thus in eighteen years of experience. Sow in August, and mulch when the ground freezes, and next season you have a lawn.

Mr. Grimes. Fall is the best time. I have tried several times to make a meadow by spring seeding, but it dries out in spots. I have had better success by sowing in the fall. I would sow oats with the grass very thin. Sowing in the fall gives it a start, and the next summer it gets established before the drouth comes on. You must roll it also after sowing. I would sow blue-grass and Alsike clover. The latter is a more rapid grower than the white, and runs on the ground, and looks fine while it lasts.

Mr. Hollister. Alsike clover is coarse in appearance and unfit for a lawn.

Mr. Grimes. Another grass for lawns is the English lawn mixture.

Mr. Hollister. The lawn mixture usually consists of one bushel of red top, one bushel of blue-grass, four pounds of white clover, and two pounds of sweet vernal. Wood meadow-grass is also often mixed in.

ANNUALS.

A paper on "Annuals," by Miss Hortense Share, of Rosemount, was read, and ordered on file for publication.

On motion of Mr. Grimes, the thanks of the Society were tendered Miss Share for her valuable, interesting and well-written paper.

The following is the paper in full :

While preparing to remove to Minnesota, friends often said to me, "What are you going to do without flowers in that cold country?" "I am not going to do without; expect to cultivate flowers wherever I have a home." "Well, you will see—too awful cold up there—with no summers to speak of, and frost all the year round—too near the North Pole!"

The first two summers were exceptionally dry, and the winds on the prairie simply abominable. The choice shrubbery, roses and vines we brought with us died—the loss of each one causing a pang, seemed like parting from old friends. The flower seeds I planted in June came up beautifully in September after the rains. The bulbs, many kinds and choice, perished the first winter.

I was disgusted, and turned to the wild flowers, for flowers of some kind I must have. The many beautiful kinds on the prairie, in the brush, and on the shores of Minnie Elk were a source of continued delight.

But in a land of strangers I longed for the familiar faces of the old home flowers. With me flowers are a necessity—thence follows endless painstaking. So I set to work to conquer difficulties, and propose to tell how I

succeeded. First, we set out in the large yard innumerable trees and shrubbery to break the force of the furious winds. It was a rainy season, and they all grew and flourished; and to-day we are living in almost a wood.

We often think the winds do not blow as they used to, but going from home find them still "on duty" on the prairie.

After twelve years experience I am not afraid to try anything, and have had in perfection in one summer three hundred varieties of flowers.

The soil when new is all that can be desired; so rich that even with careless culture the growth is simply wonderful. After a few years it needs enriching if you cannot make new flower beds. I enrich the ground with anything but crude manure, that from a spent hot-bed is excellent; a sprinkle of leached ashes is good; sweepings from the hen house; liquid manure from the barnyard; soot from the stoves, and wherever I find extra good dirt some of it goes to the flower beds, until everything laughs with bloom and beauty. Spade the ground deep and rake thoroughly; but do not sow the seed until the ground is dry and warm. A few kinds need to be put in early. The seasons are very short with late and ungenial springs, and early autumn frosts. To remedy this I sow in a hot bed the seeds of such flowers as bear transplanting the last week in April or first week in May transplanting into the prepared borders the last week in May, or first of June, according to the season. A rainy evening is desirable, but, if ready, do not wait. I take up the plants carefully with as much earth as possible, having previously given them a good watering, and left the sash off nights to harden them. If very dry pour water in the holes, set the plants firmly, pour on more water and draw up dry earth around the stem, leaving a slight depression around each plant.

Next morning cover with paper, leaves, or better still if I have them, invert small flower-pots or tin cans over them; in short anything that will exclude the sun is pressed into service, and the flower beds are "a sight!" Only water every second day, in the evening, unless the weather is very hot and dry. After the fourth day leave them uncovered until ten o'clock. In a week they are growing well and left uncovered all the time. With a push hoe I stir the ground frequently—keeping it loose and mellow, and killing any volunteer plants. With weeds, am not troubled, as none are allowed to seed.

Chickens are excellent scavengers; they have the run of all my flowers, seldom harm anything, but do a world of good, as this ground abounds with "bugs and things." One year some beds were infested with worms and insects eating the leaves and roots of the plants. I left all the dead flower-stalks until spring, raked the beds, burned the trash on them, spread and spaded in the ashes; the result—not a bug or worm to be seen, not a plant destroyed.

I give a list of some Annuals, the seeds of which are sown where they are to bloom:

Abronia.—A pretty trailer; flowers in trusses like the verbena, but smaller; delicate fragrance. Looks best in a bed by itself.

Alyssum (sweet).—Pretty for borders, and delicious in boquets or vases. *Amaranthus*, tricolor.—Very showy, but needs hurrying up to escape early frosts.

Antirrhinum.—Blooms first season from seed; in warm countries is a

perennial; plants sometimes winter well if covered with coarse litter and there is plenty of snow.

Browallia.—A lovely little blue flower. Looks best in masses, but the plants should not be crowded. Cover a little deeper than the catalogues say—on account of drying winds.

Bartonia Aurea.—A most lovely golden colored flower—shines in the sun with a metallic lustre—handsome as a cactus bloom; foliage beautiful; the whole plant has a strange foreign look. I admire it very much.

Coreopsis.—Showy and brilliant; especially the bronze-colored. Are fine as single specimens, but I prefer it in a bed by itself; seeds itself.

Candytuft.—In variety, never saw this flower in perfection until I grew it in Minnesota; sow very early in the spring, and again in June, to have a constant supply for bouquets.

Delphinium.—Some of these are perennial, but bloom first season from seed, winter well with slight covering.

Dianthus (China and Japan Pink.)—Biennials, full bloom the first season. The new varieties are beautiful. With a covering of leaves and snow they bear our hardest winters. Plant seed every spring to keep up a supply.

Escholtzia.—(I call that a horrid name!) Profusely blooming plants, with fine foliage; sometimes called California Tulip Flower.

Marigold.—All varieties, are showy plants—provided you like them, which I don't—except *Tageta signata pumila*, the intensely double flowers of which, and lace-like foliage are very pretty.

Marvel of Peru.—A border of this old-fashioned plant makes quite a show, and is very effective as a hedge.

Mignonette.—No flower-garden can be complete without this "Little Darling"—we want a profusion of it everywhere.

Morning Glory.—This vine fairly revels in this rich soil—Such a prodigality of bloom, flinging out its dainty chalices of most exquisite tints by the hundreds.

Perilla.—A very ornamental plant, deep purple foliage. Colors best in full sunshine.

Tropeaeolum or Nasturtium.—The dwarf varieties are superb for massing; the tall growing for rock-work.

Nemophila.—All the varieties are beautiful, and colors delicate, are best massed but not too thickly, are profuse in bloom. Seed should be sown early as possible to have them in bloom before the very hot weather, they like partial shade.

Peas (sweet.)—These to be had in perfection should be planted *very early* in the spring; from four to five inches deep. If you would have enough to fill your vases all summer plant them in rows in the vegetable garden, hoe often and draw the dirt up high around the roots, give stout brush and pick off all seed pods as they form. Its exquisite tints and delicious fragrance make the Sweet Pea a favorite with all.

Pansy.—Sown early, they flower late in summer; covered with dry leaves make fine plants the second summer. They love a damp, rather shady situation.

Poppies.—Always have poppies!

Portulacca.—Makes a beautiful bordering the first year, is a nuisance the second. Looks well in beds or large clusters. The double varieties look like little roses.

Phlox Drummondii.—Admired by all. Makes a fine show set in masses; plant about eight inches apart. If not allowed to seed will bloom all summer.

Scabiosa.—Rather coarse, but lasting a long time.

Zinnia.—With plenty of room this makes a show; good for a hedge. The flowers lasting about forever; well, I have known them to look fresh and new for three months. The three-cornered shriveled seeds produce double flowers; the large flat ones, single.

I have given the names of only a few of the hardy kinds of Annuals. The following are sown in a hot-bed and transplanted :

Asters.—The new varieties are superb. The plants are as easily transplanted as a cabbage.

Balsams.—These need some care in removing; are fine for a border. I make the soil very rich; spading in strong manure; they are gross feeders. When coming into bloom, water once or twice with liquid barn-yard manure (during a rain) and the bloom is superb. Trim according to directions given by Vick.

Celosia.—I do not admire these much, but always grow a few; the combs are immense.

Petunia.—The blotched and striped varieties are without a rival. Their free-flowering and gorgeous display makes them indispensable. Of these I never save seed; a twenty-five cent packet is enough for three years, and I have no time to waste cultivating inferior kinds of any flower, so always get the best.

Datura Wrightii.—A strong, rather coarse plant, and wants about "all outdoors" to spread itself in. The flowers are immense, delicate color, white shaded with purple, and have a sweet fragrance which florists make a fuss over, but say nothing about the horrid odor of the leaves. They scorn to call them "Jimpsons," but, if not sisters they are first cousins, anyway. However, I always have a few plants, as I like even Ohio weeds.

Verbenas.—These are a specialty with me. Have grown them from florist's plants and from seed, and prefer the latter; I get the best seed and never have a failure. Last summer I had a brilliant show on a bed freshly dug out of the sod; this was done as early as the frost allowed. April 25th I sowed the seeds in a hot bed, and every seed came up. When they were nearly large enough to transplant, I dug up the bed, over which the suds from the wash had been thrown for weeks. In a few days after I wheeled well rotted chip dirt, manure from an old hot bed, fresh prairie soil (taken from the winter's banking around the house and exposed to the action of the frost all winter,) and some lake sand, spread it over the bed, re-dug and raked it smoothly, then sprinkled over the surface four large shovelfulls of sand. In the evening of May 26th there was a warm rain, so I set out the plants—previously hardened off by being uncovered at night—shaded them from the sun for a few days, and they grew on as if they had never been moved. I never saw such growth, such depth of green, such trusses, such brilliant, gorgeous bloom, so many colors,—bright scarlets with large white and yellow eyes, intense crimsons, maroons, creamy fragrant whites, pinks, reds, regal velvety purples to blues of all shades, spicy as pinks, striped, in short, every color I ever saw in verbenas. One morning they were carefully counted—five hundred and twenty-four full blown trusses on twenty-four plants.

The raising of annuals from seed fully repays for all the labor bestowed. One dollar judiciously invested in seeds with ordinary care will give more

satisfaction than twenty dollars worth of bedding plants. The former are the hardy nurslings of sun and shower, the latter pampered darlings with frail constitutions, and almost worthless after coming far through the mail.

Of all flowers not hybrid I save my own seed, selecting from the finest plants and from the first flowers. In this way many kinds come into bloom several weeks earlier. To mark them, tie strings to those I wish to save. The seed of mignonette drops out of the little seed-pod as soon as ripe. I make sacks of thin Swiss-muslin, and draw over the flower stems, tying them at the bottom. The seeds drop into these, and in this way I get all I want.

People often say to me, "It is quite a 'chore' (I hate that word) to have so many flowers; I never have any time." Time can be found, if you know how to manage so that your affairs indoors and outdoors do not clash. And it is a positive recreation, however weary from the never-ending routine and cooking one has to do so much of in this hungry country, to get out among the flowers.

And if you have no "*penchant*" for the endless plaitings, shirring, and puffing of the present abominable style of dress, there will be ample time to cultivate all the flowers you have room for.

AMENDMENTS.

The Committee on Amendments to the Constitution and By-laws reported the following additional articles :

ARTICLE 8. The Society may at any regular annual meeting elect as honorary members, any person or persons who may have performed valuable services for the Society, or upon whom the Society may wish to confer special honor. Such memberships shall be held for five years from date of election, and shall be entitled to all the privileges of the Society except voting.

ARTICLE 9. This Society may at any regular annual meeting, and for sufficient services, elect any person or persons as life members of the Society. Such shall enjoy all the privileges of regular members.

Article 8 was adopted. Article 9 failed by a vote of 5 for and 5 against.

A motion was made to refer Article 9 back to the same committee, with instructions to report some way to raise revenue by the sale of memberships. Motion carried.

Mr. Dart gave notice that a discussion on birds would be proposed.

Mr. Pearce mentioned the subject of taxation of nursery stock for discussion.

KEEPING TRANSCENDENTS AND OTHER FRUIT.

A motion was made to invite Mr. Elliot to describe his method of keeping Transcendents so far beyond their season.

The motion was carried.

Mr. Elliot. The process is simple. Pick the fruit carefully when nicely colored, pack in a box that has a whole top, place on ice with a couple of inches of sawdust between, cover with a cake of ice, and then cover the whole well with sawdust. The Duchess, Fall Stripe and Transcendent thus treated keep nicely ; Red Astrachan not so well.

Adjourned to 9 o'clock Thursday morning.

THURSDAY MORNING.

REPORT OF THE SECRETARY.

The Society was called to order by the President at 9:30 o'clock. Communications were read from C. D. McKellup, of Faribault, and from Henry S. Evans, the Secretary of the Montreal Horticultural Society.

The Report of the Secretary was read and accepted and a resolution was passed thanking the Secretary for his full report and the thorough performance of his duties.

The following is the report in full:

Summer Meeting.

GENTLEMEN :—The Secretary has but little of interest to make a report of. The Society held a meeting at the Agricultural College, at Minneapolis, June 28th. The attendance was not large but there was a very fair exhibition of small fruits, vegetables, flowers and plants. Two papers of high character were read at this meeting, one by Prof. Chas. A. Morey, of Winona, on Fungi, touching on blight incidentally, and the other on Horticulture in its relations to education. A very pleasant feature of this meeting was a picnic dinner spread on the University grounds by the ladies of Minneapolis. All who attended this meeting expressed themselves well satisfied, but it was evident to me that the meeting amounted to little more than a meeting of those members of the State Society residing in Hennepin and Ramsey counties. The meeting and exhibition might therefore just as well be held by the horticultural societies of these counties, and hence although heretofore heartily in favor of a summer meeting of the State Society, I am not in favor of another attempt in that direction. The hope that such a meeting and exhibition would finally draw from all parts of the State, does not give much promise of fulfillment. Hence the abandonment of this idea on my part.

Centennial Matters.

Previous to this meeting your Secretary has little to report. A committee from this Society acted in concert with a similar committee from the State Agricultural Society on Centennial matters, but its only action was to organize, to recommend some memorial to the Legislature, and to await the action of that body. The kind of action committed by that body did not furnish apology for further meetings of the committee, and it never met a second time.

In view of the action of the Legislature, it was resolved at the summer meeting of the Society not to exhibit on the Centennial Grounds, but with the Pennsylvania Horticultural Society. You have seen how that resolution was disregarded by the Committee on Centennial Exhibition, and I think we can none of us be too grateful to the committee for doing just as they did. The results certainly justify the course taken. I can say this with good grace, for although Chairman of that Committee, I took no part in its proceedings.

Transactions of the Society.

Within the last year all copies of the Transactions not distributed have come into my hands, except a few retained by the Secretary of State to distribute when specially applied for. These are now placed subject to the order of the Society, and include as follows :

	377	copies	No. 1,	cloth	binding.	
•	612	“	“	2,	paper	“ by J. S. Harris.
	221	“	“	3,	“	“ by L. M. Ford.
	988	“	“	4,	“	“ by Chas. Y. Lacy.

2,198 copies, total.

What to do with these is a question which has occurred to me. It seems neither right nor proper to hoard them too closely. Thus far, I have used my own judgment in distributing them. I would now recommend that the Society authorize their distribution, so that County Horticultural Societies now in existence shall not suffer through any failure of the Secretary of State to distribute according to law. In other words, so that when any County Horticultural Society shall show that none of its Secretaries have received the volumes prescribed by law, the Secretary of this Society shall furnish the same. I would also recommend that the Society furnish to County Horticultural Societies that may hereafter be found with twelve or more members, the number of copies stated in the law, of the Transactions from the beginning of their publication. This may perhaps be an inducement for the organization of such societies and for the present at least, this Society can afford to do it.

Library.

The library of the Society have not received any important additions the past year.

Membership.

The membership for the year 1876 was much larger than it has ever been before, there being upwards of 75 members.

Expenses.

The expenses of the Secretary's office have been correspondingly large, but at the close of this meeting I think the Society will not only have paid all its expenses, including charges on fruits sent to the Centennial, but will have a balance in the Treasury.

The expenses of the Secretary's office have been as follows :

Postage.....	\$3 63
Postage on Transactions.....	6 56
Copying notes of Proceedings.....	4 45
Express on Proof to and from Printer.....	2 00
Postal Cards for Summer Meeting.....	1 50
Printing same.....	1 25
Telegram to Wis. Hort. Soc.....	1 00
Labor, Mailing Transactions, Postal Cards and Programmes.	1 42
400 Printed Programmes.....	6 00
250 " Envelopes.....	1 25
200 Stamps for Programmes.....	2 00
100 Membership Tickets.....	1 50
Sundries.....	5 80
	--- \$38 36

Other expenses have been paid as follows :

Wyman Elliot, Exp. Ch. on fruits to Centennial Exhibition..	15 40
J. T. Grimes, Exp. Ch. on fruits to Centennial Exhibition....	6 55
T. M. Smith, Postage and Exp. Ch. on fruits to Centennial Exhibition.....	8 50
	----- 30 45
	----- \$68 81

CHAS. Y. LACY, Secy.

TREASURER'S REPORT.

The report of the Treasurer was read and accepted, and both reports referred to the Finance Committee.

The following is the Treasurer's report:

Report of Treasurer Minnesota State Horticultural Society, for the year ending January 18th, 1877 :

Balance on hand Jan. 20th, 1876 (rec'd from Ex-Treas. Stewart)....	\$7 36
Received from membership fees up to Jan. 16th, 1877.....	38 00
Received from membership fees from Jan. 16th to 18th, 1877.....	59 00

Total amount received.....	\$104 36

Jan. 20th, 1876, paid C. Y. Lacy.....	\$15 00
“ “ “ T. M. Smith.....	3 00
Oct. 18th, “ “ W. Elliot.....	15 40
Jan. 17th, 1877, “ J. T. Grimes.....	6 55
“ “ “ T. M. Smith.....	8 50
Jan. 18th, “ “ Chas. Y. Lacy.....	38 36
Balance on hand.....	17 55

\$104 36

A. W. Sias, Treas.

ELECTION OF OFFICERS.

The next business transacted was the election of officers:

President.

For President, the votes were cast as follows: Smith, 8; Elliot, 4. Total, 12. Truman M. Smith was declared elected.

Vice Presidents.

For Vice Presidents, the votes were cast as follows:

First District—Dart, 7; Buck, 2; Pearce, 1; Harris, 1. Total, 11.

Second District—McKinstry, 7; Jewell, 2; Andrews, 1; Brand, 1. Total, 11.

Third District—Grimes, 7; Elliott, 3; Fuller, 1; Scott, 1. Total, 12.

E. H. S. Dart, A. W. McKinstry and J. T. Grimes were declared elected Vice Presidents from their respective Congressional Districts.

Secretary.

For Secretary, Mr. Elliott was directed by resolution to cast the vote of the Society for Chas. Y. Lacy, who was declared elected.

Treasurer.

For Treasurer, the Secretary was directed to cast the vote of the Society for A. W. Sias, who was declared elected.

Executive Committee.

For Executive Committee, the five elective members were voted for upon one ballot with the following results:

First ballot—Elliot, 10; Brimhall, 8; Brand, 7; Jewell, 6; Harris, 6; Hollister, 3; Grimes, 3; Lacy, 2; Buck, 2; Kenney, 2; Pearce, 2; Dart, 2; Gould, 2; Stewart, 1. Total for all candidates, 56. Messrs. Wyman Elliot, Wm. E. Brimhall and O. F. Brand, having a majority of the legal votes present were declared elected, and another ballot taken with the following result:

Second ballot—Harris, 10; Jewell, 4; Brimhall, 2; Hollister, 2; Kenney, 1; Scott, 1; Dart, 1. Total, 21.

J. S. Harris was declared the fourth member elected, and another ballot taken as follows:

Third ballot—Hollister, 8; Scott, 2; Brimhall, 1; Dart, 1; Pearce, 1. Total, 13.

U. S. Hollister was declared the fifth member elected.

A motion was made and carried that the President appoint the remaining standing committees.

GAME LAWS.

Mr. Arnold mentioned the bird law as a subject for discussion.

Pres. Smith. Have we not already sufficient laws of that kind if they were only enforced? Whatever the laws considered necessary, it is best to secure the co-operation of the Sportsmen's Club; because its members are the only persons that take any trouble to enforce the bird laws.

Mr. Pearce. I agree with Mr. Smith on that point.

Mr. Arnold. We want a law so stringent as to keep the sportsmen away from our orchards, and not to favor them. I move that a committee be appointed to report on laws for the protection of birds.

The motion was seconded and carried.

ARTICLES ON EXHIBITION.

The report of the Committee on Articles on Exhibition was called for and read by Mr. Grimes, after which it was accepted.

The following is the report in full:

Mr. President and Gentlemen:

Your Committee on Fruits beg leave to report as follows: We have examined all the fruit on exhibition, and find the following seedling varieties exhibited by John S. Harris—Harris Pippin, Julia, Centennial; of grafted varieties—Price's Sweet, Bailey's Sweet, Plumb's Cider, Northern Spy, Ben Davis, Walbridge, Seek-no-further. Also, a seedling crab from Transcendent; very large and valuable as a cooking fruit. We find the Julia one of

the best seedlings yet brought to notice; said to be a seedling from Fameuse; size, above medium; color, a deep mottled red or dark cranberry. The Harris Pippin, a seedling from the Golden Pippin, large; color, somewhat like the parent; quality, good.

W. E. Brimhall exhibits Haas, Wealthy, Molly, Alexander, Soulard, Hyslop, Gen. Grant.

P. A. Jewell exhibits Plumb's Cider, Saxton, Haas, Sweet Seek-no-further. Of Hybrids—Maiden's Blush, Gen. Grant, Conical, Quaker Beauty, Orange, Beecher's Sweet, and an unknown apple.

John Hart exhibits Bailey's Sweet, Utter's Red, Perry Russet, Fameuse, Yellow Bellflower, Saxton, Duchess, Early Joe, Ben Davis, Plumb's Cider.

A. W. Sias exhibits Wabasha, Elgin Beauty, Rollin's Pippin, Rollins Prolific and two unknown seedling apples; all seedlings from Wabasha county and all winter varieties. The Rollins Pippin is a late keeper.

Wyman Elliot exhibits Transcendent Crab, Pride of Minneapolis. Four plates of the Transcendent exhibited by Mr. Elliot have been well preserved and present a fine appearance.

Mr. Pearce exhibits Seek-no-further and of Seedlings No. 2, No. 3, No. 4, all winter varieties.

Mr. Mills exhibits the Alaska seedling apple, fair in appearance but too far past its season to judge of its quality. We also find the Alaska Crab on the table—an Iowa seedling, but in the same condition as the Alaska apple. Its season is probably *fall*.

S. H. Kenney exhibits the Ben Davis.

In the collection of John Hart we find several seedlings, one of which is now firm and hard, evidently a very late keeper, rather below medium size, but of fair quality.

Our attention was attracted to some samples of fruits and vegetables contributed by Mr. Wyman Elliot, of Minneapolis, which were preserved by a new patent process, which, if worth any thing at all, is worth a great deal. The articles on exhibit consisted of apples, grapes, cranberries, sweet corn and tomatoes, which were preserved before the State Fair and which seemed to be as fresh as when gathered, and to all appearance well preserved.

Busch, Hollister and Carter, of St. Paul, had upon our tables a fine collection of vegetable garden seeds, grown in our own State, which we think worthy to recommend. The time has come when our gardeners should begin to look nearer about home for their seeds and not depend upon foreign seeds sent in from year to year, many of which have remained on the market until they have become entirely worthless.

Seth H. Kenney, Morristown, Rice Co., presented a sample of sorghum syrup which for appearance and quality we have not seen equaled. It was thick and clear and had more the taste of good strained honey than of molasses. The variety of cane from which it is made is called the Early Amber. Mr. Kenney states that he manufactured the past season 1,082 gallons equal to that on exhibition, including several barrels of grained sugar. Why is it that we cannot produce our own sweets when we can grow the material and make them cheaper than we can purchase abroad.

HART'S SEEDLINGS.

(The following description and history of two of Mr. Hart's Seedlings has been received since the meeting :)

WINONA, March 15, 1877.

C. Y. Lacy, Esq., Secretary of State Horticultural Society :

DEAR SIR: In reply to yours of the 7th, I here give you a brief description of the two Seedling Apples we sent to the winter meeting.

No. 7.

First, we will describe No. 7, which is a round yellow apple, and good in its season, from August to October. The tree is one of the hardiest we have got; is one of the lot of seedlings sown and raised by Mr. Robert Pike, of Minnesota City, in 1859. The tree is a handsome growing tree, close, upright head, and bears fruit on the end of the twigs.

No. 11.

We will now describe No. 11, which is conical shaped; a dull red color, very hard and would undoubtedly keep one year. We will not describe its quality, as you have seen it and had a chance to test it. It is all that remains of four quarts of apple seed that we sowed in 1861, and it was by accident that one has been saved. We were plowing up the bed of seedlings, and one of our children picked the apple tree up and planted it among a long row of plum trees, where it has stood since without any care or attention. It is exposed to all the heat of summer and the cold of winter, growing on the hillside, facing the southwest. You may judge what care we have taken of the apples. When receiving some letters shortly after the winter meeting of the State Horticultural Society, we went out to look at the tree, and found several apples froze on the tree still. The tree is hardy. We have had the Yellow Siberian crab-trees killed, which stood near it. We have several other seedlings, which we think are really good. We think, if the weather keeps on favorable as it has so far, we will be able to show some as good seedlings as have been raised in Minnesota.

Respectfully yours,

JOHN HART.

CATALOGUING FRUITS, &C.

The report of the Committee on Cataloguing Fruits and Ornamental Trees and Plants was called for, and given by Mr. Elliot at the request of the chairman, Mr. Jewell. The report was accepted.

A motion to adopt it was not seconded.

A motion was made to refer the subject of the report back to a committee consisting of the same persons, to report one year hence.

A motion was made to amend by adding "and that the committee be empowered to act for the Society with reference to the subject of their report and the meeting of the Pomological Society."

Both motions were carried.

REVISION OF APPLE LIST.

A motion to take up the revision of the apple list was carried.

Duchess, Wealthy and Tetofsky.

The list of last year was read, and a motion made to adopt it.

This motion was amended so as to read, "adopt the list for general cultivation" (Duchess of Oldenburg, Wealthy and Tetofsky.)

Motion carried; 9 for and 1 against.

Mr. Kenney. Is the Tetofsky considered better than the Haas? In my orchard the Tetofsky was injured in 1873. Many trees died, and the remainder are but just recovering.

A motion was made to reconsider the last action, and carried.

A substitute was then offered that the Duchess of Oldenburg and Wealthy be recommended for general cultivation, and the Tetofsky for planting in limited quantities.

Motion carried unanimously.

Mr. Dart. Have had the Tetofsky in bearing for several years.

Mr. Grimes. So have I. It is a small tree and takes but little room.

Haas.

Motion was made that the Haas be taken from the list recommended for trial and put on the list recommended for general cultivation.

Motion carried; 8 for and 4 against.

Mr. Jewell. That is a mistake. You can't find a healthy tree of any age that fruited previous to the winter of 1872-3.

Mr. Sias. I believe my Haas trees are as hardy as the Tetofsky.

Mr. Dart. It is an unfair test to ask for old trees. We have none of any kind. We have many that are quite hardy and profitable while young, but do not retain their vigor to old age. The

Haas in orchard stood the hard winter as well as many others, and in the nursery stood a little better than the Wealthy.

The meeting adjourned for dinner, after which the discussion was continued.

THURSDAY AFTERNOON.

POMOLOGICAL SOCIETY.

Before proceeding with the Apple List, the following business was transacted:

A motion was made that a committee of three be appointed by the chair to collect fruits for the next "biennial session" of the American Pomological Society.

The motion was carried.

(Messrs. Elliot, Harris and Sias have since been appointed by the President.)

TAXATION OF NURSERY STOCK.

Mr. Dart introduced the following preamble and resolution:

WHEREAS, It has been the policy of our State to encourage tree planting by legislative enactments; and

WHEREAS, We discover what we consider a strange discrimination against nurserymen, in taxing as personal property their growing stock while other crops are exempt from taxation; this, one of the most uncertain of all crops, often proving an entire failure in a financial point of view, seems to be selected for special discouraging indorsement; therefore,

Resolved, That we ask the legislature to so amend the tax law that crops of growing trees, if not encouraged by bounty, shall at least receive as favorable consideration as other growing crops.

The resolution was carried and the Secretary was instructed to forward a copy of the same to A. W. McKinstry at St. Paul, with the request that he would secure such action as could be obtained.

(The resolution was sent to Mr. McKinstry, as above directed, was presented by him, and was referred to the Joint Committee on Taxes and Tax Laws.)

REVISION OF APPLE LIST RESUMED.

Haas Again.

A motion was made to reconsider the action on the Haas, and to place it on the list for favorable localities.

Mr. Jewell. Think there are some situations where it ought not to be planted.

Mr. Dart. Think the Haas entitled to the same place as the Duchess and Wealthy. Think it one of our most promising trees.

Mr. Pearce. Think it compares well with the Wealthy. Have seen nothing to beat the Haas. It stands the winter well, bears early, and will live as long as any. It bears well when top-grafted.

Mr. Sias. I top-worked some Transcendents with Haas in the spring of 1872. They grew more than six feet the first year. Grafted others at the same time, but the Haas did the best. It makes a good union with the Transcendent.

Mr. Humphrey. Haas trees bore remarkably well in 1872. Think the Haas will always pay on good soil.

Pres. Smith. Have not had a favorable experience with the Haas.

Mr. Arnold. Have had some Haas trees killed. Think it should be planted only on favorable soils and then protected.

Mr. Jewell. Have budded the Haas on Transcendents and had good results. Would prefer to graft in the top on small limbs.

Mr. Dart. Think the weight of the testimony in favor of the Haas.

The motion to put the Haas on the list recommended for "general cultivation in favorable localities" was carried.

Plumb's Cider.

A motion was made to put Plumb's Cider on the same list.

Mr. Dart. I would not put it on the same list.

Mr. Jewell. I have lost more of Plumb's Cider in the nursery than of the Haas. They say in the southern part of the State that it is one of the best as an old tree.

Motion was here made that in order to expedite business members be restricted in their speeches to three minutes, and be allowed to speak but once on each question. Carried.

Mr. Pearce. Mr. Wilcox, of Trempealeau, says Plumb's Cider is about as good as there is.

Motion on Plumb's Cider carried; 7 for and 1 against.

Melinda.

Motion was made to place the Melinda by the side of Plumb's Cider.

Mr. Jewell. Its hardiness has been much exaggerated. The oldest trees are on the grounds of Mr. Rollins. Two of these are dead and 3 others are dead on one side. The Duchess in the same row is in good condition. In the nursery the Melinda killed back one-third to one-half while the Duchess remained perfect. On the grounds of Mr. Sias the trees are in a dying condition.

Mr. Sias. Those trees were injured, one by the cultivator and the other by borers.

Mr. Brand. A high price was paid for the scions at first, and these were cut short, which exposed the young trees to root-killing. The Melinda is recommended for the orchard and not for nursery-men. In the orchard it will, notwithstanding its faults, give as much fruit as any other variety.

Mr. Jewell moved to amend to place on the list recommended for "most favorable localities."

A discussion followed in which Messrs. Jewell and Brand bore the burden.

Mr. Dart. Am in favor of keeping on the list for trial. If placed on the list for most favorable localities, it might be done an injustice.

Motion was made to amend the amendment and let the Melinda remain on the list for trial.

The last was carried; 8 for and 1 against.

Stewart's Sweet, Walbridge and Peach.

These were unanimously allowed to remain on the list for trial.

Price's Sweet.

A motion was made to take Price's Sweet from the list for favorable localities and place it beside the Haas on the list recommended for general cultivation in favorable localities.

Motion carried; 5 for and 2 against.

Saxton.

A motion was made to place the Saxton on the same list.

Mr. Jewell. I set the Saxton at the same time that I set the

ANNUAL REPORT.

Plumb's Cider, and now they are half dead. They died in the forks of the tree. It is not nearly so hardy as Plumb's Cider. The fruit is small and not a long keeper.

Mr. Sias. Have had poor success with it as a root graft. It has done tolerably well top worked on crabs.

Mr. Dart. Have had good success with the Saxton compared with Plumb's Cider.

Mr. Kenney. Had ten trees before the hard winter, and lost two.

Mr. Brand. I have 200 trees. They bear young and produce well.

Motion carried; 6 for and 2 against.

St. Lawrence.

Allowed to remain on list for favorable localities.

Utter's Red.

This also was allowed to remain on the list for favorable localities.

Mr. Pearce. It grows in locations not the most favorable. The fruit makes a good appearance and sells well.

Fameuse.

Motion made to place on the list for favorable localities.
Carried unanimously.

Talman Sweet.

Motion made to place on the list for favorable localities.

Mr. Dart. I set four trees, of which three are now living. It is not a good nursery tree. Will do well in favorable localities. In Wisconsin, before the hard winter, it was considered one of the most hardy. The fruit is smooth and keeps well.

Pres. Smith. I set four trees, and in the season of 1872 they bore from two to six barrels each. The following winter used up two of them, and later one more died.

Motion carried; 4 for and 1 against.

Alaska.

Mr. Grimes. Have had a few trees for several years. Don't think it much hardier than the Fameuse. The tree is a slow grower and not very fine in appearance.

Allowed to stand (recommended for trial by amateurs and pomologists.)

White Astrachan.

Allowed to stand (recommended for general trial throughout the State.)

Julia.

Motion was made to recommend for trial by amateurs and pomologists.

Mr. Kenney. It is a first-class fruit.

Motion carried; 7 for and 1 against.

Molly.

Motion made to place on the same list.

Mr. Grimes. It is placed below its merits. It produces more fruit than the Wealthy, and the tree appears as hardy. Have it in bearing, as has also Mr. Brimhall.

Motion carried unanimously.

Rollins' Pippin, Rollins' Russet, Rollins' Prolific, Elgin Beauty, Wabasha, Viola, Queen of Elgin.

Motion was made that these be placed on the list for general trial.

Mr. Jewell. In the Rollins Russet I have no confidence. It is very subject to blight.

Mr. Sias. Have been told that it was worthless because of blight. I therefore thought I would investigate this matter, and found in 1,000 or 2,000 trees of this variety one, two or three affected by blight. The trees of this variety were the finest in a nursery of 50,000 trees.

Have been told by another party a similar story of the Wealthy, which also is not true. I believe that new varieties of fruit must

undergo the same ordeal that inventors do until the nurserymen get a stock of them.

Mr. Jewell. I think the Elgin Beauty ought to go on the list for general trial, but not the others.

Mr. Sias. Mr. Richardson has more of the Rollins Russet than any one else. He says it is subject only to the blight, and he is not discouraged on that account.

A motion was made to amend by placing all but the Elgin Beauty on the list for trial by amateurs and pomologists and Elgin Beauty on the list for general trial.

The amendment was carried unanimously, and then the motion as amended was carried unanimously.

Clawson and Kimble.

Mr. Pearce. Mr. Clawson, of New Haven, has four trees grown from sprouts from a tree raised from the seed. The trees are perfect, although growing in an unfavorable locality. The fruit is better than the Seek-no-further. He calls this variety the Clawson.

These sprouts were planted about 20 years ago. Last fall I visited these trees, and found three of them loaded unusually heavy with fruit resembling the Yellow Bellflower in outward appearance. On testing them, I found the apples fine-grained, juicy, mild subacid, excellent for eating and having a small core. I gave the trees a thorough examination, and found them perfect, except a slight injury in the forks caused by the winter of 1872-3. The fourth tree was taken up and set in another place when eight or nine years old. It did well until run into with a plow, which broke the roots loose and caused half the tree to die. The remaining half hung full of fruit last year. The Kimble is another seedling growing in the same town. The seed was planted by Mrs. Kimble some seven or eight years ago. The tree is very vigorous and healthy, and bore about half a bushel of fruit last year. The fruit is of very good quality and keeps all winter.

A motion was made to place the Clawson and Kimble on the list for trial by amateurs and pomologists.

The motion was carried unanimously.

Hart's Seedlings.

A motion was made that the two seedlings of Mr. Hart go on the same list. One was a dull red, shaped somewhat like the

Gillflower, and marked No. 11. The other was yellow and sweet, and marked seedling No. 7.

The motion was carried unanimously.

CRAB APPLES.

Soulard.

A motion was made to strike out the Soulard entirely.
Motion carried; 6 for and 1 against.

Meader's Winter.

A motion was made to place Meader's Winter fourth on the list for general trial.

The motion was carried unanimously.

Hesper Blush.

A motion was made to place Hesper Blush on the same list.
The motion was carried; 3 for and 1 against.

Whitney's No. 20.

A motion was made to place Whitney's No. 20 on the list for general trial.

Mr. Dart. It is not well enough known for that.

Mr. Pearce. It is of great promise; the season is August, and the size large.

Mr. Jewell. It has not been fruited in this State.

Mr. Brand. The bark has burst in winter on trees three and four years old.

The motion was lost; 4 for and 4 against.

It was moved to recommend for trial by amateurs and nurserymen.

The motion was carried unanimously.

Alaska Crab.

A motion was made to place the Alaska Crab on the same list.

Mr. Brand. It is evident to all that it is a Fall crab, but it has been advertised as a late Winter crab.

Mr. Sias. I wintered it last winter and it stood as well as any crab. Last year was not so fair a test as some, however.

Mr. Kenney. I have bought fifty trees of it.

The motion was carried ; 7 for and 2 against.

Blight on Crabs.

The members were called upon to state their experience with Blight on Crabs.

Mr. Brand. As to Meader's Winter, I think Mr. Harris' experience is confined to his own grounds. I have fifty trees coming into bearing. I saw no blight on the Orange till this year. It is mostly twig blight, in one instance only on the trunk. I consider it substantially free. The General Grant is subject to blight, but has never injured badly. The Early Strawberry does not blight to injure it. The Conical has not been injured. The Quaker Beauty blights worse. The Maiden's Blush does not blight to injure. Aiken's Striped Winter I do not remember to have seen blighted to injure. The Minnesota I have seen blighted some but not, on my grounds, enough to injure it. I think Mr. Jordan's were on Transcendent stocks, and caught the blight from them. Of Palmer's Sweet I have five bearing trees, and it has never blighted at all. Beecher's Sweet I have in bearing, and it has not blighted with me.

Mr. Jewell. The Minnesota is as free as any tree that ever lived. The only ones mentioned that blight are General Grant and Meader's Winter, and the last not seriously except while young. The original tree stands in the vicinity of blighted trees. I have had Meader's Winter three or four years old badly injured. The General Grant in the nursery is badly injured, but if it stands to eight or ten years old it will not seriously injure. The Early Strawberry I have not seen to blight very much. The Quaker Beauty is not inclined to blight very much if away from the Transcendent. It stands well in the orchard and as an orchard tree it is safe. The Maiden's Blush blights some but I have not had it badly injured.

Meader's Sweet Russet.

Mr. Brand. I move to add Meader's Sweet Russet to the list of Crabs for general trial.

Mr. Jewell. It is not equal to Beecher's Sweet. It is not so productive nor of so good a quality.

Mr. Brand. I have eight bearing trees. It is a fair keeper, will keep into November, of better flavor than the Beecher's Sweet but the latter is more productive.

The motion was carried; 5 for and 2 against.

Sylvan Sweet.

Mr. Sias asked about the Sylvan Sweet Crab.

Mr. Jewell. It is no crab at all, but a small inferior seedling of the common apple and not hardy.

Mr. Sias. I received a few cions and grafted 500 stocks this winter. I judged from the cions that it was a crab and hardy.

Mr. Brand. I have met a gentleman who had worked for the proprietors of the Sylvan Sweet Crab, and he said the original tree was not hardy.

Brier's Sweet and Northfield Beauty.

Mr. Jewell. I would mention Brier's Sweet Crab. I have never seen a better tree than the original. It is erect and vigorous, but not a very early bearer. The quality is good but the season is short. The tree is hardy enough and is worthy of cultivation to some extent. Also the Northfield Beauty Crab. The fruit is about the size of the Haas but of better quality. If a crab and hardy enough for Minnesota will be a great acquisition.

Virginia.

A motion was made to recommend the Virginia Crab for trial by amateurs and pomologists.

The motion was carried unanimously.

Brier's Sweet again.

It was moved to recommend Brier's Sweet for trial by nurserymen and pomologists.

The motion was carried; 6 for and 1 against.

It was moved to close the subject of crabs.

The motion was carried.

NEXT MEETING.

Mr. Pearce made a motion to hold the next annual meeting at

Rochester. Some one asked if any guarantee could be given, in case the meeting were held there, that the Society would not be run by Mr. Jordan. This led to a somewhat extended discussion, of which Mr. Jordan was the chief subject, after which the motion was carried unanimously.

ORGANIZATION OF COUNTY HORTICULTURAL SOCIETIES.

The report of the Committee on the Organization of County Horticultural Societies was read. The report was accepted, and the committee continued with power to act.

The report was as follows:

Your committee report progress, and are in favor of publishing a pamphlet briefly enumerating the advantages of horticultural organizations, and the relations of the same to this Society, their rights under the laws of the State, the method of organizing such societies, and a brief constitution for their use.

CHAS. Y. LACY,
W. T. SCOTT.

REPORT ON PRESIDENT'S ADDRESS.

The report of the Committee on the President's Address was read and accepted. It was as follows:

Your committee report in favor of referring the whole subject of an exhibition by the Horticultural Society to the Executive Committee, with power to act.

REPORT OF MR. LATHAM.

The committee acting with the State Agricultural Society made a verbal report, but the Secretary failed to get the substance of it. The report of A. W. Latham, Esq., of Excelsior, of the General Fruit Committee, was read and ordered on file for publication.

The following is the report in full:

To the Minnesota State Horticultural Society:

Review.

The labor of another year has been crowned with success, and our further efforts in growing the apple and the grape have produced results most encouraging. While there are but few varieties of the common apple (*pyrus malus*) that can be planted with safety and certainty in our orchards,

the experience of over twenty years, including one or two exceptionally severe winters, has proved that there are a very few kinds which are worthy of very general culture. It was fortunate for the orchards of Minnesota that the severe winter of '72-3 was not longer deferred. Planters in this locality were setting or about to set large numbers of such varieties as Ben Davis, Fameuse, Pewaukee, &c., of which single trees were to be found looking very promising and bearing fair crops of fruit. Much, however, was yet to be learned by the settler in this yet comparatively new and untried climate. The lesson came with sudden severity, but none too soon; and our hopes of fair orchards of those varieties of apples whose names were familiar to us of old, were quickly blasted. But though the list of eligible kinds is greatly curtailed, it still contains those of merit, as the Duchess of Oldenburg, the Tetofsky, and above all, Minnesota's own offspring, the new and beautiful Wealthy. There are a few other sorts than these, not so hardy, which are doing pretty well about here and may, no doubt, be planted with profit, such as the Haas, Plumb's Cider, &c.

Duchess.

Of the Duchess it cannot be said that it came through the "hard" winter totally unscathed, but I do not remember to have seen a tree in this section that I believe to have been killed back in the top, as the term is usually applied, or otherwise injured above ground, except upon the trunk or main branches on the S. or SW. sides. There were occasional trees the following spring, as indeed there have been other springs, before and since, which had the appearance of being injured uniformly all through the tree, some of which ultimately withered and died, while others recovered. Their appearance would indicate injury to the root, although individual trees, weakened from special cause, may have succumbed to our rigorous climate.

In regard to the number of bushels of the variety ripening in this section the past season I can only conjecture and should place the amount at not far from 400 bushels, of which the pioneer of fruit culture, Peter M. Gideon, contributed nearly one-half. Most of the bearing trees are young, but few being 10 or 12 years of age and consequently the average per tree is low.

Tetofsky.

Of the Tetofsky, I can say but little, as there are few trees of this kind bearing here, except that it seems to be nearly, perhaps quite, as hardy as the preceding. Its fruit is such a very short keeper that it has little merit as a market variety, and a very few trees are as many as any planter has use for.

Wealthy.

In the *Wealthy* are centered many hopes, and its ultimate success with us is very nearly assured. I speak thus cautiously of this beautiful apple as an experience of many years in tree culture in this latitude has made me

exceedingly, perhaps over, cautious. Most of you have seen and tasted its fruit, and will agree with me that it is of excellent quality, and for beauty of appearance unsurpassed. In regard to its season, there is some dispute. I can only say that I have kept the fruit without difficulty through the winter, and at this time (Jan. 15th) the specimens in my cellar have as fine an appearance as when gathered, and will doubtless keep till March. I believe that if allowed to ripen on the tree, picked carefully, barreled, and put in a dark, cool cellar, they will be in fine condition for use during the latter part of the winter; but with the care ordinarily bestowed upon apples in latitudes where the fruit is more plentiful, they will not keep much after January 1st.

The tree is as hardy as the Duchess, and as far as my own observation goes, not nearly so liable to injury upon the trunk. It is a very satisfactory tree to most planters in a new country, who are not willing to live and wait, as in the "good old time." With care, it usually fruits at five years, or, at most, at six years of age.

It is to be regretted that an imperfection must be recorded against this valuable variety; but truth compels the statement that it is somewhat liable to blight; not, indeed, to any such degree as the crab family, but this being a scourge before which we are comparatively powerless, we dread its most distant approach. However, a large proportion of the Wealthy trees in this section, of an age to be productive, are top-worked upon Transcendent or Hyslop, and have suffered from blight through the influence of the stock, or from being planted in contiguity to trees of the crab kind. Wealthy grafted upon common apple stocks and standing apart from crab trees are comparatively uninjured. Indeed, no crab tree should ever be planted near an *orchard* of standards, as no doubt longer exists of the contagious character of the blight. This disease has not thus far attacked our standard trees to any such extent as to deter planting, but only to confirm the necessity of certain precautions as to tillage, enriching, &c.

Probably the few Wealthy trees of bearing size have produced 40 or 50 bushels the past season. A large increase is looked for the coming year.

Crabs.

Our crab orchards and nurseries have suffered this year, as before, from blight. While it cripples bearing trees more or less, it rarely kills, and great hopes are entertained that like the locust scourge, it may wear itself out and depart.

Russians.

Many new Russian varieties have fruited the past year, and look well, but they have not yet stood the test and are only regarded with hope.

Seedlings.

Many new varieties of seedlings, crabs, standard, and crosses of the two,

have also borne fruit, mostly upon the farm of Mr. Gideon. Some of these have much to recommend them in the direction of beauty and quality of fruit, hardness of tree, &c. Not to specify individual trees, suffice it to say, that the success in this work is such as to encourage further effort, and to leave no room for doubt that ultimately kinds will be originated that will be perfectly adapted to our peculiar climate, and of a quality of fruit worthy of general culture.

Grapes.

The grape crop here is as fine as usual, and I believe larger than heretofore. I leave this subject to my co-laborer, Mr. F. G. Gould, who makes it the subject of a special treatise.

Congratulations.

In conclusion, the Minnesota fruit-growers have good cause for exultation, and we must be faint-hearted, indeed, who falter now by the way. There have, indeed, been times when the clouds lowered, and there seemed certain prospect that perpetual darkness would enshroud us. These clouds are being withdrawn, and we can believe that in the not distant future the glorious sunlight of an assured success will dispel their latest shade. Let us clasp in encouragement each his fellow's hand, and press forward earnestly towards the end to which we are devoted.

Yours, fraternally,

A. W. LATHAM.

EXCELSIOR, Minn., Jan. 15, 1877.

EVERGREENS.

A motion was made that the list of Evergreens stand as adopted last year. The motion was carried.

REPORT OF GEO. H. FISH.

The report of Geo. H. Fish, Esq., of Sauk Centre, of the General Fruit Committee, was read and ordered on file for publication.

The following is the report in full:

SAUK CENTRE, Stearns Co., Minn., Dec. 16, 1876.

Chas. Y. Lacy, Esq.

DEAR SIR: Your card of the 7th ultimo, reminding me of my duty to the Society, came in due time but in my absence. I wish to assure you that I have a lively interest in horticulture, and wish soon to see it receiving its deserved attention by the people of all parts of our State. I believe a gen-

eral attention to it would add to the general health of, and be a source of profit to the people, and also tend to mental and moral culture, by opening up an attractive field for the exercise of observation and thought, and of true tastes and sympathies. Imported fruits are always expensive items of consumption, compared with the expense of raising such as our climate will admit of, to say nothing of the vastly inferior quality of most of the imported, canned and dried fruits. This county, and those west and north, have been backward in taking the initiatory steps in the enterprise of fruit raising, in the way of setting out trees and plants; likely owing to the prevailing impression that this part of the State at least is too far north, and consequently the climate too severe to admit of a chance for much success.

Apples.

Still, in the successive past few years, many have ventured to set out quite largely of the Transcendent and Hyslop trees, mostly of the former, and the two last seasons the oldest trees have proved productive. Last fall there was an abundance of Transcendent apples in town for sale at \$1.25 a bushel. It is very rarely that any of the tried, standard trees have stood the climate so as to perfect any desirable growth.

Small Fruits.

But few have made a commencement with small fruits, and there seems to be a general want of knowledge as to their importance, and indifference in regard to their raising, though enough has been done to prove that with care they can be profitably raised. I had last season half an acre of raspberries; about two-thirds yearling plants of the various kinds, the rest two year old, on highly manured sandy land, all bearing well. I have the Seneca, Doolittle, Davison's and Mammoth Cluster, of the black-caps. Part of them were mulched in fall and stood the winter the best. I am not yet certain which are the hardiest and most prolific. The Seneca and Davison's Thornless certainly have done well. I have two rows each of the Philadelphia Red and Purple cane. The Philadelphia has stood two winters, with ground almost bare of snow, and no protection, without killing at all, and last season bore prodigiously. The Purple Cane stood the winter nearly as well, and fruit is very delicious, but bore nothing like as well as the Philadelphia. I keep the red bushes pinched back severely, the same as the black, making them stocky, which may account for their hardiness. I know of several parties who have cultivated the black-caps for a number of years successfully in this vicinity, and for eating when fresh in summer, and for canning and drying, every farmer who regards economy and the comfort and health of his family, should raise them. If apples of standard varieties are uncertain, they and strawberries with care are not. Of course, some years are singularly unfavorable. Last winter there was but little snow, and many warm days, thawing the frequent light falls to an ice, which completely covered the beds, and in most cases so bound the canes as to destroy

the fruit sets, if it did not kill the plants, so that in this part of the State most of the beds were a failure. Still, enough have been raised in past years to prove that with care they can generally be relied on in this part of the State. They are the *ne plus ultra* of canned fruits, when canned properly at home. The same is true of drying them. But comparatively very few are yet raising them, and most will persist in getting plants from old adulterated beds of Wilsons, or those entirely spurious because they are free, rather than paying a fair price for true plants. This is owing mainly to the fact that people are generally ignorant of the tendency of superior kinds to be run out by those that are inferior when not cared for in that particular. Should not the exquisite relish that all people have for berries of various kinds, the tendency to social enjoyment in their eating at table, their extreme healthfulness, the source of delight to old and young in seeing them grow and produce so bountifully under good care, and the disappointments so common to children in their futile tramps in search of inferior wild ones to gratify their natural yearnings, induce every farmer and gardener not to delay their cultivation, who has a true desire to please and to make home and society pleasant?

Planting costs but little, the care required is not great nor irksome to a true taste, and remuneration *quick* and *profitable*. Would not short essays read before the Society at different times in future, as in the past, and published, discussing which are the best kinds, and what are the *especial* modes of culture necessary to their highest development and productiveness, thus keeping the subject before the minds of the people, and giving them instruction, be likely eventually to prove of eminent usefulness to the public?

G. H. FISH.

TRANSACTIONS NOT RECEIVED.

A motion was made that members who have not received the Transactions of the Society shall be entitled to the missing numbers by applying to the Secretary and forwarding postage.

The motion was carried.

The meeting adjourned to meet at 7:30 P. M.

THURSDAY EVENING.

DELEGATES TO MEETING OF AGRICULTURAL SOCIETY.

The meeting was called to order at 7:45.

A motion was made that the President appoint two delegates and attend as a third himself.

The motion was carried, and Messrs Elliot and Dart were appointed.

A motion was made that the President have power to fill vacancies in the delegation.

The motion was carried.

HONORARY MEMBERS.

A motion was made that Mrs. C. O. Van Cleve, of Minneapolis, be elected an honorary member of this Society. Carried.

A motion was made that Miss Hortense Share, of Rosemount, be elected an honorary member of this Society. Carried.

SUMMER MEETING.

A motion was made to dispense with a Summer meeting this year. Carried.

REPORT OF MR. CARTER.

The report of T. G. Carter, Esq., St. Peter, of the General Fruit Committee, was read and ordered on file for publication.

The following is the report in full:

ST. PETER, Nicollet Co., Minn., Jan. 16, 1877.

Prof. Chas Y. Lacy, Secretary State Horticultural Society :

Small Fruits.

DEAR SIR: I cannot give a report covering the whole district, but will confine it to what has come under my observation in this county, and one orchard in LeSueur county; which, by the way, is not in my district. Last winter seems to have been hard on strawberry vines more than one year old, whether covered or otherwise. The young vines from the last year's runners were all right. The strawberry and raspberry crops were not up to the average, I think; some not half a crop. Of black-cap raspberries, the Doolittles constituted the main crop, other kinds being but little cultivated. With me, however, the Mammoth Cluster and Seneca were the most productive, and the fruit the largest. The Philadelphia red bore a very fair crop. With me they came through the winter better than the blacks, and yielded 100 per cent. better. The markets in this vicinity were better supplied than in former years, and prices consequently lower; more people having engaged in the business of raising small fruits than ever before.

Of strawberries, I think the Wilson yielded best. The drouth cut both crops short.

The currant crop was larger than usual, and they sold for lower prices than heretofore obtained.

Gooseberries were largely in excess of the demand.

Plums.

Plums were not so plenty, and not so good as usual, except in a few instances. There are a number of excellent varieties of the wild plum in the county, which have been cultivated and many of them are of a large size.

The Miner is about the only tame plum raised in the county. It is very late and should be planted on a light warm soil in order to ripen well, when it is hard to find its equal. Mr. Bergen, of Lake Prairie, has two trees of the German prune, six years old, which have borne fair crops of fruit for the past two years, and are healthy and flourishing. He also has several choice varieties of the native plum. He claims that spreading fresh stable manure over the ground under his trees once in two or three years protects his plums from the curculio. Also, that an application of pine tar to all kinds of fruit trees which are diseased in the body or branches is very beneficial. This does not refer to blight, as he is not troubled with it, but probably to the damage to the bark, wounds from borers, &c.

Apples.

The crop of Transcendent apples has been very large, so much so that large quantities have been made into cider. Within the last four or five years they sold here at four dollars a bushel. Notwithstanding that this apple is very much subject to the blight, I believe the time is not far distant when we shall export dried fruit, and that it will command a better price than the best quality of eastern dried apples. Consequently, I believe it should be generally cultivated.

It does not need to be pared, I am told, and the core can be removed by a simple tin punch.

The Hyslop also makes a good dried apple, and needs no peeling, although the better for it, of course.

The blight has done no damage, so far as I have heard, except in the orchard of Ernest Meyer, of this place, where it attacked his large trees some two years ago, mainly Transcendents, I think, but has not touched two and three years old trees. Mr. S. B. Carpenter, of Lake Emily, across the river from St. Peter, in LeSueur county, also had a touch of the blight two years ago. It struck one row of young trees on highly cultivated new ground. He had used leached ashes freely on the balance of his orchard, and never had a tree touched. He applied them to this diseased row and they have never been troubled since.

By the way, Mr. Meyer had nine or ten varieties of apples on exhibition at our county fair, among which were some Fameuse and several seedlings of promise. Mr. Carpenter raised about twenty-five different varieties—the

Duchess, of which he had about twenty-five bushels; Haas, three or four bushels; Red Astrachan, one bushel; a sweet apple, supposed to be Talman Sweet, one bushel; about twenty of Transcendents, and more or less of Tetofsky, Fameuse, Golden Russet, Jeniton, Small Romanite, Maiden's Blush, Hesper Blush, Quaker Beauty, and twelve other varieties, including four Seedlings, (standards,) and an early winter Pippin, fruit as large as the Duchess, which last has stood ten years, now fruited for first time, and is hardy so far. Two of the Seedlings bear splendid fruit, are sixteen years old, but not quite hardy. The Golden Russet, Talman Sweet, Jeniton, Small Romanite, and Red Astrachan were damaged by the hard winter of 1872 and '73, and have not recovered yet. Haas are six years old, and were not hurt by the hard winter referred to.

The Duchess, young and old, are black on the south side, also some of the Transcendents. Mr. C.'s orchard is located on the south-east side of Lake Emily, and being on western border of the Big Woods, is somewhat protected, although the timber is cut off on north side as a general thing.

The Duchess is damaged on the south side of body—very few people taking care to give them protection from the sun in winter. I am satisfied that this and the *borer* kill many trees, and it is charged to hard winters. Some trees of Stewart Sweet, not less than sixteen years old, are bearing good crops—trees perfectly healthy and hardy.

Some trees in a neighbor's orchard, bought (of Moulton) for Aiken's Green Winter, seem to be perfectly hardy, while others, bought for Aiken's Striped Winter, (but labeled Aiken's Green Winter,) have killed to near the ground and are sprouting from the stump. Quite a number obtained Beecher's Sweet from same source, but they seem to be Beecher's, or some one else's, sour, but are a desirable apple.

Grapes.

Grapes were a short crop—not quite a third with me, and from that to one-half, so far as I have learned. The Concord must be grown on a light, warm soil, to be sure of ripening, as you can hardly count on two out of three crops on timber, or good black prairie soil. The Delaware is of course more certain, but not sure of ripening by any means. The Janesville is *sure* and is a very good grape, growing better the longer it hangs on the vine, and a freeze which spoils the Concord does not seem to hurt the flavor of it a particle. The dark grape which grows wild in some of the New England States, seems to do well here without any protection, and is, in my opinion, a better grape than the Clinton.

I am expected to give a list of fruits best adapted to this district, but beg to be excused therefrom, and will in its place give the qualities of the ideal tree, bush and vine, which are required to make a success in fruit growing in this district.

It must be proof against cold, heat, moisture and drouth; against blight and damage from insects; against careless setting; against damage from horses, cattle, sheep and swine, wagon wheels and farm implements gener-

ally; should be able to stand total neglect, and should bear a large crop of the best fruit the same season it is set out, which will ripen gradually until cold weather, and keep until it is ripe the next summer.

This seems to be the popular idea, and about what is expected in trees, &c., bought of our nurserymen. As it is difficult to fill the bill with any one variety now in existence, let those who are experimenting for new varieties bear the above standard in mind.

Hurriedly yours,

T. G. CARTER.

DISCUSSION.

Tar.

Mr. Grimes. I consider that as an able and truthful report. Tar may be good to keep out the wet and to protect from decay, but I should be afraid to apply it to green parts of plants. Paint will do just as well for those purposes. The German Prune is no hardier than some of the cultivated plums. The Miner while young kills back, but later it becomes hardy. The fruit keeps excellently, and on the whole it is a very good variety.

Mr. Pearce. I would like to know if tar is injurious. I have used pine tar, and no harm was done.

Mr. Grimes. I do not know that tar would do any harm, but some substances will injure. Lard is an illustration. It fills the pores and prevents transpiration.

Mr. Dart. I knew a man to kill 30 or 40 trees by binding with pork rinds.

Mr. Jewell. I have tried pine tar on 75 trees. I saturated cloth, wrapped it around them, and left it on for a month without injury. Anything, however, which closes the pores will prove injurious. I have tried the cultivated Plum, German Prune and the Miner. Some years ago I planted and sold especially of the German Prune. I know of none of them that are alive now. None survived the winter of 1872-73. I have the Miner. It was tender while young, became hardier when older, but bore none until lately. Last year I had about 100 on twelve to fifteen trees. I got some more trees later, however, which fruited younger.

Trunk Injury.

Mr. Pearce. It is a common complaint that a tree is injured on the south side. Frequently this extends only through the outer bark and does not injure the inner bark at all.

Mr. Jewell. Mr. Pearce's statement is correct. Often the blackening which we see does no harm. There may, however, be disease there.

REPORT OF MR. HARRIS ON INSECTS, &C.

The reports of J. S. Harris, Esq., La Crescent, on Insects Infesting House Plants and on General Fruit were read and ordered on file for publication.

They were as follows:

Mr. President and Gentlemen of State Horticultural Society:

The study of the habits and instincts of a few small and insignificant insects or "bugs," as they are most usually termed, appears to many people to be a matter of so trifling importance as to be unworthy the attention of any man of common sense; and yet a thorough knowledge of the science of entomology or bugs, is of vast importance to those who till the soil for a living. There is no useful fruit, grain, plant, or vegetable that has not its insect enemies, and in this State alone the annual damage done by them to the growing crops will doubtless exceed a million dollars, and they are constantly on the increase. Their name might appropriately be called "Legion," and with the exception of one single species—the Colorado potato beetle—who can tell us how to head them off? Doubtless if all of our insect enemies were as well known as the above named beetle, and had been subjected to such irrepressible conflict, much of this immense damage could be prevented.

I am but a young student in the science, and in this paper will risk my reputation only on a few insects that are injurious to flower and ornamental plants that are kept in green houses, conservatories and parlors, taking only those which are most common and giving the remedies that, in my own experience, have proved the best.

Aphis rosea, (of the natural order of Hemiptera,)

Or what is usually known as green fly, or green plant lice, infest nearly all plants that are cultivated both in and out of doors, and if left unmolested are particularly destructive to free-growing plants like monthly roses, scented geraniums, calceolarias, verbenas, &c., when kept in the house. The young lice, extremely minute and of a greenish color, when full-grown they are about one-tenth of an inch in length, and usually of a dark green color; but the color varies somewhat, according to the plants they are feeding upon. The older insects frequently have wings. On the plants kept in the house the female produces her young alive, but some naturalists state that on trees and plants growing out of doors the females, late in the fall, produce eggs for the generation of next spring. This is doubtless so, for a very little freezing kills the mature insect. They attack the young grow-

ing shoots near their points, and the young leaves on the under side, and piercing the tender cells with their proboscis suck away the juices that are needed to sustain the vigor, which causes the foliage to curl up and turn prematurely yellow. They also have a peculiarity of exuding from the abdomen a honey-dew like substance that is a favorite food of small ants, and this substance soon gives the affected plant a filthy appearance. Where ants are seen frequenting plants it is pretty good evidence of the presence of the aphid.

Remedies—In all plant structures, separate from the dwelling, fumigating with tobacco smoke is the best and most practical remedy. This should be done as often as once a week. One plan for doing it is to take a few ignited coals on a shovel and place upon them tobacco stems (the waste of the cigar factory) slightly moistened, about four ounces for each twelve feet square of space in the house, keeping the house closed for an hour or so. Another and better method where brick or earthen floors are used, is to light a few shavings and lay the moistened tobacco stems upon them and let them consume slowly. After the smoke is out of the house the plants should be syringed freely to bring down the stupefied insects, and afterwards the shelves should be brushed off and the floors swept clean. Where the plants are kept in the dwelling house this system of fumigation is not advisable as the room would carry a disagreeable odor for several days. Where but few plants are kept they may be taken out of doors or into the wood-shed, or taking a mild day for it and put into a dry-goods box with a close-fitting cover, and the smoke be blown upon them from a common smoking pipe; afterward syringe them and return them to their places.

Another excellent method for cleaning plants of this insect is to fill a tub with soft water warmed to 100 to 120 degrees: invert the plant, holding the hand over the soil or tying a piece of cloth or something of the kind over the soil in the pot, put all the branches in the water, keeping the pot in the hand, and after drawing it to and fro a few times, take it out and shake it. If any insect remain take a small fine brush and brush them off, giving another dip, which will clean them for the present. This operation should be repeated as often as the insects appear, for nothing has been found out or heard of that will totally exterminate them. After this operation is performed, care should be taken not to raise a dust before the foliage dries off.

Red Spider, (Acarus cellurius.)

This insect is extremely minute, and when on the leaf can scarcely be discovered with the naked eye. When viewed through a microscope the body is a bright red color, and the legs, which are eight in number, are of a light red, and they may be seen running about on the under side of the leaves with great rapidity. Although so small it is more difficult to exterminate than the Aphid.

With its proboscis it wounds the fine capillary vessels of the under side of

the leaves, which causes them to prematurely decay. When very numerous they work a thick web on the under side of the leaf and frequently all over it, causing the plant to present an unsightly and half-dead appearance. The bridal rose, the monthly rose, fuchsias, jassamines, violets, and callas are among the plants that suffer most quickly from their ravages, but when they once get a lodgement scarcely anything will remain exempt from their attacks. An experienced gardener will usually detect their presence before much damage is done. When the foliage of the plants begins to get brown and look sickly it requires but little sagacity to divine the cause.

Remedy.—The delight of this insect is a warm, dry atmosphere, and the only safe and effectual remedy is water. Water persistently applied to the under sides of the leaves by syringing or sponging or dipping as recommended for Aphid, will eventually subdue or destroy them. Fumes of sulphur is instant death to them, but amateurs and the inexperienced had better not try it, as it is a dangerous remedy that must be used with caution, or it will be death to the plants.

Woolly Aphid or Mealy Bug (Coccus hesperidus,)

is found infesting many collections of plants, and if not instantly destroyed soon becomes a serious enemy. It is of a white, dusty color, usually covered with down, and resembles little bunches of cotton sticking in the forks of the branches and axils of the leaves. When broken it is of a brownish red. It is generally of a dormant nature, but in warm weather it may be seen moving up and down the stems of plants. If a single plant infested with it is placed in a collection of clean plants, the whole collection will in a few weeks be covered with them. I am having my first experience with them, they having got into my collection on some gardenias purchased in the east, (New York,) and I find them upon whatever comes in their way, but indulge most freely on the Crassulas, Echiveras, Prickly Cactus, Bouvardias and Oleanders, greatly marring their beauty, and I think if left alone would kill them outright.

Remedy.—I find it is quickly destroyed by dipping the plant in a solution of one pound whale oil soap to five gallons of rain water; but as this sometimes injures tender plants I hardly like to recommend it. I think it best, when they are discovered, to watch for them and brush them off with a small tooth or nail brush, or crush them with a pointed soft wood stick. It is also said that alcohol applied to them with a fine brush or feather is instant death to them, but not having tried this remedy, I should not like to recommend it only for very hardy plants.

Brown and White Scale (Coccus.)

This item I write under protest, as it is some time since I have had an opportunity to make microscopic examinations, and I am inclined to think that both brown and white are one species.

These are less injurious to plants and less common than those previously mentioned. They are generally found in the form of a scale adhering to the stems and leaves of plants that have been kept in dark and badly ventilated green-houses and rooms, and where plants are crowded close together. They seem to flourish in the myrtle, ivy and oleander. The full grown scale is about one-tenth of an inch in length and of an oval or egg shape. This scale is not the insect proper, but a substance that forms or grows over the female to provide a protection for the eggs or young. If the full-grown scale is carefully lifted and placed under a microscope, a great number of eggs or active young, will be discerned, of a brownish or yellow color, having six legs, which they use with considerable dexterity, and after they escape from the maternal shelter they ramble around until they find a suitable place for feeding, when they fix themselves to the leaf or branch for life. Over the little insect a light colored film soon forms, and continues to increase in density and size until the insect attains its growth and produces its young, which in turn undergo similar changes, and are transformed into other scales. The effects are of a corroding nature. They extract the juices, and in time the foliage will assume a yellowish and decaying appearance, and the growth of the plant will cease. The best remedy is rubbing off with a stiff brush, or washing frequently with strong soap-suds, using a piece of sponge tied on a small stick, scrubbing every leaf and crevice.

Thrips.

The thrip is an active, jumping insect of very minute size, of various colors, from yellow to dark brown. They generally lurk close to the veins of the leaves of plants and luxuriate in shaded situations, and are very destructive when they get a foothold. The remedy is fumigating with tobacco, or the warm water bath recommended for the Aphis.

JOHN S. HARRIS.

REPORT OF GENERAL FRUIT COMMITTEE FOR DISTRICT NO 1.

LA CRESCENT, MINN., Jan. 16th, 1877.

The fruit crop of this district last year (1876) exceeded in quantity that of any previous year. Strawberries, raspberries and currants were a medium crop, but not as fine quality as in some previous seasons. Grapes were a light crop, owing to a failure to set well in the spring, but ripened well and were of good quality. The apple crop exceeded our most sanguine expectations, and were it not for the extreme hard times, it would give a new impulse to the planting of trees. The Duchess, Fameuse, St. Lawrence, Price's Sweet, Plumb's Cider, Haas, Sops of Wine, Utter's Red and Astrachans are among those doing the very best. The Walbridge still promises well, and fruited for the first time. Some varieties that flourished before the hard winter of 1872-3 are now extinct in this region. The blight prevailed pretty freely, and the crabs and some of the crab men are feeling a

little sick. We hope soon to be able to get along without them as our main dependence, and shall have no use for them when apples are cheap and plenty, for temperance is getting popular here and cider will not pay. Taken all together the prospects are favorable.

JOHN S. HARRIS,
General Fruit Committee, 1st District.

DISCUSSION.

Smoking.

Mr. Elliot. Smoking a house should be done in cloudy weather, or at close of day, when the sun is not bright, and then the bad odor gets out before the next day.

Mr. Jewell. Tobacco works like a charm. I have used it for the woolly aphid on trees extensively.

Borers.

Mr. Kenney. I would like to hear about the Apple Tree Borer.

Mr. Elliot. In the mature condition it is a short-lived insect.

Mr. Dart. Wash the trunks of the trees in the fore part of the season with lye or soap-suds. This keeps off beetles, and keeps the bark smooth, so that they can be seen if they make an attack.

Mr. Pearce. They affect neglected trees. Take ashes, fill a pail quarter full, fill with water and scrub and wash the trunks with this, using a broom. Do not let the grass and weeds grow. I think that chickens keep trees free from borers. An Eastern writer recommends using a wash of aloes and water after the soap-suds.

Mr. Jewell. I do not keep my orchard free from grass, and I never lost but one tree from borers. Another method is to make with tin a funnel around the trunk and fill this with strong soap-suds. This method drowns out the grubs in the trunk.

Mr. Dart. I believe that the lye wash is good for the tree in other ways besides destroying or preventing the borer.

Mr. Brand. I have had some experience with borers. Much hickory appears to harbor them, and where there is no hickory they are rare. The borer full grown is a beetle, and it makes an incision from $\frac{1}{2}$ to $1\frac{1}{2}$ inches in length in which it lays a number of eggs. By drawing a knife blade over these incisions you can hear the eggs crack. They hatch in about ten days and begin to work, which you can see by the sap exuding. I believe they stay

in the trunk two winters. They may be dug out with a knife, punched in the hole with wire, or the hole filled with cotton saturated with kerosene.

Mr. Kenney. I see now why some places are free from borers. They took all my time before I wrapped the trunks of my trees.

AMENDMENTS.

The report of the Committee on Amendments was read and accepted and the committee continued.

The report was as follows:

Your Committee on Amendments to the Constitution and By-Laws report that it is not prepared at present to report on life memberships with a view to raising revenues.

Your committee also report an amendment to the By-Laws which shall read as follows:

FINAL ARTICLE. These By-Laws may be amended by a two-thirds vote of the Society at any regular annual meeting.

VARIOUS RESOLUTIONS.

Fruit for State Exhibition.

A motion was made to instruct the committee appointed to collect fruits for the meeting of the Pomological Society, to collect fruits at the same time for the Exhibition of this Society next fall.

The motion was carried.

Delegates to Pomological Society.

A motion was made that the President and Secretary be authorized to issue delegate credentials to all members who will attend the meeting of the Pomological Society free of expense to this Society.

The motion was carried.

Transactions for County Societies.

A motion was made that the Secretary be instructed to issue wanting copies of the Transactions to all County Horticultural Societies.

The motion was carried.

Ornithology.

A committee on Ornithology was proposed, but it was finally decided that a paper on that subject should be provided without such a committee.

Good words were spoken for several birds, and some bad words for others.

Final Resolutions.

The report of the committee on final resolutions was called for and read. The report was accepted and adopted, passing the resolutions, which were as follows :

Mr. President :

The committee on final resolutions beg leave to report.—

First Resolved, That the members of this Society from abroad hereby tender their sincere thanks to the Committee on Arrangements, for the provision they have made for our satisfaction and comfort.

Second Resolved, That we extend to this city our best wishes for its prosperity and welfare, and especially to those families who have so kindly entertained us during our stay among them.

Third Resolved. That we instruct our Secretary to furnish those families each with a copy of the current year's reports when published, as a memento of our thanks. The members furnishing the Secretary with the names of those entitled to receive them.

Fourth Resolved, That our sincere thanks be and are hereby extended to the Chicago, Milwaukee & St. Paul, and the Winona & St. Peter Railroad Companies for their generous actions in passing us over their roads at reduced rates, and we assure them that we do not come here in our own behalf but in the Horticultural interests of this great State, and our hearts are in the work, and in performing that work we trust that all will be mutually benefited and we hereby assure all with whom we have had intercourse, that they will be remembered long after we have dispersed and retired to our several homes.

WIVES OF MEMBERS.

A resolution was offered amending the By-Laws so as to make the wives of members, members of the Society without fee.

At 10 o'clock P. M. the Society adjourned.

A P P E N D I X .

APPENDIX A.

REPORT OF THE DELEGATES TO THE MEETING OF THE AMERICAN POMOLOGICAL SOCIETY, AT THE CENTENNIAL EXPOSITION, PHILADELPHIA, SEPT. 11TH TO THE 16TH, 1876.

PART I.—PREPARED BY J. T. GRIMES.

In presenting this report, it may be proper to state that the meeting of the American Pomological Society for the centennial year was not the regular biennial session, but an ad interim meeting having its bearing on the great central idea of the exposition, in showing the people how pomology has progressed in America during the last century. No such an exhibit of fruits was ever made on this earth; in fact, it was the grand feature of the month, and Americans had more reason than ever to be proud of their country when looking over those tables loaded with more than 15,000 plates of fruit, the fairest and best ever produced beneath the sun.

The weather was all that could be desired, and there seemed to be only one regret, that Pres. Wilder was unwell and could not be present; consequently, no formal meeting of the Society was held as had been proposed.

It was the original plan to place this group in the Horticultural Department, where it would naturally belong, but there was no room there; so the management projected an annex to the Agricultural Hall, constructed of wood and glass. The tables were arranged in long rows with the ends fronting the entrance doors, and were made narrow with three shelves to each side so as to facilitate the examination of the fruits by the judges and visitors.

When we arrived on the grounds we felt somewhat embarrassed as our society had accepted an invitation to exhibit with the Pennsylvania State Horticultural Society, as we supposed at the Centennial, but when we learned that they were only intending to exhibit at their own hall in the city of Philadelphia, we thought best to make other arrangements, and accordingly applied for space at the centennial department, but were informed that it was all pre-engaged, but our fruit, when it arrived, could be placed upon

tables that were not occupied. We asked if that arrangement would be permanent. They said not, but we would have to move if those entitled to the space came forward and claimed it. We told them that we could not place ourselves in such positions as to be obliged to move round, in fact we thought some injustice had been done. Canada for instance had one row of tables the whole length of the building, Iowa had nearly as much, and some other States and societies had a very liberal proportion, while others had none. But we found that Canada did fill her tables with fruits, fine, fat and luscious, Iowa did as well, and Kansas! well what is it that Kansas can't do in advertising her resources? We also noticed that most of those States that had not secured space also failed to be there with their fruits.

But Minnesota was not left out in the cold; we were subsequently notified that if we would make formal application, two tables and 400 plates would be placed at our disposal, which was at once done and the space secured, and would have been filled to overflowing, had the Express Companies brought forward all the fruits which had been sent and on which the charges had been prepaid. As it was, our collection only numbered 209 plates containing 108 varieties of standard apples, 35 of crabs, 1 of pears and 2 of plums. Of standard apples we had on exhibition 63 named varieties, unknown 12, seedlings 19, of these E. B. Jordon, of Rochester, contributed 9, and 14 varieties of Russian apples, designated by numbers, were contributed by Moulton & Co., Minneapolis, and attracted a great deal of attention, as did all of our fruits from their firm, polished, waxy appearance. A full list of contributors will be found in Part II to this report.

The fruits were arranged for examination by the judges as follows:

Division 1.—a. Summer Apples.
b. Autumn Apples.
c. Winter Apples.

Division 2.—a. Summer Pears.
b. Autumn Pears.
c. Winter Pears.

Division 3.—a. Free Stone Peaches.
b. Cling Stone Peaches.
c. Apricots.
d. Nectarines.
e. Native Plums.
f. Foreign Plums.

Division 4.—a. Native Grapes.
b. Foreign Grapes.

Division 5.—a. Strawberries.
b. Raspberries.
c. Blackberries.
d. Currants.
e. Gooseberries.
f. Cranberries.
g. Water Melons.
h. Citron Melons.

Division 6.—a. Oranges.

Division 7.—a. Almonds.
b. Filberts.
c. Walnuts.
d. Shellbarks.

The displays by nurserymen, fruit-growers and societies were considered separately, and the awards consist of a special report by the judges and a Diploma, and a Bronze Medal from the United States Centennial Commission. The list of awards will be found in Part III. Exhibitors were required to attach cards to their fruits inserting the name of each variety, if known, or if

a seedling, or if unknown, to mark it as such ; so that the judges could also act as a committee on nomenclature, to insert, correct, or reduce all local and improper names to a common standard. This is an important work, and can only be done by a national society, such as the American Pomological.

Another work of perhaps equal importance rests also with that society which has as yet not been attempted. It is the mapping out of a fruit chart of our country, showing by isothermal lines to what limits the various kinds of fruits can be successfully grown, for instance apples, peaches, pears and plums that are grown near St. Catharines, Canada, cannot be grown as far north as central Iowa, and peaches that are produced in abundance near the eastern shore of Lake Michigan cannot be grown with any degree of certainty for more than a hundred miles south ; away from the influence of large bodies of water, and in going south, certain fruits disappear while others take their place. The value of such a chart can be seen at a glance. It would not only serve as a guide to the fruit grower, but the country could be divided into fruit zones corresponding to the areas occupied by the different fruits, and the fruits of each district placed side by side at our national exhibitions to be judged in competition only within the district to which it belonged.

In making up this report your delegates expected to avail themselves of the special report of the judges (which is part of the awards to which we are entitled) and which the Director-General assured us would be printed in pamphlet form and a copy furnished, but which we have not, as yet, been able to obtain.

The only document which we have received is the following notice of award :

INTERNATIONAL EXHIBITION. (No. 235.)

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, February 14th, 1877.

REPORT ON AWARDS.

Product : One hundred and nineteen varieties of apples. Name and address of Exhibitor : Minnesota State Horticultural Society, Minnesota.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. : For a large and valuable collection representing the pomology of the extreme North, including twenty-four

varieties of crabs (pyrus Baccata.) The whole illustrating the capacity of varieties of fruits to adapt themselves to peculiarities of climate.

SUEL FOSTER.

Signature of the Judge.

Approval of Group Judges.

T. T. LYON.
W. L. SCHAFFER.
A. W. HARRISON.

E. SATTERTHWAIT.
JOSIAH HOOPES.
WILLIAM PARRY.

THOMAS MEEHAN.
J. B. YELLOWLY.
PARKER EARLE.

A true copy of the record.

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

[L. s.]

A. T. GOSHORN,

Director-General.

J. L. CAMPBELL,
Secretary.

J. R. HAWLEY,
President.

PART II.—VARIETIES, CONTRIBUTORS, &c. PREPARED BY
WYMAN ELLIOT.

MINNESOTA FRUIT.

PREPARING FOR A DISPLAY AT THE CENTENNIAL EXHIBITION.—TO THE FRUIT GROWERS OF MINNESOTA.

The State Horticultural Society of Minnesota, at the summer meeting, held at the State University, June 28th, 1876, decided to make a display of fruits at the Centennial Exhibition, at the time of the meeting of the American Pomological Society, September 11th to 16th, and appointed the undersigned to take charge of it.

In order to make the exhibition a success on the part of the State, we would respectfully solicit every fruit grower to contribute such specimens as he may have, to the care of Prof. C. Y. Lacy, Secretary State Horticultural Society, Minneapolis, Minnesota, who will forward the same, or send direct to Philadelphia, consigned to our care. Every specimen should be wrapped in tissue paper and packed in cotton or some soft material to prevent bruising. The boxes should also be open enough to prevent heating. Each variety should be carefully labeled, and the contributor's name attached thereto, as we intend to keep a complete record, to be appended to the report which we shall make to the annual meeting of our society. Such fruits as mature before the time, can be preserved in alcohol and water, and sent.

As a distinct feature, we would earnestly recommend that originators of new varieties of fruits to send all specimens worthy of consideration, giving in writing all facts relating thereto. These, in justice to the originators, will be exhibited separate from the general collection, that the attention of the Pomologist may be directed to their merits. We shall be on the grounds at least one week before the time specified, in order to perfect all necessary arrangements.

CHAS. Y. LACY, Sec. State Hor. Soc.
J. T. GRIMES, Del. of State Hor. Soc.

In response to nearly one hundred of the above circulars sent, there were received from the following contributors, fruits to be forwarded and placed on exhibition at the Centennial.

The undersigned served in place of Prof. C. Y. Lacy, at his request, as he was sick and unable to receive and forward fruits.

W. E. BRIMHALL, ST. PAUL.

Duchess of Oldenburg.
Molly.

Haas.
Wealthy.

Crabs.

Chicago.
Hyslop.
Large Red.
Montreal Wax.
Soulard.
Virginia.

Gen. Grant.
Large Yellow.
Marengo Winter.
Montreal Beauty.
Transcendent.

TRUMAN M. SMITH, ST. PAUL.

Transcendent.

MRS. WM. PAIST, ST. PAUL.

Transcendent.

CHARLES HAUSE, ST. PAUL.

Duchess of Oldenburg.

Plumb's Cider.

THOMAS ODELL, ST. PAUL.

Duchess of Oldenburg.

Haas.

F. G. GOULD, EXCELSIOR.

Wealthy.

JACOB MARTELLA, WEST ST. PAUL.

Haas.
Gravenstein.

Fameuse.

Russian Varieties.

Sweet Pear.

Unknown.

Crabs.

Gen. Grant.

WYMAN ELLIOT, MINNEAPOLIS.

Pride of Minneapolis.
Transcendent.

Hyslop.

Plums.

Harrison's Big Red.

Harrison's Peach.

J. T. GRIMES, MINNEAPOLIS.

Duchess of Oldenburg.
Haas.Grand Sultan.
Tetofsky.*Crabs.*

Transcendent.

Hyslop.

GEO. HACKETT, MONEY CREEK.

Duchess of Oldenburg.
Golden Russet.
Lucy.
Money Creek Beauty.
Quaker Beauty. †
3 varieties Seedlings.Fall Stripe.
Early Washington.
Talman Sweet.
Sweet Winter Crab.
Plum Crab.

A. W. SIAS, ROCHESTER.

Ben Davis.
Duchess of Oldenburg.
Golden Russet.
Haas.
Melinda.
Koreana.
Talman Sweet.
2 Seedlings.Cook's Favorite.
Fameuse.
Goodenough.
Koursk's Anisette (New Russ'n.)
Red Astrachan.
Sops of Wine.
Vasilis Largest. (New Russ'n.)*Crabs.*Conical.
Hyslop.
Meader's Winter.
Montreal Beauty.
Power's Large Red.
Soulard.Beecher's Sweet.
Hesper Rose.
Maiden's Blush.
Orange.
Transcendent.*Pears.*

Flemish Beauty.

G. W. CLARK, WINONA.

American Russet.
Fall Orange.
Haas.
Keswick Codling.
Painted Lady.
Perry Russet.
Rome Beauty.
Utter's Red.Fameuse.
Golden Russet.
Jeniton.
Northern Spy.
Paradise Winter
Price's Sweet.
Romanite.
Winona Chief.

JAMES HARDWICK, WINONA.

Fameuse.	Haas.
Golden Russet.	Nonpareil.
Price's Sweet.	Talman Sweet.

WINONA CO. FARM. W. D. HATCH.

Duchess of Oldenburg.	Fameuse.
Golden Russet.	Price's Sweet.
Westfield Seek-no-further.	

WILLARD HARRISON, HOMER.

Duchess of Oldenburg.	Fameuse.
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F. B. ROWELL, HOMER.

Duchess of Oldenburg.	Fameuse.
Fall Orange.	St. Lawrence.
Talman Sweet.	

Crabs.

Transcendent.	Siberians.
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S. E. ELDRIDGE, WINONA.

Cheesbouck Russet.	Duchess of Oldenburg.
Fall Pearmain.	Golden Russet.
Jeniton.	Perry Russet.
Phoenix.	Lady Apple.
Price's Sweet.	Talman Sweet.
Saxton.	Willow Twig.
Winona Chief.	

Crabs.

Transparent.	Black Winter Crab.
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NORMAN BUCK, WINONA.

Bailey Sweet.	Fall Orange.
Fall Pearmain.	Fameuse.
Keswick Codling.	Talman Sweet.
Strawberry.	Silver-Blush Seedling.
1 unknown.	

C. F. BUCK, WINONA.

Ben. Davis.	Fameuse.
Fall Pearmain.	Lady Apple.
Westfield Seek-no-further.	1 unknown.

GEO. E. KING, WINONA.

Twenty-ounce Pippin (11 in.)

JOHN HART, HILLSDALE.

American Summer.	Pearmain.
Duchess of Oldenburg.	Early Joe.
Hawley.	Jefferson County.
Saxton.	Utter's Large Red.
Yellow Bellflower.	Red Astrachan.
6 varieties seedlings.	

Summer Varieties.

Benoni.	Paradise.
Red Astrachan.	Seedling No. 8.

O. M. LORD, ROLLINGSTONE.

Fameuse.	2 unknown.
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MRS. MARY CAMPBELL, ROLLINGSTONE.

Baldwin.	Blushing Lady.
Duchess of Oldenburg.	Fameuse.
Utter's Large Red.	
4 varieties seedlings—No. 3 named Dumelon.	

JAMES MITCHELL, HILLSDALE.

Perry Russet.	4 unknown varieties.
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P. A. JEWELL, LAKE CITY.

Duchess of Oldenburg.	Fall Stripe.
Green Winter.	Haas.
Peach.	

Crabs.

Aiken's Green Winter.	Beecher's Sweet.
Badger State.	Conical.
Early Strawberry.	Gen. Grant.
Hesper Rose.	Maiden's Blush.
Orion.	Orange.
Quaker Beauty.	

I. H. MOULTON, EAST MINNEAPOLIS.

Cordell.	Fameuse.
Haas.	Red Astrachan.
Saxton.	Walbridge.
Wealthy.	

Russian Apples.

Transparent Muscovite.

Nos. 580, 543, 985, 987, 377, 587, 463, 988, 274, 393 and 190, in catalogue of apple trees imported in 1870, from St. Petersburg, Russia, by the U. S. Department of Agriculture.

Crabs.

Aiken's Green Winter.	Aiken's Striped Winter.
Beecher's Sweet.	Badger State.
Gen. Grant.	Orange.
Quaker Beauty.	Sweet Russet.
White Winter.	

J. C. BEACH, HOMER.

6 specimens of large apples for name.
Named Cranberry Pippin (by Plumb.)

E. B. JORDON, ROCHESTER, MINN.

Ben Davis.	Carolina Red June.
Duchess of Oldenburg.	Jeniton.
Haas.	Melinda.
Price's Sweet.	Peach.
Seek-no-further.	Saxton.

Crabs.

Aiken's Green Winter.	Beecher's Red.
Beecher's Sweet.	Conical.
Early Strawberry.	Fellows' Winter.
Gen. Grant.	Hesper Blush.
Hyslop.	Maiden's Blush.
Minnesota.	Malakoff.
Meador's Red Winter.	Meador's Green Winter.
Orange.	Sweet Russet.
Transcendent.	

Seedlings.

Haas No. 1, large. Haas No. 2. Haas No. 3, small.

JOHN S. HARRIS, LA CRESCENT, MINN.

Autumn Strawberry.	Ben Davis.
Bailey Sweet.	Cranberry.
Duchess of Oldenburg.	Dominie.
Early Harvest.	Fameuse.
Golden Russet.	Hubbardston's None-such.
Julia.	Jonathan.
Northern Spy.	Pomme de Gris.
Perry Russet.	Price's Sweet.
Plumb's Cider.	Red Astrachan.
Roxbury Russet.	Sops of Wine.
St. Lawrence.	Saxton.
Seek-no-further.	Talman Sweet.
Tetofsky.	White Astrachan.
White Pippin.	Walbridge.
Vandever.	Sylvan Sweet Crab.

[If the names of any contributors have been omitted, the Secretary would like to publish them in a future report.]

LIST OF FRUITS STARRED FOR MINNESOTA IN THE BIENNIAL REPORT OF THE
AMERICAN POMOLOGICAL SOCIETY.

Ben. Davis.*
 Duchess of Oldenburg.*
 Edgar's Red Streak or Walbridge.*
 English Russet or Poughkeepsie Russet.*
 Fall Pippin.*
 Fall Queen or Haas; Gros Pommier.**
 Fameuse or Pomme de Neige; Snow Apple.*
 Gilpin or Curthouse; Little Romanite.*
 Golden Russet, of Western New York.*
 Gravenstein; ripens early and keeps late.*
 Hawthornden *
 Late Strawberry or Autumn Strawberry.*
 Maiden's Blush.*
 Plumb's Cider.*
 Rambo.*
 Red Astrachan.*
 St. Lawrence.*
 Sops of Wine or Hominy.*
 Tetofsky.*
 Talman Sweet.*
 Wealthy.+
 Willow Twig or James River.*

Twenty-two varieties are contained in this list. One variety, the Wealthy, is put down for trial, and one variety, the Haas, is double starred, and this over the Duchess, one of the most hardy, productive and best varieties in the State. It has occurred to us that this list is a little defective and needs some revision. Let us take a glance at the varieties on exhibition at the Centennial, and also at our State Fair, and see if they entirely correspond with the above list. The Hawthornden and Maiden's Blush are neither in the list of apples on exhibition at our State Fair or at the Centennial. No doubt there are some in the list of nearly three hundred varieties of the Pomological Society, besides those starred, that may be adapted to some particular sections of our State. In the list of standard apples sent for exhibition at the Centennial, we find there were of the Duchess of Oldenburg twelve contributors; Fameuse, eleven; Haas, eight; Golden Russet, six; Saxton, six; Wealthy, Russian varieties, Red Astrachan, Fall Orange, Perry Russet, Utter's Red, Price's Sweet, Fall Pearmain, three; Ben. Davis, Keswick Codling, Lady Apple, two. In the remainder of the list no two contributors exhibited the same variety.

In that of those sent for the State Fair, there were of Duchess of Oldenburg, ten contributors; Fameuse, eight; Haas, nine; American Golden Russet, Ben Davis, Pomme de Gris, Saxton, Tetofsky, Wealthy, Utter's Red, four; (Remark, Utter's Red twice by the same exhibitor, as Utter's Red and Lucy.) Dominic, Perry Russet, Rawle's Janet, Seek-no-further, Talman Sweet, Alexander, Plumb's Cider, St. Lawrence, three; Bethlemite, Little Romanite, Northern Spy, Walbridge, Winter Wine, Bailey Sweet, Price's Sweet, Sweet Pear, Fall Orange, Vale's Winter Pippin, Pioneere, Molly, two. In the remainder, no two exhibited the same variety. The above lists show that our Society have

been wise in keeping their list for general cultivation within bounds, rather than having too many varieties to select from.

We generally get our best and greatest number of varieties from those persons most favorably located for fruit raising. If our State could be districted according to limitation of success with certain varieties, it would be of much advantage to those just embarking in fruit culture. For example—a certain portion of the river counties raise fruits that are wholly unadapted to the interior of the State. There are isolated sections in nearly every portion of the State where, from the nature of the soil, elevation or proximity to considerable bodies of water, fruit can be more successfully raised than in the surrounding country. Yet, to publish a suitable list for these locations, would be doing great injustice to those in favored situations, while to limit it to only those varieties which are hardy and successful in all portions of the State would do the more favored equal wrong. I would suggest that the list of fruits cultivated in this State for starrng at the next biennial session of the American Pomological Society, be placed in the hands of a proper committee.

WYMAN ELLIOT.

PART III.—AWARDS AT THE CENTENNIAL ; POMOLOGICAL DEPARTMENT.

The recommendation for awards by the Pomological group of Jurors were adopted by the Centennial Commission without a single exception, as follows, viz. :

CANADA.

Fruit Growers' Association, Ontario.

D. W. Beadle, Sec. St. Catharines	Apples and Grapes.
James Dougal, Windsor	Apples.
Wm. Gourney, Hamilton	Salem Grapes.
W. F. Taylor, Hamilton	Clinton Grapes.
Mayor Pafford, Niagara	Exotic Grapes.
Thomas H. Parker, Woodstock	Grapes under glass.
Chas. Arnold, Paris, Ontario	Apples and Seedling Grapes.
Donald Smith, per Fruit Growers' Society	Apples.
Hugh Scott, Jr., London, Ontario	Apples.
Jas. M. Stacy, Masonville	London Pippins.
J. W. Newman, Lachine	Seedling Apples.
J. Morgan, Quebec	Collection of Grapes.

CONNECTICUT.

State of Connecticut	Apples, Pears and Plums.
S. S. West, Columbia	Apples.
T. C. Austin, Middletown	Apples.
T. S. Gould, West Cornwall	Apples and Pears.
P. M. Augur, Middlefield	Apples.

David Williams, East Hartford	Apples.
B. H. Atwater, Berlin	Apples.
P. D. Stillman, Hartford	Pears.
John Turner, Norwich	Pears.

DELAWARE.

E. Anderson, Felton	Pears.
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DISTRICT OF COLUMBIA.

John Saul, Washington	Pears.
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FLORIDA.

Redmond & Co., Pensacola	Figs.
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INDIANA.

Indiana Horticultural Society, Wm. H. Ragan, Secretary, Clayton	Apples and Pears.
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IOWA.

Iowa State Horticultural Society	Apples and Pears.
Z. H. Hollingsworth, Sandusky	Apples.
R. S. Willet, Malcolm	Apples.
E. H. Elkins, Burlington	Apples.
Jas. Smith, Des Moines	Apples.
State of Iowa	Apples.
W. W. Gearheart, Burlington	Apples.
David Leonard, Burlington	Apples.
Henry Avery, Burlington	Apples.
T. C. Barney, Keokuk	Pears.
John Given, Keokuk	Pears.
G. O. Hilton, Keokuk	Pears.
G. B. Bracket, Denmark	Pears.
W. T. Smith, Des Moines	Pears.

KANSAS.

Kansas State Board of Centennial Managers, Topeka	Apples.
Leavenworth County Horticultural Society	Apples.
Dr. J. Stayman, Leavenworth	Apples.
D. L. Hoadley, Lawrence	Apples.

MAINE.

Maine Pomological Society	Apples.
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MASSACHUSETTS.

Massachusetts Horticultural Society	Apples and Pears.
Joseph H. Fenno, Revere	Apples and Pears.
Benjamin G. Smith, Cambridge	Apples and Pears.
J. W. Manning, Reading	Apples.
Worcester County Horticultural Society	Pears.
Samuel Hartwell, Lincoln	Apples.
John Cummings, Woburn	Apples.
Worcester County Agricultural Society	Pears.

Chas. F. Curtis, Jamaica Plain	Pears.
Wm. H. Earle, Worcester	Pears.
Mrs. Geo. A. Chamberlain, Worcester	Pears.
Hon. Marshal P. Wilder, Boston	Pears (400 varieties.)
Hovey & Co., Cambridge	Pears (175 varieties.)
Amos Bates, Hingham	Pears.
Griffin & Dolan, Cambridgeport	Pears.
O. B. Hadwen, Worcester	Pears.
F. & L. Clapp, Dorchester	Pears.
Newel Wood, Millberry	Pears.
E. W. Lincoln, Worcester	Pears.
John C. Newton, Worcester	Pears.
Robert Manning, Salem	Pears.

MICHIGAN.

Michigan State Horticultural Society	Apples.
Michigan State Pomological Society	Peaches and Prunes.
N. Helling & Bro., Battle Creek	Apples.
J. W. Humphrey, Plymouth	Apples.

MINNESOTA.

Minnesota State Horticultural Society	Apples.
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NEBRASKA.

Nebraska Horticultural Society	Apples and Pears.
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NEW JERSEY.

New Jersey State Horticultural Society	Apples, Pears, Grapes and Peaches.
Agricultural Society of Egg Harbor	Grapes.
Thos. J. Beans, Moorestown	Peaches.

NEW YORK.

Elwanger & Barry, Rochester	Apples, Pears, Grapes and Plums.
J. B. Seely, Vine Valley	Grapes.
Jas. H. Ricketts, Newburgh	Seedling Grapes.

NORTH CAROLINA.

Natt. Atkinson, Asheville	Apples.
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OHIO.

Ohio Horticultural Society, M. B. Bateman, Secretary, Paynesville ..	Apples.
F. S. Cary, Hamilton	Apples.
Geo. W. Campbell, Delaware	Grapes.

OREGON.

H. Lambert, Portland	Apples.
Seth Lewelling, Milwaukee	Pears.
Joseph E. Ledlock, Portland	Collection of Prunes.

PENNSYLVANIA.

Berks County Agricultural Society.....	Apples
Mrs. G. W. Carpenter, Germantown.....	Peaches.
Daniel Smeych, Lancaster.....	Peaches, Pears and Apples.
Fred Seitz, Sr., Easton.....	Nectarines.
Alfred Sheller, Lewisburg.....	Apples.
H. M. Engle & Son, Marietta.....	Apples.
Samuel Streeper, Broad Axe.....	Apples.
Sam. W. Noble, Jenkintown.....	Apples.
J. M. Nelson, Indian Run.....	Apples.
P. Kieffer, Philadelphia.....	Pears.
James Wardrop, Pittsburgh.....	Pears.
Washington Brookman, Reading.....	Pears.
E. N. Wright, Germantown Hothouse.....	Grapes.

NOTE.—The State Horticultural Society of Pennsylvania exhibited at Horticultural Hall in the city of Philadelphia.

WISCONSIN.

Wisconsin State Horticultural Society..... Apples.

The acting judges were Mr. Yellowly, of Mississippi, Mr. Lyon, of Michigan, Mr. P. Earle, of Illinois, Messrs. Harrison, Schaffer, Satterthwaite, Hoopes and Meehan, of Pennsylvania, Parry, of New Jersey, and Foster, of Iowa.

PART IV.—STATE EXHIBITIONS.—AMERICAN POMOLOGICAL SOCIETY REUNION. PREPARED BY WYMAN ELLIOT.

While looking over this vast area of fruit, many varieties unknown in this cold climate, or at least adapted only to more southern latitudes, we could but admire the taste exercised in making selections for exhibition, and the care with which they had been packed and labeled. In many instances, each variety of six specimens was enclosed in a manilla paper sack, or, when too large, each specimen was wrapped in soft paper; each variety, or when packed singly each specimen, being plainly labeled, which added much to the ease and rapidity of unpacking and placing on exhibition.

Wisconsin made a fine exhibit; and why should she not, with such men as A. G. Tuttle and J. C. Plumb to collect her fruits and place them on exhibition?

A seedling, the Darkham Russet, a good cooker, bearer, and hardy tree; healthy, good grower, spreading habit; color red russet, size above medium; is spoken of by Mr. Tuttle as one of the best new apples for their section. Also, the Kellog Russet, hardy, upright, stout grower, productive, good keeper; a seedling from Golden Russet. A dark-reddish apple, called Black Vandever, is mentioned as very hardy in that state.

Iowa, in trying to excel Kansas in quantity, if not in varieties and fine specimens, made a grand display. Her crabs were very fine, the largest Hyslop being $6\frac{3}{4}$ inches in circumference. One feature of her fruit exhibit, and a very good one, was samples in wax of their fruit exhibited at Chicago last year.

Illinois was well represented. In conversation with one of her fruit men we were told he had a new process for raising orchards which would succeed on any prairie soil, but he was loth to impart information unless paid for it. Take it for what it is worth, everything in and about this grand show was to make money off the visitors. His remedy for the codling moth was to set sour milk in pans among his trees, placing lights over them, the moths being attracted by the light drop into the milk. The milk is also relished by the moth, each serving the other as a trap to beguile the insect to death. While talking with Z. M. P. King, of Washington, D. C., on the hardiness of trees, he being a man that had taken considerable interest in fruit growing, said that many trees grown south were equally hardy when taken north, and suggested that we procure scions from the mountainous regions of South Carolina and experiment as to hardiness, for, said he, "I know of some varieties that have done admirably when taken north."

California, that boasts of such wonderfully fine fruits, started out to make a fine exhibit; but her efforts, like her fruits, were not lasting. After being shipped such a long distance the fruit soon decayed, and the third day their tables were cleared, leaving only the vacant boards to show conclusively that northern fruits were better keepers and better adapted to such exhibitions.

Grapes were not exhibited in so large quantities as one would expect, but those that were placed on exhibition were magnificent specimens, especially the Delaware, from J. B. Seeley, Vine Valley, N. Y. He had one bunch weighing ten and one-half ounces.

J. H. Ricketts', of Newburg, N. Y., seedling grapes were a wonderful collection of over sixty plates, of all flavors and shades of color. The exclusive right to propagate certain of these he has sold for \$5,000.

Though unaided by our State Legislature we were enabled, by the generosity of a few of our fruit growers, to make a very creditable show. Had the fruits sent by our worthy President and John S. Harris, arrived, we should have been better prepared to cope with other States. As it was, the varieties on exhibition compared favorably with the same varieties from other localities. High freight and the poverty of our Society, deterred us from sending forward the quantity of each variety that some States exhibited. Our Crabs were a wonder to many; a limb two feet long containing fifty apples attracted universal attention.

The want of proper information in regard to directing packages of fruit, was the reason your delegates failed to receive the fruits of Pres. Smith and brother J. S. Harris, two of the most essential collections made up by our members for that occasion.

We applied for instructions to our State Centennial Board, but as they were then in Philadelphia we were unable to procure the information we so much needed.

The American Pomological Society, through its treasurer, sent out cards to the members containing the following: "The grand exhibition of fruits at the Centennial is to take place from Sept. 11th to 16th. Our members will join in a social reunion on the 14th of that month, by invitation of the Penn. Horticultural Society."

When our collection was ready to forward no one knew whether to direct to the State Centennial Board, Centennial board of Commissioners, or Penn. Horticultural Society. We accordingly directed as we thought best to Penn. Horticultural Society.

We, as delegates, express our satisfaction at the promptness of those members who aided in making the collection, and especially commend the zeal of, and assistance rendered by, Norman Buck, Esq., of Winona. The morning we reached Winona was stormy and disagreeable, but Mr. Buck saved us much trouble by having all fruit collected at his office. Mr. Hart drove in from his place through the storm to bring us specimens that just filled a deficient spot. On the whole, the collection from Winona county was a very marked feature in our exhibition.

In accordance with the invitation of the Pennsylvania Horticultural Society to the members and friends of the American Pomological Society to a social reunion, a reception was held September 14th, at Horticultural Hall, Broad street, all the more enjoyable to the large number of guests present on account of its informality. The numerous guests were received by Mr. J. E. Mitchell, Chairman of the Committee of Reception; Mr. W. L. Schaffer, President of the Horticultural Society; Mr. A. W. Harrison, Secretary, and other officers. The Hall was beautifully decorated with flowers, foliage and tropical plants, flags and elegant damask curtains. A large portrait of Hon. Marshall P. Wilder occupied a place in the center of the stage and was a marked feature of attraction. As he was prevented by illness from being present, the likeness, to those who were wont to behold him on like occasions, full of wit and humor, made up in part for his absence. He has been President of the American Pomological Society since its organization twenty-seven years ago.

He sent to the Pennsylvania Society his sincere regret that he could not be present on such a happy occasion, with the following sentiment:

"The Pennsylvania Horticultural Society, a great leader in the cause of American horticulture. Renowned and prosperous in the past, may it be remembered, honored and revered as a benefactor to our country and the world."

To this, President Shaffer gave this response:

"The American Pomological Society, may it continue to flourish and produce good fruits in the long future, as it has in the past quarter of a century under the skillful and genial culture of its distinguished chief, Marshall P. Wilder, and his able assistants."

Among the members of the Pomological Society present were,

Dr. J. A. Warder, of Ohio, and P. Barry, of Rochester, N. Y., Vice Presidents ; Thomas P. James, Treasurer ; Judge Sley, Charles M. Hovey and Robert Manning, of Boston ; Wm. Parry, of N. J. ; P. Berckmans and Charles Downing. Other distinguished guests present were Count Dassie, of Italy ; Profs. Garde, from Norway, and Elias, from Egypt ; Rusten Effendi, Turkish Commissioner ; several Canadian Commissioners ; Gov. Anthony, of Kansas ; Prof. Thurber, of New York, and Messrs. Saunders, of Washington, Parsons of Flushing, Breckenridge of Kentucky, and G. E. Morrow, Secretary of the American Agricultural Congress. In addition to these, there were present members of the ladies' committee and several officers of the United States Centennial Commission and Board of Finance.

We present the Pennsylvania Horticultural Society's programme and Centennial desert table for the year 1876, to be preserved by our Society.

We have here sketched a few of the many things we saw, felt, smelled, tasted, and heard, for it required all the senses to take in this vast panorama of productions and inventions, the handiwork of woman as well as man. We have not attempted to describe all that we saw and heard, but spoken only of that which we considered interesting and instructive to our Society and the fruit growers of our State.

WYMAN ELLIOT.

PART V.—EXHIBITION OF PENNSYLVANIA HORTICULTURAL SOCIETY.

We cannot conclude this report without referring to the meeting of the old Pennsylvania Horticultural Society, an institution which has grown very strong in the popular affection. The annual meeting took place Sept. 12 to 14, according to announcement, and through the courtesy of Mr. Harrison, their secretary, your delegates were presented with a free ticket to the exhibition and also to the reception given on the evening of the 14th.

Occurring at the same time of the meeting of the American Pomological Society at the Centennial, it proved a much greater success than could have been anticipated. Fruits were particularly beautiful and abundant, and judging from what we saw Pennsylvania must stand in the front rank as a fruit-growing State.

President Wilder, of Boston, had a fine collection of pears, as also did Hovey & Co., of Cambridge, Mass., besides some others. The Fruit-Growers' Society of Potomac, contributed some choice specimens of fruits, and the finest peaches we saw were from Mt. Vernon, Va.

The collection of plants was unusually fine and well grown, and embraced a large number of beautiful novelties. The designs and

ornaments of cut flowers would pass a critic's eye, showing that the City of Brotherly Love was fully up to the standard. The word "beautiful" seemed to pass every lip, but we thought it a tame expression of what we saw. Among the designs we noticed a ship made of cut flowers, which seemed to be plowing the waves across the ocean's broad expanse. Its sails were made of the white flowers of the Pampas grass, and stood unfurled before the breeze.

The basement of the building was fitted up for the exhibition of vegetables, of which there was a fine display, but nothing better than we frequently see in our own State.

At the reception given by the Horticultural Society to their pomological brethren, President Schaffer received the guests and all were made to feel perfectly at home. It was a great occasion for those in kindred pursuits to become acquainted with one another, when hand grasped hand and hearts beat in unison in one common cause—there were no "speeches" for all were full, and silence on such an occasion would have been the better part of eloquence.

And while the Horticultural Society evidently felt gratified that so many had responded to the invitation, we know that none of the guests but felt it was an occasion to be remembered. But still there is a lingering of sadness when he bid farewell to those veterans whose heads have become white in the pursuit of horticultural knowledge, and whose faces we shall probably never see again this side of the garden of Eden.

In conclusion our thanks are due to Capt. J. H. Reaney, agent for the Keokuk Northern Line Packet Company, for giving us a first-class ticket at half-rates from St. Paul to St. Louis on our way to the Centennial. We appreciate such liberality when directed to the interests of a society like ours, laboring at their own expense for the public benefit, and we cordially recommend our friends and the traveling public when going by way of the river to patronize said line.

J. T. GRIMES,
WYMAN ELLIOT,
Delegates of State Hort. Soc. of Minnesota.

APPENDIX B.

LOCAL AND COUNTY HORTICULTURAL SOCIETIES REPORTING.

GERMAN HORTICULTURAL SOCIETY OF RAMSEY COUNTY.

J. C. Fleischer, St. Paul.....President.
 A. Miller, St. Paul.....Secretary.

RICE COUNTY HORTICULTURAL SOCIETY.

R. A. Mott, Faribault.....President.
 A. W. McKinstry, Faribault.....Secretary.

NICOLLET COUNTY HORTICULTURAL SOCIETY.

Ernest Meyer, St. Peter.....President.
 T. G. Carter, St. Peter.....Secretary and Treasurer.

Nine members.

This Society sends the following report :

Annual meeting to be held on last Saturday in February of each year. Secretary authorized to call summer and autumn meetings at his discretion.

Meeting mainly devoted to discussion of locust question, as this county and vicinity is well stocked with eggs. Paris Green recommended as a preventive (five parts flour to one part Paris Green) to keep them off from all kinds of garden vegetables, that being the experience of some of the members in 1875. Since our meeting the locusts have ruined the entire crop of strawberries and raspberries of S. D. Payne, of Kasota, one of our members, and have taken my grapes, strawberries and raspberries. Our President, Mr. Meyer, has had a fair crop of strawberries and raspberries,

his fruit being protected by a strip of timber from the sand prairie where they were hatched in immense numbers.

Hastily,

T. G. CARTER, Secretary.

M'LEOD COUNTY HORTICULTURAL SOCIETY.

James Chesley, Hutchinson.....President.
Wm. H. Pendergast, Hutchinson.....Secretary.

Organized September 27th, 1876, with ten members.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

A. W. Sias, Rochester.....President.
S. D. Hillman, Rochester.....Secretary.

Fourth annual meeting held at Rochester, Feb. 22d, 1877. The following extracts are taken from the report of this meeting :

Varieties of Apples Recommended.

- Wealthy*—For a late fall and early winter variety.
Elgin Beauty—For general cultivation.
Rollin's Russet—For general trial as a winter apple.
Rollin's Prolific and Rollin's Pippin—Second and third for general trial.
Duchess of Oldenburg—For late summer and late fall.
Tetofsky—For early summer.
White Astrachan—For trial.
Haas—For general cultivation for late fall.

Seeding down Orchards.

Mr. Hillman called attention to an inquiry of a Byron correspondent in regard to seeding down orchards, etc.

Mr. Sias said the subject was of much importance, as they had recommended varieties which, under certain conditions, were subject to blight. Some claimed that the *Wealthy* and *Haas* blighted badly. But the varieties that blighted the worst were frequently free from the disease where the orchard was seeded down. Clover was the best for this purpose. Some of the finest varieties might thus be raised and kept free from blight. He valued the blighting varieties highly, and meant to set them largely and seed down to clover. He would seed before planting. He would mulch the trees with straw, but not with manure. He regarded blight as a parasitic funga.

Mr. Mason said he had observed marked results from seeding down. A man near Spring Valley had trees in his garden which

were ruined with blight, while the same variety a few rods away, on sod, were perfect trees. Some varieties required cultivation, and were worthless without it.

Mr. Sias said the slow-growing varieties he would not seed down.

Mr. Jordan said the Duchess was not worth planting unless it was cultivated.

After further discussion, a meeting was appointed to be held at the residence of Mr. William Somerville, when the meeting adjourned.

To give some idea of the horticulture of Olmsted county, the following extracts are inserted here:

MINNESOTA FRUIT.

From Rochester Record and Union of Sept. 8th, 1876.

A few days since, Messrs. Sias & Somerville, proprietors of the College Hill Nursery, presented us with a large basket of fine fruit, which is worthy of more than a passing notice, since they have demonstrated that apples of the finest flavor can be grown successfully in Minnesota. They had picked the apples from their orchard, or nursery, selecting a few specimens from nearly every variety in bearing. There were in the lot 15 specimens of standard apples and 10 different kinds of crabs. Besides these were a number of pears of the Flemish Beauty variety, grown to perfection now for the first time. The following is the list of standard fruit: Duchess, Haas, Tetofsky, Melinda, Fameuse, Sops of Wine, Red Astrachan, Ben. Davis, Goodenough, Prolific, Elgin Beauty, and four kinds of seedlings which appear hardy but have not been named. One specimen of Tetofsky measured $9\frac{1}{2}$ inches in circumference.

Mr. Sias informs us that the Elgin Beauty and Prolific are this year bearing largely in the orchard of Mr. Rollins, the old trees having some three barrels of apples on them. He is not prepared to recommend these varieties fully, and he is experimenting largely with Russian varieties. He has two of the latter which have come into bearing this year—Koursk's and Vasilis Largest.

The latter variety resembles the Duchess somewhat. It is a large summer apple, and appears as hardy as the Duchess.

A SUCCESSFUL FRUIT GROWER.

From Rochester Record and Union, of January 26, 1877.

Mr. R. L. Cotterell, of Dover, has one of the best, if not the

best, orchard in this county. It contains some four or five acres, filled with the leading hardy trees, both of crab and standard varieties. He has a number of trees which were purchased of A. W. Sias, of this city, some fourteen years ago, that are now over a foot in diameter. Last year his orchard was so heavily laden with fruit that many trees were seriously injured by the breaking of the limbs. His success in fruit growing may be readily seen from the crop of apples raised last year. He sold over \$200 worth of apples, besides using a large quantity himself and manufacturing several barrels of cider. He also stored away sixteen barrels of fall and winter varieties of apples for his use during the winter. He cannot give an accurate statement of the number of bushels of apples produced, but says that he had no difficulty in disposing of his Duchesse at \$4.00 per barrel, when imported apples were selling at \$3.50. The Duchesse are the most profitable apple grown, but they do not bear heavily only each alternate year. One tree, which was laden the heaviest with fruit, produced apples 11½ inches in circumference.

The Fameuse or snow apple is an annual and heavy bearer and is a profitable tree. The standard apples are principally the following, given in the order in which they ripen: Red Astrachan, Sops of Wine, Tetofsky, Duchesse, Haas, St. Lawrence, Fameuse, Red Romanite, Greening and Russet. There are also two or three kinds of sweet apples raised. He has not suffered much loss from winter-killing, of the kinds named, and says he would plant again in the event of their being killed. The orchard when in full bloom, or later in the season when fairly groaning under its heavy load of delicious fruit, presents a fine appearance. It is almost enough to cause the average Minnesota farmer to break one of the commandments and covet his neighbor's goods. The specimens of apples shown us by Mr. Cotterell, on the occasion of a recent visit, were very large and fine. We could scarcely help wishing that every farmer in the county had as good an orchard and was as comfortably situated.

THE ROCHESTER NURSERY.

From Rochester Record and Union, of July 27, 1877.

We had occasion to call a few minutes one day this week, at the nursery of Mr. M. W. Cook, in East Rochester, and we were very agreeably surprised at the success he has attained in the cultivation of small fruit and nursery stock. He was busy among his strawberry vines, of which he has about eight acres. He finds the growth of small fruit, in connection with his nursery, both a pleasant and profitable occupation. He has picked over two hundred bushels of strawberries this year, averaging from 300 to 700 quarts daily during the picking season—all of which were sold at fifteen cents per quart.

It was impossible to supply the local demand, and he will soon enlarge his berry "patch," as he considers five acres of strawberries more profitable than the best one hundred acres of wheat which can be produced. He picked 150 bushels of berries this year from $1\frac{1}{4}$ acres of the Wilson and Col. Cheney varieties. One picking yielded 480 quarts. They were set two feet apart one way and one foot the other.

Mr. Cook is now picking his raspberries. He considers they will not yield over one-tenth of a full crop this year.

The trees in the nursery are in a very thriving condition. He set out over 60,000 grafts this last spring, of leading varieties. He has 8,000 fine two year old Duchess trees in one place, and 3,000 in another. He has 5,000 Orange crab, 3,000 Haas, 2,000 Tetofsky, and quite a large stock of other leading varieties of trees. Mr. Cook makes it a point to keep the grass and weeds down by means of thorough cultivation.

From Letter of E. B. Jordon.

It may be of some interest to you to know the varieties of fruit trees I have now planted and growing in orchard, which is about as follows: 1. Wealthy, apple, 3,000 trees; 1. Melinda, 2,500; 1. Duchess, 1,500; 2. Haas, 1,000; 1. Tetofsky, 200; 2. Plumb's Cider, 100; 2. Saxton, 50; 3. Ben. Davis, 50; 3. Fameuse, 50; 2. Rollins' Russet, 300; 1. Peach Apple, 50; 3. Walbridge, 50; 3. Pewaukee, 50; 3. Sops of Wine, 75; 2. Jeniton and one kind 4., 25 (I have two varieties of Jenitons, one has borne on my grounds every year since the spring of 1873, the other is not hardy); 3. Utter's Red, 50; 3. Bethel, 50. Also, from two to twenty-five of the following: 3. Autumn Strawberry; 2. Northern Spy; 3. Price's Sweet; 3. Red Bud; three varieties of 1. Haas' Seedlings; 4. Talman Sweet; 3. Blue Pearmain; 2. Rollins' Prolific; 1. Elgin Beauty; 1. Wabasha; 2. Early Pinnock; 2. Viola; 4. Willow Twig; 4. Black Gilliflower; 2. Fulton Beauty; 2. Bailey Sweet; 3. Price's Sweet; 2. Baxter's Pound; 3. Goodenough; 2. Domanista; 2. Blue Pearmain; 3. Winona Chief; 3. King of Minnesota; 4. Bennett's Yellow; 5. Canada Red; 2. Fall Orange; 4. Fall Pippin; 2. Rollins' Winter Sweet; 3. Hart's Early; 3. Sweet Pear; 3. Ramsdale Sweet; 4. Dominie; 5. Smith's Cider; 3. Kirkbridge White; 4. Carolina Red June; 1. Fisher's Maiden's Blush; 2. Fisher's Favorite; 2. Red Bud; 3. Seek-no-further.

I have marked the apples 1, 2, 3 and 4, which may indicate their standing with me for hardiness.

I have some other kinds, such as Perry Russet, Golden Russet, Grimes' Golden Stark Apple, &c., that I have omitted to mention, as they have all been thrown out with (or by) me some time since.

Of crabs I will only mention a few of the leading sorts that I

have the most of under cultivation in orchard: Orange, 200; Beecher's Red, 200; Conical, 130; Gideon's No. 5, 75; General Grant, 25; Minnesota, 50; Early Strawberry, 50; Hesper Blush, 25; Meader's Red Winter, 25; Beecher's Sweet, 30; Aiken's Green Winter, 20; Gideon's Nos. 3 and 6, about 25 each.

My orchard covers a little over fifty acres.

E. B. JORDON.

ROCHESTER, Minn., Jan. 16, 1877.

APPENDIX C.

INCORPORATION OF THE SOCIETY.

ARTICLES OF INCORPORATION OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

Know all men by these presents, that we, the undersigned, John S. Harris, of La Crescent, Houston county, John H. Stevens, of Hennepin county, Wyman Elliot, Charles Hoag, J. T. Grimes, A. Stewart, R. J. Mendenhall, Peter M. Gideon and Charles H. Clark, all of Hennepin county, D. A. J. Baker, Truman M. Smith, D. A. Robertson, William E. Brimhall, H. J. Brainard, L. M. Ford and Wm. Paist, all of Ramsey county, and Thomas Ramsden of Washington county, O. F. Brand, A. W. McKinstry and Levi Nutting, all of Rice county, and P. A. Jewell, of Wabasha, E. H. S. Dart, of Owatonna, Steele county, all of the State of Minnesota, do hereby associate ourselves together for the purpose of becoming incorporated under the name, and for the purposes hereinafter stated, pursuant to the provisions of title and chapter 34 of the General Statutes of said State of Minnesota, so far as the same may be applicable, and do now adopt the following Articles :

ARTICLE 1. This corporation shall be known as the Minnesota State Horticultural Society.

ARTICLE 2. The object of the society shall be to collect, condense and collate information relative to all varieties of fruits, flowers, and other horticultural productions, and dispense the same among the people.

ARTICLE 3. Any person interested may become a member of the society by paying to the Treasurer or Secretary, the annual fee of one dollar, and signing the constitution and by-laws. The wives of members shall be members of the society without the payment of a membership fee.

ARTICLE 4. The amount of capital stock of this corporation shall be twenty-five thousand dollars (\$25,000,) with privilege to increase it to \$100,000, to be held in shares of twenty-five dollars each.

ARTICLE 5. The officers of this society shall be as follows: President, one Vice President to reside in each Congressional District of this State, Secretary, Treasurer, and an Executive Committee of three or more members, all of whom shall be elected by ballot at the annual meetings of this society, which shall be held on the 3d Tuesday in January.

ARTICLE 6. The principal place of business shall be wherever the majority of the society may hereinafter designate.

B Y - L A W S

ADOPTED AT THE ANNUAL MEETING HELD JANUARY 20-23, 1874.

DUTIES OF OFFICERS.

1. It shall be the duty of the President to preside at all meetings of the society, when present, and to deliver an address at the annual meeting of the same. In the absence of the President, one of the Vice Presidents shall preside in his place.

2. The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the society; establish and maintain correspondence with all local, county, district and State horticultural societies, and secure by exchange their transactions, as far as possible; to aid the President as an executive officer, in the dispatch of business relating to meetings of the society, and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which shall become part of the transactions for the current year, and shall be prepared by him for the public printer.

3. The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the Secretary countersigned by the President.

4. An Executive Committee of five shall be chosen annually, who shall, in connection with the President and Secretary, (who shall be members ex-officio) have in charge all matters pertaining to the interests of the society; shall revise all matter coming into the hands of the Secretary, and pass upon the same their approval before its submission to the annual meeting.

5. The Executive Committee may call a meeting of the society at any time and place they may deem advisable for the interests of the society, giving at least thirty days' notice through the public press, and shall in no case incur any expense exceeding fifty dol-

lars except by authority of the vote of the society at its annual meeting, when the specific object and the amount so appropriated shall be designated.

6. The President, at each annual meeting of the society, or as soon thereafter as practicable, shall appoint a General Fruit Committee, consisting of one member from each Senatorial District in the State, and it shall be the duty of each member to report upon the fruit crop in his respective district annually; also a limited list of fruits best adapted to general cultivation in the district which such member represents.

7. That committees on vegetables and market gardens; flowers and floriculture; trees for the forest and forest culture, and entomology, be appointed each year, whose duties it shall be to report on their several topics to this society at the annual meeting.

8. The society may at any regular annual meeting elect as honorary members, any person or persons who may have performed valuable services for the society, or upon whom the society may wish to confer special honor. Such memberships shall be held for five years from date of election, and shall be entitled to all the privileges of the society except voting.

9. Final Article. These By-Laws may be amended by a two-thirds vote of the society at any regular annual meeting.

APPENDIX D.

LAWS OF SPECIAL INTEREST TO HORTICULTURISTS.

FROM CHAPTER 57 OF THE GENERAL LAWS OF MINNESOTA
FOR 1877.

Be it enacted by the Legislature of the State of Minnesota :

SECTION 1. Chapter thirty-eight (38) of the General Laws of one thousand eight hundred and seventy-four (1874), entitled "An act for the preservation of game," is hereby amended to read as follows:

SEC. 1. No person shall kill or pursue with intent to kill any woodcock, saving only during the month of July after the third (3d) day of said month, and during the months of August, September and October; nor any prairie hen or chicken, nor any white-breasted or sharp-tailed grouse or prairie chicken, save only during the month of August after the fourteenth (14th) day of said month, and during the month of September; nor any quail or partridge, save only during the months of September, October and November, nor any ruffed grouse or pheasant, save only during the months of September, October and November; nor any aquatic fowl, save only between the first (1st) day of September and the fifteenth day of May succeeding, in any year.

SEC. 6. No person shall break up or destroy, take away, or in any manner interfere with any nest, or the eggs therein, of any woodcock, snipe, quail, partridge, ruffed grouse or prairie chicken, pheasant, plover, or any species of wild duck, brant or wild goose, not domesticated; nor shall sell or expose for sale the said eggs, nor shall have the same in his possession for any purpose. And every railroad company and every express company, and all employees and agents of the same, shall be deemed persons within the meaning of this section; and any person or persons offending against any provision of this section, shall be punished by a fine of not less than five (5) nor more than fifty dollars (\$50,) and by the forfeiture of all eggs in his or their possession, together with the costs of prosecution.

SEC. 8. No person shall kill, cage or trap any whipporwill, night hawk, blue bird, finch, thrush, lark, linnet, sparrow, wren, martin, swallow, bobolink, robin, turtle dove, cat bird, or any other harmless bird not elsewhere mentioned in this chapter, excepting blackbirds and wild pigeons. Any person or persons offending against any of the provisions of this section shall be punished by a fine of not less than five [dollars] (\$5) nor more than fifty dollars (\$50,) or by the forfeiture of any gun or guns, cage, trap, net or any other device, and all sporting implements in his or their possession, together with the costs of prosecution, or both, in the discretion of the court.

* * * * *

SEC. 11. No person shall at any time enter into any growing or standing grain not his own, with sporting implements about his person, nor permit his dog or dogs to enter into any such grain without the permission of the owner or occupant thereof; and any person who shall enter upon the premises of another with gun, dogs, or any sporting implements upon his person, without permission of [the] owner or occupant thereof, from and after the first (1st) day of December of any year, to or before the fifteenth (15th) day of August following, with intent to kill, hunt or pursue any animal or game-bird, the killing of which is forbidden by this act, at any time (except woodcock, during the period it is lawful to kill the same,) shall be liable to a fine of ten dollars (\$10.00) for such offense, to be recovered by action before any justice of the peace of the county where the offense was committed, by the owner or occupant of said premises. But nothing in this section contained shall be construed to limit or in any wise to affect the remedy of the owner of any such grain or premises, or of the person injured, at common law for trespass.

For penalties and methods of proceeding, see General Laws for 1877. Page 91.

From Statutes at Large of Minnesota, Bissell, page 1001:

SEC. 114 (45). Willful trespass on garden, orchard, etc., how punished.—Whoever willfully commits any trespass by entering upon the garden, orchard, or other improved land of another without permission of the owner thereof, and with intent to cut, take, carry away, destroy, or injure the trees, grain, grass, hay, fruits or vegetables there growing, or being, shall be punished by a fine not exceeding fifteen dollars nor less than three dollars.

TRANSACTIONS
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY,

PROCEEDINGS, ESSAYS, AND REPORTS

AT THE
ANNUAL WINTER MEETING,

HELD AT

Rochester, January 15th, 16th and 17th, 1878.

PREPARED BY CHAS. Y. LACY, SECRETARY.

MINNEAPOLIS :
JOHNSON, SMITH & HARRISON.
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1878,

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OFFICERS FOR 1878.

PRESIDENT.

TRUMAN M. SMITH.....St. Paul.

VICE PRESIDENTS.

J. S. HARRIS, First District.....La Crescent.

DITUS DAY, Second District.....Farmington.

U. S. HOLLISTER, Third District.....St. Paul.

SECRETARY.

CHAS. Y. LACY.....Minneapolis.

TREASURER:

A. W. SIAS.....Rochester.

STANDING COMMITTEES.

EXECUTIVE.

M. PEARCE.....Rochester.

WYMAN ELLIOT.....Minneapolis.

GEO. W. CLARK.....Winona.

O. F. BRAND.....Faribault.

WM. E. BRIMHALL.....St. Paul.

President and Secretary, *ex officio*.

COMMITTEE ON LOCAL SOCIETIES.

J. S. HARRIS.....	La Crescent.
A. W. LATHAM.....	Excelsior.

COMMITTEE TO VIEW HART'S SEEDLING STRAWBERRY.

M. W. COOK.....	Rochester.
A. W. SIAS.....	“
GEO. W. MASON.....	“

DELEGATE TO MEETING OF WISCONSIN HORT. SOCIETY.

A. J. PHILLIPS.....	West Salem, Wis.
---------------------	------------------

DELEGATES TO MEETING OF STATE AGR. SOCIETY.

WYMAN ELLIOT.....	Minneapolis.
O. F. BRAND.....	Faribault.
B. F. PERRY.....	Rochester.
TRUMAN M. SMITH.....	St. Paul.
DR. TWITCHELL.....	Chatfield.

CORRESPONDING SOCIETIES.

UNITED STATES DEPARTMENT OF AGRICULTURE.

Hon. Wm. Le Duc, Washington, D. C.....	Commissioner.
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AMERICAN POMOLOGICAL SOCIETY.

Hon. M. P. Wilder, Boston, Mass.....	President.
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MONTREAL AGRICULTURAL AND HORTICULTURAL SOCIETY.

Henry S. Evans, Montreal, P. Q.....	Sec'y and Treas.
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FRUIT GROWERS ASSOCIATION OF ABBOTTSFORD.

Charles Gibb, Abbotsford, P. Q.....	Secretary.
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WESTERN NEW YORK HORTICULTURAL SOCIETY.

Patrick Barry, Rochester, N. Y.....	President.
P. C. Reynolds, Rochester, N. Y.....	Sec'y and Treas.

ILLINOIS STATE BOARD OF AGRICULTURE.

S. D. Fisher, Springfield, Ill.....Secretary.

ILLINOIS STATE HORTICULTURAL SOCIETY.

O. B. Galusha, Morris, Ill.....Secretary

MAINE STATE POMOLOGICAL SOCIETY.

Geo. B. Sawyer, Wiscasset, Me.....Secretary.

MICHIGAN STATE POMOLOGICAL SOCIETY.

Chas. W. Garfield, Grand Rapids, Mich.....Secretary.

FRUIT GROWERS ASSOCIATION OF ONTARIO.

D. W. Beadle, St. Catharines, Ont.....Secretary.

NEBRASKA STATE HORTICULTURAL SOCIETY.

D. H. Wheeler, Plattsmouth, Neb.....Secretary.

WISCONSIN STATE HORTICULTURAL SOCIETY.

F. W. Case, Madison, Wis.....Secretary.

MICHIGAN STATE BOARD OF AGRICULTURE.

Robt. G. Baird, Lansing, Mich.....Secretary.

IOWA STATE HORTICULTURAL SOCIETY.

J. L. Budd, Ames, Ia.....Secretary.

MINNESOTA STATE AGRICULTURAL SOCIETY.

R. C. Judson, Farmington, Minn.....Secretary.

GERMAN HORTICULTURAL SOCIETY OF RAMSEY COUNTY.

J. C. Fleischer, St. Paul.....President.
A. Miller, St. Paul.....Secretary.

RICE COUNTY HORTICULTURAL SOCIETY.

R. A. Mott, Faribault.....President.
A. W. McKinstry, Faribault.....Secretary

NICOLLET COUNTY HORTICULTURAL SOCIETY.

Ernest Meyer, St. Peter.....President.
 T. G. Carter, St. Peter.....Secretary and Treasurer.

M'LEOD COUNTY HORTICULTURAL SOCIETY.

James Chesley, Hutchinson.....President.
 Wm. H. Pendergast, Hutchinson.....Secretary.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

A. W. Sias, Rochester.....President.
 S. D. Hillman, Rochester.....Secretary.

MEMBERS FOR 1878.

Barry, Hon. P.....	Rochester, N. Y.
Brand, O. F.....	Faribault, Rice county.
Brainard, H. J.....	St. Paul, Ramsey county.
Brimhall, Wm. E.....	St. Paul, Ramsey county.
Cannon, Wm.....	Fort A. Lincoln, D. T.
Carter, T. G.....	St. Peter, Nicollet county.
Clark, Geo. W.....	Winona, Winona county.
Cook, Martin W.....	Rochester, Olmsted county.
Cotterell, R. L.....	Dover, Olmsted county.
Dart, E. H. S.....	Owatonna, Steele county.
Day, Ditus.....	Farmington, Dakota county.
Day, L. E.....	Farmington, Dakota county.
Day, A. A.....	Farmington, Dakota county.
Elliot, Wyman..	Minneapolis, Hennepin county.
Gould, F. G.....	Excelsior, Hennepin county.
Gott, B.....	Arkona, Ont.
Griese, Chas. H.....	Cleveland, O.
Grimes, J. T.....	Minneapolis, Hennepin county.
Hatfield, W. H.....	Dover, Olmsted county.
Harris, J. S.....	La Crescent, Houston county.
Hart, John.....	Winona, Winona county.
Hoag, M. J.....	Rochester, Olmsted county.
Hodges, L. B.....	St. Paul, Ramsey county.
Hollister, U. S.....	St. Paul, Ramsey county.
Jordan, E. B.....	Rochester, Olmsted county.
Kenney, Seth H.....	Morristown, Rice county.
Knaupheide, Rudolph.....	St. Paul, Ramsey county.
Lacy, Chas. Y.....	Minneapolis, Hennepin county.
Latham, A. W.....	Excelsior, Hennepin county.
Mason, Geo. W.....	Rochester, Olmsted county.
McHenry, Wm.....	St. Charles, Winona county.
McKinstry, A. W.....	Faribault, Rice county.
Miller, C. F.....	Dundas, Rice county.
Moritz, Wm.....	St. Paul, Ramsey county.
Norquist, John.....	Red Wing, Goodhue county.
Pearce, M.....	Rochester, Olmsted county.
Perry, B. F.....	Rochester, Olmsted county.
Phelps, Wm. F.....	Winona, Winona county.
Phillips, A. J.....	West Salem, Wis.

Porter, R.....	Rochester, Olmsted county.
Schmaurs, F. J.....	Lake City, Wabasha county.
Sias, A. W.....	Rochester, Olmsted county.
Smith, Truman M.....	St. Paul, Ramsey county.
Smith, T. Tunis.....	St. Paul, Ramsey county.
Somerville, Wm.....	Rochester, Olmsted county.
Thompson, Josiah.....	Minneapolis, Hennepin county.
Turner, H. A.....	Faribault, Rice county.
Twitchell, Dr.....	Chatfield, Fillmore county.
Wachlin, Wm.....	Faribault, Rice county.
Webb, Isaac W.....	St. Paul, Ramsey county.
Wilcox, E.....	Trempeleau, Wis.
Willoughby, John.....	Newport, Washington county.
Wyman, Sam.....	Waseca, Waseca county.

HONORARY MEMBERS.

Geo. Peffer.....	Pewaukee, Wis.....	elected 1874.
Miss Hortense Share.....	Rosemount, Minn.....	elected 1877.
Mrs. C. O. Van Cleve....	Minneapolis, Minn.....	elected 1877.

LIFE MEMBER.

Mrs. Wm. Paist....	St. Paul, Minn.
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FRUIT LISTS,

AS APPROVED OR REVISED AT THE ANNUAL MEETING AT ROCHESTER,
JAN. 15TH TO 17TH, 1878.

NOTE.—It should be remembered that negative votes are not always unfavorable ones. Those casting them may be in favor of placing the variety *either* in a higher or a lower list.

APPLES.

Recommended for general cultivation—

Duches of Oldenburg. Wealthy.

Recommended for planting in limited quantities—

Tetofsky.

Recommended for general cultivation in favorable localities—

Haas. Price's Sweet, (Unanimous vote.)
Plumb's Cider, (Unanimous vote.) Saxton.

Recommended for favorable localities in southern portions of the State—

St. Lawrence. Fameuse, (Unanimous vote.)
Utter's Red. Talman's Sweet.

Recommended for general trial throughout the State—

White Astrachan, (Unanimous vote.) Elgin Beauty, (Unanimous vote.)

Recommended for trial—

Melinda, (Unanimous vote.) Walbridge, (Unanimous vote.)
Stewart's Sweet, (Unanimous vote.) Peach, (Unanimous vote.)

Recommended for trial by amateurs and pomologists (all by unanimous vote)—

Alaska.	Queen of Elgin.
Juha.	Rollin's Pippin.
Molly.	Rollin's Russet.
Clayson.	Rollin's Prolific.
Kimball.	Wabasha.
Hart's Seedling, No. 7.	Hart's Seedling, No. 11.
Viola.	Clara.

CRAB APPLES.

Recommended for general cultivation.

Transcendent, (9 for and 5 against)	Orange, (Unanimous vote.)
Hyslop, (Unanimous vote)	Early Strawberry, (Unanimous vote.)
Beach's Sweet. (Beecher's) (5 for and 2 against.)	

Recommended for planting in limited quantities.

Conical, (8 for and 1 against.)	Maiden's Blush, (Unanimous vote.)
Hesper Blush, (Unanimous vote.)	

Recommended for general trial.

Powers' Large Red, (13 for and 2 against.)	Virginia, (Unanimous vote.)
General Grant, (8 for and 5 against.)	Beach's Red, (Unanimous vote.)

Recommended for trial by amateurs and pomologists.

Minnesota, (Unanimous vote.)	Brier's Sweet, (Unanimous vote.)
Aiken's Str. Winter, (Unanimous vote.)	Quaker Beauty, (10 for and 2 against.)
Whitney's No. 20, (Unanimous vote.)	Woodland Winter (6 for and 2 against.)
Alaska, (Unanimous vote.)	Hutchinsons Sweet, 6 for and 2 against

Varieties quite exempt from blight.

Orange, (Unanimous vote.)	Minnesota, (Unanimous vote.)
Beach's Sweet, (Unanimous vote.)	Power's Large Red, (Unanimous vote.)
Conical, (Unanimous vote.)	Early Strawberry, (9 for and 1 against.)
Maiden's Blush, (Unanimous vote.)	Virginia, (6 for and one against.)
Whitney's No. 20, (Unanimous vote.)	Beach's Red, (Unanimous vote.)

Varieties quite liable to blight.

General Grant, (Unanimous vote.)	
Transcendent, (10 for and 1 against.)	Hyslop, (14 for and 1 against.)

Varieties recommended and not named in these lists were not assigned, either for want of sufficient knowledge, or because they are not decidedly exempt from blight or decidedly liable to it.

GRAPES.

Recommended for general cultivation.

Concord, (Unanimous vote.) Delaware, (Unanimous vote.)

Recommended for planting in limited quantities.

Hartford Prolific, (8 for and 1 against.) Northern Muscadine, (Unanimous vote.)
 Clinton, (11 for and 1 against.) Eumelan (8 for and 2 against.)
 Roger's No. 15, or Agawam, (Unanimous vote.)

Recommended for trial.

Iona, (9 for and 1 against.)
 Janesville, for its earliness, (Unanimous vote.)
 Roger's No. 4 or Wilder, (Unanimous vote.)
 Roger's No. 9 or Lindley, (Unanimous vote.)
 Roger's No. 19 or Merrimack, (Unanimous vote.)

STRAWBERRIES.

Recommended for general cultivation (unanimous vote)—

Wilson's Albany.

Recommended for general cultivation for near market and home use (unanimous votes)—

Downer's Prolific. Charles Downing.
 Green Prolific. Countess de Haricourt.

Recommended for trial—

Seth Boyden, (Unanimous vote.) Col. Cheney, (Unanimous vote.)
 Kentucky, (Unanimous vote.) Prouty's Seedling, (Unanimous vote.)
 Michigan Seedling, (6 for and 1 against.)

RASPBERRIES—BLACK-CAPS.

Recommended for general cultivation—

Doolittle. Seneca.

Recommended for trial—

Ontario.

RASPBERRIES—RED.

Recommended for general cultivation—

Philadelphia. Turner.

CURRANTS.

(Action of 1877.)

Recommended for general cultivation—

Red Dutch.	Victoria.
White Grape.	

Recommended for general cultivation as a black variety—

Black Naples.

Recommended for trial—

Stewart's Seedling.

PLUMS.

(Action of 1876.)

Resolved, That in view of the vast number and variety of native plums of great excellence in our State, and the uncertainty of getting a genuine article by importation, therefore we recommend that our people depend principally upon our own native plums for a supply.

Recommended for trial—

Miner. (13 for, 4 against.)	De Soto. (10 for, 8 against.)
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GOOSEBERRIES.

None were recommended.

EVERGREENS.

List adopted 1876 and approved 1877. The votes recorded are those of 1876.

White Spruce, 1st.	(10 for, 8 against.)
Norway Spruce, 2d.	(11 for, 8 against.)
Scotch Pine, 3d.	(13 for, none against.)
Balsam Fir, 4th.	(15 for, none against.)
White Pine, 5th.	(11 for, none against.)
American Arbor Vitæ, 6th.	(11 for, 2 against.)
Red Cedar, 7th.	(11 for, 4 against.)
Red or Norway Pine, 8th.	(11 for, none against.)
Austrian Pine, 9th.	(9 for, 7 against.)
Mountain Pine, 10th.	(8 for, none against.)
Siberian Arbor Vitæ, 11th.	(14 for, none against.)
Trailing Juniper, 12th.	(13 for, none against.)

PROCEEDINGS

AT THE

WINTER MEETING,

HELD AT ROCHESTER, TUESDAY, WEDNESDAY AND THURSDAY,
JANUARY 15, 16, AND 17, 1878.

The society met pursuant to the following notice which was forwarded by postal card to the principal newspapers and the leading horticulturists of the state.

ANNOUNCEMENTS.

MINNESOTA STATE HORTICULTURAL SOCIETY,
Minneapolis, Dec. 24th, 1877.

The annual winter meeting of this society will be held at Rochester, beginning at 10 o'clock A. M., Tuesday, January 15, 1878, and continuing three days. The following have already promised papers on the subjects named, and favorable answers are daily expected from others.

U. S. Hollister, Esq., St. Paul, "The Growing of Seeds for Market."

Hon. L. B. Hodges, St. Paul, "Planting Trees for Shade and Ornament on Streets and Roads."

E. Wilcox, Esq., Trempeleau, Wis., report on "The Propagation of Hardy Trees."

Hon. R. J. Mendenhall, Minneapolis, report on "Injurious Insects."

J. S. Harris, Esq., La Crescent, report on "The Horticultural Exhibit at the State Fair."

Prof. Chas Y. Lacy, Minneapolis, "Education for Farmers."

The following subjects have been proposed for discussion: "Commercial Fertilizers—does it pay to use them in the West?" "Home made Fertilizers—best plans for securing, composting and applying for fruit and vegetable gardens;"

“Horticultural Literature and Libraries;” “The Orchard—best location, aspect, soil and protection.

Messrs. Miller of Dundas, and Kenny of Morristown, will be present with samples of sugar and syrup, and prepared to answer questions relating to their production. The various fruit lists adopted or approved last year will be taken up for revision. Every facility will be given for the exhibition of fresh and preserved fruits, vegetables and other horticultural products; and it is hoped that this feature will be even more prominent than heretofore. The citizens of Rochester will give free entertainment to members of the society and those becoming members. Such are requested to forward their names to S. D. Hillman, Rochester, Secretary of local committee. All are cordially invited to attend the meeting. The usual reductions in railway fares are expected. No formal programme will be printed, but a second announcement will follow this in a few days.

CHAS. Y. LACY,
Secretary.

MINNESOTA STATE HORTICULTURAL SOCIETY,
Minneapolis, January 11th, 1878.

The annual winter meeting of this Society will be held at Rochester, beginning at 10 o'clock A. M., Tuesday, January 15th, 1878, and continuing three days. The following papers will be on the programme in addition to those already announced:

Mrs. W. L. Breckenridge, Rochester, paper on some floricultural subject.

Col. Geo. Healey, Rochester, “Location, Laying Out, Planting and Care of Cemeteries.”

Wm. Somerville, Rochester, paper on “The Form of Orchard Trees.”

E. B. Jordan, Rochester, (subject not announced.)

M. Pearce, Rochester, “Soil and Cultivation for Fruit Trees.”

J. C. Kramer, La Crescent, paper on “Grapes,” paper on “Potatoes.”

O. F. Brand, Faribault, (subject not announced.)

Judge S. W. Eaton, Rochester, will address the Society.

The following subjects, in addition to those already announced, will be opened for discussion: “The Congressional Tree Planting Act;” “Sorghum, Its Cultivation and Manufacture;” “Uses of Crab and Siberian Apples;” “Probable Effects of the Warm Weather of December, 1877;” “Game, Trespass, and other Laws Affecting the Horticulturist;” “The Garden Pea—Cultivation, Varieties, &c.,” “The Tomato.”

Interesting reports are expected from several committees, and the exhibition of fruits, &c., will, it is hoped, be large and fine. The citizens of Rochester will give free entertainment to members of the Society and those becoming members.

The annual membership fee is one dollar, but all are cordially invited to attend the meeting. The meeting will be held in Good Templars’ Hall, Brown’s Block.

The Winona & St. Peter R. R. will return members at one cent per mile. The Chicago, Milwaukee & St. Paul R. R. has not yet been heard from, but it is confidently expected that it will, as heretofore, return members at one-fifth fare.

CHAS. Y. LACY, Secretary.

Owing however to lateness in the arrival of members, the meeting was not called to order until 2:45 p. m.

ADDRESS OF JUDGE EATON.

At that hour Judge S. W. Eaton, of Rochester, delivered the following address of welcome to the society:

Gentlemen of the Minnesota State Horticultural Society:

I could wish that one more thoroughly versed in the processes and details of your occupation had been selected to occupy the position in which I find myself placed, but yielding to the earnest solicitation of friends, I have consented to address you at this, your yearly convocation, feeling that I shall receive all reasonable indulgence at your hands. My remarks, from the reasons stated, will necessarily be general in their character and import.

I see before me gentlemen from various localities in our beautiful and highly productive state, representatives of a noble and useful occupation. You have, I take it, assembled at our beautiful and thriving city to compare notes and communicate results of your labor and experiments for the past year; to interchange opinions, discuss methods and mature plans for advancement of horticulture in our State.

Your wisdom and business sagacity are apparent in the formation of a society to advance the interests and ensure the success of the branch of industry in which you are engaged. In concert of action there is strength; in co-operation, the grandest results are achieved. In associated effort knowledge is obtained and experience and advantages utilized which would be quite impossible in individual action.

Yours is an honorable and a useful occupation. Among the varied instrumentalities of comfort, refinement and civilization, horticulture occupies a prominent and an honored position. Wholesome, luscious fruit, as all know, constitutes an important factor in the world's living, and no table, however humble, is considered complete without some portion or variety at least of these toothsome productions.

Besides the delicious fruits, no inconsiderable portions of which are being supplied through the efforts of our horticulturists, we should mention the not much less useful, but more ornamental trees, shrubbery, plants and flowers. It has been said that he who causes two blades of grass to grow where only one grew before, is a public benefactor. On the same principle, but in a larger sense, he who causes trees, shrubs, plants and flowers to grow where nothing grew before, either useful or beautiful, confers on the public a lasting good. Indeed, it is not, perhaps, too much to say, that in this state, where there are large treeless districts, the propagation of trees is one of the most necessary and important features of our industries. To my mind, a treeless habitation is no home at all. Even the most elegant and costly residence, built on the most beautiful and eligible site, lacks one of the most important features and attractions of a home, unless surrounded, or at least flanked, by a liberal and tasteful show of trees and shrubbery.

Who, that has any taste, love or appreciation for the beauties and attractions of home, would think of building a house, even of inferior dimensions, on the bleak and unbroken prairie? Fine, vigorous trees, beautiful in appearance, useful in breaking the force of the winter winds and yielding their grateful shade,

impart to any home a charm and an attractiveness which nothing else, procured at the same cost, can afford. The good taste and refinement of the family circle are most happily evinced in the propagation of beautiful plants and lovely flowers in and about the home. More than this, your cemeteries, your streets and farms, your walks, your yards and courts are rendered more beautiful and attractive by a generous and judicious cultivation of shade and ornamental trees—a fact, I am happy to state, which is becoming more generally appreciated in city and country throughout the State.

In the propagation of ornamental trees and of plants, the horticulturists of the State have, I believe, met with general and gratifying success. Also, in the cultivation of the smaller fruits, suited to our soil and climate satisfactory and profitable results have been realized; but from the best information which I have on this subject, I feel compelled to say that in apple raising, much failure and loss have attended the best and most careful exertions of the nurserymen of the State. And yet, we are unwilling to believe that in a State celebrated all over the world for its remarkable fertility of soil and its large variety of productions, the apple cannot be successfully and profitably propagated. We are the more encouraged in this hopeful view from the improved results which we have witnessed in this direction within the past few years. Our horticulturists, profiting by experience, and acquiring knowledge through patient, intelligent investigation and effort, will demonstrate to us to-day that apples, fine, fair and luscious, can successfully be grown in Minnesota. If you doubt this proposition, you should visit, in the proper season, the orchards and nurseries scattered all over the State, or attend the annual county fairs, and you will be convinced. There can be little or no doubt that many of the people of this State have been grossly cheated or deceived in the purchase of apple trees—I refer solely, to this kind of property which has been imported here from other States. In, perhaps, a majority of cases, varieties of trees not adapted to our soil and climate, have been selected, taken up without proper care and boxed up, or otherwise; these trees have been shipped to customers in Minnesota, and when they have arrived here, they were as utterly dead as a last year's brush heap. For years this kind of trade went on, costing our farmers and others large sums of money, besides subjecting them to much labor, cruel disappointment and deep disgust. I do not maintain that there was intentional fraud on the part of the nurserymen in other States in these transactions; all the parties may have been, and probably were, honest; and yet, the ugly fact that our people paid out a good deal of money for apple trees and did not succeed in getting one in one thousand to live and thrive, remains undisputed. Possibly, apple trees started or propagated in another State, hundreds of miles away, may be brought here and cultivated with success, but I am of the opinion that it is not a safe or profitable investment. To be successful, even in a moderate degree, due reference must be had to the varieties selected and proper care in shipping and handling must be observed. However, to me it seems that trees propagated entirely in the State will be found to be the only safe and reliable ones.

I have intimated that the culture of the apple in our State has thus far met with indifferent success. It is not the case, I believe, that any of the horticulturists in the State have experienced as gratifying results in this regard as they could have wished. None have been wholly successful, neither have any to my knowledge, met with entire failure. In reference to the cause of failure, you, gentlemen, are much better qualified to instruct me than I am to enlighten you. You will, however, I know, pardon me for briefly hinting at some of the main

causes which, in my opinion, have heretofore tended to prevent more favorable results. Prominent among these causes may be mentioned the fact that fruit growers have failed in ascertaining the varieties of the apple best suited to our soil and climatic conditions. It is confidently believed—yes, I may say it has already been demonstrated, that there are varieties of apples which, with the proper treatment and care, will do well in our State, both as respects growth and fruitage. Your efforts in the future will more fully demonstrate the best kind of trees to propagate, and your good sense and sagacity will not permit you to hesitate long in adopting the varieties which promise the largest success.

The proper season of the year as well as the best method of transplanting are, of course, essential conditions and cannot have escaped your patient and intelligent observation.

The different varieties of soil, the location of the orchard, the kind of mulching—or whether any is necessary—pruning, the destruction of borers, caterpillars and other pests, are all questions and conditions which in my judgment, are intimately connected with this pursuit, and to which you, of course, have given your earnest and untiring attention.

The citizens of our highly favored State have an interest and feel an honorable pride in its prosperity, its increasing wealth, and in the development of its grand and illimitable resources, and whatever legitimate and honest industry is calculated to subserve these desirable ends should receive the encouragement and fostering care of our people.

The soil of our vast prairies and stretches of wood land, in fertility and in ease of culture, confessedly unsurpassed by that of any other State or district in the world, only awaits the skillful touch of an intelligent and well-directed industry, under the blessing of heaven, to yield a generous and bountiful harvest. From economical considerations, if from no other, we, as a State, should produce, so far as practicable, whatever of the comforts and luxuries of life may be desirable. No money should be sent abroad for any of these which can, with reasonable care and effort, be produced at home. If I am correct in this view, we should foster and encourage the interests and aims of horticulture.

The propagation of wholesome, nutritious fruits, the cultivation of trees, shrubbery, plants and flowers must, in the very nature of the occupation and its associations, be pleasing, delightful and elevating. Who is there that, dwelling and toiling among these beautiful and attractive surroundings, does not feel stirred by delightful and pleasurable emotions, at once pure and refining? Indeed, it is claimed, and without doubt justly so, that the intelligent and judicious tilling of the soil brings the mind into nearer communion with the Infinite Creator than any other merely earthly occupation. Brought into more immediate contact and relationship with the operations of nature's beneficent productive forces, and with a live, abiding faith in the grand results, laden with the comforts, luxuries and attractions of home and society, the meditative, reflecting mind looks up "through nature to nature's God."

I would impress upon all the importance of making the home pleasant and attractive. Farmers, whether wealthy or possessed of limited means, as well as the residents of cities, towns and villages, may add largely to their happiness, enjoyment and well-doing by giving more and earnest heed to these suggestions. Would parents have their children love home; would they have them cheerful, contented and happy under the parental roof, they should try to invest that home with charms and attractions suited to the young and admiring mind. Children and youth, with minds pure, innocent and susceptible, are passionately

fond of the beautiful and the ornamental. They must have something lovely and attractive at home, or they will grow churlish and discontented and seek the gratification of those innate desires away from the home of their childhood, and which is too often the case, among scenes and associations hurtful and injurious to both mind and body.

To furnish these luxuries and ornaments to which we have alluded and which are so essential to our comfort and enjoyment as a people, is especially the task of our horticulturists, and that they may be prospered in their pleasant and highly useful occupation is the earnest wish of the people of our young and flourishing State.

Your association, as I learn, was formed in Rochester, eleven years ago. Since that time our city has had a creditable and gratifying growth. Four large and extensive nurseries are established here and are doing a prosperous, and I doubt not, a paying business. For evidence of our material prosperity we point you to the broad acres of fertile lands which surround our city on every side, to our capacious warehouses and elevators, our fine business blocks and excellent hotels, our elegant homes and pleasant streets. That our educational and religious interests have been nurtured and directed with proper care and effort, our comfortable school buildings and our dozen neat and elegant churches will attest.

Gentlemen from abroad, on behalf of the resident members of your society, I cordially welcome you to the kindness and hospitality of the citizens of Rochester.

PRES. SMITH'S REPLY.

At the conclusion of the address President Smith thanked Judge Eaton for the kind greeting which he had extended to the State Horticultural Society, and pledged the efforts of the society to bring about the results mentioned. These he said had been the efforts of the society heretofore and would be in the future. He compared Rochester in Minnesota to Rochester in New York, as being a similar center of fruit-raising and tree-growing.

At the conclusion of President Smith's reply, a vote of thanks was tendered Judge Eaton and a copy of his address requested for publication.

COMMITTEES.

President Smith then announced the following committees :

On finance, Messrs. Kenney, Hollister and Jordan.

On the articles on exhibition, Messrs. Latham, Brand and Sias.

On the address of the president, Messrs. Hoag, Harris and Day.

The secretary having failed to present a formal programme, Messrs. Lacy, Pearce and Harris, were appointed a committee to prepare one.

COMMERCIAL FERTILIZERS.

This subject was called up for discussion.

Mr. Elliot. We have plenty of fertilizers at home without the aid of foreign ones, but the day is coming when we shall need them.

Mr. Hollister. I have had some experience with them; have made trials with Peruvian guano and bone dust and have decided in favor of home-made manure. Have used two tons of gypsum on pieces of corn, potatoes, peas and clover—have seen no good results from it. Could not tell where it had been sown two weeks later, although sown in strips through the fields.

Wood Ashes.

Mr. Kenney. Would like to hear about the use of wood ashes.

Mr. Hollister. They have been one of the best of fertilizers with me. I think one ton of them worth two of gypsum. Have put them on corn when three inches high, and they were of temporary benefit. Have sown broadcast on peas just before blossoming with good results. Have got the best results from an application to a newly set bed of strawberries at the rate of five to ten bushels per acre.

Mr. Elliot. Think they increase the yield of onions one-third.

Mr. Wilcox. Have used gypsum on clover and it increased the yield one-third; saw no good from its use on strawberries.

Mr. Kenney. From three-fourths of an acre I obtained two hundred and forty bushels of onions; the manure was ashes sown broadcast. Have put ashes on strawberries at the rate of one peck to the rod and think them excellent for this fruit.

Mr. Wyman. Have used ashes and horse manure together for onions and obtained good results.

Mr. Phillips. Have sown gypsum on clover and obtained three and a half bushels of seed per acre to two bushels where gypsum was not sowed.

Mr. Hollister. Think that in mixing ashes and horse manure no permanent result will be obtained though the immediate effect will be very marked. The ashes will liberate the ammonia which will destroy its permanency as a fertilizer.

Mr. Hodges. I think the best fertilizer for onions is to herd cattle on the ground previous to breaking. Have sowed seed broadcast on such ground and thinned to four or five inches. The onions grew so large they had to stand on edge to get room.

PAPER OF HON. L. B. HODGES.

Mr. Hodges was called upon to read his paper, which was as follows :

PLANTING TREES FOR SHADE AND ORNAMENT ON STREETS AND ROADS—WHAT TREES TO PLANT, AND HOW TO PLANT THEM.

The foregoing is the heading of the accompanying article. The text was furnished by Prof. Lacy. I don't know what book he got it out of; neither do I care.

There ought to be a good many sermons preached on that text to all the people of Minnesota. Right here in Rochester it don't seem so necessary. The people here have appreciated the importance and necessity of this work, and have taken hold of it in earnest. The changed appearance of this town-site, as between 1854 when I first camped on it and now, 1878, is due more to tree planting than any other one class of improvements.

Great as has been the change in this immediate vicinity within so short a time, still greater changes have occurred in other localities. Villages and cities originally built on the open prairie, without a tree or shrub in sight, whose streets and avenues were formerly raked fore and aft by the fierce blasts of winter, and scorched by the blazing suns of summer, have by the intervention of the tree planter, been converted into bowers of beauty, protected alike from furious wind and blazing sun.

No investment of time and money is more satisfactory or more permanently useful than that employed in planting forest trees along the lines of our public highways. In a prairie country like ours, no investment adds so much to the beauty of the country or the ready cash value of the real estate so adorned. The prosecution of this good work appeals alike to the best judgment and most cultivated taste.

Much has been done in this direction, but far more remains yet to be done. We have done just enough to thoroughly demonstrate the practical nature of the work, the thorough adaptability of our prairie soil to develop magnificent specimens of forest trees.

In the tree planting returns for 1877, the number of rods planted to trees and hedges along the public highways of Minnesota is given as 265,633, equivalent to 642 miles and 192 rods. The returns are imperfect, incomplete. One thousand miles would be much nearer the mark. This is a good beginning, but only a beginning.

Have any of you figured on the probable number of miles of public highway in the prairie portion of Minnesota? There are full five hundred prairie townships in what is known as the treeless region of Minnesota. Then there are at least half as many more prairie townships in other comparatively well timbered counties, like Ohmsted and Dodge. This rough estimate, which I think is below the actual figures, gives us 750 townships of prairie. Allowing thirty-six miles of public highway to each township gives us 27,000 miles. This must be doubled to give us a row each side the highway, making a total of not less than 54,000 miles yet to be planted along the highways of the prairie regions of Minnesota; enough to reach twice around the globe and some four thousand miles to lap

over. Who can correctly estimate the climatic effects and the ameliorating influences following so grand a work? I assume, as a matter of course, that in the treeless region, the planting would be close enough to form staunch and permanent wind breaks.

The protection thus afforded to growing crops would of itself be of inestimable value. The protection afforded to orchards and other fruit growing institutions would alone amply repay the cost, while the comfort afforded to man and beast would be beyond the power of figures to express.

VARIETIES OF FOREST TREES BEST ADAPTED FOR THIS WORK.

This is so largely a matter of taste that no list that could be made would suit every one. This task must conform to facts and to common sense. The adaptability of the soil to each variety of forest tree must be recognized. The natural limits that have been assigned to each variety of forest tree must be borne in mind, and then the peculiar service required in the particular locality to be benefited, and, finally, the pecuniary ability of the owner of the real estate must be taken into account.

For merely shade, in my opinion no tree can excel the White Elm (*Ulmus Americana*). As an ornamental shade tree it is absolutely unapproachable. It is undoubtedly the most "magnificent vegetable of the temperate zone." It is long lived, hardy, and a rapid grower. But it needs room to spread itself. Planted sixty feet apart their tops will interlock long before reaching maturity. The White Elm will do well on any Minnesota prairie from Iowa to Manitoba, but grows more rapidly on river bottoms and rich, moist soil. It seems to possess the advantage of withstanding the bad effects of dust and smoke, and would consequently be better adapted to planting in large towns than most other varieties of trees. In this connection, let me warn the fellows out on the broad prairies not to plant too large White Elms. I have seen them transplanted from two to three or four inches in diameter, trimmed to bare poles, tops cut off say twelve to fifteen feet from the ground, and in three years develop so much top that the wind would blow them over so far as to leave them standing at a very acute angle. They seem to develop top more rapidly than root. On the rich, moist alluvial soil of the western counties plant small trees.

Acer Saccharinum—Sugar Maple, Rock Maple.

The Sugar Maple as a shade and ornamental tree can not be too highly prized. It is indigenous to Minnesota, but is more particular about its location than the White Elm. In this state it prefers well drained localities. A locality in which the White Elm would flourish to perfection would in many instances prove fatal to the Sugar Maple. I have had but poor success in planting them on level prairie with deep clay subsoil. Such localities should be underdrained for the Sugar Maple. I very much doubt if they can be made to live where the ground is saturated with moisture during the growing season. On the second bench of the streams, and along the banks and sides of ravines, on any tolerably good soil, and on hill sides, the Sugar Maple flourishes and reaches its best proportions. Poor sandy soils are not suited to the growth of the Sugar Maple, neither are most of the rich bottom lands of the Red River Valley.

Juglans Nigra—Black Walnut.

All things considered, I am strongly inclined to the belief that the Black Walnut is the most valuable forest tree that can be grown in Minnesota. Its growth is very rapid, and when fully developed is one of the largest of our forest trees. It prefers a rich, moist soil, but will flourish and make a very satisfactory growth on any number one prairie not too far north. The Minnesota Valley seems to be the northern limits for this tree in that portion of Minnesota west of the Mississippi river. I have never seen any Black Walnut to amount to any thing north of the valley of the Minnesota river. They are a tender tree when young, and we occasionally get a winter in which they require considerable protection. As a shade and ornamental tree it sometimes rivals the White Elm. When planted as a shade tree give it plenty of room, that its natural habit of throwing out a low broad top may be encouraged. Bryant tells of a Black Walnut tree at three feet from the ground twenty-five feet in circumference. "At the height of twelve or fifteen feet the trunk divides into several branches, each of which by itself would constitute a large tree; the whole forming an immense canopy, overshadowing an area one hundred and fifty feet in diameter."

Juglans Cinerea—Butternut.

When grown in open ground throws out a low spreading top; is a hardy, rapid grower, and in all respects a desirable shade and ornamental tree. This tree and its first cousin, the Black Walnut, ought to be considered in the double character of not only forest but fruit trees. A Black Walnut orchard, or a Butternut orchard, propagated from the seed planted on the right kind of soil, would soon throw in the shade any apple orchard in Minnesota; would come into bearing as quick. would grow faster, stand more grief, and bring more bushels of either fruit or dollars, in the long run. I suggest, as a practical measure, the offering of liberal premiums to encourage the planting of Black Walnut and Butternut orchards.

Tilia Americana—Linn, Linden, Basswood.

This is another very desirable shade tree. Rapid grower, hardy, long lived. Will grow and develop well on any good farming land, but prefers a rich, moist, cool soil. Furnishes good shade and shelter for man and beast, and also bountiful crops of flowers, from which the "little busy bee" manufactures a most excellent article of honey. Basswood suitable for transplanting is not easily found in large numbers in our native forests, and the main source of supply for shade trees must be from propagation in forest tree nurseries.

Fraxinus Americana—White Ash.

One of our most valuable forest trees. Very hardy. Rapid grower, and when planted wide apart throws out a beautiful wide spreading top. Most of the prairie soil of Minnesota is well adapted to the growth of the White Ash.

This tree will do its best in a cool, deep, moist soil. It don't amount to much on a warm, dry, sandy soil; is not afraid of cold weather; deserves a higher rank in public estimation. For general planting on our northwestern prairies, no forest tree merits more general cultivation and attention. It is easily propagated from seed, and can be furnished by millions; cheap as corn fodder.

Fraxinus Sambucifolia—Black Ash.

For merely a shade and ornamental tree, perhaps preferable to White Ash; will grow best on ground too wet for White Ash; will flourish and develop magnificently on ground too wet for most any other timber except it may be tamarac.

Populus Angulata, or Populus Monilifera—Cottonwood.

The highly refined, fastidious and aristocratic element of our large towns and cities unite in despising this noble tree. But who cares? It has its own merits, merits that will cause it to be propagated, cherished, nourished and protected by willing hands and loving hearts, until the great interior treeless region of the North American continent shall have been reclaimed and become one of the traditions of the past. When the marble monuments vainly erected to perpetuate the memory of the names of its traducers shall have crumbled into dust; when even the state Horticultural Society has ceased to exist, even then will this monumental tree shed its blessings and its cotton alike upon the just and the unjust.

I propose to stand by the Cottonwood. Whether planted on a sand bank or a river bottom, in the door yard or in a desert, on the prairie or in the timber, the result is a great, sturdy, healthy forest tree. It is a success, and that's why people plant it. It don't fool away years of precious time getting ready to do something, but it is up and a coming from the word go. It is emphatically a pioneer tree. This and the White Willow will do more to prepare the way for the cultivation of fruit trees than any other agencies I can think of.

I have enumerated enough of the deciduous trees. I could easily have extended the list to twice its length. But "Enough is as good as a feast."

Evergreens.

I shall not branch out much on evergreens; had rather wait and hear from John Kepner. I desire to say a good word for the Scotch Pine. I find it absolutely hardy, and a thrifty, good grower on the broad prairies of Kandiyohi and Stevens counties; have had them growing out for nearly four years. They always look bright and healthy. They are undoubtedly a good tree to plant by the roadside. It is the great lumber tree of Scandinavian nations of northern Europe. It delights in buffeting old Boreas; is admirably adapted for wind-breaks, and will be used extensively for this purpose just as fast as the prairie farmer becomes able to pay for it.

I have experimented with various sorts of evergreens on the prairies, and have had more comfort from the Scotch Pine than all others combined.

The European Larch, about which volumes have been written, has so far proved hardy, healthy and a rapid grower on the main line of the St. Paul and Pacific railroad, where it has been planted as an experiment in different localities and on widely varying soils. From experience so gained I should not be afraid to go in tolerably heavy on the European Larch.

HOW TO PLANT THEM.

It is all surplusage trying to tell this crowd how to plant trees. You know as much about it as I do; but it may be this paper may fall into hands not so experienced as yours. And so I commence by saying, the first thing to do is to pre-

pare the ground. In commencing *de novo* on the prairie, I should first break the sod in June. I should let it sweat till October. I would then backset it, bringing up two or three inches of new ground. (I am supposing you are preparing to plant along the highway the whole length of your farm. In the spring I would plant it to potatoes. I prefer potatoes for this purpose because the ground gets worked over more in growing this crop than any other you would be likely to plant. After digging the potatoes in September, I would then plough the ground as deep as I possibly could; the deeper the better. And then I would harrow thoroughly. I would have all the holes dug before I took up a tree, and I would dig big holes, not very deep but a good ways across; deep enough so you can throw in dirt, good mellow black soil, forming a little mound in the bottom of the hole to set the tree on. Then, while an assistant holds the tree in an upright position, manipulate the fine, soft, mellow earth all among the roots, spreading them out full length, so they nestle and lay comfortable like and natural. If any of the roots are bruised and mangled trim them off smoothly with a sharp knife; and also cut out all dead roots.

Too much care can not be exercised in transplanting forest trees. In taking them up get all the root you can, especially small fibrous roots. Don't allow the roots to be exposed to sun or wind. Don't let them freeze while out of the ground. Plan your work so as to have the least possible number of hours intervene from the time the tree is lifted from its native spot till it is in the ground again. Should unavoidable delays occur, heel them in, or better still, bury them all over in loose earth, taking them out as you plant them. After getting the roots comfortably arranged, shovel the fine, black, mellow soil in, pressing it firmly. You don't want to tramp it.

I think most good sized trees, especially the Cottonwood, do better planted somewhat deeper than they originally stood.

Don't drown your trees with water. Many people heave in several buckets of water in each hole. This is unnecessary. Your tree don't want to stand in a mortar bed. More trees are killed by too much water than by too little. If possible, mulch thoroughly as soon as planted. Mulch with any good manure. Chip manure is best. Old hay or straw is good.

If the ground is reasonably moist when the planting is done, good, thorough mulching will protect the tree from drouth far more effectually than indiscriminate bucketfuls of cold water. Cold water is a good thing in its place, but needs to be used with some judgment.

Don't mutilate your trees. This trimming up to bare poles and then cutting the top off may be necessary in very exposed localities, as too much top resists the wind to such an extent as to loosen the hold of the roots to the soil. This won't do. In such localities plant small trees. A tree no larger than a rawhide riding-whip, with its full complement of fibrous roots, will soon get away from such trees as are usually planted along highways; *provided, always*, you plant it in ground which has been thoroughly prepared, and then give it the same care, protection and cultivation you do your corn when you get fifty bushels per acre. If I was in a hurry, and couldn't wait, and must have big trees at once, I would take up root enough so there would be no necessity of cutting off the top; only trimming the top into symmetry. It would be, perhaps, necessary to steady and brace it against the wind until well rooted. How to do this your own ingenuity should suggest.

AFTER CARE.

In planting a line of shade trees along a public highway, I should aim to dedicate a strip of ground at least one rod wide to this purpose. I should plough that strip and harrow it at least twice each year, between May and August, keeping down all weeds and grass. Every year I should work the mulching when well decayed into the ground, replacing it from year to year, until the tree is firmly established and able to help itself to food and drink. Bear in mind that a young tree needs care, protection, feed and water, as much as a young steer, and the better treatment either gets the better it grows and prospers. The mulching and cultivation is to the tree what corn, hay and water is to the steer.

I can not too strongly condemn the infamous and brutal treatment given to trees by men who ought to know and to do better. The man who handles trees in transplanting, as he would fence rails or posts, deserves to lose them, and generally does. To illustrate; last spring I saw a large box of ornamental trees, mostly evergreens, on the platform at Willmar. After lying there exposed to wind and sun several days, I saw them opened. The moss and other mulch they were packed in had prevented the roots from drying, and had they *at once* been properly planted, could have been saved. It seemed a whole neighborhood had clubbed together, and each one's package was bound up separately. These packages were taken from the box and laid on the platform, where for several days they were exposed to drying winds and scorching sun. They were all killed within twelve hours; but those fellows would come every day or two and carry off a bundle and plant them, all the same; and you can't make one of them believe that nurseryman is any better than a horse thief.

We must preach to the people that a tree, if not exactly animal, is, at least, a living, breathing organism, as susceptible to good or bad treatment as anybody; as quick to appreciate good treatment as you or I, and as quick to resent bad treatment. In fact there are few classes of living beings who tolerate less bad treatment than trees.

WHEN TO PLANT—SPRING OR FALL?

This is a question often asked. I do not consider it of as much importance as many do. It is not half as important as a thorough preparation of the soil, mulching and thorough cultivation. With most forest trees it really makes but little difference. For several years I have planted largely, commencing in the fall as soon as the leaves fall; planting until winter comes, heeling in or burying what is left, and in the spring commencing again and planting right along till 20th of May, or until the leaves start. Some seasons there is no perceptible difference between spring and fall planting of most varieties of forest trees. Should it set in very dry, as it sometimes does early in spring, and continue dry for several weeks, your spring planting will suffer to a certain extent, limited, however, by the amount of mulching and cultivation the trees receive during the season of trial. Should there be a reasonable supply of moisture during the spring and early summer no appreciable difference would be likely to be observed. Large sized trees, whether planted in the fall or in the spring, will quite readily go through the first season making a good, healthy, vigorous growth, and if June and July of the next season is unusually hot and dry, succumb to the withering influences of the season. This, however, is largely prevented by mulching or cultivation.

Small forest trees one, two and three year olds, usually, and so far as my experience goes, have always escaped this peril. I have sometimes thought the transplanting of large forest trees from the forest to the open prairie more hazardous in the fall than in the spring.

Sometimes facts prove it to be so, and then again facts prove it not to be so.

The fact is, you can't most always tell.

With a thorough preparation of the soil, and prompt, clean culture, your trees, if properly handled and planted, will, as a rule, outlive the fellow that plants them.

DISCUSSION.

Evergreens.

An inquiry was made as to why the roots of evergreens dry quicker than those of deciduous trees.

Mr. Hodges. I mulch my evergreens thoroughly.

Mr. Wilcox. I would suggest that the resin of evergreens becomes thick and thus the sap dries quicker than that of other trees.

Butternut.

Mr. Elliot. Butternuts must be planted where they are to grow,

Mr. Wilcox. I have transplanted them after growing two years.

Mr. Hart. I think the butternut is hardy if well-kept and cared for.

Mr. Elliot. I move that a vote of thanks be tendered to Mr. Hodges for his essay, and that a copy be requested for publication. The motion was seconded and carried.

Mr. Hodges. You may take the seeds of any forest tree however hardy and plant millions of them and the first winter you will lose nearly half; these being weakest; no tree will go through the first and second winters without loss. After this there is no trouble if they are taken care of. The butternut grows as far north as the Sauk valley. Planted here on prairie as many live as of any other tree. The black walnut is more tender and cannot be grown so far north as the butternut. Have planted seed from the Minnesota and the Zumbro valleys but without success.

Mr. Cook. I got a few butternut trees from Bryant of Illinois, but they did not live.

Mr. Hart. I believe the butternut is hardy and the losses are generally from carelessness.

Mr. Hodges. With Chestnuts I have had no personal experience. A friend in 1855 brought Chestnuts from Chataqua County, N. Y. For several years they grew in summer and froze down in winter.

Then there was a period of mild winters and the trees grew and bore, but in 1872 and '73 they were killed root and branch.

Mr. Cotterell. I took some home and planted and a year later found them growing. They grew and died about as fast. I thought the tap root must be cut and I cut it in one row. These do not appear to kill down. I think I will cut the tap root of the remainder.

Mr. Harris. Houston County has Chestnut trees that have borne. I have trees; one transplanted young, the other not at all. They are doing well.

Horse Chestnuts.

Mr. Pearce. There has been one Horse Chestnut in Rochester for many years. It grows up in summer and kills down in winter.

REVISION OF APPLE LIST.

It was moved and seconded and the motion carried to take up the revision of the apple list.

Motion was made and seconded that the varieties of apples now recommended for general cultivation be continued.

Wealthy—Duchess.

Mr. Harris. We have not seen much of this variety on exhibition at our State Fairs. If the tree is as hardy and the fruit as good as is claimed why have we not seen and know more of it? It was put on the list for general cultivation in violation of the rule requiring trial and fruiting in different parts of the State.

Mr. Elliot. The first fruit was on exhibition here in 1869. Then the cions were sent to Illinois to be propagated and the trees sent back here, giving only eight years for their growth here—not sufficient time to show much fruit. On light soils the tree is not as hardy as the Duchess of Oldenburg, but on clay soils it is perfectly hardy.

Mr. Latham. The reason why it has not been exhibited more is that until within a few years Mr. Gideon has had all the bearing trees and he is not in accord with the Horticultural Society. The old tree is dead and was not winter killed. It bore after the hard winter of '72-3 but afterwards blighted and finally died. His younger trees are mostly on Crab stocks but some are not on Crabs and these look well. The tree is certainly hardy. Had never seen a tree winter killed or injured on the south side.

Mr. Wilcox. My first cion failed, but the next year they succeeded. My Wealthy trees have never blighted. Last year I had some apples from a tree four years from top working. Am very much pleased with the Wealthy.

Mr. Jordan. On Mr. Gideon's grounds no tree is exempt. Have had much blight, but when the Transcendent near by had to be destroyed the Wealthy was not injured. Have worked the Wealthy on the Transcendent and neglected to rub off the buds on the Transcendent stock. Branches from these buds blighted but the Wealthy cion on the same tree did not.

Mr. Latham. I do not emphasize the matter of blight but on Mr. Gideon's grounds the Wealthy blights worse than the Duchess. It has not blighted with me.

Mr. Jordan. Mr. Gideon works on Crab seedlings indiscriminately and such are very subject to blight.

S. P. Quincy, Olmsted Co. I got some cions and put on the Hyslop. The branches of the Hyslop blighted but the Wealthy cions did not until the Hyslop became affected.

Mr. Phillips. I got 75 trees and the next winter came to see the fruit at the meeting of this Society. Was disappointed in this, but heard it highly recommended and so I got 75 trees more. Have never lost but one tree and that was by accident. More than this, *they have never failed to grow from the terminal bud* and this I consider this good evidence of hardiness. Mine are growing on white oak clay soil. Shall set 500 more in the spring.

Mr. Brand. I have opposed recommending the Wealthy for general cultivation for the same reason as Mr. Harris—insufficient trial, but I have planted more largely of it than of any other variety.

Mr. Pearce. Have not always been a particular friend of the Wealthy. I think it hardy, but disposed to blight. It is very hardy, a rapid grower and recovers from an injury sooner than any other variety. Have now more faith in it than in any other. It has come out all right every time.

Mr. Hurt. I find it a slow grower and am afraid that we may not all have the genuine variety.

Mr. Harris. Have seen the Wealthy where I would not give anything for it, but elsewhere have seen it doing better.

Mr. Day. I have a tree $1\frac{1}{2}$ inches in diameter which produced 57 apples in 1876.

The motion to recommend Wealthy and Duchess for general cultivation was carried unanimously.

Tetofsky.

Motion was made and seconded to recommend the Tetofsky "for planting in limited quantities."

An amendment was offered and seconded to recommend "for general garden culture and orchard planting in limited quantities."

Mr. Brand. It is generally objected that the tree does not bear well, but it has not been planted here long enough to test its bearing qualities.

Mr. Harris. I know of trees planted 10 or 12 years that bear 2 or 3 bushels of fruit, but the fruit is not worth much. It does not keep.

Mr. Cotterell. It comes however when people bite sharp for fruit. I am pleased with the Tetofsky.

Mr. Pearce. We have one in this vicinity 12 to 14 years old that is a great bearer. They are slow growers but sure. I have two trees and would hate to take \$15 or \$20 each for them.

The amendment was lost and then the motion was carried unanimously.

White Astrachan,

Motion was made and seconded to place the White Astrachan on the same list.

Mr. Elliot. The fruit is like the Tetofsky—not seen for a long time.

Mr. Harris. It is a better desert apple. The tree is one of the handsomest that grows, and the hardiest also. A thousand bushels of the fruit could be sold in La Crosse. I have the trees in bearing.

Mr. Wilcox. I endorse what Mr. Harris says of the White Astrachan.

Dr. Twitchell. I have tried for four or five years to raise the trees and do not believe they can be successfully grown.

Mr. Jordan. I doubt if it can be grown outside of the protection of the river bluffs.

Mr. Wilcox. Mine are on the prairie and much exposed.

Mr. Brand. Mine grow steady and have not borne, but I think the tree hardy.

The motion to recommend "for planting in limited quantities" was lost ; 2 for, 8 against.

Haas.

Motion was made and seconded to recommend the Haas for "general cultivation."

Mr. Hart You have not the Saxton. I have eaten it from my own grounds for thirteen years. The tree bears at five years and I have received \$7.00 for the fruit of a single tree in one year.

Mr. Sias. There is a difference in our location. I am high up on the prairie; Mr. Hart is on the Mississippi bottom.

Mr. Phillips. The Saxton is where it belongs—on the list recommended “for general cultivation in favorable localities.”

Mr. Brand. I view the Saxton from still higher ground than either Mr. Hart or Mr. Sias and it does well with me. Have over a hundred trees and am glad to have them. Several of them bore in 1876 and the fruit is good.

Mr. Kenney. I obtained ten trees. They are perfect and I have had some fruit from them. The trunks have been protected with crushed sorghum stalks.

Motion “to strike from the lists” was lost by a vote of 4 for and 9 against.

Motion was made and seconded to recommend “for favorable localities.”

Motion was made and seconded to amend by including the Haas. This was objected to by the mover of the motion.

Motion was made and seconded to adjourn to 7:30 P. M. Carried.

TUESDAY EVENING.

The Society was called to order by President Smith at 7:30. The revision of the apple list was continued.

St. Lawrence.

The St. Lawrence was allowed to remain recommended “for favorable localities.”

Motion was made and carried to add to the above heading the words “in southern portions of the state.”

WHITE ASTRACHAN AND ELGIN BEAUTY.

Allowed to stand recommended “for general trial throughout the state.”

Melinda—Stewart's Sweet.

Allowed to stand recommended “for trial.”

Mr. Wilcox. I move to amend by adding "if top worked on Crabs." Many varieties thus succeed when they would not if grafted on the apple. The Haas is one of them.

Mr. Latham. It is not safe to recommend the Haas "for general cultivation."

Mr. Jordon. It is not entirely hardy here.

Mr. Pearce. I have not decided whether to graft any Haas or not. The tree is a good grower but not hardy and is liable to injury.

The motion was lost, two for and ten against.

Plumb's Cider.

Motion was made and seconded to recommend Plumb's Cider "for general cultivation."

Mr. Pearce. I do not believe there was one tree that was not killed or injured by the winter of '72-'73.

Mr. Latham offered an amendment, which was seconded, to strike from the list recommended "for general cultivation in favorable localities."

Mr. Brand. Better leave it there ; it does well on Mr. Gideon's place.

Mr. Latham. I would change my amendment to recommend "for favorable localities."

This was not objected to and Plumb's Cider was recommended "for favorable localities" by a unanimous vote.

Price's Sweet.

Motion was made and seconded to place with Plumb's Cider.

Motion carried by unanimous vote.

Mr. Kenney. I have thirty on transcendent stocks looking well, but on their own stocks they are not good.

Saxton.

Motion was made and seconded to strike the Saxton from the list.

Mr. Pearce. There is no question but the tree is hardy and no tree produces more fruit. It continues to bear even when diseased. The apples are very good. Better let it stand on list recommended "for general cultivation in favorable localities."

Mr. Sias. I have had it for 18 years and not a blossom yet.

Mr. Jordon. We don't want it to cumber the ground.

Walbridge.

Motion was made and seconded "to strike from the lists."

Motion lost by a vote of 2 for and 2 against.

Mr. Wilcox. I consider it top-worked one of the best.

Mr. Brand. Mr. J. S. Harris has some fine trees of it.

Mr. Elliot. Mr. Tuttle, of Wisconsin, says the old trees bear well but they do not bear young.

Peach Apple.

Mr. Jordan. This apple is worthy of some notice. I took it to the Centennial Exhibition. The trees have borne since the hard winter. The fruit does not keep well but is nice.

Mr. Brand. The tree is very hardy.

For trial by Amateurs and Pomologists.

Motion was made and seconded that varieties so recommended last year be allowed to remain.

Motion carried by unanimous vote.

The following are the varieties:

Alaska,	Julia,	Queen of Elgin,
Molly,	Clayson,	Kimball,
Rollins Pippin.	Rollins Russet,	Rollins Prolific,
Wabasha,	Hart's Seedling, No. 7.	Hart's Seedling, No. 11.
Viola,		

Clara.

Mr. Day. I have seedling which has borne for two years. The fruit of one year kept until June of the next year. The tree is ten or twelve years old and hardy.

Motion was made and seconded to recommend "for trial by amateurs and pomologists."

Motion carried by unanimous vote.

Mr. Sias. Would like to know what is the object of this list if amateurs and pomologists cannot get the stock with which to make the trial.

Mr. Hart. We must look to that question. Although my seedlings were recommended a year ago I have not been asked for any cions. I am ready to place them for trial in the hands of any responsible parties.

Mr. Harris. I am ready to distribute cions of the Julia if the stock is not lost as I fear it may be from an accident to the tree.

Jefferson County.

Mr. Hart. I have an apple called Jefferson County. I think it a good one.

Mr. Wilcox. I got some cions of it from Mr. Hart and it has borne with me several years. Am much pleased with it.

Mr. Jordan. It has not succeeded with me.

PROFESSOR LACY'S PAPER.

Professor Lacy's paper on "Education for Farmers" was then presented. After the reading a vote of thanks was passed and a copy requested for publication.

The following is the paper in full:—

(Copy of the paper has not been furnished.—*Printer.*)

MR. HARRIS' REPORT.

The discussion on Game, Trespass and other Laws was passed over and the paper of J. S. Harris on the Horticultural Exhibit at the State Fair was called for.

After the reading it was moved to file for publication: The motion was seconded and carried. The following is the paper:

THE HORTICULTURAL EXHIBIT AT THE STATE FAIR OF 1877.

Mr. President and Gentlemen of Minnesota State Horticultural Society:

Our worthy Secretary has chosen me to furnish a report of the Horticultural exhibit at the State Fair. I assure you that I am not able to prepare such a report in time for this meeting. However I will endeavor to be ready with one before our transactions go into the hands of the printer. As a whole the last State Fair, held in Minneapolis, Sept. 3d to 8th, 1877, was very satisfactory. Financially it was a grand success, not only paying all expenses but furnishing a surplus sufficient to enable the Society to pay the whole indebtedness of the previous Fair of 1876. We should like to attribute the success to the unparalleled display of horses, cattle, sheep, swine, poultry, grains, vegetables, fruits, flowers and fine arts, but honor and justice forbid. A share of the credit must be given to the enterprising city where it was held, to the remarkably fine weather which prevailed at the time and to the liberality of the visitors, for the exhibition was not remarkable for a State of our resources, where all the people are noted for *pluck and enterprise*. Several of the departments were not filled up to the standard of previous years, and more especially was it the case with the Horticultural department. The causes of this deficiency were mostly such as are

beyond our control. The fruit crop was almost a failure in all sections of the State. But very few of our apple trees bore even samples for the codling moth to deposit their eggs in and perpetuate their species, and the Siberians were not plenty and were not up to their usual standard of excellence. In many parts of the State drouth had prevailed and greatly injured the vegetables. Flowers and ornamental plants were shown in profusion, but the practiced eye of the professional gardener could see that the season had not been propitious for them.

Probably another draw back was the Agricultural Society was in bad odor with some of our best fruit growers, who were holding unpaid premium claims for the previous fairs, and who would not therefore help us out in the exhibition.

Having taken these adverse circumstances into consideration the State board expected but little and therefore allotted but little space for the show of fruits. However we were most happily surprised, for the exhibition far exceeded our expectations.

Apples.

The largest and most complete show of apples was made by I. H. Moulton, of East Minneapolis, about 125 plates, many of them of very fine appearance for so unfavorable a season. A marked feature of this exhibition was some fine samples of the Wealthy and a number of varieties of Russian origin, which he is propagating in his nurseries. J. S. Harris & Son, of La Crescent, Houston County, showed about 30 varieties of apples and 18 of Siberians. E. Ely, of Winona, showed 22 varieties from the orchard of Mrs. Campbell of Minnesota City, and a few Siberians. P. A. Jewell, of Lake City, 5 or 6 very choice plates of apples and 16 of Siberians. J. T. Grimes showed the best Transcendents on exhibition, but through an oversight of the committee was not awarded a first premium. Gould, of Excelsior, showed Duchess, Wealthy and Siberians. Brimhall, of St. Paul, showed Duchess and Siberians. Gould, of Beaver Dam, Wis., two plates of new varieties of Siberians, of very superior quality, and A. W. Sias, Rochester, sent in a basket of new Seedling Siberians of fine appearance. A. Stewart, of Litchfield, made a display of Minnesota peaches. Some others not mentioned above showed Duchess and Siberians. A marked feature of the exhibition was that the apples made a much better show than the Siberians notwithstanding the unfavorable season.

Grapes.

The exhibition of grapes was really superior to the apples. They were shown great profusion and of superior quality and were well ripened for so early in the season, showing that evidently the grape is at home on our soil.

The largest exhibitors were R. Knaupheide of St. Paul, J. C. Kramer of La Crescent, F. G. Gould of Excelsior.

There were also some fine plates of Delaware and Concord by amateurs. In Mr. Kramer's collection was a white seedling of excellent quality which he claims to be perfectly hardy, and it appears to be worthy of trial.

The exhibit of Flower and Ornamental plants was fine and extensive but a much better effect could have been secured if more space had been allotted to them. The leading exhibitors were Wyman Elliot, J. C. Booth, and Geo. A. Brackett.

Owing to their crowded condition the judges found considerable difficulty in making just awards.

Garden Vegetables.

The competition in this department was spirited and the show large, but in general appearance the specimens did not give a fair example of what our gardeners can do in a favorable season.

The University of Minnesota had on exhibition a very large collection that were raised on the State Exp. Farm, which, to those who have a personal knowledge of the farm spoke volumes for the skill of the producer (for the soil of the farm is a poor bed of sand that had been entirely exhausted by cropping before it came into the possession of the University). Busch, Hollister & Co., Wyman Elliot, J. T. Grimes, and several others showed extensive collections. There were no huge squashes or mammoth cabbage to help out the show.

Premium List.

We have a premium list for the Horticultural department that compares favorably with that of any other state, but I think the time has arrived when it should be revised. A special premium should be made for apples of Russian origin to encourage their trial, and professional nurserymen ought not to be brought into competition with orchardists and farmers. A special premium should be given on the lists adopted by the Horticultural Society. I would suggest that a suitable committee be appointed by this society to revise the list before the next State Fair or that it be made the duty of the executive committee to do so.

JOHN S. HARRIS.

The society then adjourned to meet at nine o'clock Wednesday morning.

WEDNESDAY MORNING.

TREE PLANTING LAWS.

The society was called to order by President Smith at nine o'clock. The subject of Congressional tree-planting and other forestry laws was referred to a committee consisting of Messrs. Hodges, Brand and Elliot.

A communication from Dr. John A. Warder, of Ohio, requesting action on a memorial, asking the appointment of a commissioner to visit and report upon the forests of Europe, was read and referred to the same committee.

SUGAR AND SYRUP.

It was decided to take up the discussion of this subject. A number of questions were submitted by J. S. Kramer, Esq., of La Crescent, and were answered by Messrs. Miller and Kenney and others.

Best Variety.

The Secretary. What kind of seed gives the most profit in sugar and syrup?

Mr. Miller. The Minnesota Early Amber Sugar Cane is the best I ever tried. Its granulating property is much superior. Other kinds have not granulated with me. It ripens as surely as a crop of corn: I think I can feel more sure of a crop of this than of a crop of corn.

Mr. Kenney. My Amber Cane was two and a half inches high on the 9th of June, when the frost came; it cut every hill nearly to the ground. I let it alone and most every hill came up again. It made a good crop which was cut September 16. The last of it was worked October 9th. Lying so long was injurious, but four acres of Cane produced four hundred and twenty-eight gallons of syrup.

Mr. Miller. As to the earliness of the Early Amber, a man in Sheldon, Douglas county, planted the seed June 2nd, and the cane was ripe before frost.

Mr. Kenney. I began working the cane last year, August 28th, and took a sample of sugar, September 3d. It was a choice article.

Planting.—Harvesting.

The Secretary. What is the cheapest and best way to plant?

Mr. Miller. If you are planting but little, plant with a hoe in moist soil, about one inch deep. But for four or more acres get a planter. I used a Corn Planter, but it must be nicely adjusted. A planter plants as fast as four men and better because it puts the seed in moist soil. If the soil is clayey it must not be packed.

Mr. Kenney. It does not hurt the cane to freeze after one day's wilting, because then the cells do not burst by freezing. I prefer to let it lie on the ground till the leaves are cured; then the cane can be stored. Lay it on the ground in such a way that the tops and leaves will overlie and protect the stalks from the sun. It is important to cure the cane to get rid of the acid, especially in making sugar. I have always stripped the leaves from the cane for fodder, and believe the leaves paid me for the labor. I have got about two tons of fodder per acre.

Mr. Miller. I found from the Sorgho Journal, that it is unnecessary to strip the cane. I cut off the tops but do not strip. Would not give a man ten cents a day to strip. The cane handles better and the leaves protect it from the sun. They also assist in keeping off the dirt when it is beaten up by rain. Have not been troubled by broken and dried leaves with my mill, which is the Victor, made by the same firm as Cook's Evaporator.

Mr. Kenney. I use a mill made at Madison and will get another of the same kind. Used the Victor one season and then sold it.

Mr. Miller. Have used a mill with a choker but shall throw it aside. The leaves are better than Timothy hay, but the labor of stripping at that season is too great. The crushed stalks and leaves go into the yard to cattle, horses, sheep and hogs, which like them very much.

Mr. Kenney. I strip and cock the leaves to cure, and they can be stacked in a couple of weeks. Have had the fodder in February. I manage so that two men and a boy strip for 140 to 170 gallons per day.

The Secretary. What is the best time and depth to plant?

Mr. Miller. Plant as early as you can—before corn-planting—say the first week in May.

Mr. Kenney. It is advantageous to plant in succession. I planted 120 rods, June 1st, on new timber land, and obtained 118 gallons of syrup; this was stripped on the hill, cut and allowed to lie three days in the sun.

Mr. Miller. There is no danger of the seed rotting in the ground if it is planted early. It can be depended upon for a crop of seed. The seed can be fed to all domestic animals. It can be ground and fed to hens. It is extra feed for them. Hogs fatten on it and horses and cattle eat it. It gives from 20 to 25 bushels seed per acre.

Sprouting the Seed.

The Secretary. Is it advisable to start or sprout the seed before planting, and if so in what manner?

Mr. Miller. I have never been favorable to sprouting since I tried it. I planted the seed dry and with sprouts one-fourth of an inch long and could see no difference in the growth or results.

Mr. Kenney. I have also planted the seed sprouted and not sprouted and could see no difference.

Mr. Harris. I found thirty years ago that there was no advantage in sprouting seeds.

Mr. Elliot. My experience has been the same.

Soil.

The Secretary. What kind of soil is best, sandy or clayey?

Mr. Miller. Sandy soil has been regarded as the best for syrup, making it of a lighter color. Have tried it but was unable this year to make as good syrup as from clay soil. Would say that clay soil is better.

Mr. Kenney. Land that will produce from 40 to 50 bushels of corn will produce good cane.

Mr. Fox. I have found rich alluvial bottom land best for syrup, but for an article that will granulate I want the mullatto soil or yellowish clay.

Messrs. Kenney and Miller. Our soil is generally black prairie soil underlaid with clay, which sometimes plows up.

The Secretary. At what distance should it be planted and how many kernels in the hill?

Mr. Miller. I plant three and one-half feet apart each way and get the best yield by planting six to eight kernels to a hill.

Cultivation.

The Secretary. What is the best method of cultivating?

Mr. Kenney. I do the first cleaning with hoes, simply dressing out around the hills. I get the help to do this in time, whatever the cost. If the weeds once get ahead it is impossible to repair the injury. Next I go through lightly with a shovel plow and stir the ground often while the cane is young as in the cultivation of corn.

Mr. Miller (in answer to a question.) I should be afraid to harrow unless the ground was very level. Otherwise the hills might be covered by it.

Mr. Latham. A neighbor of mine has used a small light harrow and thus saved the first hoeing.

Time to Harvest.

The Secretary. How ripe should the cane be for best yield of syrup and sugar?

Mr. Kenney. Three years ago (1875) I made my first sugar from cane that was ripe, but there was not much of it; next year (1876) I had four acres which I let get dead ripe, and from this I could get no sugar. Two acres, however, were planted later, May 28th. This was cut up greener and granulated almost before the syrup was cold. It made about 600 pounds of sugar. The seed was not hardened when the cane was cut. This year (1877) I began August

28th to make up my product. I worked three lots directly from the hill, then a lot that lay a week. This had nearly all turned to sugar by the following Monday. Mr. Birdsell had 62 rods of cane that lay five days and made 62 gallons of syrup. In two or three days there was only two or three gallons of syrup to the barrel remaining. My best yield of sugar was from cane with the seed half ripe, cut five days before working. But this year Mr. Miller let the seed get ripe and got nearly as much sugar as I did.

Machinery.

The Secretary. What are the best machines and the best method of manufacturing syrup and sugar?

Mr. Miller. For sugar there is no evaporator equal to Cook's. I had four acres of cane about half ripe and six acres pretty ripe. The ripe cane granulated in the cooler so as to make twelve barrels of sugar. All ripe cane granulated very much the same. Have used no purifiers.

Mr. Wardell, of Iowa. From the Imphee variety of sorghum I have made little sugar, but a very fine quality of molasses. I used animal charcoal to remove the flavor.

Mr. Miller. The Victor Mill is made of different sizes. The largest size costs \$250.00, with down sweep to go with four-horse power. The next smaller size costs \$190.00. No. 4 Evaporator, 3 feet 9 inches by 9 feet costs \$50.00 at Cincinnati, and \$15.00 more for each addition in size. The larger sizes are 4 ft. wide and 1½ ft. longer per size.

Mr. Wardell. With too much pressure a detrimental substance appears in the sugar, and prevents making the best syrup.

Mr. Kenney. The Climax mill costs \$150.00 at the shop, with 10 per cent. off for cash. I think it the best that is made because it is self-adjustable. Have used a refining process but was disappointed in it and have ceased to use it.

Mr. Day. Have also given up the refining process because of the cost and trouble. I use a mill like Mr. Kenney's.

Yield per Acre.

The Secretary. What is the yield of sugar and syrup per acre? How many gallons of juice are required for a gallon of syrup, and what is the yield of sugar per gallon of syrup.

Mr. Day. Have had yields of from 47 to 250 gallons of syrup per acre. The Amber cane on good ground, well cultivated, will give an average of 100 gallons per acre.

Mr. Kenney. Three years ago I got seed of Mr. Miller and obtained 125 gallons per acre, but southern grown seed gave 150 gallons. The stalks of this grow larger. It is also later but still early enough to ripen.

Mr. Miller. Last year I got an average of 155 gallons per acre. This year I lost the account, but figuring on a small piece of cane, I got 160 gallons per acre.

Mr. Kenney. Since I got the seed from Missouri, I have obtained 160 gallons per acre. 8 to 9 gallons of juice make one gallon of syrup and one gallon of syrup yields from 5 to 7 pounds of sugar.

Cost of Production.

The Secretary. What is the cost of production, and what are the receipts from it?

Mr. Kenney. A man at Rice Lake made enough from three acres to pay for mill and pans and to supply his family with syrup. The cost of cultivation is a little more than that of a crop of corn. The cost of stripping and hauling is about \$8.50 per acre. Three boys and myself boil about 60 gallons per day (from daylight until dark) costing for labor about \$5.00 and for fuel about \$1.00. I have offers to grow, strip and deliver at my mill at \$25.00 per acre. One cord of basswood boils about 90 gallons of syrup.

Mr. Harris. I gather that it costs about 40 cents per gallon to get it into the barrel.

Selling Price.

Mr. Brand. It sells in Faribault for 80 to 90 cents a gallon and is sought after by many. It is without sorghum flavor. A gallon of syrup leaves a half gallon of syrup after the sugar is separated.

Mr. Kenney. I receive 75 cents per gallon by the barrel, 80 cents by the keg, and 90 cents for less quantities. Beginners sold at 50 cents, but the same parties now sell at 70 cents and the supply is exhausted. It is estimated that Rice county raised 15,000 gallons and it would require 60,000 to supply the demand.

Mr. Miller. Twenty-five cents a gallon is the common price for manufacturing at the mill.

Mr. Kenney. I got 35 cents a gallon for all I made for others. Paid \$3.00 a day to a man to boil. Two pounds seed per acre are required.

Mr. Miller. In draining the sugar I have had the best success with centrifugal force. I first got the seed from Mr. Stubbs, of Long Lake. He said the seed had been raised in this state about

five years, but did not tell where it came from. I thought that cane would degenerate, and sent some seed to St. Louis to be grown there. It had been grown in Missouri only two years when the short and early stalks became very few, while in Mr. Kenney's, grown from Minnesota seed, the short and early stalks were nearly one quarter of the whole.

Mr. Hollister. It seems strange that this variety should deteriorate in this State if it originated here. The circumstances favorable to its origin should also be favorable to its continued growth.

Mr. Miller. It mixes with broom corn all kinds of sorghum and with Durra, Pampus or Upland Rice.

History of Early Amber Cane.

NOTE.—Something concerning the history of this variety since the meeting adjourned has been obtained from Mr. Elliot. It is as follows:

DUNREITH, Ind., Feb. 20.

Wyman Elliot:

DEAR SIR—Your favor of February 12 is just at hand, and contents noted. The history of the Early Amber Cane, as I understand it, is this: Eighteen years ago this winter I went to Europe to select nursery stock, seeds, etc., to add to my collection at Richmond. While in Paris I bought of Vilmoïn, Andrieux & Co., a few pounds of Chinese sugar cane seed, merely requesting the best kind they had. A part of this was given to a friend in this county, who was a skillful manufacturer of sorghum syrup, and by him planted. I requested this gentleman to note carefully whether this was different from and superior to kinds already grown here. In the plat so planted, embracing about one-fourth of an acre, there appeared one stalk of different habit from the rest during its growth, and that ripened its seed by the time the remainder was fully in bloom. The seed from this stalk was carefully saved, and planted the next season at some distance from any other cane, so as to prevent admixture. This crop ripened much earlier than any other cane had heretofore been known to do in the neighborhood, and when the cane was manufactured the syrup was found superior in taste, to any heretofore produced. On account of its earliness and the beautiful amber color of the syrup, I named it Early Amber. I do not believe the name was ever applied to any cane until I applied it to this. There is an apparent want in the chain of pedigree here that is easily explained. At the time the first crop of Early Amber was worked up here, a young man from North Carolina named Lindley was employed by the gentleman who grew and made up this lot, to assist in the sorghum works, and this workman seeing the value of the new kind of cane, saved and carried back to North Carolina a fine lot of Early Amber seed. From the product of this seed carried back to North Carolina, seed was again brought to Wayne county, Indiana, and introduced as early Carolina sorghum. It was seed of this, grown by Mr. Conley, of Wayne county, Ind., that I first advertised as Early Amber, though I knew of the origin of that

grown by my friend in this (Henry) county, but having my hands full of my own business, nursery and fruits, I did not give sufficient heed to the cane interest. I have, however, during the past few years traced the matter up, and am perfectly sure that what was received from Wayne county from North Carolina was the direct product of seed carried from here by Mr. Lindley. I have sold the Early Amber seed largely in the west and northwest during the last ten years, especially in Iowa and Minnesota. In the latter state I have frequent customers about Long Lake and Lake Howard as well as occasional orders from many other localities. One enthusiastic manufacturer in your state told me that he considered the introduction of Early Amber in his state as one of the most paying farm crops.

I have never given the attention to the subject of varieties of sorghum that I should, and do not certainly know whether the single seed found in the French seed was a "sport," and a new variety, or whether it was a seed of a well known sort, that accidentally got in with the kind intended to be given me, nor whether the variety now known as Early Amber is not known elsewhere under another name. I have only written what I do know about Early Amber, and regret my want of knowledge.

Respectfully yours,

E. Y. TEAS.

P. S.—If a satisfactory method of separating sugar from Early Amber syrup is developed and made public at your convention on the 27th, I should be glad to get into correspondence with those having the process in hand.

While the value of this industry is probably greater with you than with us who are nearer the eastern and southern markets, yet I am confident the sorghum interest will be recognized with us as of greater importance than it now is. Syrup is now worth forty to fifty cents per gallon, and much is sold here that is produced in Western Virginia and elsewhere. We should at least grow our own syrup, and sugar also. Hoping your convention may be a profitable occasion, I am,

Yours truly,

E. Y. TEAS.

CRAV AND SIBERIAN APPLES.

Motion was made and seconded to close the discussion on sugar and syrup and take up the revision of the list of Crab and Siberian Apples. Motion carried.

Motion was made and seconded to refer the list of Crab and Siberian Apples to a committee. After some little discussion the motion was lost.

Motion was made and seconded that the names of the lists be first fixed. Motion carried.

Motion was made and seconded that the first list be "recommended for general cultivation." Motion carried.

Motion was made and seconded to strike out names of lists adopted last year as follows: "Recommended for general trial," "Recommended for general trial in favorable localities," "Recommended for general trial in localities not subject to blight," and "Recommended for general planting by those not afraid of blight." Motion carried.

Motion was made and seconded to strike out the list "Passed over without action." Motion carried.

Motion was made and seconded that two lists of Crab and Siberian Apples be added, in the first of which should be placed those varieties "quite exempt from blight," and in the second those varieties "quite liable to blight."

The motion was carried.

Transcendent.

Motion was made and seconded to place Transcendent first on list recommended "for general cultivation."

Motion was carried, 9 for and 5 against.

Virginia.

Motion was made and seconded to place Virginia second on same list.

Mr. Smith. The fruit was the best in the St. Paul market last year. It is about the size of Transcendent, and the flavor good either for eating or for pies. The tree stands best of any in Mr. Brimhall's orchard.

Mr. Elliot. Mr. Chas. Hoag, of Richfield, got some of the trees from Illinois twelve years ago. I obtained a part of them. They are hardy and do not blight, but on sandy soil do not bear well.

Mr. Harris. The trees appear equally well with the Transcendent and the fruit is equally good and valuable.

Mr. Sias. I saw trees moderately loaded two years ago on Mr. Stewart's place. There was no blight on them, though Stewart's Sweet stood blighted all around them.

Mr. Hart. The Virginia is highly spoken of in Winona county. It is proved to be hardy.

Motion carried, 10 for and 2 against.

NOTE.—In a letter from F. G. Gould, of Excelsior, to the Secretary, dated Jan. 14th, 1878, occurs the following paragraph:

Hope a new and better name may be adopted for the Virginia Crab. I do not believe it originated in Virginia. The tree is said to be exceedingly hardy and nearly free from blight, fruit better than Transcendent and nearly as large. When it is better known there will be a demand for it for prairie planting, where most of the new crabs but partially succeed.

The society adjourned to meet at 1:30 P. M.

WEDNESDAY AFTERNOON.

CRAB AND SIBERIAN APPLES RESUMED.

The society was called to order by Pres. Smith, at 1:30.
The revision of the Crab Apple list was resumed.

Orange.

Motion was made and seconded to recommend "for general cultivation."

Motion carried by unanimous vote.

Early Strawberry.

Motion was made and seconded to place on same list.

Motion carried by unanimous vote.

Meaders' Red Winter.

Motion was made and seconded to recommend "for general cultivation."

Mr. Harris. Mr. Jewell says it is one of the worst to blight and it grows too slow for firewood.

Mr. Brand. If I could have but one variety, I would take Meaders' Red Winter. Have over 50 trees in bearing. The original tree did not blight to injure, and I have never had any blight on mine except on trees that I had pruned severely.

Mr. Mason. I know that Mr. Meader himself has but little confidence in it, and about Hesper, you cannot sell the variety at all.

Mr. Sias. Have had it in bearing for three years but do not think very favorably of it. It is not hardy enough.

Motion lost, 1 for and 5 against.

Power's Large Red.

Motion was made and seconded to recommend "for general cultivation."

Mr. Sias. I believe I was the first to introduce it in this State. I got it from S. B. Parsons, of Flushing, L. I. It is perfectly hardy as free from blight as any I know of and an enormous bearer. The fruit is a little smaller than Transcendent and about the same season as Transcendent.

Mr. Cotterell. I can confirm what Mr. Sias has said. There is no blight upon it. The fruit is sought after more than any other, and the tree has borne exceedingly each year.

Motion carried by unanimous vote.

Hyslop.

Motion was made and seconded to recommend the Hyslop "for general cultivation."

Motion was carried by unanimous vote.

Russell's Sweet Winter.

Mr. Day inquired concerning this variety.

Mr. Sias. The fruit is too small. Have seen the tree.

Mr. Day. A neighbor of mine has some answering its description. They have never blighted.

Mr. Wilcox. I got two trees three years ago. Both have blighted to the ground.

Minnesota.

Mr. Mason. What is the objection to this. It has never blighted.

Mr. Phillips. Does it ever bear?

Mr. Harris. I have trees large enough to bear three bushels, and they have not borne. (See "Minnesota" again.)

Conical.

Motion was made and seconded to recommend "for planting in limited quantities."

Motion carried, 8 for and 1 against.

Meador's Sweet Russet.

Motion was made and seconded to place on same list with Conical.

Mr. Brand. Have had several trees in bearing for several years. The tree never blights, is hardy and a fair bearer.

Mr. Miller. I have eaten the apples and they are nice; entirely without the crab taste.

Mr. Jordon. The tree is a shy bearer, little subject to blight. The fruit is very delicious, honey sweet.

Mr. Brand. The trees were planted in 1871, hence they have not stood long enough to determine whether prolific or not.

Motion lost, 2 for and 5 against.

Minnesota (again).

Motion was made and seconded to recommend "for planting in limited quantities."

Mr. Sias. I know the originator. He says the tree is a good or fair bearer. The fruit is large and of good quality. The season is early winter. The tree is hardy.

Motion was made and seconded to amend so as to recommend "for trial by amateurs and pomologists."

Mr. Pearce. Why recommend it at all? I have thrown it out. The amendment was carried by unanimous vote.

Motion was made and seconded to reconsider the list of Crabs recommended "for general cultivation." The motion was lost.

Balance of List.

Motion was made and seconded that the balance of the list be recommended "for trial by amateurs and pomologists." A substitute was offered that each variety be considered separately. The substitute was carried.

Beach's Sweet.

Motion was made and seconded that Beach's (Beecher's) Sweet be recommended "for general cultivation."

Motion carried, 5 for and 2 against.

Quaker Beauty.

Motion was made and seconded to strike out the Quaker Beauty entirely.

Mr. Sias. It is not sufficiently hardy—not adapted to our climate.

Mr. Mason. It is hardy at Hesper. It is rather a shy bearer but the fruit is nice.

Mr. Brand. Have had it growing several years on rich soil and much exposed. Nothing is hardier, but it has never borne.

Mr. Day. I got the Quaker Beauty several years ago and I have valued it highly. It is perfectly hardy. The fruit is nice—larger than Transcendent.

Mr. Dart. I have raised a few apples of this variety. The tree is not a good nursery tree because it grows scraggy. I have understood the tree to be a good bearer. The fruit is good.

Mr. Wilcox. I don't believe it is either good for the nurseryman or the fruit grower. I know it killed with me.

Mr. Cook. The tree is tender while young and a poor nursery tree

Mr. Jordan. Have had it standing six years in the nursery and it has borne no fruit. I see no value in it.

Motion was made and seconded to amend so as to recommend "for trial by amateurs and pomologists."

The amendment was carried, 10 for and 2 against.

Maiden's Blush.

Motion was made and seconded to recommend "for planting in limited quantities."

Mr. Harris. The tree is hardy and good.

Mr. Brand. The bark bursts and the tree does not bear very well. At any rate it bears late.

Mr. Dart. Many trees bear late and then bear well. This is a very satisfactory nursery tree.

Dr. Twitchell. In my nursery the tree is as good as the Wealthy. The trees bear late, but I have seen them as heavily loaded as the Transcendent. The trees are as hardy as any I ever raised. Mine are six or seven years old, but there are some in Chatfield nine or ten years old.

Mr. Wilcox. It is one of the best. The tree bears late but bears well.

Motion was made and seconded to amend so as to recommend "for general cultivation."

Mr. Latham. I don't think it is well enough known to recommend for general cultivation.

Mr. Jordan. I got two trees six years ago and they have not done satisfactorily.

Mr. ———. I have nice trees six or seven years old, but they have borne no fruit.

The amendment was lost, 4 for and 7 against.

The motion was carried unanimously.

Hesper Blush.

Motion was made and seconded to recommend "for general cultivation."

Motion was made and seconded to amend so as to recommend "for planting in limited quantities."

Dr. Twitchell. It is as hardy as the Maiden's Blush and equal to it.

Mr. Wilcox. It is one of the worst to blight.

Dr. Twitchell. The gentleman probably knows and speaks of the Hesper Rose in place of Hesper Blush.

Mr. Jordon. Saw trees of this variety in fine condition in Hennepin county several years ago, but last year I saw the same trees nearly dead.

Mr. Brand. The tree is particularly subject to the borer. The amendment was carried unanimously.

Woodland Winter.

Motion was made and seconded to strike the Woodland Winter (Woodlawn Red) from the lists.

Mr. Sias. The old tree bears heavily. I have a few in the nursery and they are fine.

Mr. Jordon. The fruit is as good as the standard apple.

Motion was made and seconded to amend so as to recommend "for trial by amateurs and pomologists."

The amendment was carried, 6 for and 2 against.

Aiken's Striped Winter.

Motion was made and seconded to recommend "for trial by amateurs and pomologists."

Mr. Jordon. Have had it in bearing two or three years and it is not of any value.

Motion carried by unanimous vote.

General Grant.

Motion was made and seconded to strike from the lists.

Mr. Cotterell. We have men here who have had it without blight.

Mr. Phillips. I had ten trees struck off by blight.

Dr. Twitchell. It blights no more than the Transcendent. The fruit is larger than Transcendent and as good as the Duchess.

Mr. Dart. It ought to go ahead of the Transcendent, Would like to have it recommended "for planting in limited quantities."

Mr. Hatfield. I got some trees and they have done well.

Mr. Day. The tree is as hardy as the Transcendent and blights no more. The apples are large unless too many are allowed to grow.

Mr. Wilcox. What has been said in its favor is my experience.

Motion made and seconded to amend so as to recommend "for general cultivation."

The amendment was carried by unanimous vote. (See "Gen. Grant" again.)

Whitney's No. 20—Alaska—Brier's Sweet.

Recommended "for trial by amateurs and pomologists" by unanimous votes.

Hutchinson's Sweet.

Recommended "for trial by amateurs and pomologists", 6 for and 1 against.

Aiken's Green Winter.

Motion was made and seconded to recommend "for trial by amateurs and pomologists."

Motion lost, 2 for and 4 against.

Power's Large Red (again.)

Mr. ——. The tree is as hardy as any tree in Minnesota, and the fruit is very fine.

Mr. Sias. The fruit sold readily for two dollars per bushel.

Motion was made and seconded to reconsider the action on Power's Large Red.

Motion was made and seconded to lay the Crab Apple subject on the table.

This motion was carried.

MR. MENDENAALL'S PAPER.

Mr. Mendenhall's paper was called for and read by the secretary, after which a vote of thanks was tendered and the paper ordered on file for publication.

The paper was as follows:

THE CABBAGE BUTTERFLIES.

In this northern clime, where fruit is comparatively scarce and difficult to grow, great store is naturally set by the vegetable garden, which our intense though brief summers develop in remarkable perfection.

Among our most important garden crops is the cabbage. This delicious and healthful esculent thrives greatly in our quick, rich soil, and is noted for a solidity of structure and delicacy of flavor not excelled, if even attained to, in any other part of the world. These qualities render it one of our most marketable products and a source of no small profit to the producer.

The only impediment to the successful cultivation of the cabbage plant is the occasional prevalence of certain "worms" and other insects, which gnaw and erode the leaves, and in this way interfere with the compactness and vigor of its growth. Among the most injurious of these insects are the larvæ of two or three butterflies, distinguished as the "Cabbage Butterflies," or "Garden Whites." These butterflies are familiar to every one as they flit lazily from flower to flower sipping nectar, or hover in flocks over the cabbage or cauliflower beds intent on the more serious business of placing their eggs where their young can find sustenance. We have in this country two native and one imported species. The first of these, and the one which at present has the widest range, has been named the Southern Cabbage Butterfly (*Pieris protodice*, Boisd.) The popular name is clearly a misnomer, as it was bestowed upon it by Prof. Riley under the erroneous impression that it occurred in destructive numbers only in the South and Southwest.

This is our darkest species of *Pieris*, the body being black and both upper and under wings of the female being quite regularly checkered in gray, black and white. The sexes differ more in color in this than in any other of the species; the wings of the male being creamy white, with but five more or less distinct black spots on the outer half of the upper pair, while the under pair are plain white. The insect hibernates in the chrysalis state in some protected situation. The butterflies of the first brood make their appearance in May, and deposit their greenish-white, sub-conical eggs singly on the young cabbages and turnips, as well as on some wild cruciform plants, such as mustard, pepper-grass, (*Lepidium*) and cress (*Arabis*). The young larva is of a dull orange color, with a black head, but shows the characteristic lines and black dots immediately after the first molt. When full grown it measures about one and one-eighth inches, and is nearly cylindrical in form. The ground color is greenish blue, with four narrow longitudinal yellow stripes and a broad band of lilac along each side. The surface is roughened with numerous minute black spots from which proceed short, stiff hairs. It feeds for about three weeks, during which it molts four times. The chrysalis is attached by the tail and supported in an upright position by a band of silk around the middle, like those of the typical *Papilios*, which it likewise closely resembles in form. It is of a bluish-gray color dotted with black. The butterflies from the first brood emerge from their chrysalides in from eight to ten days, and immediately proceed to place their eggs upon the now well-grown cabbages. The first brood is seldom numerous enough to do much damage, but the fall brood, being under favorable conditions very abundant, has destructive powers proportionately great, and often causes considerable loss in large fields.

The only other species we have with us as yet, is the Potherb Butterfly (*Pieris oleraceæ*, Boisd.) This is a peculiarly northern species, being rarely found as far south as Pennsylvania in the East, and probably not much below the southern boundary of our own state in the West, while it extends northward as far as Great Slave Lake, and possibly beyond. The butterfly has a black body covered with soft white hairs, and the wings are of an unspotted creamy white color slightly shaded with gray at the base and on the front edges, especially on the under surface. It lays its eggs usually three or four together, on the under sides of the leaves. The eggs are of a yellowish color, somewhat pear-shaped, and furrowed with longitudinal ribs. The larva is a velvety, dark green cylindrical worm, without spot or stripe. It changes to a pale green or whitish chrysalis ornamented with minute black dots. There are two broods of worms during the

season, the second brood, like that of *protodice*, being the most destructive. The development of this insect is somewhat irregular, and it may usually be found in all its stages during the months of July and August and the early part of September. The larvæ of both these native species feed preferably upon cabbage, but also devour with apparent relish the leaves of turnip, cauliflower and kohlrabi, and are occasionally found upon radishes, cress, pepper-grass, mustard and several wild plants of the same family (*Cruciferae*).

The first named species feeds indiscriminately on the upper and under sides of the leaves, and is easily detected by its dark and variegated coloring. The second species, on the contrary, conceals itself on the under side of the outer leaves, with which its green color so closely blends that it requires careful search to discover it.

Destructive as these indigenous butterfly larvæ sometimes prove, their depredations are trifling in comparison with those of the imported Rape Butterfly (*Pieris rapæ*, Schrank). This insect has long been known throughout Europe as one of the most serious pests of the vegetable garden. It was introduced into this country about twenty years ago, and has since spread over almost the entire Dominion of Canada, and established itself throughout the northern and middle Atlantic states. It was first recognized in the vicinity of Quebec, to which port it was doubtless unconsciously brought and cast ashore in the egg or chrysalis state, with the refuse from some vessel; or perhaps the butterflies from chrysalides suspended during the voyage, escaped while the vessel was at the dock, and fluttered landward to perpetuate their kind on new soil. As with most imported insects, the change of climate seemed to impart new vigor to this pest, and as its European parasites had not followed it across the ocean, and our native species had not then adapted themselves to the immigrant, it multiplied for the first ten years with exceeding rapidity, and in 1870 was estimated to have destroyed, in the neighborhood of Quebec alone, more than \$240,000 worth of cabbages. Its ravages were equally severe for some years in the market gardens around Boston, New York, Philadelphia and other eastern cities, where the unconscious gardener would walk amid a snow storm of white butterflies, bemoaning his ragged and wilted rows of cabbages and cauliflower, without dreaming of associating the innocent looking flutterers around his head with the work of devastation going on at his feet. To illustrate how little general knowledge there is upon the subject of the transformation of insects, it is said that a certain entomologist while attempting to capture some of the butterflies from one of these suburban gardens, was driven out with much abuse by the irate gardener, for beating down the plants with his net. In vain the gentleman attempted to explain the service he was rendering in the capture of the butterflies. He was listened to with absolute incredulity. The gardener could never be made to believe—not he—"that catching white butterflies in a bag would save cabbages from worms"!

As this destructive insect is slowly but surely advancing westward, it is well for us to make ourselves acquainted with its characteristics in order that we may recognize it upon its first appearance, and yield it "no quarter."

The two sexes of the imported butterfly are much alike, and bear a casual resemblance to the male of the so-called Southern Cabbage Butterfly. The body and the tips of the front wings are black. The female has two conspicuous black spots near the outer edges of each of the front wings, while the hind wings are marked with a large spot on the upper edge and a smaller one near the middle. The male has a single black spot on each of the front wings and an indistinct one on the upper edge of each of the hind wings. The larva is of a deep green

color, covered with a dense, velvety pubescence, and ornamented with three longitudinal yellow stripes. It does not, as in the case of our native species, confine its depredations principally to the outer leaves, but has the habit of boring into the heart of the plant, and defiling it through and through with its gnawings and excretions. In localities where this worm is naturalized, no cabbage can be committed to the pot without first being picked to pieces and each leaf carefully looked over to detect worms that may be lurking in its folds.

The increase of this insect has been materially checked during the past seven or eight years, by the attacks of two parasites. The first of these, a minute Chalcid, was originally supposed to be its European enemy, which had by some fortunate accident been introduced into this country in infested larva or chrysalides, but later investigations render it more probable that the parasite is a native of this country, as well as of Europe, and that it probably preys upon our native species in the absence of the imported one. It is a very small, metallic green, four-winged fly, and bears the scientific name, *Pteromalus puparum*, Linn. This fly punctures the skin, and lays its eggs on all parts of the worm, and the tiny maggots, often to the number of forty or fifty, feed upon the fatty tissues near the surface, so that the larva, though weakened, is not vitally injured by their presence, and is able to change to chrysalis. The parasites then work deeper, and soon destroy the life of their victim; and in the course of ten or twelve days the flies begin to emerge.

The second parasite is a *Tachina* fly, a two winged insect about the size of the common house fly, which it closely resembles in general appearance. This insect has also proved a valuable ally of the gardener in reducing the numbers of the cabbage worms.

Various applications have been experimented with in destroying the worms, but for the most part those that were efficacious against them, such as carbolic powder, white hellebore, and Paris green, at the same time rendered the plants upon which they were used unfit for food. Dusting with lime and wood ashes, and drenching with hot water, have been tried with considerable success. The best measures, however, are *preventive* and consist in trapping the chrysalides under pieces of board placed here and there among the plants, and elevated an inch or two from the ground by means of clods or stones under each end. When ready to change the worms will eagerly avail themselves of such shelter, and the boards should be examined every week or ten days during the season, and the chrysalides removed and destroyed, with the exception of those that are parasitized, which may be known by their dark livid color. Another preventive is to catch the butterflies, which always fly low and slowly, in a butterfly net. The latter is a bag two or three feet in length, made of coarse book muslin or mosquito netting, the open end being secured around a hoop of thick wire, having the ends twisted together and soldered into a narrow tin tube to form a handle, which can be lengthened at pleasure by fitting into it a stick or cane. The butterflies can be caught on the wing or as they alight, by throwing the net over them and giving it a dextrous twirl to secure them, after which a slight pinch between the thumb and finger puts an end to their power for injury forever.

The cabbage plant is liable to the attacks of a large number of other insects, but none of these have proved formidable pests with us, although further south the damage done by some of them renders the cultivation of cabbage very unsatisfactory and unremunerative.

At the conclusion of the reading of this paper, Mr. Pearce called attention to the apparatus for the destruction of nocturnal insects, in the report of the Department of Agriculture.

MR. HARRIS' REPORT ON INJURIOUS INSECTS.

The report of Mr. Harris on Injurious Insects was then called for and read by the writer, after which a vote of thanks was tendered and a copy requested for publication.

Mr. President and Gentlemen:

One of the greatest aids that could be given to the farmers and horticulturists of this State by the present legislature would be a practical entomologist, whose duty it should be to inquire into the minutest details of the lives and habits of insects both beneficial and destructive, and cause to be published frequent reports of his investigations, that the people may be able to recognize their friends and exactly when, where and how they may combat their enemies to the best advantage. It is evident that insects destroy or seriously injure one-fourth of the products of this State, and that they are alarmingly on the increase. (One thousand dollars expended in furnishing the necessary information would return a hundred fold to the people.) It is of the utmost importance that the tillers of the soil should be informed of the best means for heading them off. Books and papers treating upon the subject of entomology are scarce and difficult to obtain, and what little is written and published in our agricultural papers is so over-shadowed by other subjects that it is not half as beneficial as practical reports devoted exclusively to the subject, consequently the most of our people are ignorant of the habits, instincts and various transformations of insects, and are unwittingly giving aid and encouragement to their enemies by furnishing them the best facility for their increase.

If they knew that the weeds and wild plants that luxuriate in the angles of rail fences were a particularly favorable place for protection during their transformations, that decaying logs and stumps are the very best nurseries for them, and that danger lurked in everything that marred the beauty of their places, self-interest would prompt them to clear out the fence angles, grub and burn the stumps and clear up and destroy everything that is useless but to present hiding places or inducements for insects to take up their winter quarters in or to deposit their eggs for the coming season, and the farms and gardens of our State would present an appearance of neatness and thrift.

The insects that were most injurious to the horticulturist in the year 1877 are the chinch bug, the May beetle and its larva, the white grub, cut-worm, cabbage worms of two species, canker worm and steel blue grape bud borer (*and bed bugs.*)

Chinch Bug.

Early in the season the chinch bug (*Micropus leucop terus*) made its appearance in Houston county. They were massed about the base of strawberry plants, young beets, cabbage, etc., and for two or three days I observed them very numerous on the green fruit of the raspberry. At the beginning of the straw-

berry season they suddenly disappeared from the fruit and vegetable plants, and commenced marching in herds through some of the wheat fields, sweeping everything before them. The full grown insect is about one-twelfth of an inch in length, and of a black color with white wings. When crushed they emit a very unpleasant odor. It is said that multitudes of them live through the winter concealed under chips, stones and various kinds of rubbish, and that the females deposit their eggs in the ground in the month of June to the number of 300, and that the first brood of young mature from first of July to middle of August, and that dry seasons are much the most favorable for them. I discovered the first about the 20th of April, (about a pint or more) under a board that had lain through the winter by the side of my raspberry bed.

Remedy.—Farmers sometimes save their crops by plowing a deep furrow along the side of their fields, which the insects are entering, and then hitching a horse to a log and drawing it back and forth in the furrow, which crushes them as they fall into it, and are unable to crawl out over the loose dirt of the sides. Salt is said to be a remedy. Few if any birds prey upon them.

May Beetle.

In the month of June the May Beetle (*Phyllophaga Quercina*, Harris) came out of the earth in great numbers and devastated the foliage of the fruit and forest trees to a considerable extent. At night they swarmed in such numbers as to present the sound of bees swarming. Their larva, the large white grub, is very destructive to flower and garden plants, also to strawberry plants and young trees. As they work entirely under ground, they are not discovered until the mischief is done. I have found as many as eight under a single hill of strawberries, and lost three-fourths of the crop of cabbage on a half acre. They continue to work on through the entire summer. Whenever a plant is discovered wilting it should be immediately dug out and the grubs destroyed, or they will move on to the next plant. Ducks and other poultry are useful in destroying the beetle. The Butcher bird has a particular appetite for the grubs, and will destroy great numbers of them when turned to the surface in plowing. I think that multitudes of the beetle might be trapped at night in kettles or tubs of water with lighted lanterns suspended over them.

Cut Worms.

Cut worms (for description of them I refer you to an essay by Mr. Mendenhall, read at Market Hall, Minneapolis, Dec. 22, 1877) were numerous and very destructive to cabbage and tomato plants, young Lima beans, cucumbers, melons, &c. One good preventative against them is to keep the ground clear of weeds. The moth, or perfect insect, is led by instinct to seek out the foulest or weediest places to deposit her eggs, to be sure of provender for her progeny; hence the slovenly gardener suffers the most from their ravages.

Grape Bud Borer.

The steel blue grape bud borer is a short beetle about one-tenth of an inch long. They made their appearance about the time the buds commenced swelling, and the damage they do is by boring into the heart of the bud, thus destroying its vitality. I did not make their acquaintance until they had about finished

up their work, and am not familiar with their habits or history. As, like the Colorado potato beetle they have a habit of feigning dead and falling to the ground when disturbed, I think they might be caught in nets by holding them under the vine and giving a sudden jar to it. At one time in the summer I discovered the leaves of some Concord grapes infested with a dark caterpillar about one-third of an inch long, which was eating the leaves full of holes. Before I could take time to secure some of them in order to watch their transformation before they had entirely disappeared. Probably they were the larvæ of the beetle.

I do not know that bed bugs are injurious to the horticulturist, only as they keep hired hands from getting sufficient rest at night, and consequently they take more in daytime.

Cabbage Worms.

A green and yellow striped caterpillar about $1\frac{1}{2}$ inches in length when fully grown, has been very destructive to cabbage, eating the leaves away and even into the hearts, causing premature decay. I have not had time to study them up, but think they are the larva of a yellowish white butterfly (*Pieris rapææ*, or *P. oleracea*) that is seen hovering about the garden in considerable numbers. There appeared to be several broods of them during the summer. Sprinkling the cabbage with a moderately strong brine would probably be beneficial. Thousands can be destroyed when they are small, before they have wandered from the leaf upon which they have hatched. A few minutes spent daily in looking for and destroying them will prevent their doing any serious damage.

Considerable damage was done to the cabbage in the fall by another insect that eats holes in the leaves, riddling them like a sieve. The caterpillar is little more than one half inch long, of a greenish color, and thickened in the middle. Dr. Fitch has described it in N. Y. Report of 1853 Page 874, as the Cabbage Moth (*Cerostoma brassicella*.) When disturbed, the caterpillar drops from the plant to suspend itself by means of a silken thread. The pupa is formed in a silk-like cocoon woven upon the leaves, and as it is but a few days before the perfect insect emerges, probably more than one brood is hatched out in a year. I noticed them quite numerous last fall in the garden of Mr. L. Chase of Minneapolis. I think salt water would be a good remedy. My patch was entirely cleared of them by a flock of blackbirds, but they scratched the cabbage to pieces considerably in getting at them.

JOHN L. HARRIS.

MR. HOLLISTER'S PAPER.

Mr. Hollister's paper was then called for, and read by the writer. After the reading, a vote of thanks was tendered and a copy requested for publication. The following is the paper.

GROWING SEEDS FOR MARKET.

It is not intended by this paper to convey the impression that seed growing is an easy and sure horticultural horse to ride to sudden competence. Neither is it intended to show that any one can succeed in the business, any more than an essay detailing the workings of any commercial enterprise would guarantee business success to any person undertaking it.

The great question with any productive industry is that of supply and demand. The minor problem is, if there is an evident demand, how to profitably reach the market. Common commodities of horticultural birth—grains, fruits and flowers, have simply to be placed on the open market, when they immediately find a price. Their merit is easily discernible by appearance and condition. Not so with garden seeds. Their appearance is not their guarantee. Seed time and harvest—the work of a year, only tells their story. Bound up in the shell of a little seed, that the most practiced eye cannot distinguish with certainty whether it be Swedish Turnip or Flat Dutch Cabbage, lies the hidden germ that tells of success or failure. All sorts of radish seed look alike, as also tomato, turnip, lettuce, &c.

In buying fruits you can judge for yourself. In buying seeds you are at the mercy of the seller, for he must judge for you; and that is where the trouble comes from when you attempt to find a market for garden seeds of your own growth. You must first convince your customer that you are yourself reliable, then you may begin to quote prices, and not before.

A beginner in the business might grow a full list of sorts, true to name, and as good as could be produced anywhere; he might fill his satchel with samples, and tramp from St. Paul to Boston, visiting every seedsman on the route, and not sell a dollar's worth. On the other hand, a grower with a reputation for growing good stock, need never leave his premises to effect a sale, but will be pushed to the full capacity of his farm to supply the demand.

Understand me; that when seedsmen speak of a grower, they have reference to the man who grows seeds to sell in bulk to dealers, a man who issues no catalogue, does no advertising, but depends upon others to sell his stock for him; and this class are very numerous, and occupy a very important place in the seed trade. There are but few dealers in this country who are also growers. Most of them who make big claims, only grow a few varieties, and sort up from the general growers. For instance, a seedsman in Illinois or Michigan may grow to good advantage the vine seeds, but the weevil infests his peas so that he must send to Minnesota or Canada for them. He can grow sweet corn to perfection in Illinois, but if his gardeners want a really early sort it must be grown somewhere north of his location. He can grow tomato seed, but must go to Staten Island for his cabbage seed. He can grow parsnip, but must go to New York for carrot. He can grow onions, but must go to Connecticut for his seed. And thus the interchange is made: we buy of the East, the East buys of us. We import radish, cauliflower, celery, spinach, and Swede turnip from Europe, and in turn sell them squash, cucumber, tomato, cabbage, carrot and onion.

The general grower must supply the most of this exchange stock, which certainly opens a wide field for intelligent industry. While we may to a certain extent point out how many sorts may be grown, we do not advise that a general list be attempted. Better grow pumpkins carefully, and get a reputation for No. 1 pumpkin seed than to attempt a long list of fancy sorts and expect to get your money back before you establish a reputation. Grow no large quantity of seed of any kind until you know where you are going to sell it, and at what price, unless you have a good deal of money to spend for advertising, and are willing to take your chances in creating a market.

While this advice may seem to discourage it also encourages. It discourages careless attempts; it encourages the careful, pains-taking, scientific grower. One is sure of failure; the other is sure of success. And both meet their just reward.

If any man should be rewarded for his labor it is the tiller of the soil; and if any man deserves to go empty handed and unrewarded, it is he who places spurious seeds in the furrow of the husbandman. The grower and dealer in seeds has then a critical and sacred duty. The burial and the resurrection of the seed they sell will proclaim how well they keep their trust.

Soil and Preparation.

Seed growing is also vegetable growing, for the same operations are necessary to grow the stock from which the seed is to be produced as is pursued in market gardening operations. It is highly important then that the ground be in the best possible tilth.

A sandy loam, or warm light soil, brought up to the required standard strength by the application of fertilizers, is the best condition of soil we have any knowledge of for growing vegetables, and as far as our experience goes, is of the sort to produce the plumpest, brightest and best developed seed. We find a strong clay soil too cold and slow, and that a deep black loam has a tendency to induce too rampant growth of vine or stalk, which is quite apt to be at the expense of the quality of seed. Let us suppose then, that the soil is in the right condition, plowed in the fall and again in the spring, thoroughly pulverized with harrow and roller, laid out in straight rows, so as to be sightly in appearance and easy to work, and we will begin by

The Selection of Seed Stock and Stock Seed.

In seed-growing parlance, the roots of all biennials that are planted for seed crop are called seed stock, while the seed of annuals planted for the same purpose is called stock seed.

In selecting roots, like beets, carrots, &c., care should be taken to use only those perfect specimens that preserve most radically the form, color and foliage of the variety sought to perpetuate. And this can partially be done in the field at harvesting time, by first rejecting all that showed foliage of the wrong color or shape. Then again rejecting unshapely and off-colored roots, you can arrive at nearly a perfect seed stock. In annuals the selection is easier as the plant, seed and fruit tells the story, unless there has been admixture by too close planting; in which case the damage is irreparable. In selecting these stocks the greatest care must be observed, and it is a work that should never be entrusted to inexperienced persons. It is one of the secrets of success, and the most important branch of the business.

I have been assigned a subject that would require, to do it justice, more space than you would be willing to allow me. I can therefore only glance at the list, and give here and there a practical hint that may be of value to some one, even though they may wish to grow *only* for their own use.

Beets.

One of the most difficult seeds to procure to suit the fancy of a critical planter. It has a great tendency to sport, and only by strict selection of seed stock and complete isolation of the growing seed crop can any thing like satisfactory results be obtained. In harvesting the seed stock in the fall, the crown should not be

cut close. Winter as you please, in cellar or in pits. Plant as soon as danger of frost is over, in rows three feet apart and eighteen inches apart in the row, and cover to the crown. Soil should be rich. Cultivate thoroughly, and hill up well at the last hoeing, to support the stalks. Cut as soon as the seeds turn brown. Dry in the sun, and thresh with a flail, but take care to do this before the stalks become so dry as to break badly, as it is then almost impossible to separate the short bits of sticks from the seed. Clean with a fanning mill, and spread out in a dry loft to cure before sacking; and here is a good time to remark that all seeds keep better in sacks than in barrels or bins. Good six years.

Beans.

This aristocratic plant will well repay for planting on moderately rich soil, notwithstanding its reputation for thriving on gravelly knolls. Plant at late corn-planting time, in rows running north and south, thirty inches apart, one bushel of seed per acre. Cultivate well; hill but little, as the pods should stand well up from the ground. Never hoe or cultivate when the vines are wet. Harvest as soon as ripe. Stack in hard stacks around a pole with plenty of brush at bottom, and cover with hay; and let them remain in this position until thoroughly dry and cured out. If dried for only a day or two on the ground, they will thresh well, but are not cured out sufficiently to sack with safety. They are apt to heat, which will ruin them for seed and also take on a dingy appearance, while if cured in the pod they preserve the bright glossy appearance so valuable in seed stock. Thresh with a flail, and compel your men to wear rubber shoes while at work, as heavy boots are sure to split a great many beans. Clean with a fanning mill, and sift with a No. 8 seive, and hand pick.

Cabbage.

This vegetable responds liberally to careful selection of seed stocks, and fails just as liberally in proportion as poor specimens are planted for seed. Old established specimens preserve their individuality remarkably well, but the new introductions are apt for years to persistently sport, as having an ambition to be every thing at once. This is familiarly illustrated in that new candidate for public favor, Henderson's Summer, which in our grounds seems yet to be undecided whether to be a Jersey Wakefield, Early Wyman, or Fottler's Brunswick; and for the interest of the seed trade, I hope it will soon settle down to business, and establish for itself a pedigree. Winter according to your most approved notions, taking care that the roots are preserved tolerably fresh, and that the stalk at its junction with the head is preserved from alternate freezing and thawing, as that is a vital point, and if injured is sure to rot off when planted out. Plant 4x4 ft. deeply, so the head nearly rests upon the ground. Harvest as soon as the pods turn yellow, as there is danger of loss by shelling, and the seed loses its plump appearance if allowed to get too ripe. It ripens irregularly, and several cuttings must be made to insure an even sample of seed. Much of the cabbage seed sold has the appearance of having two or three sorts mixed, owing to the carelessness of the grower in harvesting the whole stalk at one time, containing seed in every stage of ripening. Dry upon cloths in the sun to dry, and remove to the threshing floor by tying the corners of the sheets together. Thresh with a very light flail; clean with fanning mill, and finish with No. 18 seive.

For seed stock winter cabbage should be planted at the usual time. Early sorts must be planted so as to mature late in the fall.

Borecole, Brussels Sprouts, Broccoli and Cauliflower, owing to our hot, dry summers, are not profitably grown here, but are brought mainly from Germany.

Carrot.

American grown carrot seed is far better than the European. The European is fifty per cent cheaper—which accounts for the difference of price—in catalogues of dealers. Those determined to present the best stock of American seed, are compelled to sell at a higher price than their competitors who sell imported seed; and this is also true of American beet and cabbage—both superior, but owing to the high comparative price of labor both must be sold at a higher price.

Select the best roots, plant in April on rich ground, one foot by four. The seed ripens unevenly and must be gathered at different times and spread on a floor under cover to dry. Thresh; rake the stems off, sift through a No. 8 seive and continue sifting and rubbing the seed through smaller meshes until you finally finish with fanning mill and No. 24 seive.

Celery.

Seed stock celery is preserved in the same manner as for winter and spring sales, being sure to preserve those with solid stems and perfect heart. Plant early in spring four feet by two. When a majority of the seed is of a brown color cut the whole stalk. Dry in the sun about one or two hours and thresh lightly, and clean this first threshing by itself with No. 24 seive.

Lay the stalks away for two days to dry more thoroughly and thresh again. This second threshing is usually sold as soup celery.

Sweet Corn,

owing to its tendency to mixture, requires as much care as any seed crop. Nothing but radical and complete isolation will insure purity of stock. In the management of our own seed farms I insist on at least forty rods intervening between sorts.

Plant stock seed, selected with reference to color of seed, color of cob, number of rows, and size of the ears of the sort you wish to perpetuate. No grain or vegetable will respond more readily to care in this respect unless it is the tomato. In the climate of Minnesota the soil must be *rich* and *light* to insure a profitable crop of seed corn of any variety.

Plant in check rows three and a half feet each way, four kernels to the hill. Cultivate and use the hoe often. Our plan of harvesting, though expensive, is a sure one.

When almost ripe we drive through the field and gather all the ears in a wagon. They are taken to the drying house, partially husked and the ears trained up in bunches of about twenty ears each and hung on nails overhead, and on bars across the room until they are filled.

In husking the poor ears are thrown out as stock food, and the good ears that are broken off so that they cannot be hung up are placed upon lath shutters, and the whole immediately dried with fire heat. No shelling is done by us until wanted for spring sales, as we have found by experience that sweet corn rapidly

loses its germinating properties if shelled and sacked much in advance of the season for planting. Stock seed should be selected while husking, as you can then more readily detect the earliest and best ears.

Cress, Endive, Kohl Rabi and Leek are mainly grown in Europe.

Lettuce is not a satisfactory crop in this country, and much of the seed used here is grown in England.

Cucumbers, Melons and Squashes

are handled so nearly alike that one description will suffice for all; supposing, of course, that having good stock seed, you know how to grow the crop. Complete isolation is demanded for all the sorts, and it is more imperative with the squash family than any of the other vines.

The crop being grown, we first go over the field and select and haul away the most perfect specimens for stock seed, to be used in growing a seed crop the next year. When the crop is thoroughly ripe, they are either hauled to a convenient place or cut open and the seed taken out in the field. With melons and cucumbers the latter plan is pursued, as they break badly in handling. Prepare tables to work on in cutting and taking out the seed. The whole inside is scooped out and put in barrels, and water poured over the mass sufficient to just cover it, and left in warm autumn weather about forty-eight hours, or until decided fermentation takes place. The whole is then thoroughly stirred up with a stick, allowed to settle half an hour, and the top poured off, which carries with it a large portion of the pomace. Use water freely now, filling the barrel full, and continue stirring and pouring off until the seeds are clean. To begin with, the barrels should not be filled more than half full of the pomace, and after fermenting, the barrel should be filled full of water before pouring off, as the more the liquid is reduced with water the more readily the seed separates from the pulp and settles to the bottom. This is the only plan we pursue in cleaning melon and cucumber, and it has the advantage of disposing of all light seeds, as nothing but the perfect ones settle to the bottom.

In separating the squash seed from the pulp, we are compelled to use a cylinder enclosed in a box made to conform to its shape and size. The cylinder is spiked with teeth about three inches long, with corresponding spikes in the concave of the box, and set so that when the cylinder is turned, the spikes pass like the arrangement of cylinder and concave in a threshing machine. The seeds and pulp are thrown in at one end, and while the cylinder is turned with a crank, gradually passes out at the other into a barrel, from which the final washing can be done. As soon as washed the seeds are spread out in the sun if the weather permits, or over fire heat under shelter if it is cloudy. We use frames 3x6 feet, covered with cotton cloth. If we are drying out of doors we always pile them up one frame on top of another, as many as two men can carry, and take to the dry house over night, as a sudden storm of wind and rain would cost you several days extra work, if left out of doors.

Onion.

Owing to the fact that onion seed is only considered good for one year, new stock must be annually grown to supply an immense demand, and the business of growing this seed has assumed great proportions.

The seed stock is grown and wintered the same as for market. Plant on moderately rich ground, as early in the spring as the ground can be worked, in rows three feet apart, and from six to eight inches in the row. The onions should be just covered with earth. When ripe, the seed bolls are gathered in baskets and hauled to a dry air loft, where they are piled in heaps of about twenty bushels, the windows closed, and allowed to remain until they begin to heat, when they are spread out thinly, the windows opened until they are nearly dry, when they are piled and allowed to heat again, and finally dried for threshing. This sweating process opens the pods, and very much facilitates the labor of threshing. We thresh with a flail, run four times through the fanning mill, and float in water, to carry off all chaff and broken bits of stem. After washing, the seed must be spread out thinly and dried as soon as possible.

Peas.

Sown in every garden from Maine to Texas and from Manitoba to Florida, and in large quantities at that; it takes at least one hundred thousand bushels annually to supply the demand for garden peas alone in this country.

This vast territory, or at least nine-tenths of it, cannot produce any peas fit for seed.

The whole country south of latitude 42 is so infested with the pea weevil that the peas are unmerchantable for seed or for any other purpose except for food for swine. This vast area must either import peas from Europe or have them grown in latitude north of 42.

The climate and soil of central and northern Minnesota is admirably adapted to this crop, and there is certainly a field for profitable operation.

As fine a lot of Champion of England peas as I ever saw were grown for us last summer in Le Sueur county. Our own fields near St. Paul prove conclusively to us that there is no better place in America to grow this important seed crop.

New clean land is to be preferred. We plow in the spring as early as possible, and drill the peas in four inches deep, two and a half bushels per acre of all sorts.

Rows run north and south thirty inches apart for dwarf sorts, and thirty-six inches for tall sorts. Cultivate thoroughly so as to keep the ground loose, and hill slightly to protect the roots from the sun and support the vines. We never give support to any field crop of peas; even the Blue Imperial Tall and Champion of England are allowed to sprawl around as much as they please, and we find the loss does not near approach the cost of bushing.

From the best stock seed you will always find a few spurious vines that we call the Barneys. Go over the field at blossoming time, and pull them out. The Barneys, as they are found in Early Kent, Dan O'Rourke, Phil. Ex. Early and Carter's First Crop, will be found with pink blossoms. In Tom Thumb, Little Gem and Blue Peter, the color of the blossom is the same, but the vine presents a rough, scraggy appearance.

As soon as ripe we go over the field with steel knives, shaped something like the blade of a pruning knife, and about twelve inches long fastened to a handle four feet long. With this implement they are rapidly cut close to the ground and left two or three days until thoroughly dry, when the vines are pitched together with forks, loaded on a wagon and hauled to the threshing floor, where they are threshed with flails. Three good men on the floor will keep two men and a team hauling, which gets the crop out of the way quite rapidly.

Clean well with a fanning mill and hand pick. The green or wrinkled sorts should be harvested before perfectly ripe in order to preserve their fine green color.

Tomato.

Tomato seed, when conscientiously saved for sale, is taken only from what we call first pickings. The first to ripen, as well as the largest and finest shaped fruit, is always formed low down on the stem and is the only fruit that should be gathered for seed purposes.

In curing the seed the ripe tomatoes are passed through a mill much like the old-fashioned cylinder apple grinder, only the teeth on the cylinder are about three inches long.

After grinding they are placed in a barrel and allowed to ferment, and are washed and dried same as cucumber or squash.

Turnip.

With a short chapter on turnip seed, I will finish the list.

The fancy white turnip, and most of the Swede or Rutabaga seed is imported from Europe. The great labor required to handle the roots in storing and transplanting in this country of high priced labor renders the business unprofitable, when grown in competition with equally as good stock grown in England and Germany.

There is now being offered in this country a large stock of worthless American seed, that is offered at a price that will temporarily ruin the business of the dealer who offers good stock, and I am sorry to say it is being offered by dealers who ought to know better. The worn out cotton and tobacco fields of Virginia are being turned to advantage in this respect.

Seed is sown broadcast of the different varieties, and without any cultivation the crop is allowed to struggle for existence and shape.

In that climate they can remain out all winter with safety, and are not harvested, but are allowed to remain just as they grew, and without any opportunity to weed out the worthless, and the whole mass is allowed to go to seed, until the field presents the appearance of a tangled growth of wild mustard. When ripe it is harvested with a reaper, and the whole operation has been attended with so little expense that the growers and dealers in this spurious article are able to undersell other dealers and reap a rich harvest besides.

About two thousand bushels of this stuff were grown last year, and some of you who buy from commissioned boxes will have an opportunity to test it.

Separation of Varieties.

I will give you my plan for securing isolation in growing a general crop. Our fields are laid out in forty acre lots, 80 rods square. We have a notion that everything should be sowed north and south, and lay out our grounds accordingly.

We will suppose we have eight sorts and wish to grow in an isolated position.

Selecting a field that suits us, we begin, for illustration, on the west side and plant ten rods wide, or five acres of Early Maine Corn.

Next to this plant five acres of Hubbard Squash, then five acres of Valentine Beans, then two acres of Cucumbers and three of Onions.

Between the next space to be planted and the Valentine Beans we have a space of ten rods, and will now plant five acres of Mohawk Beans with safety.

The first corn planted is a very early sort and we can plant five acres of Evergreen Corn, as it blossoms at so widely different periods there is no danger of mixture. We will now plant five acres of Six Weeks Beans.

We are now fifty rods from the Hubbard squash and will plant five acres of Marblehead to complete the field. In this manner we can utilize all our available land for seed growing and still preserve complete isolation.

You may remark that we are growing beans on the same soil required to grow corn and squashes. We grow beans on corn land and find it pays. We are too far from town to be able to procure manure enough to enrich a whole field fit for squashes, and consequently resort to manuring in the hill, which plan we find to work well enough for us.

Seed growing is a business that requires strict personal attention on the part of the person engaging in it. He must have every convenience for rapid work, with plenty of shelter, drying sheds, threshing floors, bins, &c. A strict system of labeling must be persisted in. From planting in the field until sacked for market the label must be made to follow the product.

Trust nothing to memory or your skill in detecting different varieties, for if you do it will sooner or later get you in trouble.

Care in this business will surely bring its reward. There is no more pleasant agricultural or horticultural industry, including, as it does, growing the finest sorts of vegetables. The new candidates are grown and anxiously watched in their development.

Acres of phlox, zinnias, petunias and gladiolus distributed for isolation, keeping an eye to effect, have their place in this exhibit. Straight rows, clean culture, thrifty growth, all combine to give a seed farm, a self satisfied appearance, that must be a source of gratification to any one of horticultural taste who has charge of it.

U. S. HOLLISTER.

COMMERCIAL FERTILIZERS.

It was proposed to resume the discussion on this subject.

President Smith. Farm-yard manure, it is known, from long continued application loses its value and effect, and by using salt, ashes, gypsum, lime, &c., we may be able to obtain better results.

Mr. Harris. Farm-yard manure may not be the best for continued use on grapes but it is for most crops.

EVENING MEETING.

Owing to a lecture in which it was thought members of the society might be interested, the question of holding an evening meeting was raised.

Motion was made to hold an evening meeting, but was not seconded. The following motion was then made and seconded:

Resolved, That we do not desire to interfere with the arrangements of the people of Rochester and will not hold a meeting this evening.

The motion was lost.

CRAB AND SIBERIAN APPLES RESUMED.

Motion was made and seconded to reconsider the motion laying the Crab Apple question on the table. Motion carried.

Powers' Large Red (again.)

The reconsideration of Powers' Large Red was called up. Motion was made and seconded to recommend "for planting in limited quantities."

Mr. Sias. I have had it in bearing five or six years.

Mr. Jordon. It has borne four bushels on one tree.

Mr. Hoag. It is a noble bearer and perfectly healthy. The fruit is without an astringent taste. I would set 1,000 trees of it sooner than of any other variety.

Mr. Pearce. It is free from disease, free from blight. The fruit is not so large as Transcendent but much better.

Motion was made and seconded to amend so as to recommend "for trial by amateurs and pomologists."

This amendment was lost, 6 for and 11 against.

The motion to recommend "for planting in limited quantities" was lost, 1 for and 12 against.

Some talk about rings ensued, which it is not necessary to report.

Mr. Brand. It has not appeared that the fruit, though acid, has any flavor. (In answer to a question it was stated that no trees were known in Wabasha county.) I sold this variety in Wabasha county in 1866 and if they are not alive where have they gone? Those trees that are now only six years old have not been severely tried.

Motion was made and seconded to have a list of Crab Apples recommended "for general trial." The motion was carried.

Motion was made and seconded to recommend Powers' Large Red "for general trial."

Motion carried, 13 for and 2 against.

Virginia (again.)

Motion was made and seconded to reconsider action on Virginia.

Motion carried, 9 for and 5 against.

Motion was made and seconded to recommend "for general trial."

Motion carried by unanimous vote.

Blighting Varieties.

Motion was made and seconded to proceed to assign those Crab Apples "quite exempt from blight" to list with that heading, and those "quite liable to blight" to list with this heading.

The motion was carried and the following varieties assigned without discussion, by the following votes:

Varieties quite exempt from blight—

Orange, (Unanimous vote.)

Virginia, (6 for and 1 against.)

Early Strawberry, (9 for and 1 against.)

Powers' Large Red, (Unanimous vote.)

Beach's Sweet, (Unanimous vote.)

Minnesota, (Unanimous vote.)

Conical, (Unanimous vote.)

Whitney's No. 20, (Unanimous vote.)

Maiden's Blush, (Unanimous vote.)

Varieties quite liable to blight—

Transcendent, (10 for and 1 against.)

Hyslop, (14 for and 1 against.)

General Grant, (Unanimous vote.)

Varieties recommended and not named in these lists were not assigned, either for want of sufficient knowledge, or because they are not decidedly exempt from blight or decidedly liable to it.

 WEDNESDAY EVENING.

CRAB AND SIBERIAN APPLES.—Continued.

Pending the consideration of the blight question the Society adjourned to meet at 7:30 P. M., at which time the Society was again called to order by the President, when that question was closed and other business proceeded with.

Beach's Red.

Mr. Jordon. I think quite well of this variety and some have gone to planting it in considerable numbers. It was started near Hesper. The original tree has borne ten bushels, and my trees have never failed to blossom like pinks. For hardiness they have no superior. Some that I sold three years ago are now bearing. The fruit is like the Conical in shape, tender, sub acid, nice, about the size of Transcendent.

Mr. Mason. I can confirm what Mr. Jordan has said. It bears every year and does not blight.

Motion was made and seconded to recommend "for general trial."

Motion carried by unanimous vote.

Motion was made and seconded to place on list of varieties quite exempt from blight.

Motion carried by unanimous vote.

COLONEL HEALY'S PAPER.

It was proposed that Colonel Healy's paper should be read and it was accordingly read by the Secretary, Colonel Healy being absent. After the reading a vote of thanks was tendered and a copy requested for publication.

The following is the paper in full:

THE LOCATION, LAYING OUT, PLANTING, AND CARE OF
CEMETERIES.

To the Horticultural Society of the State of Minnesota:

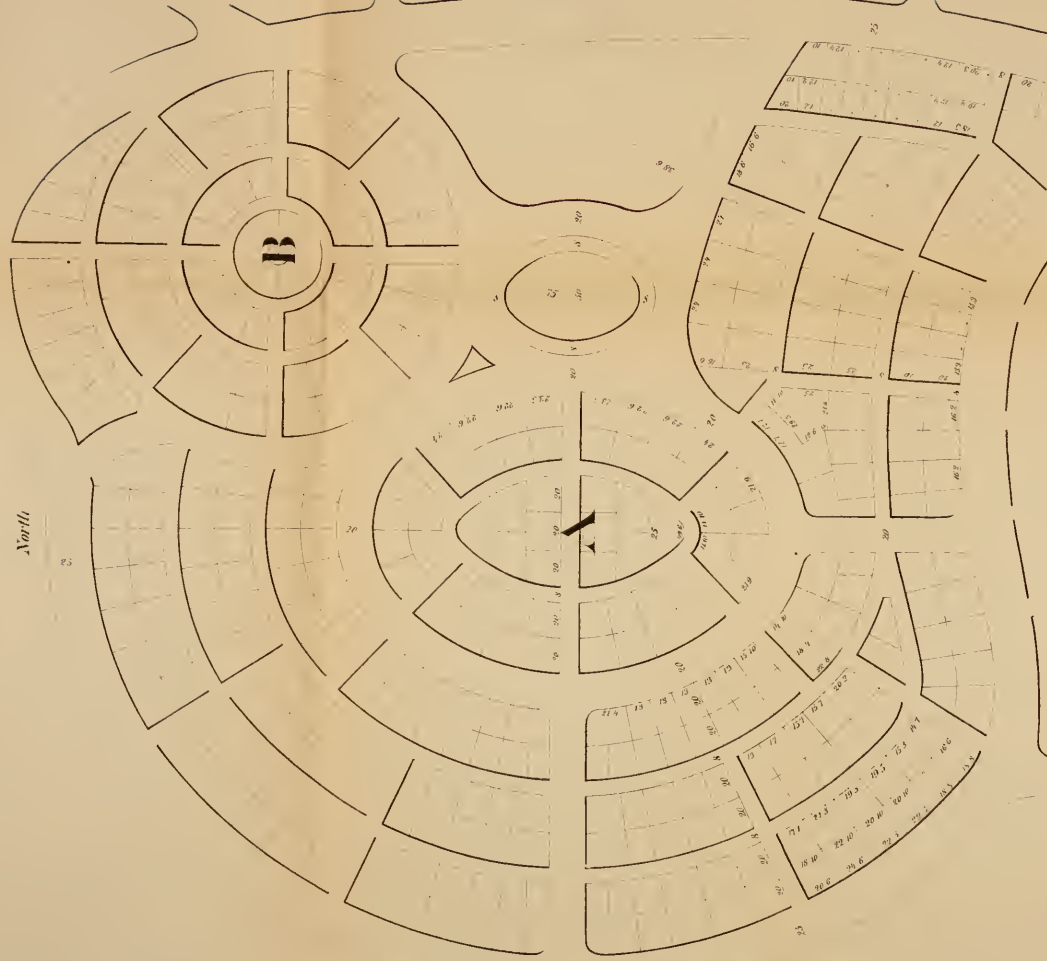
GENTLEMEN—Having been requested by a member of your society to make a short report on the subject of cemeteries, the manner of laying out, planting, ornamentation, &c., I very reluctantly consented on account of my inadaptedness to a service of this kind. I have had some experience in the laying out of cemeteries, to be sure, and I laid out and surveyed the several sections in Oakwood Cemetery of Rochester, Minn., that have been laid out; but to delineate and explain the matter in a report is quite another thing, and I have therefore introduced with this report a copy of section No. 3 in said cemetery, the more fully to exemplify my views.

Cemetery in its most comprehensive meaning embraces all burying-grounds, but in modern times it is almost exclusively applied to ornamental or rural burying-grounds. Formerly it was the custom to bury in church yards, and it originated in this wise: In the Dark Ages, if the remains, or any part thereof, or something representing the remains of a dead saint to whom a church may have been dedicated, could be obtained, they were buried near the altar in the choir. "It became a prevalent desire of men eminent for piety or high rank thus to be



PLAT OF SECTION N^o 33
Oakwood Cemetery,
ROCHESTER, MINN.

North



In this Section the Lots are numbered from 1 to 117.

buried in churches, that they might be near these saints. The extension of the practice was the origin of church yards." These in walled and crowded towns became unhealthy. The removal to large tracts outside the city was first practiced in Paris, in which, as the largest walled town in Europe, the disposal of the dead had long been a matter of anxiety.

The new places of interment began to develop humanizing and elevating influences, in beautiful trees, shrubs and flowers and works of monumental art. This practice, originating in the Pere la Chaise cemetery near Paris, extended to London and other English cities, and in the United States, particularly in Brooklyn and Philadelphia, there are cemeteries equal in arrangement to any in Europe.

So determined were the people to abide by the old practice that the English government in 1850, as a sanitary measure, enacted a law for the closing of grave yards in crowded cities. It was applied first in London, where the danger was most urgent, and was afterwards extended to the English provinces and to Scotland.

Another quite as senseless a custom, the burial of the dead with the head to the west, has been almost entirely superseded by a promiscuous deposit without any view as to the direction in which the body should lie. This also, I imagine, has been brought about principally by the establishment of rural cemeteries, which are generally laid out in such manner that but a small portion of those interred could be laid in that manner.

Site.

Grounds for cemetery, if extensive, should be diversified, consisting generally of slight elevations and depressions, interspersed with occasional deeper indentations for a fountain or small lake, with space around the same for a grove and seats for the weary; also occasional higher elevations with steep banks are desirable for the erection of vaults or tombs. These differences in elevation should not be enough to make the grounds difficult to traverse but sufficiently so to make them conspicuous.

Avenues, Drives and Walks.

Having selected suitable grounds the next thing of importance is to locate the avenues, drives and walks or paths to conform thereto, which of course will make them more or less circular and often serpentine. To demonstrate, in the plot at A and B are prominences, and the ground at A is encircled in an elliptical form by an avenue and walks which very nearly correspond to the form of elevation. To the west and north of this elevation the descent is very gradual and the avenues and walks are lain parallel to the central figure, while in other directions they are changed. On the east side of this elevation the descent is more abrupt and terminates in a depression sufficient for the erection of a fountain. Still east of the fountain and between it and a main avenue is a plot not quite elevated enough for graves, and is set apart for a hitching ground. At B is another slight elevation which is surrounded by an avenue and walks, forming a complete circle fitting the contour of the ground almost exactly. This section is surrounded by others which are laid to conform to the ground in a similar manner. Other formations might call for very irregular serpentine avenues and paths, and such is the character of the Greenwood and Mount Hope cemetery grounds.

As a rule the main avenues should follow the more depressed portions of the grounds, occasionally crossing a ridge to again enter low ground or perhaps a ravine, and the lots and paths should occupy the elevations. Avenues should be 20 to 25 ft. broad, drives about 15 ft. and walks 6 ft. to 8 ft. The majority of lots should contain from 350 to 400 square feet of surface each, and located where the contour of the ground is pretty regular, as in the plat, in blocks of some 6 to 12 lots in a block, with one tier of blocks backing against another tier and pointing on either an avenue, drive or walk. Between the lots there should be left by the owners a space some two or three feet in width for a path to afford a passage to the back end of lots without crossing the same. On steep sidehills a walk would be necessary between each tier of lots, and in very diversified irregular grounds, such as the Greenwood, no uniformity should be observed, and the form of lots should vary according to circumstances, depending upon the peculiar surface of the ground. These lots are to be laid in circular, square, oblong, octagonal or elliptical form, as the circumstances of each case render desirable.

Enclosure of Lots.

Much might be said in regard to the kind of enclosures for lots, the propriety of combination in such enclosures, the kinds of monument that should *not* be erected and the manner of erecting such as are proper, and also concerning improvements generally, might be touched upon, but it would extend this report beyond the limits I had designed—I will however say that no wooden structure should be allowed either as an enclosure or monument and that thin marble slabs if over two feet in length should be laid horizontal, because the ravages of time will at no distant day be sure to bring them to that position.

I think that light and symmetrical hedges or heavy cut stone blocks are the most appropriate for borders to lots, the hedges in this climate to be formed of the *Siberian Arbor Vitae* or other shrub that is equally hardy.

Planting.

The planting of trees, shrubbery and flowers in the older cemeteries have especially engaged the attention of those having control, and the general conclusion arrived at is, that care ought to be taken in the kind and amount of the articles, especially forest trees, which have often been removed in consequence of their branches obstructing the view, discoloring monuments, and the swelling and extending of the roots, disturbing the foundations of monuments. Instead of on lots forest trees should be placed on the borders of wide avenues and other places outside of lots purposely reserved.

On this subject a late report of the secretary and comptroller of Greenwood Cemetery has the following: In view of this great and increasing evil, caution in the matter of tree planting is becoming more and more desirable. However pleasant the shade, the sunshine is better. Greenwood has all the shadow it needs, though another tree should never be planted there. Our experience shows that it would require but a few years of unchecked growth to convert the whole cemetery into a jungle. We entreat all who are or who may become lot owners in Greenwood to be sparing and judicious in the setting out of trees and shrubbery. It would be well, indeed, if the smaller lots were never planted with anything more spreading or of more rapid growth than the yews. There is nothing so neat and clean, nothing that is so pleasing, at all seasons and to all eyes as

close shaven green sward. Of nearly all trees it may be said that they impede the growth of grass and flowers, while in many cases the hindrance is complete.

In regard to flowers the same report says: "Care ought then to be taken that *too many* flowers are not set out, and that the kind and colors of such as are selected be appropriate. Nothing coarse or incongruous with the object and place should be chosen. Those which are delicate in size, form and color should be preferred—such as are simple and unobstructive, and particularly those which are symbolical of friendship, affection and remembrance, seem most fitting to beautify the 'Place of Graves.'"

Most respectfully submitted.

GEO. HEALY.

DISCUSSION.

Planting.

Mr. Harris. If we could get at some principles in the planting of cemeteries it might be of some use. Would like to have trees and plants recommended for that purpose. In the older states large trees have been found objectionable. Would like to see a list of moderate growing trees, roses, and herbaceous plants.

Mr. Sias. I have tried both the American and the English yew but they did not survive.

Mr. Jordon. Many have been planted in this city but they are all gone.

Mr. Pearce. I used to think a cemetery an unpleasant place, but now I think it a beautiful place. We show ours to all who visit the city. The lots are kept of uniform height and covered with Blue grass. Flowers are grown on them and a moss rose, nearly hardy, has been extensively planted. Verbenas are also much planted, especially white ones.

Trees to Plant.

Mr. Jordon. It would be wise to recommend some trees. I have planted many and have planted reluctantly anything but Arbor Vitæ. I fear our cemetery will yet be overrun by large trees as Pines, Balsams, &c.

Mr. Elliot. I would suggest the Savine Juniper and the native Trailing Juniper.

Mr. Sias. The best three trees of my acquaintance are the Prostrate Juniper, Savine Juniper and Arbor Vitæ.

Mr. Latham. Does any one know the Mountain Pine? I have only seen it four feet high, but Douglass says it reaches ten feet at maturity.

Mr. Pearce. I introduced the Rocky Mountain Dwarf Pine three years ago. It grows very symmetrically round and is very hardy, but is too dwarf for level ground.

Mr. Dart. I think the Mountain Dwarf Pine adapted to the purposes named. A neighbor of mine prizes it more highly than any in his yard. There is also the Tom Thumb Fir and the Tom Thumb Arbor Vitæ.

Mr. Sias. I have the Tom Thumb Arbor Vitæ and it has done well.

President Smith. The Tom Thumb Arbor Vitæ has proved tender with me.

Mr. Hart. The Trailing Juniper is the most beautiful dwarf plant I know of.

Mr. Hollister. Something is wanted to relieve the evergreens. The European Cut-Leaved Weeping Birch is the nicest thing for this purpose.

President Smith. There should be something in the cemeteries besides these pigmies, but not on the lots.

Mr. Elliot. At Lakewood we have a superintendent, and before anything is planted his approval and consent must be obtained. Hard Maple is the best for drives in cemeteries.

Mr. Jordon. The Weeping Birch is hardy here.

At this point the discussion on planting cemeteries was closed, and it was decided to postpone the President's address until Thursday morning.

MR. WILCOX'S PAPER.

Mr. Wilcox was requested to read his paper. At its close a vote of thanks was tendered and a copy requested for publication.

The paper was as follows:

THE PROPAGATION OF HARDY TREES.

TREMPEALEAU, Wis., Jan. 23, 1878.

C. Y. Lacy:

The act incorporating the Minnesota State Horticultural Society says: "Article 2. The object of the society shall be to collect, condense and collate information relative to all varieties of fruits, flowers and other horticultural productions, and dispense the same among the people."

In contributing my mite to the above, I shall draw largely from the experience, observation, &c., of other men, believing that a vast territory and the experience of those conversant with fruit-growing therein, will be more valuable than my own in a limited sphere. I shall, however, not forget to give a short account of my failures and success and hopes for the future.

The first work in growing an apple tree, like building a house, is a good foundation. If this is built on a sandy foundation it will not stand, so if an apple tree be grafted on a tender root. The winter of 1872-3 taught us in Wisconsin, Minnesota, Northern Illinois and Iowa, a very expensive lesson which ought to be turned to profit in the future. The winter of 1874-5 should teach the same lesson in Michigan, Ohio, Indiana, Illinois, Iowa, and even New York.

Now I will call up my first witness. F. R. Elliot, he says: "The growing of trees from grafting or budding upon roots of seedlings grown from the refuse seeds of apples or pears from the mill is no better towards the improvement and reliability of varieties, than that of growing stock or mankind from haphazard meetings. Selections of all future life must be made to secure advance, by growing, in the vegetable as well as the animal, from pure and hardy stock, free from contamination.

"All the records of growth and longevity of orchards may be traced to the stock upon which they have been worked. It is the same in the vegetable as the animal kingdom. If the native healthy character is not kept up by the knowledge of the proprietor and manager, then decay must exhibit itself in a large percentage of the stock."

From this want of knowledge of the origin and hardihood of the stock comes the great loss of trees in our orchards.

As the origin and hardihood of the stock is Mr. Elliott's main idea, let us next enquire of Charles Downing about that. He says:

"Transplanted into a warmer aspect, stimulated by a richer soil, reared from selected seeds carefully pruned, sheltered and watched, by slow degrees the sour and bitter crab expands into a golden pippin." Now to attain this great excellence in quality of fruit how much have we lost in hardihood of tree, and this is the next object of enquiry. We lost in our nursery the winter of 72-73 about 60,000 trees by root killing. They were grafted the common way on apple roots; about 40,000 were one year old—nearly all killed, while say 10,000 seedling crabs same age along side went through without injury; about twenty three-year-old crab seedlings top worked with Tetofsky came out all right, while 120 same age and variety grafted on apple roots were nearly all killed.

In the orchard consisting of about 1,500 trees, all ages from a few years up to 15 years, about 1,000 were root killed, even transcendents 10 years old; these leaved out in the spring, set fruit a little later; seeing that the leaves and fruit did not increase in size, I took my spade and found the roots all dead. Charles M. Hambright, of Gould's Nursery says: "I might add that side by side in our yearling seedling block the common apple seedlings were 95 per cent killed, and not one of the crab with about the same proportion of loss in our three and four year old grafts."

Pres. Tuttle says: "Root killing is often mistaken for blight, for the outward form of the injury is much the same in both cases." I might multiply testimony almost indefinitely from my scrap book, but will stop on the root question after quoting extracts from two letters. The first is from Charles Downing; he says: "I should think you are on the right track, that is, obtain the hardiest root stock, then graft your best and hardiest kinds on that stock." Samuel Foster writes: "I learned some years ago from D. W. Adams of Alamakee county, Iowa, that in that region they would not depend on the seedling roots to grow on except to put in a long cion and plant deep, then the cion would take root. Your plan of crab roots is no doubt best. I have sometimes top dressed the crab and have seldom or never known their roots to kill.

Here I will rest my case as to the root and introduce a few of the plans of those who believe in grafting upon roots grown from seeds indiscriminately obtained from the mill.

1st. A long cion and deep setting.

2d. Slitting the bark near the ground when transplanting, (this is the work of the purchaser.)

3d. The nurseryman to dig his trees when one year old and replant them setting six inches or more deeper than before."

4th. Mulch about the trees. I will not give my reasons at any greater length for preferring crab roots.

Now, having, as I believe, shown how to get a good root to graft upon can it not be shown how a tree can be grown which will stand our climate. This is our plan: Graft the Transcendent crab upon crab roots grown from seeds of Transcendent, Hyslop, Golden Beauty, or any of the Siberians which we have, using a long cion and setting deep. When the Transcendent is large enough bud into its limbs such hardy standard apples as have proved best adapted to this climate as well as best adapted to this work. Some kinds are failures when thus worked. We do not mean to say the Transcendent is the best or only kind of tree we would use for this work, in fact we hope a number of kinds will prove better by being less subject to blight.

Now I will give a brief history of our failure and success in top working but will not go back any further than 1872. In the nursery that year we had some hundreds one year old from the bud put into three year old Transcendents. These were grafted on common apple roots. Our theory then was that hardy varieties worked the usual way by grafting upon apple roots was well enough and that more tender kinds, such as Domine, Jonathan, Early Joe, Wagner, &c., could be grown in this way. The following winter took the conceit in both cases out of us. In the first place many of the Transcendents were killed to the root and where they survived most of the buds of the above kinds failed. A few of these trees lived and were transplanted into the orchard one and a half feet deep, soil generally loam with a gravelly subsoil; they have done well, except some more of the tenderest kinds killed last winter. Since then both in the nursery and orchard we are using the hardest kinds we know of adapted to this work.

We find Wealthy, Price's Sweet, and a seedling we have perfectly at home, Plumb's Cider Utter, Fall Orange and Fall Stripe do very well; Walbridge and Haas, some defective unions; Duchess, Fameuse, Tetofsky, not a success on Transcendent, but on seedling crab Tetofsky and Duchess do very well; the Orange crab is a failure top worked on Transcendent; Willow Twig works well and stands well so far. Now I could furnish reports from Maine to Nebraska of those who have themselves or know of others who have practiced top working upon the common apple and always with greater success than when worked the common way. If done upon Transcendent or other hardy crabs Hybrids or even well known hardy standards like Duchess or Wealthy how vastly better would be our prospect of success. The best evidence of faith in some of the fruit men in this plan is found in their works. They have in their own grounds for their own orchards from a few trees up to thousands top worked on crabs, thus practically endorsing this plan, except the roots are the old way and they are making great efforts to get crab roots even paying five times as much for crab seeds as the common apple seeds cost. Now a few words about the future of apple growing in the Northwest. Horace Greeley found the man he had been a long time looking for who could raise an average of one hundred bushels of corn to the

acre near Grinnell, Iowa. I have been looking a long time for a young man just starting in life who believes in apple growing in the Northwest. Have any of the members ever looked around upon the faces of those found at our winter meetings and noticed how few will be seen below the age of middle life and how great is the proportion of grey beards. Where are our young men getting their education? Is it at the saloon and caucus? I know it is not at our Horticultural meetings. Still these old fanatics are laying the foundation for future success in apple growing in the Northwest.

Since writing the above I have received the following letter bearing upon the subject.

E. WILCOX.

FARIBAULT, 1, 28, '78.

Friend Wilcox:

In reply to yours of the 19th, I will say: In the spring of 1874, I set about five thousand Wealthy, and twenty-five hundred Malinda root grafts planted side by side on very rich, deep new land, the soil being black sandy loam. These were grafted on common seedling stocks. They came well and made remarkable growth, many of the Malinda standing three and a half feet. I think that was the highest point they ever reached. The next spring the whole lot were injured badly, but the Wealthies came on and made as nice a lot of trees as could be desired; no root killing noticeable among them, and making at four years old, *heavy* six to seven foot trees. From the twenty-five hundred Malinda grafts I have never dug twenty-five good trees. They were nearly all root killed. They did not ripen their wood the first fall; the Wealthy did. The same spring I grafted in April, about the 10th, twenty-five hundred Wealthy and two hundred Malinda on crab roots. This lot were also planted side by side, about three weeks after the first lot. They all grew well, and I think the Malinda looks as well today, every thing considered, as the Wealthy. The soil on which the last lot was planted was more dry and had more clay in it than the first piece. My opinion is that it was the crab roots that saved the last lot of Malindas. The last lot are on a western slope, the first on level land.

Very truly yours,

O. F. BRAND.

DISCUSSION.

At the conclusion of the reading the following discussion was held:

Mr. Sias. We don't want to graft everything upon crab roots. I find the best success attends the closest relation between stock and graft, hence the apple had better be put on the apple root, then set the tree four inches deeper so as to get roots from the graft, and afterwards mulch the tree so as to insure against loss by root-killing.

Mr. Wilcox. But Mr. J. J. Thomas truthfully says, continuous mulching requires too much labor.

Mr. Latham. I have found obstacles to the use of crab roots, but top working half hardy trees upon the Transcendent makes them hardier. Those thus put in before the hard winter, are now living.

Mr. Pearce. Since the hard winter I have used a short root and long scion and set deeply and of good trees, thus treated I have not lost one by root-killing.

Mr. Jordan. The apple on its own root is better than on any other. I have 1,000 Wealthy trees that have been top-worked for three years. As a rule the top-working of standards on crabs is a failure, but as the exception it is a grand success. The Hyslop is best for the Wealthy. The Transcendent is good for Plumb's Cider, and Rollin's Russet for the Haas. Am convinced that many half hardy varieties can be successfully grown by top-working. The Jeniton on the Transcendent. As to the time of working—it must be done in the first weather after January that is warm enough for a man to work out without gloves. Set the cion as close to the main stem as possible so that no beetle may be formed on the branch. The wax should contain no animal fat, but consist of four parts resin, one part beeswax and one-fourth part oil of turpentine and more or less oil, according to the temperature of the day. Pull this mixture until it is like taffy, then go to the orchard, drawing the wax into ribbons wind it round, without twine or any thing else.

Mr. Latham. Mr. Gideon paints the wax on old sheets and pillow cases. I have used it also thus and it can't be beat.

Mr. Harris. I don't believe in hybrids between the common apple and the crab—they don't bloom at the same time.

Mr. Jordan. I beg to differ, because of the Hesper varieties. They are all from the same variety of crab, but there is a great difference in size, and many resemble some particular variety of apple. They came from a bushel of apples that were thrown out, frozen, from the trunk of a stranger, and these apples came from an orchard of standard apples with one crab apple tree in it.

Mr. Harris. I have two seedlings from the Transcendent. The fruit of one is nearly as large as my fist but the seed of that tree came from a season when the Transcendent was out of bloom before the Standard apple was in bloom.

At this point the Society adjourned, to meet at 9 o'clock Thursday morning.

THURSDAY MORNING.

The meeting was called to order by the President at 9 o'clock.

COMMITTEE ON FINAL RESOLUTIONS.

Messrs. Latham, Hollister and Miller were appointed a committee on Final Resolutions.

REPORT ON FORESTRY LAWS.

The committee on Congressional tree-planting and other forestry laws, reported through its chairman as follows:

Your committee to whom was referred the duty of reporting such amendments to the congressional timber culture act, as we demand necessary to best promote and encourage the growth of forests on the western prairies, agree in recommending that said act of congress be so amended as to embrace the following points:

First, That every legal sub-division of 80 acres of government prairie land be made subject to entry under the provisions of said act.

Second, That 10 acres of land covered by any timber entry be planted and kept in a healthy growing condition.

Third, That the trees be planted not more than four feet apart each way.

Fourth, That at the time of proving up there shall be not less than 900 trees standing on each acre, and that the rows of trees shall be not more than 8 feet apart, and the trees standing in each row not less than four feet apart in the row.

Fifth, That the entire amount of ten acres of breaking be done in the month of June next succeeding the date of entry.

Sixth, That said ten acres of breaking shall be thoroughly subdued by two years of cultivation after the season of breaking, and that the third year after breaking the ground the trees shall be planted.

Seventh, That at the time of proving up the trees shall average ten feet high.

Eighth, That in the event of any failure to break and cultivate and plant as hereinbefore specified, the land so entered shall be subject to entry under the provisions either of the timber culture act or the homestead act.

Ninth, That the claimant be allowed to propagate his trees either from seeds and cuttings or by transplanting.

Tenth, That the claimant be allowed to plant his trees in groves of not less than two acres in each grove, or in belts not less than three rods wide on any part of the land.

Respectfully submitted,

L. B. HODGES,

O. F. BRAND.

Your committee to whom was referred the memorial to congress of the committee of the American Nurserymen's Association, would recommend a hearty endorsement of said memorial by this society. We recognize the fact that the

future welfare of the nation depends largely upon the success of a system of forestry which will ultimately reclaim the great treeless region of the North American Continent, and render it a habitable and revenue producing region.

We have carefully examined said memorial, and no language at our command would more clearly set forth our own views. We cordially endorse it, fully believing the accumulated experience of European nations would greatly aid us in many ways, and as the sense of this committee we submit the following resolution :

Resolved, That the members of the Minnesota State Horticultural Society, recognizing the great importance of gaining a more correct knowledge of the science of forestry, do hereby most earnestly and respectfully urge upon our senators and representatives in congress to use all honorable efforts to secure the passage of the Bill No. 1218 of the House of Representatives.

Respectfully submitted,

L. B. HODGES,
O. F. BRAND.

DISCUSSION.

Distance to Plant.

After reading the report the following discussion was held:

Mr. Dart. The planting recommended is too thick. The trees must be taken out or they will die out. Think the underbrush ought to be cleaned out of nature's groves.

Mr. Sias. The nearer the trees stand, the less brush, the better the shape.

Mr. Somerville. Have had an experience with trees seventeen years, when set twelve feet apart they make brush, when you want a straight, thrifty tree set out four feet by four, and cut out the stunted ones.

Mr. Jordon. The bill is too strict in its provisions because in case of failure the settler loses his claim.

Mr. Harris. Four feet by four is not too close, rows four feet apart and trees two feet in the row would be better.

Mr. Dart. Four feet by eight would be better than four feet by four.

Mr. Pearce. There is no danger of getting the trees too close.

Mr. Hollister. Must plant close enough to get straight trunks. Would plant four feet by four if I had ten acres to plant. Have seen them planted in Wisconsin ten inches apart in the row and afterwards thinned.

Mr. Hart. Have helped to plant trees in Europe. They plant close there.

Mr. Wardell. Six years ago I planted 25 acres for shelter and timber. Planted White Willow, Cottonwood and Soft Maple. Planted the Willows four feet apart and after five years took out enough for two years' use. A neighbor runs three fires from the trimmings of six acres. He cuts in June, seasons for one month, and then puts into the shed. I cultivated the trees like corn for three years. They are a source of profit, ornament and usefulness. I can sell my farm for from \$10.00 to \$15.00 per acre more than I could without them. My grove and orchard are the last things to be neglected. I would plant again in the same way. Have not yet taken out any trees, but only branches. Where the trees have been mainly lost in any way, the remaining ones are of little account. Everywhere they succeed best with close planting and the thinning process.

Mr. Hodges. Two years' cultivation is required before planting for subduing the prairie sod.

It was moved and seconded to take up the report section by section, which motion was carried. The first section was read. A motion was made to amend it so that it would correspond to the action of the State Forestry Association.

A motion was made and seconded to lay the report on the table to be taken up at any time.

This motion was carried.

PRESIDENT SMITH'S ADDRESS.

President Smith then read his annual address, which was ordered on file for publication. The following is the address in full:

Ladies and gentlemen of the Minnesota State Horticultural Society:

Another year has passed, and we meet again for mutual instruction, to review the past and prepare for the future. When we turn back the pages of history, both sacred and profane, we find Horticulture old as man himself; that it was the first occupation of man, and has continued to occupy his attention more or less ever since, and yet, how imperfectly is it understood. Then why should we be discouraged if we can not solve all of its problems in the short space of a few years. Yet while Horticulture is so old, Horticultural Societies are of recent origin. The oldest in the world of which we can find any record being but seventy years, and within the memory of many still living, was organized in London in A. D. 1808, and called the London Horticultural Society. One nobleman, Sir Joseph Banks, and two private gentlemen, were chiefly instrumental in its organization. This society established the first experimental garden in A. D. 1817; and this model garden still exists and flourishes at Chiswick, having been removed there in the year 1822. From this beginning horticultural and kindred societies soon sprang up and flourished in different parts of the old world, Ger-

many and other nations soon following in the good work. The first and oldest society in the United States is claimed by the Pennsylvania Horticultural Society. They celebrated their fiftieth birthday December 21st, 1877, and at the time of that celebration, three of its originators were still living, to wit: David Landreth, the well known seed man, and Jeremiah and Moses Brown. May not these men well be classed among the fathers of horticulture in America, and should we not honor and respect them for the good they have accomplished? Can they not look back with pride upon the advance in horticulture in all its branches in the last half century, and see the improvements, the new varieties of fruits, flowers and vegetables, that have taken place in the last fifty years, many of them under their observation and through their aid and assistance, and the benefit that society has been, not only to the state of Pennsylvania, but to the United States and the world?

Now, when we remember that since the formation of the societies above named, and with their aid and assistance, and with the aid and assistance of the many hundreds of societies since formed, there has been more advancement in horticulture, horticultural implements and knowledge among the masses, and the improvement of old varieties and the introduction of new, rare, and before unknown varieties of fruits, flowers and vegetables, in the last fifty years than in the two thousand years previous. Now, when we look upon the past, and see what has been accomplished in the last fifty years under the many difficulties they had to contend with; and when we take into consideration the advantages we now have; the facilities of correspondence and the experience of the best and most eminent horticulturists; the abundance of horticultural reading, books and periodicals; the cheapness, and facility of obtaining new and rare plants and seeds from all parts of the world; our system of railroads, steamships and express companies and mails, all aiding us, together with the number of horticultural and agricultural societies in all parts of the United States and most of the civilized world, shall we not look with hope at the future of horticulture? Can we not take hold and work with courage and with a reasonable expectation that if we do our whole duty we shall see much greater progress in the future than in the past; and may we not confidently expect to see many new and choice fruits raised in Minnesota, and in abundance to supply all the wants of her citizens, so that we may have enough and to spare? Shall we not take hold with a will and with courage to work for the best interest of our society, our state and her citizens?

Horticulture is a study, always fresh, always presenting something new to admire. The book of nature is always open for us to read, and the God of nature is always ready and willing to show new beauties and new and rare species to the willing and attentive student; and we find our oldest and ablest horticulturists still as close students and as eager after knowledge as the new beginner. Men like the late Thos. Rivers, are as earnest as ever in the search of its hidden mysteries. In fact the pleasures of horticulture and the desire to acquire a more perfect knowledge seems to grow with our old age. When once fairly enlisted in the cause nothing seems to dampen our ardor and zeal in the good work. Neither age nor infirmities, cold winters, early or late frosts, will drive us from our chosen profession.

Now as we are in our infancy, only eleven (11) years last October since the first attempt at an organization in our State, and five (5) years since we commenced work under our present constitution, may we not hope, before we have attained our fiftieth birthday as a society, that we may accomplish much for our state. If

any of us now assembled should then be living to help celebrate that day of our existence as a society, may they not point with pride to the orchards, vineyards and fruit gardens, beautiful lawns and shade and ornamental trees along our principal streets, roads and avenues, grounds decorated with evergreens, shrubbery and flowers, glass structures well filled with fruits, flowers and exotic plants, as a part of what the Minnesota State Horticultural Society has accomplished? Now in order to do this we must enlist the masses to help us work. We must secure local societies in every county, town, city and school district. They must hold their meetings monthly, or oftener, and must exhibit at the same their fruits, flowers and vegetables in their season, compare notes and modes of cultivation, and from their united experience select the best varieties and modes of treatment to be presented to this Society at its winter meetings. Then from these varied reports from all parts of our State, we will have a basis to work upon, something from which to select what is best for the State at large and for special locations.

At a former meeting there was a committee appointed with this in view—to draft and prepare a blank form of constitution and by-laws and have the same printed so that they could be distributed throughout our State and help to facilitate the organization of such societies. I sincerely hope that committee has performed that duty, and that we may soon have many local societies. May I not again call your attention to the necessity of a State Entomologist, and through you, if you should think best, the attention of the Governor and Legislature? I think one should be appointed and paid by the State, which could be done at a very small cost in comparison to the benefit to be derived therefrom. Could not some of the professors or teachers of some of the State institutions of learning, that are competent and willing, with a few hundred dollars added to their salary, perform the duties of State Entomologist, and thus not burden our already heavy tax payers to any extent, and still be of much and lasting benefit to our entire State?

Permit me to again call your attention to the subject of cranberry culture, believing as I do that it is one of the great resources of our state. With thousands, if not millions, of acres of the best cranberry marshes in the United States lying idle and useless, should we not urge their improvement, that they may become productive, and help to increase our exports as well as the health, wealth and comfort of our citizens? Cannot capital and labor from the older states and men that understand it be induced to take hold of the matter? I think it would pay our State or our railroad companies to take hold and to donate a few sections of suitable lands in small tracts, upon certain stipulations that the parties should plant and properly cultivate in cranberries for a series of ten years or more, and thus give the business a start, and not let these lands lay dormant the next twenty or thirty years. When we take into consideration that as our country settles up and our cities and towns grow in wealth and population the demand for the cranberry constantly increases; that they now have to be imported in large quantities to supply this demand; that our once full supply of wild fruits, cranberries especially, is constantly declining as the country becomes settled up; that the marshes are being filled up by the washings from plowed ground, and run over by the herds of cattle that roam by the ten thousand over the unfenced portions of our State, tending to exterminate the once abundant crop of wild fruit. When we take into consideration that the cranberry properly ripened, and grown and handled with care, can be kept in a fresh state, without canning or other expensive process, for one year or more, and that it can be sent to distant

markets at a small percentage on its cost or worth, in comparison to wheat and other heavy produce; when we witness its successful cultivation in several of the older States, should not we give attention to the subject? As an illustration of its importance, one gentleman in New Jersey, Jas. Hinchey, near Medford, is reported to have commenced about twenty years ago, on an old mill pond of ten acres, which cost him to put into a bearing condition about \$1,600, and took three years to accomplish it, and from which he has taken seventeen crops without a failure, and never less than one hundred bushels to the acre. From this commencement he has now several hundred acres valued at from \$100,000 to \$200,000, with a net increase of from \$20,000 to \$40,000 per annum, with a crop in 1877 that was estimated at twenty thousand bushels, and to require ten thousand days' labor to harvest. This success has been reached in a State where disease and insects prevail to such a degree that the aid of the microscopist of the United States Department of Agriculture was called to aid in discovering a remedy for the disease of sun scald or rot, which often destroys whole crops of many of the growers. Now what this society and the State at large needs most is knowledge; to know what to plant; what our particular soil and location is most suitable for, what varieties will succeed best, which are the hardiest and most productive, which are best adapted to each locality. Now where are we to get this knowledge and to look for correct information on this and other subjects of the kind? May we, or should we not, with confidence look to our State University, the agricultural department thereof, and its professors and students, for much of this information?

If we give the encouragement they deserve, and fill their classes and halls with our sons and daughters, as we should, will not the great wants of horticulture and agriculture soon be spread broadcast all over our state? Especially if in addition to the above we organize local, county, town and school district societies.

We should establish or help to establish in every city and town, a system of fairs or exhibitions, to be held for the purpose of showing our products in their season of maturity and sale. Exhibitions can, if properly managed, be of the greatest benefit, both in spreading a desire to excel and in exciting competition, and will thereby increase and promote the interests of horticulture in our state, until we shall find every school house surrounded with its shade and ornamental trees, flowers and shrubs, and every city and town with its parks and lawns well planted with shade and ornamental trees well cared for. Let us strive to have every farm have its fruits, vegetables and flowers in abundance, as well as its lawns, shade and ornamental trees, thus causing homes in Minnesota to be loved and sought after, and creating a desire among our boys and girls to engage in fruit and flower growing, and to make their homes the most pleasant and happy places on earth. This matter of exhibitions or fairs has been a study and problem upon which most of us have spent much time and thought, and upon which as far as I can learn, there has been no satisfactory conclusion arrived at, but one point upon which all agree is that there is a necessity for these exhibitions, in order that we may see the varieties and samples that we wish to discuss and learn about. Who cannot get a better idea of an apple, pear, bunch of grapes, flowers, or any thing else we wish to discuss and learn about by having the same before his eyes, that he may add the sense of seeing to his facilities for learning the best varieties and modes of cultivation. Now, desirable as these frequent meetings and exhibitions are, few can be induced to attend them—say they can not spare the time, and many say it will not pay. I, for one, believe we can not do without them in some shape without great loss, and will, at the risk of ridicule and being called a

fanatic, propose a new plan; one I am confident, if well matured and properly conducted, will do more to stimulate and increase an interest in, and advancement of, not only horticulture but agriculture and other kinds of employment, than all the fairs ever held. It is this: establish in every town or city, big or small, a central and well filled public market, where all can meet and bring the products of the garden and farm, and have ample room to display and arrange to the best advantage whatever they may have to sell, be the same a load of wheat or potatoes, a cow, horse, or apples, grapes, vegetables, or a bouquet of flowers. Here would come together both producer and consumer, the producer as exhibitor and the consumer as judge. The latter will be ready and willing to pay a premium on the best and finest grown specimens of every kind, in better price and more ready purchase, while the man who produces the best will receive his premium, without the interference of any rings or national rules, or without being compelled to spend the entire week waiting to know whether he is entitled to a premium or not. Here all can meet on common ground, and show what they have to the best advantage; and where all come into competition, does it not give us all a chance to see the best and to learn of new varieties and new modes of cultivation? If any one has anything new all want to know about it, how it succeeds, where it can be obtained, &c.; and can we not there learn and see much without loss of time, money or stock on exhibition. We can have a short meeting in some suitable location, for discussion, if desirable, without much extra expense in time or money. I firmly believe, after an experience of many years in the business, that if the farmers and gardeners in each and every town or city, would agree to sell their produce at a central location or market, and upon a regular market day, in small towns once a week at a certain place and time of day, and in city three times a week or every day, the producer and consumer would both be greatly benefited thereby, and an interest in horticulture be raised and encouraged among the masses.

Now, as heretofore, I must advise you to go slow in order to make haste, and in order to accomplish the most good in the shortest space of time. Let us be very careful to only recommend for general culture such varieties of fruits, flowers, vegetables or trees and shrubs as are well known to succeed with ordinary care and cultivation and such only as will succeed in most of the soils and situations where the masses are likely to plant them. For instance, we all know that the Duchess apple and the crab apples are likely to succeed in most soils and localities, and will give more dollars and more satisfaction. A few trees or plants that are hardy and will succeed and produce fruit in abundance are more satisfactory than whole orchards or plantations of worthless stuff. Fruit growing in Minnesota, for the present, at least, will be pursued by those who have a love for it and by those who are willing to take care of and study the habits and wants and necessities of the kinds planted and the soils and situations most suitable for their growth, instead of by those who seek the profit there is in large plantations and orchards without care or thought of what is to be a success. I for one believe that with proper selections of soils, locations and varieties, fruits, such as apples, cranberries, grapes and other small fruits can be grown with a reasonable profit to the grower to supply the wants of our own citizens and some to export, with the addition of health and wealth to our entire state.

In closing let me urge you, one and all, to help bring about a more general knowledge of horticulture in all its branches; and here let me say we should devote more time to the subject of vegetable culture, all of which is more practical and profitable, as far as our own use is concerned. There are many new and improved

varieties, or claimed as such, I would like to have discussed. Can we not all learn something in the matter by an interchange of views? In conclusion I thank you for the many kindnesses you have bestowed upon me, and the unity and harmony that have characterized our meetings the last five years. Hoping you will forgive my errors, and believe them of the head and not of the heart, and that I shall be ever and always willing to join hands in any and all projects that I can see or believe for the best interests of the Minnesota State Horticultural Society, Minnesota Horticulturists and the state and its citizens, I close.

REPORT OF FINANCE COMMITTEE.

The finance committee submitted their report, which was accepted, as follows:

Your committee have examined bills and vouchers presented by Sec. Lacy, amounting to \$32.75, and bill of J. T. Grimes, amounting to \$2.65; found the same correct, and recommend that orders be drawn on the treasurer for the amount.

SETH H. KENNEY,
U. S. HOLLISTER.

REPORT OF TREASURER.

The treasurer submitted the following report which was accepted.

REPORT OF THE TREASURER STATE HORTICULTURAL SOCIETY, GIVEN AT ROCHESTER, JAN. 17th, 1878.

Amount in treasury at the close of its last annual meeting at Owatonna, January 18th, 1877.....	\$17 55
Membership fees received of C. Y. Lacy, January 17th, 1878.....	56 00
One Transaction sold, " " " " "	50
Membership fees taken by A. W. Sias.....	7 00
Received for postage on reports.....	65
Total.....	\$81 70
Paid C. Y. Lacy, January 17th, 1878.....	\$32 75
Paid J. T. Grimes, " " "	2 65
Balance in treasury " " "	46 30
	<hr/>
	\$81 70

Respectfully submitted.

A. W. SIAS,
Treas.

REPORT OF SECRETARY.

The Secretary made a verbal report, which was accepted, when it should be put in writing. The following is the report:

Mr. President and Gentlemen:

Your secretary has but a brief report to make.

No meetings of the executive committee have been held since the adjourment of the last annual meeting of the society.

The action of the society at the last meeting, giving to those who should become members copies of the Transactions from the beginning of their publication, was not thought prudent at the time, but it has been found to work well, and the continuance of the rule is recommended.

The membership of the society was about the same for 1876 as for 1875, and larger than at any time previous to the latter year.

Considerable difficulty was experienced in preparing a programme for the present meeting. Many members of this society are much like farmers in general in their reluctance to write a letter, even in reply to letters of business demanding immediate attention. They are also very modest about accepting the honor of preparing papers and opening discussions.

The treasurer's report shows the finances of the society to be in a flourishing condition. The expenses of the secretary's office for the past year, have been as follows:

Letter postage and postal cards.....	\$ 3 94
Preparing Transactions for printer....	4 70
Writing postal cards.....	42
Postage on Transactions.....	5 67
Wrappers for ".....	47
Express on ".....	1 55
Labor mailing ".....	1 50
Postal cards.....	2 00
Printing same.....	1 50
Printing railroad passes.....	1 50
Postal cards.....	2 00
Printing same.....	2 00
Printing membership tickets.....	1 50
Programmes of meeting.....	2 50
Telegrams.....	1 50
Total.....	<u>\$32 75</u>
Adding to this amount express and postage on Centennial Diploma and Medal.....	2 65
Gives the total expenses of the society for the past year.....	<u>\$35 40</u>

It was moved and seconded that at the close of the meeting orders be drawn on the Treasurer to meet all expenses of the society to date.

ELECTION OF OFFICERS.

The Society then proceeded to the election of officers, with the following result:

President—Truman M. Smith, of St. Paul.

First Vice President—J. S. Harris, of La Crescent.

Second Vice President—Ditus Day, of Farmington.

Third Vice President—U. S. Hollister, of St. Paul.

Secretary—Charles Y. Lacy, of Minneapolis.

Treasurer—A. W. Sias, of Rochester.

WISCONSIN DELEGATE.

A. J. Phillips, Esq., presented credentials as delegate from the Wisconsin State Horticultural Society. He was received by vote and a vote of thanks tendered for his attendance.

The election of the remaining officers was postponed until the afternoon, and the Society adjourned to meet at 1:30 P. M.

THURSDAY AFTERNOON.**FORESTRY LAWS.**

The meeting was called to order by the President at 1:30 P. M.

It was moved and seconded to take from the table the report of the committee on Congressional Tree-planting, and other Forestry Laws. The motion carried.

A motion was made and seconded to reconsider the action of the Society taking up the report section by section. The motion was carried.

A motion was made and seconded to endorse the action of the State Forestry Association on the Congressional Tree-planting Act and to adopt that part of the report relating to House bill 1,218. (See page 84.)

MR. PEARCE'S PAPER.

Mr. Pearce was called on to read his paper, after which a vote of thanks was tendered and a copy requested for publication.

The following is the paper in full:

PLANTING AN ORCHARD.

Mr. President, and members of the State Horticultural Society of Minnesota:—It is now over twenty years since I first began to set fruit trees in Minnesota, and like all fruit growers of the state, I have met with many reverses and disappointments, and it is only within the last few years that I have met with anything like success, and that with but few varieties.

My experience teaches me that in order to make fruit growing a success, much depends on location, soil, its thorough preparation, and cultivation, and general care of the trees.

Location.

Location should be high, dry, rolling land, with a heavy, firm and moderately rich soil with a subsoil sufficiently porous to give perfect drainage in a few hours.

Soil.

Fruit trees, especially standards, can not live in wet, sticky, sour land, of which large amounts are to be found in this and adjoining states. Permanent success in apple raising on the most of our soils depends largely on the amount of trenching and ditching done previous to setting the trees; and good cultivation for several years afterwards, or at least till the trees are in good bearing condition, is the best possible practical protection against drouth and root killing. A want of proper drainage about the roots of fruit trees, in my opinion, is one of the principal causes of root killing. When freezing in such a condition, the ground heaves and cracks, loosening the roots of the trees and exposing them to the air; which is fatal.

In portions of the country where the land is low and inclined to be a little wet and sticky, good drainage for fruit trees can often be had by digging down a few feet, till a porous substance is found, and filling with small stone within three feet of the top and the balance with good soil, and setting the tree in the centre, a little deeper than it stood in the nursery.

Trees.

As a general rule, small fruit trees are not satisfactory in Minnesota to nursery men or those that buy them. When suffered the second year to branch from where they ceased growing the previous year, the branches are too near the ground, and the only remedy is to cut them off; which is always injurious to the tree, by exposing the sap cells to the air, which is very apt to produce black heart. After experimenting for a few years by cutting a part of my yearlings to the ground, and applying grafting wax, and allowing one bud to grow from the graft, which at the end of the growing season will be from three to four feet high, tapering like a whip stalk, as straight as a candle, I consider such trees the very best to set in orchard. They will branch at the proper height, and make beautiful trees. I am so well pleased with the experiment that I intend to cut all my yearlings down to the ground in the spring. This also saves a world of trimming and stripping of leaves.

Varieties.

It is a mistake and a great detriment in fruit-raising in Minnesota for the farmers and others to set out such a large variety of fruit trees, when it is well known by nurserymen and others, that there are but three varieties of standard apples in the state that have been thoroughly tested and are known to be reliable, namely, Tetofsky, Duchess and Wealthy; all good apples, summer, fall and early winter. If those three varieties were set out in large quantities in the state, and no others, with the exception of a few crabs where standard apples will not live, and leave new varieties to amateurs and nurserymen, it would be but a few years till we would have all the fruit we could use, and more too.

Nurserymen and tree-peddlers should regard the wants of the country more and their own private interests less, and never sell a tree which they have good reason to believe will not give good satisfaction. In so doing, confidence will be established in the minds of the people and the nursery business will be placed on a more permanent basis.

Seeding and Cultivation.

There may be places where fruit trees can be set out and the land seeded at once to grass or Timothy, and the trees grow and do well, but I am quite sure that place cannot be found in Minnesota. It should be borne in mind that our air is naturally dry, and our location subject to extreme drouths during the summers and early part of the falls, which have killed thousands of fruit trees, regardless of varieties, where the orchards have been neglected or seeded down to timothy. During the protracted drouth of last summer, I visited, I might say, scores of young orchards, and in every instance where they were cultivated, the trees were healthy and in a good growing condition, regardless of the drouth. But those that were neglected, or seeded to timothy, were invariably unhealthy, and often in a dying condition.

If you expect fruit trees to grow, remain healthy, and in due time yield their fruit in a ripe condition, you must give them the same cultivation that a skillful farmer gives his corn and potatoes. Anything short of this, taking one year with another, will result in failure. There is a false doctrine advocated by many, that fruit trees should not be cultivated, on the ground that it prevents the wood from ripening up in the fall. A little careful thought on this subject will convince the most skeptical that it is all wrong. Cultivation produces growth, health, quantity and quality, but the time of ripening is the same with the tree, potato and corn, with the exception of soil and location. There is no use of losing the use of land where fruit trees are set sufficiently far apart to plant between the rows with corn, potatoes, or any hoed crop.

Crab Apples.

Never grow apples and crabs together, on account of the latter's blighting and spreading to other varieties that are not predisposed to blight.

The crab apple is a substitute for the standard apple, on soils and locations where standard apples fail, such as very rich vegetable soil, locations very much exposed, level and inclined to be wet, very sandy, etc. To meet such soils and locations, several new varieties of crabs have recently been brought to the front, all possessing more or less merit, but I doubt very much whether any of them possess the merit of the well known Transcendent, which, with all its blight, has produced more good fruit than all the rest put together.

Cracked Bark.

In this and several of the northern states, it is not an unusual thing for the bark on fruit trees to crack near the ground, the south side of the tree to blister or become injured, also the forks and other parts of the tree, all of which is, without doubt, the result of the freezing and thawing of the sap at improper times. In former years, those blemishes or injuries on fruit trees annoyed me

very much, but of late years, I have made it a business as soon as discerned, to heal or cure them right up, which can be done in the growing season as easily as a cut or bruise in the flesh. It is simply this: With a sharp pruning knife, remove all the diseased parts to sound, healthy wood and bark, and then apply a good coating of grafting wax, melted, quite warm, with a brush. Keep the wax on till all is healed.

The wax is made as follows: Two pounds resin, one pound beeswax, third of a pound mutton tallow or Venice turpentine; first melt the resin, then add the beeswax, and last the tallow or turpentine; when melted, pour into a pail of water and pull and work like taffy.

Mulching.

It is said that an ounce of preventive is worth a pound of cure. On this principle mulching is introduced. It is a preventive in the broadest sense, when properly applied and at the right time. It should be administered at any time during the growing season at the approach of extreme heat or drouth, and removed when the danger is over. Mulching should also be applied late in the fall or early in the winter, after the ground is well frozen, to prevent it from thawing out during the winter or too early in the spring, and thus keep back the flow of sap till the danger of freezing is over in the spring.

Propagation.

In conclusion of my scattering remarks, I wish to say a few words about nurserymen and what they are doing, also about windbreaks around orchards and buildings. Nurserymen have done a good work in producing hardy fruit trees for Minnesota. But still they are far from being satisfied. They are putting forth their best efforts to produce fruit trees that will not root-kill. They are experimenting in various ways to accomplish this end, some with short roots and long scions, striking root from the scion; some are planting crab seed and using crab stock to graft on. E. Wilcox, of Trempeleau, Wisconsin, goes still farther; he uses crab stocks, grafts with known crab scions, and when those are two years old, buds into the branches with standard apples. All of the above plans may possibly make the roots more hardy, but from a philosophical standpoint, I have my doubts whether anything is gained by using crab stock. Long scions with short roots, set deep in good fruit soil, worked deep, ditched if necessary, and the trees kept well cultivated, as a general rule, will strike root from the scion, and the fruit trees will be the same variety, root and branch, on which I doubt if there can be any improvement to make them more hardy.

For winbreaks, set out four or five rows of Scotch pine seedlings, about five feet apart, from six to nine inches high, around your orchard and buildings, at a cost of about twelve dollars per thousand, cultivate well, and in a few years you will have a windbreak that is a windbreak.

DISCUSSION.

Saeding Down.

Mr. Fox. I know of an orchard that was sown to oats three years in succession and then seeded down. It has never been culti-

vated since and the trees have never been pruned. The trees have done well, having lived through the winter of 1872-3.

Mr. Pearce. The trees must be cultivated while young.

Mr. Jordon. I never knew a large planter that was successful in seeding. Can point to cases in which seeding down has been successful, but the general recommendation should be to cultivate. It is true that some orchards in grass came through the winter of 1872-3 better than those that were cultivated.

Mr. Elliot. Mr. Whitney has his orchard in grass, and has better success than others, but he cuts the grass and uses it to mulch the trees.

Mr. Mason. Some trees ought to stand in grass, while others are killed by it. The Duchess is one of the latter, while the Transcendent set in sod is healthy, thrifty and little subject to blight. In Fillmore county there is an orchard, a part of which is used for garden and part in sod. In the former the trees are two or three times as large, but the branches are killed by blight, while in the latter the trees are comparatively free from blight. Have wondered why fruit trees are not divided into two lists, one for cultivation and one for standing in sod.

President Smith. J. J. Thomas says if the trees make a great growth cultivate, but not late in the season. The cause of death in 1872 and '73 was late growth and the sudden cold weather. Trees came through in 1864, though it was much colder. Should cultivate not later than July 1st.

Mr. Harris. The dryness of the ground was another cause of the destruction of trees in 1872 and 3. It was so dry at my place that we dug six feet without finding moist earth.

President Smith. There was plenty of water in the soil at St. Paul.

Mr. Hall. It is a good plan to mulch with flat stones. Cover the roots with dirt and then put on the stones and then some more dirt.

Mr. Sias. I approve of that.

Mr. Harris. That is no doubt the place for the stones rather than under the tree.

Mr. Hart. I doubt the value of stones around the trees in Minnesota.

Mr. Pearce. One year with another I think it safer to cultivate than to seed down.

Mr. Hart. I find that where I cultivate the tree ripens its wood earlier than where I do not.

Mr. Hollister. Down in Southern Wisconsin and Northern Illinois it is a common practice to seed the orchards to clover for three, four or five years, then to plow up, grow a crop of buckwheat, and seed down again.

Mr. Jordan. It is safer to recommend cultivation than seeding down, because the trees are less likely to be neglected.

Pruning.

—————. I have killed wild plums by pruning them from the middle of May to the middle of June.

Mr. Hart. I have done the same.

Mr. Jordan. I have pruned in grafting without injury, but that is before the sap starts.

Mr. Hall. I pruned my trees last spring and they made good growth.

Mr. Cotterell. I have pruned and my trees have not been injured by it.

Mr. Jordan. Late pruning is what does the harm.

MR. HARRIS' FRUIT REPORT.

Mr. Harris was called upon for his general fruit report.

The report was read, accepted, and ordered on file for publication. The report was as follows:

REPORT OF GENERAL FRUIT COMMITTEE FOR DISTRICT NO. 1.

Strawberries.

In the first district the fruit crop of 1877, was generally considerably below the average, and some kinds were an entire failure. Beginning with the season, strawberries apparently came through the previous winter in good condition. They blossomed and set fruit in a style that was almost marvelous, but from some cause or combination of causes much less than the usual quantity came to maturity, and the berries were generally of an inferior quality—small, hard and seedy being the prevailing type and but very few really large and fine berries among them.

Who knows the cause of this? I must confess I do not. (Just previous to the time of ripening on my grounds the chinch bugs were very numerous, literally covering the base of the plants.) I do know that the better the soil the more the failure, and the best berries that I saw during the season were grown in a bed composed of sand and gravel liberally mulched with marsh hay.

Raspberries.

Black cap raspberries were injured considerably by the severity of the previous winter but blossomed and set a fair quantity of fruit, but before ripening most of the bearing canes were apparently struck with a blight and in a few hours the half grown berries had blackened and withered, thus ruining the crop. I think the yield of fruit was less than five bushels per acre. With the reds the Philadelphia froze mostly to the snow line and fruited but little. The Turner was not very much hurt by the winter and was well loaded with fruit, but alas! the birds had found out their good quality and claimed the whole. We could not yield to their claims very cheerfully and fought desperately for our rights, but powder and shot did not seem to diminish their numbers, and we retired from the contest, leaving them the whole crop.

Currants.

Currants—there were none in all this region; apples, cherries, and plums the same, or nearly so. Crabs and Siberians produced perhaps one-fifth of a crop.

Grapes.

Grapes did not exceed one-half crop but the quality of the fruit was superior. Now the question arises, will this unfavorable result of the year be set down against Minnesota as a fruit state, and discourage or deter our farmers from planting orchards or fruit gardens? I trust not. According to reports received, other states and sections of our country have done but little better. When our wheat or other crops are a partial failure do the people attribute the fault to the state, or in any wise discontinue the planting of wheat and other grain? Neither should they give up the planting of trees and vines, but rather should study and investigate the cause of the failure, that in the future they may be able to somewhat guard against or prevent a like occurrence.

Apples and Crab Apples.

Doubtless the extraordinary crop of 1876 had much to do with the short crop of the apples and crabs. The trees were greatly enfeebled by maturing so much fruit, and after the fruit was harvested had not time to recruit up and get in good condition to endure a Minnesota winter, and the wonder really is that so many have survived and still live to give promise for the future. I remember that when gathering fruit in the fall of '76 we found the elasticity of the wood gone and even the branches of the so-called *iron clad* Siberians would snap like dry sticks, and the wood looked sick and used up. The great thaw and continued warm weather of the latter part of winter, followed by zero weather in March, by injuring the vitality of the fruit buds that were to give the year's crop, was probably an assisting cause but not the principal. One lesson taught here is do not let the trees in young orchards over bear. Our most severe losses of trees have invariably followed a season of excessive fruitfulness. The same causes will account for the meagre crop of cherries and plums last year. From conversation held with a number of fruit men I am led to believe that the failure of currants is generally attributed to the late May frost, but on my grounds that cannot be,

for they had failed to blossom or set any fruit to be injured, and the frost was so slight that tomato plants and early cucumbers recovered from its effects. If the weather had anything to do with it I must attribute it to the February thaws and March freeze, or to the snow storm of April 27th and 28th, and likewise the failure of the black caps may be partly attributed to the above causes.

Our grape vines were wintered better and the short crop cannot be charged to any of these causes, as they did not start early enough to receive injury. In the early spring our hopes of a large crop were very sanguine, therefore we were not watching them with due vigilance, and the little steel blue bud borer caught us napping, and in a very short time had stripped the vines of two-thirds of their buds. We have promised ourselves to watch for the little scamp this coming spring and try to head him off.

No new varieties of apple, or other fruits, have come out as candidates for favor in the last year.

Our trees and vines generally ripened up the seasons growth well, and have entered upon the winter in good shape to endure a hard winter, and the soil was so thoroughly wet that there is but little danger to be apprehended from root-killing.

La Crescent, Minn., January 14, 1878.

JOHN S. HARRIS.

DISCUSSION.

Mr. Hall. I had Philadelphia raspberries on the side of a ditch well mulched, and got a good crop.

Mr. Perry. I have a currant that ripens its fruit much later than other varieties.

Mr. Pearce. I am sure of injury to trees from overbearing. Unless we remove a portion of the fruit we must give more manure. It is well to bear this in mind, as we are apparently going to have a great crop another year.

Mr. Sias. I cannot endorse the shooting of birds recommended in the report. I think they were entitled to all the fruit there was last year.

President Smith. As to overbearing, I picked fruit, while green, from several trees in 1876, and these were the only ones that bore in 1877. They bore well. I had but a few currants and those were of the Prince Albert variety. Prince Albert, Victoria and —— are the best red varieties.

Mr. Elliot. From two acres last year I got fifteen bushels. The ground was heavily mulched the fall before; the crop was best where the mulching was done latest, and poorest where mulching was lightest. Mine are mostly Red Dutch.

ELECTION OF OFFICERS CONCLUDED.

The society here resumed the election of officers.

For executive committee the secretary was successively directed to cast the ballot for the following:

M. Pearce, Rochester.

Wyman Elliot, Minneapolis.

George W. Clark, Winona.

O. F. Brand, Faribault.

William E. Brimhall, St. Paul.

The president and secretary are members ex-officio.

DELEGATES TO THE MEETING OF THE STATE AGRICULTURAL SOCIETY.

The following were elected successively:

Wyman Elliot, Minneapolis.

O. F. Brand, Faribault.

B. F. Perry, Rochester.

President Smith, St. Paul.

Dr. Twitchell, Chatfield.

A motion was made and seconded to empower this committee to fill any vacancies by the appointment of members of the Horticultural society. The motion was carried.

COMMITTEE ON LOCAL SOCIETIES.

The committee on local societies, through its chairman, Prof. Lacy, reported that nothing had been accomplished, and asked to be discharged.

Mr. Harris. I believe that local societies ought to be organized for the distribution of information on horticultural subjects. For instance: there is great ignorance on the subject of injurious insects. Such societies should have cabinets of insects, birds, and other horticultural products, and books. We want collections of insects to show which are injurious and which are harmless, and collections of birds to show which to protect and which to destroy.

Mr. Harris' speech was quite animated, and by the vote of the society he was requested to prepare a copy for the Transactions and for the papers.

The committee was discharged and a new committee appointed consisting of Messrs. J. S. Harris and A. W. Latham.

General Grant (again).

Motion was made and seconded to reconsider the action by which General Grant was recommended for general cultivation.

Motion carried, 7 for and 3 against.

Motion was made and seconded to recommend General Grant "for general trial."

Motion carried, 8 for and 5 against.

Seedling Grapes.

Mr. Kramer's report on Seedling Grapes was then read by the Secretary, after which it was ordered to be received and published in the transactions.

The report was as follows:

Mr. President and Gentlemen of the Horticultural Society:

I have tried for fifteen years to raise seedlings of the grape. The first three of the Concord made me wait ten years for fruit, and none of them can I recommend, because they are not good enough for me. I made another attempt with the Delaware, which has led to some result. That produced the handsome Beauty of Minnesota. According to present prospects it will remain the Beauty. It was produced in this wise: I took one of the largest bunches of the Delaware and tied it up with a bunch of the Concord so that the blossom would mingle and bees carry the pollen, and thus the cross was accomplished. Seed from this union brought fruit the third year. Three vines have now borne for seven years. At first the fruit was small, to be sure, but every year it has grown larger and better.

After the first years growth from the seed, I planted in places, spaded about a foot and a half deep and three feet in diameter. The next year I spaded the remainder of the ground, leaving untouched that which I spaded the year before. Thus without disturbing the roots giving them a chance to spread.

For protection I have done but little, but have made some experiments. Have covered with earth, but that is an injury because it destroys too many fruit buds. Covering with brush, or simply pulling up the stakes and laying them down is better. Sorghum stalks are the best of all things because they are heavy and hold the snow, and because mice do not like them.

For pruning grapes there are many methods, and each man thinks he has the cat, in his favorite, when he hardly has hold of the tail.

J. C. KRAMER.

DISCUSSION.

Mr. Harris. I have seen this grape and tasted it. Mr. Brand says it is a seedling of the Delaware. It is about as good as the Delaware, in size a little larger. It is prolific and bears like the Delaware. The color is white and the season about that of the Concord.

Dr. Twitchell. I cover my grapes with corn stalks.

President Smith. I cover with earth.

REVISION OF GRAPE LIST.

Concord.

Motion was made and seconded to recommend the Concord "for general cultivation."

Motion carried unanimously.

Delaware.

Motion was made and seconded to recommend the Delaware "for general cultivation."

Motion carried unanimously.

Janesville.

Motion was made and seconded to recommend the Janesville "for general cultivation."

§ *Mr. Cotterell.* I had a vine that proved itself worthy and was afterwards called the Janesville. It climbed twenty feet high in the trees, and I do not pretend to cover it. The fruit is sweet, and has been pronounced better than the Concord. It is of the color of Concord but not so large. Not so sour as the Clinton. Have had it for fifteen years.

Mr. Harris. It is probably not the Janesville, as that was only distributed in this State in 1870, and the fruit described is larger and better than the Janesville. Think it not safe to recommend the Janesville for general cultivation, as the vines generally prove feeble growers.

Mr. Jordon described a circumstance indicating that the Eumelan had been mistaken for the Janesville.

Mr. Pearce. The Concord has proved a failure in Southern Minnesota for general planting. The fruit of the Janesville is pronounced first rate by competent judges. The wood is short jointed and ripens or hardens as it grows.

President Smith. There are evidently two or three kinds supposed to be Janesville. Mr. Knaupheide has the Janesville and likes it, but his buyers did not want it a second time. (In answer to questions) I sent the first grapes that were shipped from Minnesota to New York. In 1877 sold 2,850 lbs in the St. Paul market at an average price of 17½ cents. Grapes have not failed to ripen with me for seventeen years. The Delaware has ripened about Sept. 1st. The fruit ripened first on the highest ground. Have not girdled the vines or used other devices to hasten the ripening. This

year the Iona ripened as soon as the Delaware, which it has not done before. Think the bad reports of this variety are owing to weakness of the vines caused by faulty propagation. It is of the Concord type, the leaf large, and white underneath. I protect all my grapes. Have a seedling of Dr. Sylvester's, which he has sent me for trial. It is very promising; the fruit keeps till April.

Mr. Cook. I purchased 50 vines of the Janesville and have been much pleased with it, but the vine is not so hardy as represented. The fruit I like very much. It is a little smaller than the Concord. A sweet grape. Better than the Concord for this section.

Mr. Pearce. Mr. Dewey reports that he has grown the Janesville for seven years and has not taken from the trellis, and has taken 50 pounds of fruit per vine.

Mr. Mason. Have visited the Janesville in several places. The vines have been hardy enough to remain on the trellises and Mr. Jewell claimed the fruit to be good. Wherever grown the fruit is liked and the vine perfectly hardy. Farmers give their vines no attention father than to put on the trellis. Hardiness, then, is the first question. The Janesville should be put on for general cultivation and its qualities stated.

(Here Mr. Hall asked leave to call attention to some pop corn on exhibition. He said it was not only very excellent for popping, but ground into meal it made a mush that was very delicious, tempting to the appetite even of a sick person.)

Mr. Porter. What we are calling the Janesville is the Connecticut seedling. The former name is a misnomer. If there is a Janesville it is good for nothing. The Clinton is a much abused variety. Trained to trellises five feet high it ripens as early as the Concord.

Mr. Cook. I think Mr. Porter has the Connecticut seedling instead of the Clinton.

Mr. Jordon. There is no doubt but the Janesville is different from any other variety—is distinct.

The motion to recommend for general cultivation was withdrawn.

Hartford Prolific.

Motion was made and seconded to recommend "for planting in limited quantities."

Motion carried, 8 for and 1 against.

Clinton.

Motion was made and seconded to recommend "for planting in limited quantities."

Mr. Porter. When thoroughly ripe the Clinton is a good grape—
No. 1. I should want it to hold a better place on the lists.

Motion carried, 11 for and 1 against.

Roger's No. 15 (Agawam) and Northern Muscadine.

Placed on same list by unanimous vote.

Eumelan.

Placed on same list by a vote of 8 for and 1 against.

Iona.

Mr. Latham. It bears a large crop uniformly, but is rather late—does not always ripen. But even when half ripe it is as good as a ripe Concord.

Mr. Porter. I never saw a ripe Iona.

President Smith. I have had them from the 1st to 15th of September. Mr. Knaupheide had them also. It sets too much fruit to ripen in good time.

Mr. Sias. Mr. Porter correctly represents our experience with the Iona here.

Mr. Latham. Every one buys Iona unless talked out of it. Motion was made and seconded to recommend "for trial."

Motion carried, 9 for and 1 against.

Janesville (again.)

Motion was made and seconded to continue recommended "for trial for its earliness."

Motion carried by unanimous vote.

Rogers No. 4 (Wilder), No. 9 (Lindley), and No. 19 (Merrimack.)

Motion was made and seconded to recommend "for trial."

———. I have them and any one is welcome to them who will take them away.

Mr. Latham. That is not my experience. Any one can have mine by paying a good price for them.

President Smith. I have but a few of No. 9, but [wish I had more. They sold for 25 cents last year with the Concord at 8 to 10 cts. (Specimens of this and No. 4 were exhibited on the table.)

Mr. Harris. I have thought No. 19 better than No. 15.

The motion was carried by unanimous vote.

Motion was made and seconded to close the grape list. Carried.
The meeting then adjourned to meet at 7:30 P. M.

THURSDAY EVENING.

The meeting was called to order by the President at 7:30.

STRAWBERRY LIST.

The strawberry list was taken up for revision.

Wilson's Albany.

Motion was made and seconded that the Wilson stand recommended "for general cultivation."

The motion was carried unanimously.

Countess de Haricourt.

Mr. Elliot. The berry is of a light color and has a fine aroma. Wm. Lyon, of Minneapolis, marketed \$1,500 worth, at 13 cents per quart, last season. It is a French variety.

President Smith. Countess de Haricourt is larger but less regular than Downer's Prolific.

Mr. Cook. I could see no difference between them growing side by side.

Mr. Elliot. I would as soon believe the berry I allude to one as the other, but at all events it is a good one.

Charles Downing.

Mr. Smith. The Downing keeps up its size through the season better than the Wilson.

Mr. Harris. The Downing was the best last year.

Seth Boyden.

Mr. Cook. Am no great friend of the Wilson. There are several that are better for me. Seth Boyden is one of them.

President Smith. Had only a few of those last year, but they were very fine.

Mr. Cook. (In answer to question) Seth Boyden does fairly alone, but does better with others.

Downer's Prolific.

Mr. Harris. Downer's Prolific is the best berry for the farmer. It is five times better than Wilson for the table, and bears as much, taking the whole season.

Mr. Mason. The Wilson is the poorest berry on the list. I move to place Downer's Prolific at the head of the list "for general cultivation." The motion was seconded.

Wilson's Albany (again).

Mr. Elliot. I can pick out more successful beds of the Wilson than of any other variety. There is more of it in market. It is reliable.

President Smith. The Wilson will bear transportation. Downer's Prolific can't be shipped to St. Paul and be valuable when it gets there. There is no other known berry that will bear shipping and sell there as the Wilson does. I have seen this fact proved on the market there.

Mr. Mason withdrew his motion.

Motion was made and seconded that the classification of strawberries be so changed that the purpose for which recommended shall follow the name of each variety. The motion was carried.

Downer's Prolific and Charles Downing (again).

Motion was made and seconded to recommend "for general cultivation for near market and home use."

Motion carried unanimously.

Seth Boyden (again) and Green Prolific.

Motion was made and seconded to recommend for same purpose.

President Smith. The Green Prolific belongs there but the Seth Boyden has not been tested enough. With me it has not been prolific enough for that place.

Mr. Cook. Seth Boyden is one of the best both in yield and flavor. The judges at the Centennial Exhibition reported it as one of the sweetest and best there. I can endorse that judgment. Mine are growing on a dark sandy loam.

President Smith. Our differing experience shows that it is not fit to recommend for general cultivation.

Mr. Hart. I agree with what Mr. Cook says of it if planted with the Wilson or Boston Pine.

Mr. Cook. It does best on clay loam and is better when fertilized by other kinds, but that is not necessary.

It was voted to act upon one variety at a time.

The vote being taken on Seth Boyden the motion was lost; four for and seven against.

The vote being taken on Green Prolific, the motion was carried; eight for and one against.

Motion was made and seconded to recommend Seth Boyden for trial.

Motion was carried by unanimous vote.

Col. Cheney and Kentucky.

Recommended "for trial" by unanimous vote.

Michigan Seedling.

Motion was made and seconded to let stand recommended "for trial."

Motion carried, 6 for and 1 against.

Prouty's Seedling.

Mr. Hart. Think it was through Mr. Bates recommendation that this variety was recommended for trial. I do not suppose he ever raised a hundred quarts of it. Would, however, keep it on trial.

A motion to that effect was carried by unanimous vote.

Countess de Haricourt (again.)

Motion was made and seconded to recommend "for general cultivation for near market and home use."

Mr. Cook. Better to put it on trial, for if it is not the same as Downer's Prolific we do not know it.

Mr. Hart. If it is the same no one will be hurt by putting it on the same list.

Motion carried unanimously.

Crescent Seedling.

This variety was inquired about but no one could give any information.

Cumberland Triumph.

Mr. Cook. I have not fruited sufficiently to say anything about it.

Champion and Monarch of the West.

President Smith. A year ago last winter the Champion stood with me without protection. It was the hardiest of all, a pistillate variety. The Monarch of the West killed out entirely.

Cinderella.

Inquiry was made concerning this variety, but no one had tested it.

Great American.

Mr. Cook. I have plants of this variety. They have survived one winter, but have not fruited.

Mr. Hart. I like its growth, but have not fruited it much. I like it as far as I have seen it.

Hart's Seedling.

President Smith. I received some plants in 1876. Last year I set five rows and they grew well; got some fruit from the old vines; have seen the fruit several times and think it is not excelled.

Mr. Elliot. I also received plants in 1876. Last spring I found two plants alive, and these grew well. I have seen the fruit, and its appearance recommends it, but it does not handle like the Wilson; it handles, however, somewhat better than the Charles Downing.

Mr. Hart. Mr. Elliot has described it well. It bears better than the Wilson, and the fruit is better, but there are kinds with still better fruit.

Mr. Harris. I received ten vines in midsummer, and they all lived. I transplanted some the following spring, and these bore the same season. I move that a committee from Rochester be appointed to visit Mr. Hart's strawberry next summer, and that other members of the society be invited to accompany this committee. The motion was seconded and carried and Messrs. Cook, Sias and Mason appointed such committee.

Ida.

Mr. Hollister. I saw the *Ida* at Mr. Kenney's last summer and he said he could get more money from this variety than any other.

President Smith. The fruit is too small and too acid.

Mr. Harris and Mr. Cook concurred in these objections.

It was voted to close the discussion on strawberries.

RASPBERRIES.

Doolittle—Seneca.

The *Doolittle* and *Seneca* were ordered to stand recommended "for general cultivation."

Ontario.

The *Ontario* was ordered to stand recommend "for trial."

Philadelphia—Turner.

The *Philadelphia* and *Turner* were ordered to stand recommended "for general cultivation" for red varieties.

Purple Cane.

Some one inquired concerning this variety.

President Smith. The *Purple Cane* is worthless.

Mr. Jordon. I have received \$120.00 for the product of one half acre. I move it be recommended "for general cultivation." The motion was seconded.

The motion was lost by a vote of 5 for and 10 against.

CATALOGUING FRUITS, &C.

The report of the committee on cataloguing fruits and shade and ornamental trees and plants was called for.

Mr. Elliot, after stating the difficulties and disappointments, read the report which he had prepared.

A motion to receive and adopt was seconded and carried.

The following is the report:

Evergreens.

We will first notice the evergreen family, a type of special importance to all persons who are interested in ornamenting and adorning their farms and homes or public grounds.

This class is highly valued for wind breaks and screens, as well as for ornamenting our yards and lawns. When judiciously used, they form a pleasing contrast to deciduous trees, in winter, their foliage bedecked with hoar frost sparkling in the dazzling sunlight. The objection of some, the many losses that attend their transplanting, is almost entirely due to manner of handling. Their roots are very sensitive, and cloudy, moist weather should be selected for transplanting. With digging and planting well done, the after care is but little. Mulch well with coarse litter, straw, chip dirt, sawdust, or whatever will protect the roots from the scorching rays of the sun.

[NOTE—Never use manure around the roots in planting.]

F. R. Elliot, in his work on landscape gardening, states, first that in removing and transplanting evergreens they should have bolls of earth attached; and second, they should only be moved at certain seasons of the year. But those who practically and theoretically understand the evergreen tree or plant, can move them at any time when the ground can be worked freely, except the months of July and August, in all our latitudes from above 43° to 40°; below that, June and September must be included with July and August. In transplanting, it is only requisite to remember that the tree has its leaves on, and that there is, consequently, a constant demand upon the roots for evaporation by the leaves, and therefore it will not do to permit them to get dry. With small sized trees, a root nearly corresponding with the top, is generally procured, and when the trees have been rightly grown in the nursery, cutting in of the top is unnecessary. But in case of the removal of trees six feet or more in height, unless extraordinary care is taken, a great reduction of the root is the result, and then it is always advisable to shorten in the length of the branches corresponding with apparent loss of roots the tree has sustained.

We would recommend for general planting the following varieties:

1. White Pine (*Pinus strobus*.)
2. White Spruce (*Abies alba*.)
3. Balsam Fir (*Abies Balsamea*.)
4. Scotch Pine (*Pinus Sylvestris*.)
5. Austrian Pine (*Pinus Austriaca*.)
6. Rest or Norway Pine (*Pinus resinosa*.)
7. Arbor Vitæ (*Thuja occidentalis*.)
8. Norway Spruce (*Abies excelsa*.)
9. Siberian Arbor Vitæ (*Biota Wareana*.)
10. Red Cedar (*Juniperus Virginiana*.)
11. Black Spruce (*Abies Nigra*.)
12. Mountain Pine (*Pinus pungens*.)
13. Common Juniper (*Juniperus communis*.)
14. Savin Juniper (*Juniperus Sabina*.)
15. Tom Thumb Arbor Vitæ (for trial.)
16. Ground Hemlock (*Taxus Canadensis*.)
17. Hemlock Spruce (*Abies Canadensis*.)
18. Yew (*Americana Canadensis*.)

Deciduous Conifers.

- American Larch or Tamarack. (*Larix Americana*.)
European Larch. (*Larix Europea*.)

This class of trees need to be taken up very early in the spring, and immediately planted with as little exposure to the sun and wind as possible in order to insure success.

Deciduous Trees.

Deciduous trees, those whose leaves fall in autumn, are more largely planted than any other on the western prairies, for shelter, belts and windbreaks. The fastest growing varieties are usually selected, while the slowest growers and consequently the longest lived *should* claim the greatest attention. A few quick growing kinds for immediate use should be planted in all collections.

As a class, these trees with their ever varying tints of green and yellow foliage often contrasted with the evergreen add much of beauty and variety to the scenery. The care bestowed on digging, planting and cultivating trees of all classes, is of vast importance to the present as well as future generations, and we can but commend the action of our State Forestry Association in telling the people what and how to plant, and what protection, care and cultivation to give. The most of the following varieties are easily obtained, either in the forests or nurseries of our state :

- Sugar or Rock Maple. (*Acer saccharinum.*)
- White or Silver Maple. (*Acer dasycarpum.*)
- Red Maple. (*Acer rubrum.*)
- Box Elder, Ash-leaved Maple. (*Acer negundo.*)
- White Ash. (*Fraxinus Americana.*)
- Green Ash. (*Fraxinus veridis.*)
- Black Ash. (*Fraxinus sambucifolia.*)
- Blue Ash. (*Fraxinus quadrangulata.*)
- Mountain Ash. (*Pyrus aucuparia.*)
- Prickly Ash. (*Xanthoxylon Fraxineum.*)
- Abell, White Poplar. (*Populus alba.*)
- Cottonwood. (*Populus monilifera.*)
- Angled Cottonwood. (*Populus angulata.*)
- Balm of Gilead. (*Populus candicans.*)
- Lombardy Poplar. (*Populus dilatata.*)
- Basswood. (American Linden.) (*Tilia Americana.*)
- White Birch. (*Betula alba.*)
- Paper or Canoe Birch. (*Betula papyracea.*)
- Butternut. (*Juglans cinerea.*)
- Black Walnut. (*Juglans Nigra.*)
- Hickory. (*Carya.*)
- White Elm. (*Ulmus Americana.*)
- Slippery Elm. (*Ulmus fulva.*)
- Hackberry. (*Celtis occidentalis.*)
- Hornbeam, Ironwood. (*Ostrya Virginica.*)
- Kentucky Coffee. (*Gymnocladus Canadensis.*)
- Locust. (*Robinia pseudacacia.*)
- Black Cherry. (*Cerasus Virginiana.*)
- Bird Cherry. (*Cerasus Virginiana Capollin.*)
- White Willow. (*Salix alba.*)

Deciduous Ornamental Shrubs.

Deciduous ornamental shrubs do not claim the attention due to them as a class. A few dollars' worth planted in conspicuous places about the grounds add much to their attractiveness, and by a judicious selection of varieties, a succession of bloom and variety of foliage may be had throughout the season. The following list comprises nearly all the most desirable hardy shrubs cultivated in the state:

Rose Acacia, Moss Locust (*Robinia hispida.*)
 Barberry (*Berberis.*)
 Buffalo Berry (*Shepherdia argentea.*)
 Flowering Currant (*Ribes aurea.*)
 Hyderangea (*paniculata grandiflora.*)
 Honeysuckle (upright) (*Lonicera Tartarion.*)
 Lilac (*Syringa Vulgaris.*)
 Purple Fringe (*Rhus Cotinus.*)
 Japan Quince (*Cydonia Japonica.*)
 Snow Berry (*Chiococca.*)
 Strawberry Tree or Burning Bush (*Euonymus atropurpureus.*)
 Snowball (*Viburnum opulus.*)
 Queen of the Prairie (*Spirea.*)
 Mock Orange (*Philadelphas.*)
 Wigelia *Linensis*
 High Bush Cranberry (*Viburnum edule.*)
 Buck Thorn (*Rhamnus catharticus.*)
 Crab Apple (*Pyrus coronaria.*)

It is certainly not because there is a scarcity of material that many of our farmers' homes look so desolate and uninviting, but it is a want of energy and a properly cultivated taste. The farmer above all others should plant trees, shrubs and flowers about his home. Let him once begin with a right spirit, and the labor of planting, arranging, &c., will become a pleasant recreation.

Perhaps we should not close this report without calling your attention to the insects that infest and destroy our trees. Their names are legion, and we should be prepared with every known remedy to repel their attacks. The only sure method of saving your seedling trees from the cut worm, is to hunt and kill by hand.

Larger trees are attacked by the borer (*Saperda*) who lay their eggs in June and July, which hatch in August and September, and means must be immediately devised to prevent their work of destruction. The best known remedy is that introduced by a learned chemical professor in the East:

"One-half bushel of lime and four pounds of powdered sulphur placed in a barrel with a cloth tied over the mouth; slake with hot water; reduce to the consistency of common whitewash, and on application add one-half ounce of carbolic acid to each gallon of liquid. Apply each spring and fall. Lime and sulphur slaked dry is said to destroy the currant and gooseberry worm.

APPLICATION FOR BORER.

Mr. Jordon. I would like to give my application for the borer. It consists of one part of lime, one part of soft soap, and one part of

fresh cow dung thoroughly mixed together and applied to the trunks and larger branches. I have used this two years and like it better than any other.

CENTENNIAL DIPLOMA AND MEDAL.

The Centennial diploma and medal having been received since the last meeting of the Society, and the former handsomely framed, Mr. Harris was called upon to make a formal presentation of them.

This he did with the following handsome speech, for which the thanks of the society were returned:

Mr. President and Brother Co-Workers in Fruit Culture:

It is with pleasure we meet you on this auspicious occasion. Many of us have been considered monomaniacs, fit subjects for the insane asylum, for pursuing our vocation with so much determination. In the future our motto must be, not to look back on losses sustained, but ever onward to the bright future of fruit culture in our State. At times it has seemed dark to those most enthusiastic, and to those weak-kneed brethren, "Oh, thou of little faith," *black as night*. But the day is dawning, already the tints of morning are discernible and we are assured of success in the near future. Skeptics and croakers, wipe well the dust from those old specs, that your eyes may not deceive you while looking at these small tributes we have the honor of presenting to the Minnesota Horticultural Society from the United States Centennial Board of Commissioners, a recognition of the products of your toils and privations. As delegates appointed to represent you at Philadelphia, it gives us great pleasure to show these tokens of your contribution and our work performed.

A motion was carried empowering the Secretary to procure obituary notices of deceased members.

ARTICLES ON EXHIBITION.

The report of the committee on Articles on Exhibition was then called for and read, after which it was accepted by vote of the society.

The report was as follows:

Your committee appointed upon the display of fruit would respectfully report that they have listed the rather limited display at hand, and tested the few seedlings offered, with the following result:

Contributed by E. B. Jordan, Rochester, a dozen specimens of Wealthy in excellent condition; Pickett's Seedling No. 5; Orange crab. He also exhibited the following sorts in glass jars: Early Strawberry, Orange, Gideon's No. 5, Gideon's No. 6, Pickett's No. 5, Conical, Meader's Russet, Hyslop, Transcendent, Hesper Blush, Aiken's Green Winter.

W. E. Brimhall, St. Paul: Alexander, Haas, Marengo, Hyslop, Meader's Winter, Soulard, Cions of Virginia Crab—6 ft. 4 in. in length and well ripened.

R. L. Cottrell, Dover, Olmsted county: Talman Sweet, Fameuse, Meader's Winter, and an unknown variety.

A. W. Sias, Rochester: Talman Sweet, Bethel, Fameuse, and an unnamed seedling of good quality; Wabasha—a seedling, season winter, of good size, pleasant sub-acid, the original tree twenty years old and claimed to be hardy and healthy: Minnesota Greening, a new variety of fair size and lively sub-acid flavor, in good condition at this time; tree only twelve years old; an unnamed seedling, Hyslop, Meader's Winter, Orange, Soulard.

T. M. Smith, St. Paul: two glasses of jelly—one of grape and another of grape and crab; a display of Rogers grapes, Nos. 4, 5 and 9, in good condition.

J. S. Harris, La Crescent: three varieties of sweet potatoes, Southern Queen, Brazilian, and St. Louis Red; the size of some of these specimens render them not unworthy of display where this vegetable has its natural home. Mr. Harris also displays a Transcendent shoot of last year's growth of the unusual length of 8 feet.

W. Elliot, Minneapolis: Cranberries, celery, pie plant, asparagus.

S. H. Kenney, Morristown: Early Amber syrup, and sugar drained by pressure from same cane.

C. F. Miller, Dundas: Sugar drained by centrifugal force and syrup from Early Amber Cane.

These specimens of sugar are as good as or better than the New Orleans variety, and commend it at once to public favor.

Twenty varieties of potatoes from the experimental gardens of the State University contributed by Prof. C. Y. Lacy.

In conclusion, your committee take advantage of their office to mildly rebuke the members of this society for the lack, we might say general, of interest displayed in getting together this our annual winter display. It is true that the last year's apple crop was light and where the grower had ten bushels two years ago, last year he had hardly one. But nevertheless if we had bethought ourselves to bring what we had and not left it to our fellows we would have made a display which would be wonderfully attractive, and be a practical assurance to the public, who look to our deliberations, that we are not a collection of fossils going over, year after year, the same old story of "The Lost Arts," but that we are alive and moving; that what we theorize and profess, that we practice and of that we can and do display the proofs.

Respectfully submitted,

A. W. LATHAM,
O. F. BRAND,
A. W. SIAS.

FINAL RESOLUTIONS.

The report of the Committee on Final Resolutions was then called for.

A motion was made that the report be adopted, spread on the records and copies furnished the Rochester papers. The motion was seconded. Mr. Elliot moved to amend so as to include the Olmsted County Agricultural Society by name. The amendment was carried then the resolutions were passed unanimously.

They were as follows :

Resolved, That while we recognize the great value of our annual meetings, and their decided yearly improvement in membership, and in the dissemination of horticultural knowledge, we earnestly request each member to use his influence to increase membership, attendance and interest, to the end that we may present the greatest good to the greatest number.

Resolved, That we, the members of this society, hereby tender our hearty acknowledgments to the citizens of Rochester, and the Olmsted County Horticultural Society, for the assistance they have extended to us in promoting the success of this our annual meeting, for their pleasant hall, their characteristic hospitality, and the endorsement they have given our efforts by their appearance at our gatherings.

Resolved, That we extend our thanks to the officers of this association for the interest they have taken and do take in its work, and especially to the president and secretary, who have borne the heat and burden of the day, have been at hand early and late, and by their unintermittent efforts aided greatly in making our labors in any degree a success.

Resolved, That we return our thanks to the Mil. & St. Paul and the Winona & St. Peter Ry's, for the reduced rate of fares allowed us on this occasion.

Respectfully submitted,

A. W. LATHAM,
U. S. HOLLISTER,
C. F. MILLER.

The society then adjourned.

A P P E N D I X .

APPENDIX A.

OBITUARIES.

DAVID ANTHONY.

DIED—At his residence, on Saturday evening last, February 3d, 1878, of apoplexy, DAVID ANTHONY.

On Saturday morning last the business portion of our town was astonished at the intelligence that the above deceased was stricken with apoplexy, and that his life was despaired of. And many were the anxious inquiries during the day, as to his condition, and a general feeling of sadness was expressed by all at the announcement of his death.

Mr. Anthony was born in South Adams, Mass., in 1833. His parents moved to Cayuga county, N. Y., while he was an infant. He received a common school education only. His first introduction into business, was in the shop of the B. & A. R. R. at Albany, as book-keeper. He removed to Illinois in 1854, and pre-empted 160 acres of land. In 1856 he returned to Massachusetts, and married his wife (the estimable lady who is now a widow) a daughter of D. A. Clary, an old and respected resident of Stockbridge. Together they returned to his farm, and together they worked to build up a home. For thirteen years they labored there, and he was successful in all his undertakings. He devoted much of his time to stock raising and selling in Chicago. During the latter part of his farming his attention was directed to buying and feeding. In 1869, being out of health, he sold his farm, and came to Minnesota, and, after looking over the state, settled in Kasson. He commenced business here as a broker, loaning money on personal property. In the summer of 1871, he bought the books of J. A. Babcock, who had been doing a small banking business, purchased a good safe, and opened a bank of deposit and discount, in the store formerly occupied by Seevents & Stevenson. In the fall he built a small office on the present site of the First National building. He continued his business in the small office until the 1st of August, 1874, when he organized the First National Bank, of which he owned over one-half the stock. He had previously made arrangements for the erection of the building, and would have used it as a private bank had not the First National been organized. He was made president, and labored incessantly for the institution, his choice from the first, and was so successful that at his death its stock was held at 132.

Mr. Anthony was always troubled with asthma, and was a great sufferer. On Friday, February 2d, he appeared in unusually good health, as many who met him on the streets can testify to. At the close of business he went to his home in excellent spirits; was a little wakeful in the night; awoke in the morning with a headache, which increased very rapidly after he got up, and soon developed into congestive apoplexy, from which he died in about fifteen hours.

In closing this biography we will say that the citizens of Kasson have lost one of its best supporters. Mr. Anthony identified himself with the interests of his adopted town; was ever ready to lend a helping hand to any enterprise that tended to the benefit of Kasson. Although not a member of any of the church organizations in Kasson, he always contributed liberally to each and all of them. He was born of Quaker parents, and inclined to that belief himself. His funeral took place from the house, on Wednesday afternoon, whence a very large concourse of people followed his remains to their last resting place. May each of our readers leave behind them the record of a life as fragrant with good deeds.

NOTE.—Mr. Anthony became a member of the Minnesota State Horticultural Society in 1875, and subsequently took great interest in its objects and proceedings.—SECRETARY.

M. W. LELAND.

MARSHALL W. LELAND, an honored member of the Minnesota State Horticultural Society, died at his residence in Rochester, Minnesota, July 17, 1877. He was also at the time of his decease, a member of the Olmsted county Horticultural Society, of which he was president. He took a lively interest in horticulture, and grew a fine orchard on his farm within the city limits. He was one of the first and foremost in making experiments with hybrid varieties, which were grown by him successfully. His death by apoplexy was very sudden and unexpected.

Mr. Leland was born in Chester, Vt., June 50th, 1810, and was over 67 years of age at the time of his death. In 1833 he entered the Madison university, at Hamilton, N. Y., but left the institution while in the senior class. He afterwards entered Columbia college in the District of Columbia, graduating in 1838. He was soon after ordained a minister in the Baptist church, preaching in the Navy Yard church, and also taught a classical school. After a year and a half he went to east Virginia, where he labored as an evangelist, meeting with great success. In May, 1840, he married Miss Julia H. Anson, of Cuba, N. Y., a most estimable lady. Afterwaads he was pastor of the churches in Hamburg, Pa., Post Wilham, Ohio, and Door Village, Ind. In the latter place his lungs failed, when he went to Cuba, N. Y., and was engaged in mercantile pursuits for six years. He came to this city in 1861, and has resided here since. He purchased the place on which he resided here of Rodney Whitney, and built the "Leland block" on Broadway. His wife died in May, 1873, of the same disease that carried him off. He leaves five children.

WILLARD C. FLAGG.

[NOTE.—Mr. Flagg's death is a loss not alone to his own state, but to the agricultural and horticultural interests of the entire country. Therefore, although he was not a member of the Minnesota Horticultural Society, it is deemed appropriate to give a place to the following tribute from the pen of Hon. M. P. Wilder, which we find in the report of the American Pomological society.—SECRETARY.]

"Willard C. Flagg, Secretary of the American Pomological Society, is dead.

"Just as the closing pages of this volume were going to press, the sad duty devolves on me of announcing the decease of the beloved and esteemed Secretary of our Association. Mr. Flagg died at his farm near Moro, Illinois, on Saturday, March 30th, 1878. He was elected Secretary of our Society at the meeting in Boston, September, 1873, since which he has continued to discharge the duties of his office with great ability and fidelity. Few men of his age have held more offices of honor and trust. He was remarkable for his activity, enterprise and executive ability.

"It may be well said of Mr. Flagg that he has been a faithful public servant. Few have done more to aid in developing our natural resources, especially in the West. Nor were his official duties confined to this section; he was not only secretary of the American Pomological Society, but President of the National Agricultural congress. He was also President of the Illinois Farmers' Association; first United States Collector of Customs for the Alton district; a member of various scientific and agricultural associations, and one of the most lucid and facile writers on agricultural subjects in the country. He was also a trustee, at various times, of a number of state institutions, including the Illinois Industrial University; a Senator from his district to the State Legislature during the sessions of 1869-1871, and the special sessions of 1872.

"In fact, the sphere of his activity was so extended we cannot make a full record of them here. But he has left us a worthy example of what one may do for the advancement of the public welfare and the interests of the associations with which he is connected.

"At a time so many are seeking to perform their work, with little regard to its quality, Mr. Flagg's love of thoroughness in all that he did, was such as to impress itself upon all who knew him, as one of his most prominent characteristics, and his industry enabled him to accomplish a vast amount of work. But (in the words of his memorial in the *Prairie Farmer*, of which he was for many years the horticultural editor) above all he will be remembered by those who knew him intimately as a man of strict honor and integrity, who loved justice for the sake of justice, and whom no one could swerve from what he considered the path of duty.

MARSHALL P. WILDER,

President of the American Pomological Society."

BOSTON, April 8th, 1878.

[NOTE.—One or two other obituary notices should appear in this volume, but the secretary has not been able to obtain them even by repeated efforts.]

APPENDIX B.

MISCELLANEOUS PAPERS AND REPORTS.

NOTES ON THE HISTORY OF FRUIT CULTURE IN MINNESOTA.

BY JOHN S. HARRIS.

[From the Transactions of the American Pomological Society, Session of 1877.]

[NOTE.—Some of the facts stated in these notes have appeared repeatedly in the Transactions of the Society, but we think their republication in this form will be acceptable to many horticulturists, as well as interesting to future generations.—SECRETARY.]

From its earliest settlement, even down to the present time, an opinion has prevailed very extensively with our people, that Minnesota is not, and will never be, a fruit producing State. And in the early years of its settlement it was no easy matter to find men with nerve and hope enough to enable them to plant trees in opposition to the public sentiment, and in the face of the difficulty attendant upon the settlement of a new country. Nevertheless, a few men, strangers to each other, and in different parts of the State, have planted and replanted fruit trees for more than twenty-five years, and struggled to succeed with a tenacity and persistency that excited the mournful pity of their neighbors; but, as for the first fifteen years of that time we were without horticultural societies or any organized effort in that direction, most of the early history of their trials and triumphs is lost to the world, or can only be gathered up by months of painful research, which I am unable to give at this time.

The first attempts at fruit growing in Southern Minnesota were made by John Shaw, in Winona county, and Samuel McPhail, in Houston county. John Shaw first came to the State in 1851 and remained during the summer, and the next spring, 1852, made a permanent settlement in the Rolling Stone Valley. He brought with him from his eastern home, a nail keg full of apple seeds, which were planted by himself and a few neighbors. A portion of the trees have withstood the severity of our climate for a quarter of a century and borne several crops of fair fruit, and become the nucleus of flourishing orchards, a lasting monument to him whose forethought has brought about so much good, for he soon fell a victim to overwork and exposure. His name is a household

word in that neighborhood and the fruits of his deeds are a way mark of encouragement to the people who will come after. This one act of a benevolent, far-seeing man forever settled the question of apple growing in that neighborhood and as a result Winona county is now far in advance of any other county in the State in the quantity of apples raised. In the spring of 1853 Samuel McPhail, one of the first settlers of Houston county, planted a few apple trees and started a small nursery in the town of Caledonia; and although he was thought to be visionary the neighbors soon caught the same spirit and nearly every farmer planted his little orchard as soon as land could be cleared up and broken; but most of them were doomed to see their trees killed to the ground about every alternate winter, and they were then usually ready to join the company of *no faith*. A few persisted in replanting and caring for their trees, and were rewarded with a very encouraging degree of success. Among the most successful of these may be named: Wm. F. Dunbar, of Caledonia; J. and C. Kline, of Union; Capt. See, of Brownsville, and J. S. Haris, of La Crescent. Unfortunately the severity of the winter of 1872-3 nearly destroyed most of our trees, for they generally had been selected without any regard to hardiness. The pioneer in tree planting in the vicinity of St. Paul and Minneapolis was L. M. Ford. He started a nursery of seedlings and grafts at Groveland, in 1850, and also imported and sold large quantities of trees. These trees from Iowa, Illinois and New York, did very well until the winter of 1855, when he lost largely. But about fifteen out of one hundred varieties came through with any show of life, and about two years later the remaining fifteen killed out, root and branch. Nothing was left but a few Siberians and Transcendent crabs, which were now pronounced *iron clad*, and from this date they began to be eagerly sought for and brought *fever* prices; as a result many planters were imposed upon by dishonest tree agents, who palmed off worthless trees for them. The same year, 1850, C. H. Oates set some apple trees on Apostle Island, in Lake Superior, which survived the winters for many years and bore fruit.

About the year 1854, Peter M. Gideon, of Excelsior, Hennepin county, commenced planting trees quite extensively and met with heavy losses, but being a man of unyielding disposition, as he had determined to make a thorough test he continued his experiments and persevered under difficulties that would have totally disheartened the most resolute of men. His labors were finally crowned with success, and he now has fine orchards of the Oldenburg and seedlings of his own growing that are now fruiting, and has added to our list of hardy apples the Wealthy, a Minnesota seedling of great beauty and fair quality, which is creating a great sensation and bids fair to soon find a place in every orchard and garden. There were a few others in different parts of the State who planted trees between the years 1850 and 1859, but we have no record of them, neither are we able to learn that any fruit of the *Pyrus* family was raised in the State previous to 1860, except Siberian crab, and one single specimen of Flemish Beauty pear, and it is probable that not one apple tree out of twenty-five planted previous to this date had survived three winters.

At the State Fair, held at Fort Snelling in that year, premiums were awarded to Mr. P. M. Nichols, of St. Paul, for display of Siberian Crabs, and to H. F. Matterson for pears; also R. Knaupheide was awarded first premium for grapes, the varieties being the Isabella and Catawba; and according to the *Farmer and Gardener*, then published at St. Paul, Mr. Eli Robinson, of Nininger, Dakota county, had a few apples on his trees. The same year, 1860, J. S. Harris raised a few Bailey Sweet apples of great size, and also St. Lawrence. The trees

belonging to Harris that produced the first apples are still living and in good health, and one of the trees has twice produced sixteen bushels per year. In the year 1861 several men in Houston, Winona and Wabasha counties raised a few apples, Mr. Huff and Dr. Ford, of Winona, had some fine Flemish Beauty pears. Reports of these successes began to circulate through the papers of the State, and tree planting began to receive considerable attention.

The first public display of apples was made by J. S. Harris, of Houston county, and E. Rollins, of Wabasha county, at the State Fair held in Rochester, Olmsted county, September 3d, 4th and 5th, 1866. The report of the fair, says Mr. Harris showed nineteen varieties, mostly grafted fruit, and some pears, the largest weighing seventeen ounces, and Mr. Rollins seven or eight varieties, mostly seedlings. This little display of fruit elicited much comment, and was the greatest attraction of Floral Hall; and thousands of people improved the opportunity to feast their eyes upon a sight which they had long yearned for, but never beheld since they left their eastern homes, and hundreds returned to their homes determined to raise their own apples; and from this fair we may date the first organized effort in fruit growing. At this date a Fruit Growers' Association was organized and has become the present State Horticultural Society, which usually holds two meetings a year, at which all kinds of fruit and the methods of cultivating them are discussed, and varieties recommended for trial and general cultivation; and although the winters of 1872-3 greatly injured the best orchards in the State, and destroyed nursery trees by the thousands, the interest is steadily on the increase, and orchards are being planted in all parts of the State.

The Duchess of Oldenburg and Tetofsky and Transcendent, and other crabs, are succeeding nearly everywhere, and the Red and White Astrachan, Alexander, Fameuse, Haas, Plumb's Cider, Walbridge, Wealthy, and Talman and Price's Sweet and Utter's Red are pretty sure to succeed in the counties bordering the Mississippi river, and we have a large list of supposed hybrid Siberians, many of them as large and fine as apples, that promise to be hardy in nearly every locality in the State. The interest in grape culture is growing rapidly, and nearly every effort in that direction has been crowned with success. Truman M. Smith and Rudolph Knaupheide, of St. Paul, are successfully growing about forty varieties; and we have a number of vineyards of the Concord and Delaware, where they are grown extensively for market. If we continue to advance for the next ten years as we have for the past, we shall rank with many of the older States in growing apples, and be excelled by few in grapes and small fruits. At the State Fair in St. Paul, in 1876, there were on exhibition more than 120 varieties of apples, thirty of Siberians, and fifty of grapes, all of fine quality and good appearance.

REPORT OF JOHN HART ON FRUIT IN WINONA COUNTY.

WINONA, January —, 1878.

Prof. C. Y. Lacy, Secretary of State Horticultural Society:

DEAR SIR—In our section of the state we have experienced the most severe season on our fruit, and one of the best as far as the growth of apple and pear trees was concerned. The appearances were never better for a large crop of fruit, until the 29th of April we had about four inches of snow, and on the 30th the thermometer went down to 22°. The consequence was a severe frost for sev-

eral days. On the 7th of May it was quite warm, and on the 8th of May we had frost again. These sudden and extreme changes had the effect of killing all the fruit buds in this neighborhood. Some of our own were in blossom at the time, our location being so warm. Even our strawberries and raspberries were all destroyed as far as the fruit was concerned. Notwithstanding all this we are not in the least discouraged, as our trees and plants have a good growth and everything looks well for a good crop of fruit the coming season.

These sudden changes have occurred in all northern countries, yet the people were not discouraged; they tried again and success in most cases has followed their efforts.

We would say a word to those who intend to plant fruit trees the coming spring. When there are only a few to be planted, plant the Duchess of Oldenburg, Hyslop, and Transcendent. The latter was the only tree that gave us a full crop last season. We would not advise the planting of pear trees unless in favorable localities. Of twenty varieties tried by us, all are dead except the Flenish Beauty and a Minnesota Seedling.

Of raspberries the Philadelphia is good.

Strawberries.

The Wilson is undoubtedly one of the best. We have a seedling of our own which we have been testing for a few years past, and think it is a good berry. Well say in our own locality it will exceed the Wilson. The berries are larger, the quality better. Planted on the same piece of land the plants will bear longer and stand the winter better.

After twenty years' experience in trying to raise fruit for market in Minnesota, we are satisfied that we have two obstacles to overcome: the extreme heat and cold of our springs, and the multitude of insects which injure our fruit trees in summer and fall. Close observation has led us to believe that they attack every variety of fruit trees, and to fear that if something is not done to protect our small friends, the birds, we will have to despair of growing fruit in Minnesota.

Respectfully yours,

JOHN HART.

APPENDIX C.

REPORTS OF LOCAL AND COUNTY SOCIETIES.

OLMSTED COUNTY.

MEETING OF MARCH 2D, 1878.

The fifth annual meeting of the Olmsted county Horticultural Society was held at the office of the *Record and Union* on Saturday afternoon, March 2d, 1878.

The Ten Commandments of Pomology.

The meeting was called to order by the president, A. W. Sias, who proceeded to read the "Ten Commandments of Pomology." He said they were translated from the Prussian by a correspondent of the *Horticulturist*, and written by a Bohemian clergyman. They are as follows:

1st. Thou shalt base thy faith only and exclusively on a vigorous seedling carefully raised; nor shalt thou suffer beside it either in thy orchard or nursery, any sucker, or make use of a sucker for propagation.

2d. Thou shalt not call any kind of fruit tree by a wrong name.

3d. Thou shalt keep a watchful eye on thy fruit trees during the time of their holidays (winter).

4th. Thou shalt honor the parents of thy fruit trees (the wild sorts) on account of their seeds, in order to raise from them long lived, vigorous trees, for the benefit of the culture of fruit trees.

5th. Thou shalt protect thy fruit trees from injury.

6th. Thou shalt not propagate thy fruit trees in any unnatural way.

7th. Thou shalt not impoverish where fruit trees grow, by constantly taking from them without ever giving.

8th. Thou shalt not bear false witness against the culture of fruit trees.

9th. Thou shalt not be immoderate nor incautious in thy desire for new kinds and varieties of fruit trees.

10th. Thou shalt not always covet nurseries in the distance to select thy fruit trees from.

Mr. Sias proceeded to read an extract from an interesting speech delivered by Mr. S. T. Jones of Kasson, at St. Charles, January 24th, 1878. He recommended the cultivation of small fruit. He who beautifies his home by setting trees and hedges, by cultivating gardens and orchards, was God's honored steward and

man's benefactor. The women should cultivate flowers, and the men should plant trees to beautify the home and render it attractive. This would greatly enhance the value of the farm, and tend to promote the healthfulness of the climate. The president closed his remarks by expressing a hope that the time might hasten when fruit trees may be planted on every man's farm throughout this fair land.

Some discussion arose with regard to adopting the commandments as read.

Mr. M. W. Cook said he thought every one ought to plant trees on his own land. It is not the good of the nurseryman that should be considered, but the general good of the community.

Mr. E. B. Jordon said if people did not take care of their trees it was not the fault of the nurserymen.

Mr. G. W. Mason thought the planting of fruit and shade trees was a benefit to the man who planted them, and also his neighbors, but he did not think it profitable to plant seedlings. He said a man who had about three thousand seedlings now had only two or three trees left.

Mr. Cook said a seedling was worthless until tested.

Mr. M. Pearce thought a seedling might be vigorous and not hardy.

Mr. Sias thought it was better to use seeds of wild varieties, than those now used, and said seedlings were more successful where they were originated, than elsewhere.

Mr. Jordon replied that there was no grounds for that, and said a tree was no better because it was grown in Minnesota; a tree grown in Missouri might do equally well. He had never raised a seedling as well adapted to the soil and climate of Southern Minnesota as the Duchess. It was just as much at home as in Russia.

Mr. Sias asked if it was as long lived as the Wealthy.

Mr. Cook said no man could answer a question he had not seen fully demonstrated.

Mr. Pearce was decidedly in favor of raising fruit from seed planted in Minnesota.

Mr. Sias said our seedlings would no doubt produce longer lived trees than foreign trees.

Mr. Pearce contended that any variety of fruit could be taken, and by successively propagating from the seed it would become acclimated the same as corn, and become hardy.

Mr. Hillman inquired if that was true, why we could not raise the peach and orange as well in Minnesota as in Florida.

Mr. Pearce. We can, and are going to do it.

Mr. M. J. Hoag said that he had more hopes of producing hardy trees from those grown here, than anywhere else; every climate had a pomology of its own.

Election of Officers.

On motion the question of the adoption of the commandments was laid on the table, and the society proceeded to the annual election of officers. They are as follows:

President—A. W. Sias.

Vice President—G. W. Mason.

Treasurer—M. J. Hoag.

Secretary—S. D. Hillman.

Ass't Secretary—M. Pearce.

Apples Recommended.

On motion the list of apples recommended at the late meeting of the state society, was adopted as follows:

Duchess, Wealthy, Tetofsky, Haas, Plumb's Cider, Price's Sweet, Saxton, St. Lawrence, Utter's Red, Fameuse, Talman Sweet, White Astrachan, Elgin Beauty, Malinda, Stewart Sweet, Walbridge, Peach.

Mr. Jordon said he had examined the fruit trees very closely, and he found his tenderest varieties were entirely uninjured, and the indications were favorable from present prospects for a larger crop of fruit than Minnesota had ever produced. He was expecting hundreds of bushels from his orchard. He should plant ten acres more to his orchard this spring in addition to his orchard of fifty acres.

A discussion arose as to the varieties to plant for an orchard of 100 trees. Mr. Pearce said in good fruit soil, he would set about fifty Duchess and the same number of the Wealthy; on some soils he would plant nothing but the hybrids.

Mr. Jordan thought fifty Duchess too many. He favored the crab varieties. A few years ago he would not plant any standard trees.

Mr. Cook said he would recommend the planting of Early Strawberry, Orange, Duchess and Wealthy.

Grapes.

Considerable discussion was had on the culture of grapes.

Mr. Jordon favored planting in rows from east to west, and Mr. Cook in rows twelve feet apart, north and south. He said Mrs. J. B. Clark, in East Rochester, had succeeded well in raising the Lady grape. He favored the Janesville grape, because it was early, hardy and productive.

After some further remarks the society adjourned to meet in the month of June, next, at the residence of M. W. Cook, at which time it is expected that strawberries will be ripe, and the merits of Mr. Cook's numerous varieties will be duly discussed.

MEETING OF JUNE 24, 1878.

Strawberries.

Pursuant to invitation a number of the members of the County Horticultural Society, and others, met at M. W. Cook's residence, Monday afternoon, to discuss the subject of strawberry culture, and visit Mr. Cook's plantation. The afternoon was extremely warm, but that did not prevent the gentlemen from taking a walk about the place, examining the beds, different varieties, etc., and sampling them rather extensively. Mr. Cook has some eight acres in the delicious berry, and the extent of the yield is simply wonderful. There were fifteen persons engaged in in picking the fruit, and that day he sent eighteen or twenty bushels to market. He has several varieties, the Wilson, Col. Cheney, Boyden's No. 30, Kentucky, and others late and early, and the field gave ample evidence of careful and intelligent culture.

After viewing the grounds the party returned to the house, where they were served with berries and cream. As soon as the repast was concluded, Mr. Sias, president of the society, called the meeting to order, and stated that Mr. Cook

and himself had been appointed a committee to go to Winona and examine Mr. Hart's new berry, the Hart Seedling. Mr. Hart is the originator of this berry. It is very large, one berry measuring nine inches in circumference. The flesh is moderately firm, form slightly conical, regular, color crimson scarlet. The fruit stalks are long and stout, leaves large and numerous. It is a hermaphrodite variety, and the blossoms are large and perfect, and the flavor delicious. Mr. Sias closed with a high compliment to Mr. Hart's personal integrity.

Samples of the berry were shown, they being very large and well formed.

Mr. Pearce moved that the report be accepted. Adopted.

Mr. Cook thought the Hart Seedling the nearest perfection of any berry he had ever seen. He could not judge of the bearing qualities, as the frost of last spring had injured the plants very much. It is perfect in form, color and quality, and is a large grower.

Mr. Pearce said a berry must be good which no one condemned. All the leading horticulturists had tried it, and had no criticisms to make concerning it.

Mr. Bamber said that at the State Horticultural meeting, these berries were on exhibition, and were pronounced perfect by all who tried them.

Mr. Sias stated that he was shown a seedling pear tree on a farm owned by a neighbor of Mr. Hart's, which was the largest and finest he had seen in the state. It was well loaded with fruit, and took the first premium at the state fair. Those who want to cultivate this fruit, should procure scions.

A vote of thanks was tendered Mr. and Mrs. Cook for their hospitality, and the meeting adjourned.

Mr. Pearce showed a beautiful bouquet of verbenas and pansies, and Mr. Cook a number of stalks of strawberries, with from nine to fifteen berries on a stalk.

APPENDIX D.

NOTES FROM CORRESPONDENCE.

CORRECTION TO LIST OF CENTENNIAL CONTRIBUTIONS.

ST. PAUL, Minn., Jan. 15, 1878.

Mr. C. Y. Lacy:

DEAR SIR—I would most respectfully call attention to the report of Wyman Elliot, on Contributions to the Centennial.

I learn that Truman M. Smith, Esq., was not properly credited with the varieties which he furnished, namely, some very large choice Duchess, and goodly number of them. Also some very choice Hyslops. I think it due our worthy horticulturist and President of this Society, that a correction be made in our proceedings.

I remain as ever a well wisher,

W. E. BRIMHALL.

FROM PROF. WM. F. PHELPS.

[NOTE.—This letter intended for the annual meeting, was received too late for that occasion. It is therefore inserted here.—SECRETARY.]

WHITEWATER, Wis., January 14, 1878.

Prof. C. Y. Lacy, Secretary Minnesota Horticultural Society, Rochester, Minn.:

DEAR SIR—Your kind invitation to the meeting of the Minnesota State Horticultural Society, to be held at Rochester on the 15th, 16th and 17th, is received. I regret that the meeting occurs during the closing days of the term, while we are in the midst of our examinations, thus rendering it impossible for me to be present. Allow me to assure you, and through you, the society, of my continued interest in its important work. Nothing but my pressing duties here would prevent my attendance at the meeting and participation in its proceedings. I trust and believe that you will have an interesting and profitable session.

Very truly yours,

WM. F. PHELPS.

FROM A. J. PHILLIPS.

WEST SALEM, LA CROSSE COUNTY, WIS., January 5th, 1878.

Prof. C. Y. Lacy, Minneapolis, Minn.

DEAR SIR—I have an earnest desire for the prosperity of your society and for the success of the horticultural enterprise in both northwest Wisconsin and in Minnesota. I enclose to you one dollar to pay my membership fees for another year, as I shall be anxious to see your report, even if I am not permitted to be present at your meeting. I perused it with interest last year.

I fully agree with Messrs. Jewell, Grimes and Arnold, in the discussion on Mr. Pearce's paper on Fall Planting and Root Killing. I have learned by experience, at different times, with different varieties and under different circumstances, that fall planting is not safe nor desirable, and should not be recommended to planters by nurserymen. Another thing nurserymen should be careful to do; to be very particular, in selling trees, to inquire about the soil and location of the man's farm, and, if possible, to recommend the best place for setting the trees; not to lose interest in him as soon as his trees are delivered and paid for; for success of the coming nurseryman depends on the work done by the present men in that business.

I have been fearful that the warm weather here in December, with the thermometer up to 60°, would start the trees, and prove very injurious; but as yet I have neither seen nor heard of any damage in this respect in this vicinity. Still, I do not like the ground freezing up without snow, as it has done this time; and in order to correct this I have a man mulching all the while now.

In my orchard of 2500 trees I have one hundred Wealthy, that are doing finely. I am a little inclined to have Wealthy "on the brain," for I do think it the most valuable as a hardy tree of any in the Northwest, except, perhaps, the Duchess, and I am now at a loss which to give the preference as to hardiness. Orange Crab, Minnesota, Peach Crab and Whitney's No. 20, are all growing fine, and seem to be perfectly hardy. Utter's Red, Fameuse, Duchess, Red Astrachan, Tetofsky, Price's Sweet and Haas, are my main varieties; but, with others, have to report but little fruit last season.

I will close by giving you one of the many incidents of fruit-growing in the Northwest. On a pleasant day in the last of October, while hunting on the bank of Dead Coon lake, near the western extremity of Minnesota, I came up to a man who was busily engaged digging a hole in the ground. Said hole was about eight feet long, three feet deep and three feet wide. My curiosity was aroused; for I thought if any one was to be buried there it must be a Minnesota giant. I accosted him, and from his dialect I found him to be a German. I said, "What are you going to bury?" "Oh," he said, "Some apple trees." He said he drove his oxen all night from Marshall, to get them home and buried as soon as possible. He invited me to go to the house and see them, for I think he had already discovered that his allusion to apple trees had touched me in a tender spot. I looked them over; fifty in number; cost \$15; bought, I think, of an Owatonna nurseryman. On examination I found some Duchess and Transcendents that might in his location, grow and bear fruit. I found him to be a bachelor, with no companion but his dog; and on looking over his land, which was rich prairie, where the winds seemed to have but little to break their fury for hundreds of miles; and hearing him ask the question, if I thought those trees

would bear any apples next year, I felt like saying—(although I did as fruit-growers and nurserymen often do, kept part back)—“My dear sir; with your limited knowledge of the trees you have bought; your lack of the same in after culture; your location on this rich, bleak prairie; the varieties you have purchased, my advice would be, dig your hole a little deeper; prepare a board bearing the inscription, here lies personal property which cost \$15; time spent talking with agent, \$1; time bringing home same, \$4; burying and incidentals, \$3. Total, \$23. Then put the trees in, cover them up, put up the board at one end of the hole, to mark the spot, and then take pains that they never were uncovered, but hold the spot sacred; and should any of the future generation of tree pedlars call that way you could effectually dismiss him without losing much time, by calling his attention to that epitaph.” But I did not say it, although I sincerely thought it the cheapest way of disposing of his trees. But as the poor man had no wife, I thought perhaps that it would be as well to set the trees, then he would have *something* to annoy him and take his time when not otherwise employed. So after giving the best directions I could as to burying, resurrecting and planting his trees, I left him dreaming of a bountiful crop of apples in two or three years.

Wishing you a pleasant and profitable meeting, I am yours truly,

A. J. PHILLIPS.

APPENDIX E.

ARTICLES OF INCORPORATION AND BY-LAWS.

ARTICLES OF INCORPORATION OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

Know all men by these presents, that we, the undersigned, John S. Harris, of La Crescent, Houston county; John H. Stevens, of Hennepin county; Wyman Elliot, Charles Hoag, J. T. Grimes, A. Stewart, R. J. Mendenhall, Peter M. Gideon and Charles H. Clark, all of Hennepin county; D. A. J. Baker, Truman M. Smith, D. A. Robertson, William E. Brimhall, H. J. Brainard, L. M. Ford and Wm. Paist, all of Ramsey county, and Thomas Ramsden, of Washington county; O. F. Brand, A. W. McKinstry and Levi Nutting, all of Rice county, and P. A. Jewell, of Wabasha; E. H. S. Dart, of Owatonna, Steele county; all of the State of Minnesota, do hereby associate ourselves together for the purpose of becoming incorporated under the name and for the purposes hereinafter stated, pursuant to the provisions of title and chapter 34 of the General Statutes of said State of Minnesota, so far as the same may be applicable; and do now adopt the following articles:

ARTICLE 1. This corporation shall be known as the Minnesota State Horticultural Society.

ARTICLE 2. The object of this society shall be to collect, condense and collate information relative to all varieties of fruits, flowers, and other horticultural productions, and dispense the same among the people.

ARTICLE 3. Any person interested may become a member of the society by paying to the Treasurer or Secretary the annual fee of one dollar, and signing the constitution and by-laws.

ARTICLE 4. The amount of capital stock of this corporation shall be twenty-five thousand dollars (\$25,000), with privilege to increase it to \$100,000, to be held in shares of twenty-five dollars each.

ARTICLE 5. The officers of this society shall be as follows: President, one Vice President to reside in each congressional district of this state, Secretary,

Treasurer, and an executive committee of three or more members, all of whom shall be elected by ballot at the annual meetings of this society, which shall be held on the 3d Tuesday in January.

ARTICLE 6. The principal place of business shall be wherever the majority of the society may hereafter designate.

BY-LAWS.

DUTIES OF OFFICERS.

1. It shall be the duty of the President to preside at all meetings of the society, when present, and to deliver an address at the annual meeting of the same. In the absence of the President, one of the Vice Presidents shall preside in his place.

2. The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all money received from members or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the society; establish and maintain correspondence with all local, county, district, and state horticultural societies, and secure, by exchange, their Transactions, as far as possible; to aid the President, as an executive officer, in the dispatch of business relating to meetings of the society, and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which shall become part of the Transactions for the current year, and shall be prepared by him for the public printer.

3. The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the Secretary countersigned by the President.

4. An executive committee of five shall be chosen annually, who shall, in connection with the President and Secretary (who shall be members *ex officio*) have in charge all matters pertaining to the interests of the society; shall revise all matter coming into the hands of the Secretary, and pass upon the same their approval before its submission to the annual meeting.

5. The executive committee may call a meeting of the society at any time and place they may deem advisable for the interests of the society, giving at least thirty days' notice through the public press, and shall in no case incur any expense exceeding fifty dollars, except by authority of the vote of the society at its annual meeting, when the specific object and the amount so appropriated shall be designated.

6. The President, at each annual meeting of the society, or as soon thereafter as practicable, shall appoint a general fruit committee, consisting of one member from each senatorial district in the state; and it shall be the duty of each member to report upon the fruit crop in his respective district annually, also a limited list of fruits best adapted to general cultivation in the district which such member represents.

7. That committees on vegetables and market gardens; flowers and floriculture; trees for the forest and forest culture, and entomology, be appointed each year, whose duties it shall be to report on their several topics to this society at the annual meeting.

8. The society may at any regular annual meeting elect as honorary members, any person or persons who may have performed valuable services for the society, or upon whom the society may wish to confer special honor. Such memberships shall be for five years from date of such election, and shall be entitled to all the privileges of the society except voting.

9. The wives of members shall be members of the society without the payment of a membership fee.

10. Final article. These by-laws may be amended by a two-thirds vote of the society at any regular annual meeting.

NOTE.—Before the adjournment of the meeting at Rochester, it was voted, upon invitation of members from that place, to hold the next annual winter meeting at Minneapolis. In transcribing the secretary's notes, this action of the society was accidentally omitted.

The appointment of A. J. Phillips as delegate to the meeting of the Wisconsin State Horticultural Society by vote, was also omitted from its proper place in the Proceedings.—SECRETARY.

4671
Linn.

TRANSACTIONS

OF THE

MINNESOTA

STATE HORTICULTURAL SOCIETY.

Report - 1874-79

Proceedings, Essays and Reports

OF THE

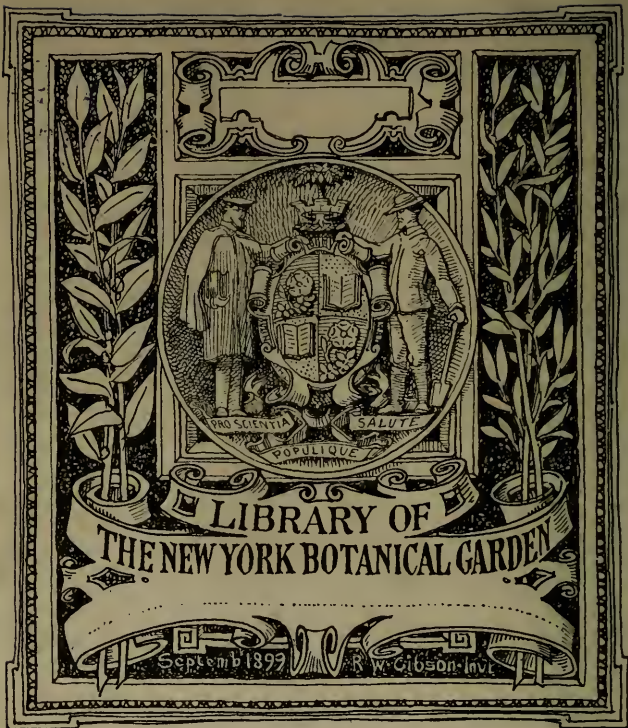
ANNUAL WINTER MEETING

Held AT

Minneapolis, January 21st, 22d and 23d. 1879.

PREPARED BY CHAS. Y. LACY, SECRETARY.

MINNEAPOLIS:
JOHNSON, SMITH & HARRISON
1879.



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OFFICERS FOR 1879.

PRESIDENT.

J. T. GRIMESMinneapolis.

VICE PRESIDENTS.

E. H. S. DART, First District.....Owatonna.
 DITUS DAY, Second District.....Farmington.
 U. S. HOLLISTER, Third District.....St. Paul.

SECRETARY.

CHAS. Y. LACY.....Minneapolis.

TREASURER.

J. M. UNDERWOOD.....Lake City.

STANDING COMMITTEES.

EXECUTIVE.

J. S. HARRIS....La Crescent.
 WYMAN ELLIOT.....Minneapolis.
 M. PEARCE.....Rochester.
 T. G. CARTER.....St. Peter.
 F. G. GOULD.....Excelsior.
 President and Secretary, *ex officio*.

COMMITTEE ON ORGANIZATION OF LOCAL SOCIETIES.

(See page 37.)

J. S. HARRIS.....La Crescent.
 A. W. LATHAM.....Excelsior.
 M. PEARCE.....Rochester.

DELEGATES TO MEETING OF STATE AGR. SOCIETY.

WM. E. BRIMHALL	St. Paul.
TRUMAN M. SMITH.....	St. Paul.
Dr. R. W. TWITCHELL.....	Rochester.
M. PEARCE.....	Rochester.
G. W. FULLER.....	Litch eld.

COMMITTEE ON RUSSIAN APPLES.

(See page 36.)

J. T. GRIMES.....	Minneapolis.
E. H. S. DART.....	Owatona.
J. M. UNDERWOOD.....	Lake City.
A. W. SIAS.....	Rochester.
A. W. LATHAM.....	Excelsior.

COMMITTEE ON SEEDLING APPLES.

(See page 37.)

D. DAY.....	Farmington.
F. G. GOULD.....	Excelsior.
G. W. FULLER.....	Litchfield.
M. PEARCE.....	Rochester.
J. S. HARRIS.....	La Crescent.

MEMBERS FOR 1879.

Ames, E. B.....	Minneapolis, Hennepin county.
Atkins, Chas. F.....	Bucksport, Me.
Andrews, John B.....	Faribault, Rice county.
Bost, T.....	Excelsior, Hennepin county.
Bell, J. E.....	Minneapolis, Hennepin county.
Brimhall, Wm. E.....	St. Paul, Ramsey county.
Christian & Dean.....	Minneapolis, Hennepin county.
Carter, T. G.....	St. Peter, Nicollet county.
Cannon, Wm.....	Fort A. Lincoln, D. T.
Cotterell, R. L.....	Dover, Olmsted county.
Dean, J.....	Minneapolis, Hennepin county.
Day, D.....	Farmington, Dakota county.
Day, L. E.....	Farmington, Dakota county.
Day, A. A.....	Farmington, Dakota county.
Dart, E. H. S.....	Owatonna, Steele county.
Elliot, Wyman.....	Minneapolis, Hennepin county.
Eastman, Wm. W.....	Minneapolis, Hennepin county.
Fuller, G. W.....	Litchfield, Meeker county.
Fish, Geo. H.....	Sauk Center, Stearns county.
Fowler, Wm.....	Newport, Washington county.
Gluck, J. G.....	Minneapolis, Hennepin county.
Gale, S. C.....	Minneapolis, Hennepin county.
Goodfellow, R. S.....	Minneapolis, Hennepin county.
Grimes, J. T.....	Minneapolis, Hennepin county.
Griese, C. H.....	Cleveland, Ohio.
Hollister, U. S.....	St. Paul, Ramsey county.
Harris, J. S.....	La Crescent, Houston county.
Hush, V. G.....	Minneapolis, Hennepin county.
Hendrickson, W. E.....	St. Paul, Ramsey county.
Harwood, N. B.....	Minneapolis, Hennepin county.
Hart, John.....	Winona, Winona county.
Jordon E. B.....	Rochester, Olmsted county.
Kerridge, F. J.....	Minneapolis, Hennepin county.
Knaupheide, R.....	St. Paul, Ramsey county.
Kenny, Seth H.....	Morristown, Rice county.
Lacy, Chas. Y.....	Minneapolis, Hennepin county.
Layman, Martin.....	Minneapolis, Hennepin county.

Loring, C. M.	Minneapolis, Hennepin county.
Latham, A. W.	Excelsior, Hennepin county.
Martin, Lewis	Anoka, Anoka county.
Morrison, Clinton	Minneapolis, Hennepin county.
McHenry, Wm.	St. Charles, Winona county.
Mendenhall, R. J.	Minneapolis, Hennepin county.
Miiler, C. F.	Dundas, Rice county.
Mills, L. D.	Garden City, Blue Earth county.
Norquist, J.	Red Wing, Goodhue county.
Pearce, M	Rochester, Olmsted county.
Phillips, A. J	West Salem, Wisconsin.
Reeve, Chas. McC	Minneapolis, Hennepin county.
Read, A. M.	Minneapolis, Hennepin county.
Read, L. M.	Minneapolis, Hennepin county.
Rand, A. C.	Minneapolis, Hennepin county.
Robertson, G. W.	St. Paul, Ramsey county.
Schmaurs, F. J.	Lake City, Wabasha county.
Sidle, H. G.	Minneapolis, Hennepin county.
Sidle, J. K.	Minneapolis, Hennepin county.
Stcrrs, O. D.	Winsted, McLeod county.
Spaulding, E. S	Minneapolis, Hennepin county.
Smith, T. M.	St. Paul, Ramsey county.
Sias, A. W.	Rochester, Olmsted county.
Tyler, S.	Minneapolis, Hennepin county.
Thompson, Josiah	Minneapolis, Hennepin county.
Twitchell, Dr. R. W.	Chatfield, Fillmore county.
Toan, B. D.	Rochester, Olmsted county.
Underwood, J. M.	Lake City, Wabasha county.

HONORARY MEMBERS.

Miss Hortense Share	Rosemount, Minn	elected 1877
Mrs. C. O. Van Cleve	Minneapolis, Minn.	elected 1877

LIFE MEMBER.

Mrs. Wm. Paist	Hersey, Minn.
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FRUIT LISTS.

APPROVED OR REVISED BY THE STATE HORTICULTURAL SOCIETY AT
THE ANNUAL MEETING AT MINNEAPOLIS, JAN. 21 TO 23, 1879.

NOTE 1. It should be remembered that negative votes are not always unfavorable ones. Those casting them may be in favor of placing the variety *either* in a higher or lower list.

NOTE 2. Since the following lists represent the action taken at two meetings the votes are generally omitted, except in case of varieties changed at the last meeting.

APPLES.

(For discussion see Page 59.)

Recommended for general cultivation:

Duchess of Oldenburg, Wealthy.

Recommended for planting in limited quantities:

Tetofsky.

Recommended for general cultivation in favorable localities:

Haas, Price's Sweet.
Plumb's Cider, Saxton.

Recommended for favorable localities in southern portions of the State:

St. Lawrence, Fameuse,
Utter's Red, Talman's Sweet.

Recommended for general trial throughout the State:

White Astrachan, Elgin Beauty,
Peach.

Recommended for trial by amateurs and pomologists—

Alaska.	Queen of Elgin.
Julia.	Rollin's Pippin.
Molly.	Rollin's Russet.
Clayson.	Rollin's Prolific.
Kimball.	Wabasha.
Hart's Seedling, No. 7.	Hart's Seedling, No. 11.
Malinda.	Yearley's Winter.
Walbridge.	Frost's Seedling.

CRAB APPLES.

(For discussion see page 60.)

Recommended for general cultivation—

Transcendent.	Orange.
Hyslop.	Early Strawberry.
Beach's Sweet.	

Recommended for planting in limited quantities—

Conical.	Maiden's Blush.
Hesper Blush.	

Recommended for general trial—

Powers' Large Red.	Virginia.
General Grant.	Beach's Red.
Whitney's No. 20.	

Recommended for trial by amateurs and pomologists—

Minnesota.	Brier's Sweet.
Aiken's Str. Winter.	Quaker Beauty.
Alaska.	Woodland Winter.
Hutchinson's Sweet.	

BLIGHT.

NOTE.—Since there was no blight in the State in 1878, the lists were not changed at the last meeting, and they represent the action taken in June, 1878.

Varieties quite exempt from blight—

Orange, (Unanimous vote.)	Minnesota, (Unanimous vote.)
Beach's Sweet, (Unanimous vote.)	Powers' Large Red, (Unanimous vote.)
Conical, (Unanimous vote.)	Early Strawberry, (9 for and 1 against.)
Maiden's Blush, (Unanimous vote.)	Virginia, (6 for and 1 against.)
Whitney's No. 20, (Unanimous vote.)	Beach's Red, (Unanimous vote.)

Varieties quite liable to blight—

General Grant, (Unanimous vote.)	
Transcendent (10 for and 1 against.)	Hyslop, (14 for and 1 against.)

Varieties recommended and not named in these lists were not assigned, either for want of sufficient knowledge, or because they are not decidedly exempt from blight, or decidedly liable to it.

GRAPES.

Recommended for general cultivation.

Concord. Delaware.

Recommended for planting in limited quantities.

Hartford Prolific, Northern Muscadine,
Clinton, Eumelan,
Roger's No. 15, or Agawam.

Recommended for trial.

Iona,
Janesville, for its earliness,
Roger's, No. 4 or Wilder,
Roger's No. 9 or Lindley,
Roger's No. 19 or Merrimack.

STRAWBERRIES.

Recommended for general cultivation.

Wilson's Albany.

Recommended for general cultivation for near market and home use.

Downer's Prolific, Charles Downing.
Green Prolific, Countess de Haricourt.

Recommended for trial—

Seth Boyden. Col. Cheney.
Kentucky. Prouty's Seedling.
Michigan Seedling. Kramer's Seedling.

For general trial for amateur cultivation.

Hart's Minnesota Seedling.

RASPBERRIES—BLACK-CAPS.

Recommended for general cultivation—

Doolittle. Seneca.

Recommended for trial—

Ontario.

RASPBERRIES—RED.

Recommended for general cultivation—

Philadelphia. Turner.

CURRANTS.

(Action of 1877.)

Recommended for general cultivation:

Red Dutch,	Victoria,
	White Grape.

Recommended for general cultivation as a black variety:

Black Naples.

Recommended for trial:

Stewart's Seedling.

PLUMS.

(Action of 1876.)

Resolved. That in view of the vast number and variety of native plums of great excellence in our State, and the uncertainty of getting a genuine article by importation, therefore we recommend that our people depend principally upon our own native plums for a supply.

Recommended for trial:

Miner.	De Soto.
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GOOSEBERRIES.

None were recommended.

EVERGREENS.

List adopted 1876 and approved 1877. The votes recorded are those of 1876.

White Spruce, 1st.	(10 for, 8 against.)
Norway Spruce, 2d.	(11 for, 8 against.)
Scotch Pine, 3d.	(13 for, none against.)
Balsam Fir, 4th.	(15 for, none against.)
White Pine, 5th.	(11 for, none against.)
American Arbor Vitæ, 6th.	(11 for, 2 against.)
Red Cedar, 7th.	(11 for, 4 against.)
Red or Norway Pine, 8th.	(11 for, none against.)
Austrian Pine, 9th.	(9 for, 7 against.)
Mountain Pine, 10th.	(8 for, none against.)
Siberian Arbor Vitæ, 11th.	(14 for, none against.)
Trailing Juniper, 12th.	(13 for, none against.)

TREES FOR FOREST PLANTING.

Deciduous—

Cottonwood,		Sugar Maple,
White Willow,	} For moist soil.	White Ash,
White or Rock Elm,		Box Elder,
		Butternut.

Deciduous Conifer—

European Larch.

Evergreens—

Scotch Pine,	Arbor Vitæ,
White Pine,	Balsam Fir,
Red Cedar,	Norway Spruce,
	Black Spruce.

PROCEEDINGS

AT THE

WINTER MEETING,

HELD AT MINNEAPOLIS, TUESDAY, WEDNESDAY AND THURSDAY,
JANUARY 21, 22 AND 23, 1879.

PROGRAMME:

TUESDAY MORNING.

TEN O'CLOCK.

1. Premium List for Horticultural Products at State Fair ; a discussion.
2. Appointment of Committees, Auditing Committee, Committee on Articles on Exhibition at present meeting, Committee on Resolutions.
3. Report of Committee on the Organization of Local Societies, (Committee consists of J. S. Harris and A. W. Latham.)

TUESDAY AFTERNOON.

1. Protection of Fruit Trees ; report by Peter M. Gideon, of Excelsior.
2. Discussion on same.
3. Report on Potatoes by A. W. Sias, of Rochester.
4. Discussion on same.
5. Hart's Seedling Strawberry ; report of Committee.
6. Horticulture in Meeker county ; General Fruit Report by G. W. Fuller, of Litchfield.
7. Discussion on same.

TUESDAY EVENING.

1. Destructive Insects ; paper by R. J. Mendenhall, of Minneapolis.
2. Discussion on same.
3. Effects of Change of Climate on Plants ; paper by U. S. Hollister, of St. Paul.
4. Discussion on same.
5. Report on Apple Culture by R. L. Cotterell, of Dover Center.

WEDNESDAY MORNING.

1. Fruit Culture and Fast Horses ; an address by Peter M. Gideon, of Excelsior.
2. Discussion on same.
3. Report on Fruits, Flowers and Vegetables at the State Fair, by J. S. Harris, of LaCrescent.
4. Discussion on same.
5. Report on Fruit Culture by John N. Norquist, of Red Wing.
6. Discussion of same.

WEDNESDAY AFTERNOON.

1. The cultivation of Beets and Carrots for Stock ; paper by P. C. Sherren, of St. Paul.
2. Discussion on same.
3. Growth and Management of Plants in the house ; paper by Mrs. E. Morse, of Minneapolis.
4. Discussion on same.
5. Preservation of Surplus Fruits ; paper by J. W. Boxell, of Valley Creek.
6. Discussion on same.

WEDNESDAY EVENING.

On this evening, Dr. P. L. Hatch, of Minneapolis, will give an "informal talk" before the Y. M. C. A., on "Birds of Minnesota." The members of the Horticultural Society have been cordially invited to attend this "informal talk," and hence the society will hold no session on this evening, unless the early conclusion of this exercise should give ample opportunity for so doing; in which case discussions and miscellaneous matters will occupy the attention of the society.

THURSDAY MORNING.

1. Annual Address of the President, T. M. Smith, of St. Paul.
2. Discussion of same.
3. Report of the Secretary.
4. Report of the Treasurer.
5. Election of Officers.

THURSDAY AFTERNOON.

1. Report on Fruits, Flowers and Vegetables at the Minneapolis Fair by J. T. Grimes, of Minneapolis.
2. Discussion on same.
3. The Production of New Varieties of Apples; report by Peter M. Gideon, of Excelsior. [Mr. Gideon will explain the plan and state the progress of the work he is now doing at Excelsior.]
4. Discussion on same.
5. Growth and Management of Fruit Trees in the Nursery; paper by J. M. Underwood, of Lake City.
6. Discussion on same.

THURSDAY EVENING.

1. Cultivation of the Strawberry;* paper by M. W. Cook, of Rochester.
*If the opportunity occurs these papers should be called up earlier in the meeting, as the programme for Thursday evening is necessarily very full.
2. Discussion on same.
3. Articles on Exhibition at Meeting; report of committee with remarks.
4. Discussion on same.
5. Growth, Management and Uses of Evergreens;* paper by H. M. Thompson, of St. Francis, Milwaukee Co., Wis.
6. Discussion on same.
7. Unfinished business. Place of meeting.
8. Final resolutions; report of committee.
9. Adjournment.

The following subjects have also been proposed for discussion, and may be taken up at the pleasure of the society:

Garden vegetables.

Small fruits; how can their cultivation be extended?

Special horticultural exhibitions; are they practicable; are they desirable; where should they be held and how conducted?

Blight; its nature, prevention and remedies.

Methods of promoting and retaining the fruitfulness of orchards.

Orchards; sites, soils, &c.

New varieties.

The fruit lists.

The parlors of the Y. M. C. A., over the city market, have been engaged for the meeting, and will be kept warm day and night during its continuance. Tables and plates, and every facility for the exhibition of fruits, vegetables and plants, will be provided. In view of these facilities and of the abundant fruit crops of the past season, the horticulturists of the state are earnestly exhorted to make such an exhibition as shall be worthy to represent the horticulture of the state.

Entertainment will be furnished by the citizens of Minneapolis to members and those becoming members. The hotels will furnish board and lodging to those presenting membership tickets, at the following rates: Nicollet House, \$2 per day; Clark House, \$1.25; National Hotel, \$1.50.

Arrangements with the railways have been made as follows:

The Chicago, Milwaukee and St. Paul R. R. will sell *return* tickets at one-fifth of regular rates on presentation of the certificate of the secretary.

The St. Paul and Pacific R. R. will do the same.

The Winona and St. Peter R. R. will sell tickets on the same terms at Winona, Owatonna, Waseca and Kasota junction.

The Minneapolis and St. Louis R. R. will sell *round trip* tickets at three-fifths of the regular rates, *tickets to be purchased of agent at starting point.*

The Minnesota Amber Cane Association will hold its annual meeting in Minneapolis, January 23d and 24th, and the reduced railway rates are extended to those who attend this meeting also.

CHAS. Y. LACY,
Sec'y Minn. State Hort. Society.

TUESDAY MORNING.

The society was called to order by President T. M. Smith, at 10:45, in accordance with notice given through the press, and the above programme, which had been mailed to the members of the society and a large number of others, supposed to be interested in horticulture or some of its branches.

Prayer was offered by the Rev. Geo. W. Fuller of Litchfield, after which the meeting proceeded according to programme as closely as circumstances permitted.

PREMIUM LIST FOR HORTICULTURAL PRODUCTS AT STATE FAIR.

The premium list was taken up for discussion. Pres. Smith explained that it had been the custom of the State Agricultural Society to set apart a certain sum of money for premiums for horticultural products, and to allow the Horticultural Society to offer this money in such manner as it saw fit, and since the list needed improvement it was thought best to bring it up for discussion here.

Mr. Hollister moved to appoint a committee of three to report on this subject to-morrow. The motion was carried and Messrs. Brimhall, Gould and Jordan successively appointed by vote of the society.

APPOINTMENT OF COMMITTEES.

Messrs. U. S. Hollister, W. Elliott and A. W. Latham were appointed by vote of the society a committee to audit accounts.

Messrs. P. M. Gideon, G. W. Fuller and U. S. Hollister were appointed a committee to report on articles on exhibition at this meeting.

Messrs. Chas. Y. Lacy, A. W. Latham and Wm. McHenry were appointed a committee on resolutions.

REPORT OF COMMITTEE ON LOCAL SOCIETIES.

The report of the committee on the organization of local societies was called for as being next in order. Mr. Latham, a member of the committee moved a postponement of the report till the arrival of the chairman, Mr. Harris. No objection was made and the motion was declared carried.

INVITATION TO LEGISLATURE.

The Secretary suggested that if an invitation was to be extended to the members of the Legislature to visit this meeting it should be acted upon at this time.

Dr. Twitchell moved that an invitation be sent.

Mr. Latham moved to amend by stating some time for the visit.

Mr. Hollister suggested that unless some legislation is desired a visit would not amount to much and would cost the State a thousand dollars.

Pres. Smith thought it best not to ask for legislation.

Mr. Gould was in favor of an invitation.

Mr. Hollister would have the Committee on Agriculture only come up.

Mr. Thompson—Am in favor of an invitation to all the members. It would be much to the interests of the society to have them come and see what we have on exhibition and what we are doing.

Mr. Jordan—Think the main object should be to get them to see what we have on exhibition. Many of them are unbelievers in fruit culture, and what we have here should do much to dispel that unbelief.

Dr. Twitchell—I hold the same views and think that what we are doing here equally as worthy of attention as what the Legislature is doing. Move the following resolution be adopted:

Resolved, That we extend an invitation to the Legislature, now in session at St. Paul, to visit us at this place at such time during our meeting as may suit its convenience.

And further, That they be requested to appoint a committee to report upon the exhibit.

The motion was carried.

Motion was made and carried that the Secretary be instructed to transmit the invitation in accordance with the above.

The report of Mr. Gideon on protection from rabbits, mice, &c., was called for and read by the writer, as follows:

THE PROTECTION OF FRUIT TREES AGAINST RABBITS, MICE, INSECTS AND THE EXTREMES OF CLIMATE.

Rabbits.

To prevent the depredation of the gray rabbit on trees, take the entrails of one and rub the trees as far up as the animal can reach, and no tree so treated will be molested inside of three or four months, but such application will only induce the white rabbit to greater destruction, so that to head off the latter you must trap or shoot them. Poison could be used to exterminate them, but I prefer to make a fry of them.

Mice.

But for mice I apply the poison. I take a small stick with a square end and insert it in the vial of strychnine, and pound it as fine as flour, and dust that over with a small bit of corn meal. The process of setting baits is this: I put a dry chip or bit of board on the ground. On that I put a smaller piece, on which I put about a teaspoonful of dry corn meal, over which I dust the strychnine, and then to keep all dry I cover with box or old sap trough, and sometimes to attract, I put hay, straw, or corn meal over the box or trough, as it may be. Five or six baits so set are enough for an acre of orchard, unless grass and weeds are very thick, in which case more might be needed, and renewed twice a year is sufficient, say in August and November. Grapes that are covered with hay or straw needs one such bait under the covering of the vines to each telis.

Bark and Leaf Lice.

And as to the bark and leaf lice that often infest fruit trees. I know of no remedy other than to leave them to the mercy of the ants, hornets, wasps, and yellow-jackets, and if undisturbed they will never fail of ultimate success, though some loss may accrue before their ultimate triumph, yet their work is the cheapest, and only certain remedy I know of, having tried nearly a score of remedies, to no avail.

Borers.

The borer that does his work near the surface of the ground, can be destroyed at once by making a small mound of dry, unbleached ashes around the trees, and if higher up by a plaster of wet ashes or lime, and held in place by a bandage of cloth. I never cut or gouge the tree in search of them.

Caterpillar.

The caterpillar I gather off by hand and crush under foot, and they that want a more delicate process can conjure up one to suit their fancy.

Cold and Drouth.

To protect against cold or drouth, I mulch early in fall, with any kind of coarse litter or meadow-muck, and leave it there the year round, for it is as essential to guard against drouth as against cold. The mulch guards the tree against all great extremes of heat, drouth, or cold, and no danger from mice if you keep plenty of baits set.

PETER M. GIDEON.

Mr. Latham moved the report be accepted and filed for publication. The motion was carried, after which opened the following—

DISCUSSION.

Wrapping With Paper.

Mr. Fuller. I wrap with building paper and thus save from mice and rabbits.

Mr. Jordon. Have seen an orchard so treated worse damaged by the paper than by mice or rabbits. It kills the bark wherever in contact with it.

Mr. Fuller. Have had experience with it for years and have never had a tree injured.

Mr. Spaulding. I commenced using tarred paper early. I first put newspaper around the tree and the tarred paper outside of this. Have recommended this method to others and have heard only of success. Have never had a tree injured by it. Think it perfectly safe if put on newspaper first.

Mr. Fuller. There is difference in paper. Some coat the paper with tar instead of using paper simply impregnated with tar.

Mr. Gideon. We should be cautious about the use of these things. Have seen tarred paper used once but it was disastrous. Why not say oiled paper? This is harmless and cheap.

Liver, Entrails, Meat, Sulphur, Whitewash.

Dr. Twitchell. I have used the liver of animals. It is the blood that the rabbits object to. Petroleum tar is certainly injurious.

Mr. Gideon. Not all meat will repel rabbits. The gray rabbit

will eat beef, and rubbing with entrails is not effective against the white rabbit.

Mr. McHenry. Have tried smearing with sulphur steeped in hog's lard, but these trees were eaten worse than those not smeared. Have since used tobacco steeped in hog's lard and this is effectual. They don't like tobacco. Doubt the efficacy of oil to repel insects.

Mr. Jordan. Have tried oiled paper but found it expensive. Then tried a lighter paper but it was still costly to put it on. I then tried chemical paint and found it effective. Have used a whitewash consisting of $\frac{1}{4}$ paint and $\frac{3}{4}$ whitewash. This sticks well. Have now two fox hounds and one grey hound, and I think these the most successful against rabbits. Wrapping and poisoning require constant and continuous attention.

Mr. Gideon. My trees head low and paper cannot be applied so as to protect. For trees in snow drifts it will not answer either. For mice in these cases must use poison traps. One man can set 500 traps per day.

Clean, Culture and Mounding.

Mr. Pearce. Mice work where there is grass. Clear the ground clean and you will suffer no injury from them. If you do not clear the ground then tramp down the snow about the trunks.

Mr. Jordan. I have men clear away rubbish and mound up six inches high with dirt.

Mr. Fuller. I make the mound of leached ashes if I have them, and if not I use dirt.

Mr. Jordan. Must be sure to remove the rubbish and make the mound firm as mice like to burrow in straw and loose dirt.

Mr. Gideon. Trees should be mulched and that at the collar and close up to the trunk. There should be no dirt there. Dirt freezes and the freezing extends into the wood and produces bark-bursting.

Sal Soda, Tobacco, Sulphur, Carbolic Acid, for Leaf Lice.

Mr. Brimhall. Sal soda, 1 pound to a gallon of water exterminates leaf lice.

Mr. Storrs. Sal soda has failed with me. Have also smoked with tobacco which did no good. Then fumigated with sulphur with the same result. Then tried soap-suds with carbolic acid, which also failed. I then made a stronger solution of suds and acid and killed both lice and tree.

Whitewash for Mice.

Mr. Latham. I have succeeded in destroying plant lice with tobacco solution. Have used a mixture of whitewash, cow manure and sulphur for mice and rabbits, painting it on with a brush. This is also a good disinfectant. It also protects the trunks against the sun, being a good reflector and reflecting the heat instead of absorbing it.

Kerosene, Ashes and Tobacco for Lice—Pinching.

Mr. Gould. It is hard to destroy leaf lice when they get well started. The wasp known as yellow-jacket will, however, if plenty enough, keep them in check. I find it a nice point to make solutions of tobacco, carbolic acid, &c., strong enough to kill insects and not to hurt the tree. At evening when the lice are gathered together they can be destroyed by pinching. The ants seen there do not disturb the lice. But when all the green lice are killed the old ones of a darker color continue producing.

Mr. Jordon. Mr. Sias has been successful with kerosene oil. It does not hurt the tree, and putting on a few branches clears the whole tree of lice. For the trunks of trees I have used a wash of lime, cow manure and soft soap, putting it on in May, and have found it of great value in keeping the trees clean and healthy. Instead of soft soap, have sometimes used refuse from lye.

Mr. Gideon. Used kerosene last year and it made no impression on lice. Used paris green and flour so abundantly that the leaves were burned, and the lice survived.

Mr. Fuller. I have taken an ash pail and thrown ashes up among leaves on a plum tree while the lice were young, and thereby cleaned them out.

Mr. Tyler. Have used very strong tobacco solution, on peach trees, washing it off with clean water the next morning. Tobacco sickens the lice and they come off easy with clean water.

Mr. Spaulding. Have found two varieties of aphid on plum trees. Have been most successful in pinching them.

Natural History of Aphid.

Dr. Twitchell. I believe paris green would have been effective if thoroughly applied. The natural history of this insect is inter-

esting. The first to hatch in the spring are females. These are hermaphrodite, and some thirty generations, also hermaphrodite are successively produced during the season. Toward the close of the season males are produced, and these fertilizing the females, eggs are produced, which hatch the following spring as above stated. To destroy the first crop is therefore most important, and these I would pinch off.

Mr. Brimhall. Salsoda made strong enough will kill them. One pound to a gallon of rainwater is about right.

Mr. Gould. Would leave undisturbed the little wasp nests before mentioned, as enemies of the lice. For mice cats are good. Mice have never hurt my trees. I even have grass growing near them, and the cats keep off the mice. Rats are increasing with us. They have found out how to bark trees and I don't know what to do with them.

Mr. Storrs. Washing with tobacco solution has had the best effect in my experience.

At this point the society adjourned to meet at 1:30 p. m.

TUESDAY AFTERNOON.

REPORT ON POTATOES.

The meeting was called to order by President Smith at 1:45. Mr. Sias being absent his report on potatoes was read by the Secretary. It was as follows:

Prof. C. Y. Lacy,

DEAR SIR:—Were it not for the fact that you had rendered it incumbent upon me, by your liberal donation of some twenty choice varieties of the Irish potato, to be distributed among the members of the Olmsted Co. Horticultural Society, to say something on this important subject, I would not intrude my crude thoughts upon this intelligent body of horticulturists at this time. I have too much respect for the the feelings of this society, to inflict upon them a long, dry paper on the theory and practice of potato culture in Minnesota—fertilizers, &c. Will merely give a bit of my experience, and a prediction or two, and I am done.

Value of the Potato.

Of all our horticultural productions, there is perhaps nothing of greater importance, if we except the apple, than the Irish potato. A native of South America, and introduced into the British dominions in the 16th century. Webster says: "In the British dominions and in the United States, it has proved one of the greatest blessings bestowed on man by the Creator."

Source of New Varieties—Seedlings.

The fact that the Commissioner of Agriculture, Wm. G. LeDuc, has just introduced a very superior variety of the Irish potato into this country from Peru, is a matter of considerable interest, and possibly of great commercial importance. Although I am inclined to think it almost too good a thing to hope for, that we should obtain a variety of the Irish potato, that originated south of the equator, that will even prove of as great commercial value as some of our best native seedlings. We will doubtless find varieties richer in saccharine matter, and of most excellent quality, and to those who have a preference for sweet potatoes, a great acquisition.

But for lack of adaptation to our more rigorous climate and soil, lack of productiveness or lack of keeping qualities, is it not too much of a good thing to hope for, as I said before, that they should prove as great a blessing, or of as great a commercial value, as the Early Rose, Peach Blow, or a dozen others that might be mentioned? I took a similar view in regard to Russian varieties of the common apple, soon after the introduction of the four hundred varieties from St. Petersburg, in 1870, by the department of agriculture. And after putting one hundred and thirty varieties on trial, and fruiting a dozen kinds, I am still more fully convinced of the correctness of the prediction.

The past season I took more fruit from one Minnesota seedling, known as the Rollins Pippin (and still more from the Rollins Prolific) than from the whole dozen new Russians put together. They were all top grafted on the Hyslop, except one tree, and the Russians had been grafted one or two years the longest. Mr. M. J. Hoag, an old settler in this State, and a man of considerable experience in the nursery business before he came here, expressed my views exactly before our county Horticultural Society, when he stated that "Every climate must have a pomology of its own." Now this means seedlings. Possibly this rule may not apply with quite as much force to potato seedlings as to seedlings of the apple, but to all those who are tired of sending east for new varieties at one dollar per pound, I say, try it. Were this State thrown entirely on its own resources, and obliged to run an independent line, and depend wholly upon its own seed and seedlings, for potatoes, apples, strawberries, &c., who does not believe that in a single decade we should be the gainers thereby. Let us see how it is with the common apple. Why, already, our last report from this society shows that no one attempts to place anything ahead of one of our Minnesota seedlings for fall, and I will here predict that in our list for "trial by amateurs and pomologists" there will be found varieties for winter, which, for hardiness and quality combined, will surpass anything imported into this State. (If any timid member should happen to cry "axe to grind" at this point, please to inform him that this axe called "Minnesota Seedlings," has such a ring of superior steel about it—it is not what was called iron-clad before the winter of seventy-two and three—that even the most confirmed old croakers will yet be willing and anxious to catch

hold and help grind.) And as to the strawberry, I shall be disappointed if Mr. M. W. Cook, chairman of the committee to visit Mr. John Hart's seedling last June, does not undertake to show that the numerous seedling strawberry growers down east, who are bringing to the front strawberries that rival the common apple in size, will have to look well to their laurels, or they are all distanced by a Minnesota seedling. While we should not be unmindful, or ungrateful for past favors from abroad, in the shape of new varieties of the Irish potato at one dollar per pound, yet as a matter of economy and profit, I think it would be well to experiment with new seedlings of our own.

Trial of New Varieties.

To go back to the potatoes distributed from you to the members of our county Horticultural Society, I will say that I found open and willing hands for all except the Eureka, Excelsior, and Fluke. These I planted myself, and am highly pleased with the result. The Excelsior is a potato of high excellence for the table, as its name would imply. Among the new varieties on trial the past season, I wish to mention the Burbank as one of the best with me; planted half a bushel and dug about twenty-five, and, had we succeeded in keeping off the Colorado beetle, think the yield would have been nearly doubled. I also wish to mention a very fair late potato, Breese's Prolific. Some six or eight years ago, as I was passing a grocery store in our city, I saw a basket of these potatoes turned up to the full exposure of the sun, and, as it was about the first of June, they had probably been so exposed at least a month, until they had turned quite green, and had sprouted and put out in leaf. I took them and cut them into pieces of one and two eyes each, and planted on land that had never been manured; had been cultivated and cropped six years; and from this bushel of potatoes I gathered a trifle over over one hundred. I attributed this large yield partly to the fact of their having been so long exposed to the sun.

Last fall I dug my first crop of potatoes from the seed, and for aught I know they are all right, but to my inexperienced eye they certainly look like "small potatoes."

And now, in conclusion, if fortune should favor me in the pursuit of this new enterprise, and I should chance to strike a bonanza, you may expect to hear from me again.

Respectfully yours,

A. W. SIAS.

DISCUSSION.

Results with New Varieties.

Prof. Lacy gave the result of experiments with potatoes on the State Experimental Farm, as detailed in the following tables:

	Yield per acre on Clayey loam.	Yield per acre on Sandy soil.
Ruby, early.....	59.6 Bush.	98.3 Bush.
Early Wideawake, early.....	78.9 “	1 9.6 “
Centennial, early.....	.....	32.0 “
Four other early varieties (average).....	48.7 “	113.3 “
Improved Peachblow, late.....	32.7 “	18.7 “
Superior, late.....	91.6 “	44.1 “
St. Lawrence, late.....	112.9 “	114.6 “
White Ash, late.....	56.0 “	69.4 “
Mahopae Seedling, late.....	.....	57.7 “
Tioga, late.....	.....	82.0 “
Six other late varieties (average).....	151.3 “	70.9 “
Trophy.....	49.8 “	.....
Bliss Triumph.....	48.2 “	.....
Iowa Beauty.....	31.6 “	.....
Success.....	36.1 “	.....

Ruby, Burbank's Seedling.

Mr. Hollister. We have discarded the Ruby because of its poor quality.

Mr. Grimes. Burbank's Seedling has yielded 390 bushels to the acre, is of extra quality and at its best in the spring. (Mr. Grimes distributed specimens to several parties.) Mr. Storrs suggested that those who received specimens should report upon them at next meeting.

Mr. Hollister. We have tried the Burbank's Seedling and are much pleased with it.

Early Rose, Brownell's Beauty, Snowflake.

Mr. McHenry. I have not computed the yield per acre, but have weighed and compared the seed and the product. Early Rose produced 56 times the quantity of seed planted, while Snowflake and Brownell's Beauty produced 72 times the seed planted. These varieties I have found to be the best.

Mr. Hollister. We find the Snowflake best for yield and for market.

Mr. Gould. I like it as well as any but the yield is not as good as Early Rose and it is a little inclined to rot.

Mr. Brimhall. The Snowflake yields as well as Early Rose and sells better. It brings 5 cents per bushel more, but turns black when warm weather comes.

Dunmore's Seedling—Victor.

Mr. Gray. I obtained 10 pounds Dunmore's Seedling cut to a single eye, planted in rows $3\frac{1}{2}$ feet apart and dropped the eyes 15 inches apart in the row and got 610 pounds potatoes. Planted 15 pounds Victor at same time and in same way and got 9 bushels (540 pounds). The *Dunmore* is a good baking potato, in appearance like the Peerless. I generally get 180 bushels per acre of Early Rose. Mr. Gray proposed that the Society recommend a list of potatoes for cultivation but the proposition was not seconded.

Hart's Seedling Strawberry.

The report on Hart's Seedling Strawberry was called for but no member of the committee was present.

Mr. Pearce commenced to give a verbal report and then the Secretary was directed to read report as contained in Report of Olmsted County Horticultural Society, printed in last transactions.

Mr. Smith. Have cultivated it for two years. Had it in bearing last year. The Grange met at my house and pronounced the fruit the best on my place. I am much pleased with it. It stood the winters as well as any and it bears well. The fruit is not as hard as the Wilson. The quality is not excelled and the size is good. The yield has not been fairly tested. Mr. Hart requested me to name it. I have thought of "Winona" and "Hart's Minnesota." Would like to have the Society decide upon a name.

Mr. Brimhall. Would say that the vines in Mr. Smith's hands had every advantage of soil and care. Under these conditions the first was equal to any on vines of the same age. The flavor is unexcelled.

Pres. Smith. It bore for a longer time than most varieties, and the size did not fall off.

Mr. Dart. If this berry is all it appears to be we have done all we as a society need do, and may let Mr. Hart name it himself.

Mr. Elliot. I think it as hardy as the Wilson. This year it came out as well though not protected. Know of none that will produce plants as well. It yields well but can't say that it will do as well on all soils as the Wilson. Don't think it will bear as much hard usage in shipping as the Wilson, but it stands up well.

Mr. Grimes. I move to call it "Hart's Winona."

Mr. Pearce.—I move to amend so as to call it "Hart's Seedling." This amendment was lost.

Mr. Dart. I move to amend so as to call it "Hart's Minnesota Seedling." This amendment was carried, and then the motion to call it "Hart's Minnesota Seedling," was carried.

Mr. Grimes.—I move to recommend "Hart's Minnesota Seedling for general trial for amateur cultivation." Motion carried unanimously.

Mr. Abernethy.—What is it a seedling from? (No one was prepared to answer this question.)

HORTICULTURE IN MEEKER COUNTY.

A report of General Fruit Committee on Horticulture in Meeker County, was read by Mr. Fuller. The paper was as follows:

LITCHFIELD, MINN., JAN. 15th, 1879.

The past two years have been favorable for all kinds of fruit trees in this section. The very mild winter of '77 and '78, and the early spring following, put every tree on its best behavior last season.

Tetofskys that had hardly made six inches growth since their setting, years ago, grew from three to five feet, and ripened up to the very tips. Perhaps the constant manuring and cultivation I had been giving them will partly account for this.

I have scotch pines nine years from the seed, twice transplanted, that are from eight to ten feet high, many of them making last season a growth of over two feet. The dry, hot weather of mid-summer, especially that of '77, tried all kinds of trees not well cared for, and many failed. But all trees well cultivated or thoroughly mulched, came through both seasons well.

Varieties of Apples.

The Duchess and Wealthy are the only large apples I have offered for general cultivation. The Peach apple and Tetofsky seem equally hardy, though the latter needs a good deal of petting and pushing at first, and I now propose to put them only into hands that will care for them.

I have also the White Astrachan and Haas, but they look sickly. But a man living in the timber about Kandiyohi Lakes tells me that both these apples are doing well with him. And yet the land there is low.

Variety of Crab Apples.

The following crabs I find reliable: Transcendent, Hyslop, Early Strawberry, Orange, Meader's Winter, Beach's Sweet, Stewart's Sweet, Hutchinson's Sweet and Minnesota.

Minnesota—Orange.

The Minnesota has not yet fruited with me, though it has with others, and I do not feel perfectly satisfied with it. The Orange has also been slow in bearing.

Quaker Beauty.

The Quaker Beauty top kills somewhat the first year or two, but stands well a year or two afterwards. I have trees nine years old, looking well but blossomed for the first time last season. One tree, six years from the graft, not transplanted, blossomed full.

General Grant.

The first orchard planting of General Grant failed so badly that I gave them up. But subsequent plantings have done better, and I find they are doing well, through the country, are in favor with the people, and I feel disposed to give them another trial.

Sweet Russet—Hesper Blush.

The Sweet Russets are doing well on my grounds, and gave me some of their honey sweet fruit last season.

The Hesper Blush is too tender for this section.

Crops of 1877 and 1878.

There was but little fruit in this region in 1877. The only currants I knew of grew on bushes on my grounds, standing close to a row of evergreens.

Last year was favorable for all the small fruits, and bushes of all kinds were loaded. It was equally favorable for apples, excepting the hard freeze when most of the trees were in full blossom, which killed most of the apples and plums. Some trees that were later in blossom, like the Meader's Winter, being full.

Successful Orchards.

I know of two orchards in this county that are doing exceptionally well. They are situated on the north side of timber, and on very rich ground, one of them being planted on a former cattle yard. In this orchard, there are three Haas trees perfectly healthy apparently and were full of fine large apples last season.

There is another orchard in the timber, on a sandy knoll, that bears every year, while other trees in the vicinity do not. In visiting this orchard this past fall I thought I learned the reason. These trees have been mulched every year, until the ground under the trees is from 12 to 18 inches higher than the general surface.

Survivors of Early Plantings.

Through the county there are many Transcendants and Hyslops, and a few Virginia Crabs, that were set 12 or 15 years ago, that have done well. They are only a few, however, left of the many of all kinds that have been sold. Some Duchess have stood well but most of those early plantings are dead or dying.

Difficulties.

The many failures of trees that were good and the still more failures of the trees that were not good, sold by tree agents of the same character, and the grasshopper raids and the light wheat, and the low prices and the "little brass kettle," and above all the big interest on big mortgages, on almost ever man's farm, make the cultivation of fruit in this section rather difficult just now. But there is a good time coming.

Evergreens.

I think much of evergreens, not only as things of beauty and ornament, but of great value in connection with fruit culture. I name the following in the order of their value here: Scotch Pine, Balsam Fir, Arbor Vitæ, White Pine, Norway Spruce, Austrian Pine.

DISCUSSION.

Mr. Grimes moved that the report be placed on file. The motion was carried and the following discussion ensued :

Stewart's Sweet—Peach.

Mr. Fuller. (In answer to questions.) Stewart's Sweet we have found a good variety. The White Pine grows nicely but does not transplant as well as the Scotch. The Peach Apple is as hardy as the Duchess with me. Have had no blight in my section. I use a great quantity of ashes in my orchard, covering the ground for some distance from the trunks of the trees.

Mr. Jordon. The Peach Apple is too early for exhibition at the September fairs. Has about the same season as the Duchess. In quality none is better and it keep about the same as the Duchess.

Tetofsky—Peach—Duchess.

Dr. Twitchell. The early falling of the leaves from the Minnesota is a good feature as it indicates an early cessation of growth. I can't see why any one should raise the Tetofsky when they can raise the Duchess. The latter bears about four times as much, the fruit is about as good and keeps four times as long. Think the Peach Apple equally as worthless where we can grow the Duchess.

Mr. Jordon. The Peach Apple is delicious in flavor, nice and delicate in texture ; has no equal in these respects. Equally hardy with the Duchess.

Mr. Grimes. The Tetofsky has a place. It goes out of season just about the time the Duchess comes in. I fear the Peach does not stay long enough to make it of value. The Duchess when ripe is good and first-rate both for cooking and for market.

Mr. Dart. The Tetofsky is very desirable for its season just before the Duchess. It was ripe last year August 18th. Every man that raises apples ought to have a few of the Tetofsky. It needs, however, thorough cultivation and attention.

Mr. Jordon. I can confirm that statement. The Tetofsky is a good heavy bearer when 8 to 10 years old. The Peach Apple likewise has its place to fill.

Mr. Gould. Tetofsky trees planted 10 years ago have not borne a peck of fruit in any one year, while the Duchess planted at the same time have borne 2 or 3 bushels in one year.

Mr. Gideon. I have four Tetofsky 10 years old and the same number of Peach and have not had one peck of fruit from either. The Duchess of the same age have borne three to four bushels.

Mr. Pearce. I think the Tetofsky is abused. It is a favorite of mine. The tree is wonderfully hardy. Its great beauty is the earliness of the fruit. My folks think more of it for cooking than of any other. Can begin using it when quite green and continue until ripe.

Mr. Fuller. The tree will not grow unless pushed by care and cultivation.

RUSSIAN APPLES.

The probable effects of the present open winter was proposed for discussion.

Mr. Dart moved that no one be allowed to speak more than five minutes on any one leading topic, but the motion was not seconded.

Mr. Grimes moved that the society hear from Mr. Spaulding, on Russian varieties of apples, which motion was carried.

(Mr. Spaulding had a large number of varieties from Summit Nurseries on exhibition.)

Mr. Spaulding. Last year was the first year of fruiting. The fair was early and the fruit was picked much too early in order to place it on exhibition. Hence it is now wilted and not in good condition. In 1869 when it was uncertain whether we could raise apples or not, Mr. Moulton sent to St. Petersburg and got cions of 300 varieties, which we top-worked on Transcendent and Hyslop. We

fruited last year 200 varieties, and 80 of them, we believe, will be valuable. Many of these were ripe before August 1st, ahead of the Duchess and Tetofsky. Among the winter varieties are some fine ones that will keep till April. (In answer to a question.) We find several catalogue numbers bearing the same fruit and the same number attached to several different varieties, so that we cannot depend on names given in the catalogue. We have begun a new catalogue, and shall propagate under these numbers only. Have selected 80 varieties for propagation for trial.

Mr. Jordon. Think we should go slow on extremes. We have 300 Russian varieties in Rochester, and Mr. Sias' statement regarding them gives a fair idea of their success to this time. I hope we shall get something nice from them, but have not seen it yet. Believe we shall grow our fruit from seedlings produced in this State. Besides the Wealthy we now have at least one that is valuable, and many more coming forward.

Mr. Gould. We must bear in mind that the Russians are not yet fairly tested. All have been top-worked and that is not a fair test even in a hard winter. Think Mr. Moulton is doing a great work in testing so many varieties.

Mr. Spaulding. I came not with much of an ax to grind but principally to show that there are some undoubted winter varieties among them.

The Secretary read here the following letters from Prof. Budd, of Iowa Agricultural College on the subject of Russian apples :

CROSSING OF APPLES,

IOWA STATE AGRICULTURAL COLLEGE,
OFFICE OF PROFESSOR OF HORTICULTURE AND FORESTRY. }
AMES, IOWA, Dec. 23, 1878. }

Prof. C. Y. Lacy.

MY DEAR SIR:—Yours at hand. I do not know any one who has given so much attention to the crossing of the types or families of the apple as I have done for the past ten years.

Knight demonstrated that all the families of the apple of Europe and Asia mingle freely, especially when planted in near proximity. Our native crab seems far removed, and natural crosses may be very unfrequent, yet I believe they are possible. The Soulard crab we have given critical study in tree, leaf, and fruit, the past season, and many of us believe it to be a cross, or, at least, as the French say, a "deflection." I have some seedlings of the Soulard, which in leaf exhibit a still more positive variation from the parental form.

History of Russian Apples.

The Russian apples are interesting for study from this standpoint. They exhibit just such variations in leaf, bud, cell-structure, fruit, and habit of growth, as we might expect, taking their history into consideration as given by Dr. Regel, Dr. Arnold, and others. It is the most extended example of crossing of widely varying forms to be found perhaps in the world. It commenced away back in the early ages, when China was called "far Cathay," by introducing north of the Caspian, the thick-leaved summer apples of northern China, the Siberian apples, and the hardier forms of the common apple from the Caucasus slopes, where it attained the highest perfection known in the early ages.

These three widely varied forms here mingled and spread naturally by the process of seedling production, common to this day on the Russian steppes. On the Darwinian plan of the survival of the fittest, the hardier varieties went north, and still north, until at this day, at the northern limit of apple growing on these plains only summer varieties can be grown, on account of the shortness of the seasons. Russian history talks of the origin of their varieties in this way, and the varieties themselves confirm the story. Some of them, even among the winter varieties, retain the original Chinese leaf, bud, and style of growth. These Chinese leaves have from one to two more rows of palisade cells than our common thin-leaved varieties. So these varieties, like Duchess in leaf, &c., stand our intense summer heats, as well as our arctic cold. Again, many of these varieties show in leaf, bud, wood and habit of growth, the Siberian form in a marked way. These varieties will be as hardy as the others, but more apt to suffer with us by summer blight.

Still again, among the Russian winter varieties, we have a queer mingling of the Chinese form, and the Caucasus range form. The size of leaves, their form, pubescence, netveining, margins, &c., are extremely varied, but they are all characterized by marked thickness of leaf.

I will only add that it would take us about five hundred years to originate as many hardy varieties in the natural way as the Russians now have. In the artificial way, if we were methodic and took advantage of the hints nature has given us as to the tendency of the Siberian to blight, we might work rapidly. This is too much of a question for a hasty letter.

Yours fraternally,

J. L. BUDD.

Mr. Dart moved that the thanks of the Society be tendered and the letter filed for publication, which motion was carried.

Mr. Pearce. Are the Russian varieties more disposed to blight than the natives?

Mr. Dart. No.

Mr. Pearce. I don't know about that.

Committee on Russian Apples.

Mr. Grimes. This subject of Russian apples is an important one. I move the appointment of a standing committee to visit two

or three times during the season Mr. Moulton's orchard of Russian apples.

Mr. Dart. I think the duties of the committee should extend farther. Might be charged we were partial.

Mr. Gould. Would amend to make it the duty of the committee to report on Russian varieties of apples under cultivation in this state. Would also amend to make the committee consist of five instead of three. These amendments were carried and the following successively nominated and elected to serve upon the committee: J. T. Grimes, E. H. S. Dart, J. M. Underwood, A. W. Sias, A. W. Latham.

Committee on Seedling Apples.

Mr. Hollister. Move the appointment of a committee of three to report on Minnesota Seedlings at the next meeting of the Society. The motion was amended to make the committee consist of five members and then carried. The following were successively elected to serve: D. Day, Farmington; F. G. Gould, Excelsior; G. W. Fuller, Litchfield; M. Pearce, Rochester; J. S. Harris, La Crescent.

ORGANIZATION OF LOCAL SOCIETIES.

The report of the committee on the Organization of Local Societies was called for and was read by Mr. Harris, the chairman. The report was as follows:

Mr. President, and Gentlemen of the State Horticultural Society:—The Committee on the Organization of Local Societies would respectfully report, having given the matter a careful attention and would submit the following for the consideration of this meeting.

Peculiar Need of Horticultural Progress.

In agriculture, commerce and manufactures Minnesota is making unparalleled progress and commanding the favorable attention of the whole civilized world. With one single exception, within her borders is found every element and every article is or can be produced in abundance that is essential to promote the health, happiness and prosperity of a mighty nation. Our grain fields, our dairies, our sheep folds, and our lakes, rivers and brooks, stocked with the best of fish bid defiance to grim want, and with only such an amount of skillful labor bestowed upon them as is essential for the perfect development of the physical nature, the earth yields her increase and we have bread enough and to spare. The one exception is fruit *all our own*—the luscious apples, melting pears, grapes that hold "wine in the cluster," and all the smaller fruits plenty and convenient where we may pluck them from the tree and vine fresh and ripe, and this must

be supplied through the agency of horticulture. The time was in the very near past when there was but a faint hope that this want would be met, but thanks to the information collected and sent out by the State Horticultural Society and the persistent efforts of some of our people in making trials and experiments. Enough has already been accomplished to encourage us in the belief that fruit can, and yet will be, successfully grown here in quantity sufficient to satisfy our varied wants. When this shall be, and how it is to be done, are the grave questions we are called upon to meet, and it depends upon the solution and answer to the latter question whether the answer to the first shall be, "Very soon," or "Far away in the future, after generations have passed away." Therefore we are called upon to consider the question "How shall it be done."

We do not profess to have matured any plans on the subject, and now only introduce it that it may enlist the attention and stir up the minds of you who know and feel how important it is that our horticulture should overtake and keep pace with our progress in all the other arts and sciences. We believe that political economy, public policy, and the influence which horticulture exerts upon the condition of society demand for it the fostering care of the State government; but to secure that care there must first come an awakening and educating, for even the legislature is not awake to its importance. It may be that before we have a legislature in sympathy with us, we will have to begin at the cradle, and raise up a generation that is familiar with natural science, who by study and observation have learned how plants live and grow and produce their fruit; how they may best be propagated with a view to secure hardiness; what methods to pursue to produce varieties by crossing and hybridizing, with a certainty of improvement, and have at least a superficial idea of the influence that horticulture exerts upon society. But for this we can not wait. What shall be done?

Horticultural Societies the Means.

The most effectual means that at present appears to be available in awakening an interest favorable to horticulture and hastening the desirable end, appears to us to be the establishment of a system of district or county societies, which shall hold frequent stated meetings for the discussion of various questions bearing upon the subject and the conducting of systematic experiments. In every community where such an organization has maintained a live existence for a reasonable length of time, we quickly detect an air of refinement and spirit of emulation among the people to make their homes and their surroundings pleasant, comfortable and beautiful. It requires no arguments or array of facts to prove to us that such associations should be organized and kept up all over our State, and that they would not only be useful in their several localities, but would prove a source of wealth, power and influence to the State. How shall it be done?

Plans for organizing.

One plan that suggests itself is that this State Society take the matter in hand and mature a method of organizing them under its auspices, and holding them as subordinates, assigning to them their work, and requiring them to keep in correspondence and co-operation with it. To carry out this method would require the appointment of a commission to enter the field and push forward the work, and perhaps for many years have an oversight of them, at an expense of one to three thousand dollars per year. We see at once that this is not practicable, for

we have neither revenue or endowments at our disposal. [Nothing but a single copy of our annual transactions in pamphlet form for each member; all that the great North Star State can afford to spend in this way to make our people prosperous and happy. Doubtless individual members of this society have spent double the amount of their hard earnings for the same cause]

Another method which suggests itself, is placing the matter under the care and direction of the Agricultural College of the State University. There it would require an extra appropriation from the State, to put and keep it in complete working order; and past experience in the getting of appropriations should convince us that this is hopeless.

The last, and only practical method, is to enlist the interest of the individual members of this State Society and all fruit growers throughout the State in the enterprise; and we trust that when you return to your homes you will immediately enter upon the work. And we recommend that this society do, before the final adjournment, adopt suitable resolutions and recommend a form of by-laws and constitution and order; the same to be printed in circular and sent to those interested in every county in the State.

We also present a form of constitution and by-laws that we think, with some reconstruction may be adopted for the use of county societies.

CONSTITUTION.

1. This association shall be known as the..... Horticultural Society.

2. Its object shall be to improve the condition of pomology, horticulture and gardening, and to discuss and disseminate information upon all questions pertaining to the art and science of horticulture.

3. Its members shall consist of annual members, paying an annual fee of one dollar; of life members, paying a fee at one time of ten dollars; and honorary members, who shall only be persons of distinguished merit in horticulture or kindred science, who may be admitted to all the privileges of members except the privilege of voting for the election of officers.

4. Its officers shall consist of one president, one vice president, one secretary, one treasurer, and an executive board of five; all to be elected at the annual meeting, and to serve until their successors are chosen. The president and secretary shall be members of the executive board.

5. This society shall hold monthly meetings at a place designated at each last previous meeting, and an annual meeting on the . . Saturday of December; and immediately after the annual meeting the outgoing secretary shall report to the secretary of the State Horticultural Society, giving the names of the officers elect, the number of members, number of meetings held during the year, and number of volumes in library and synopsis of transactions and result of experiments conducted under the auspices of the society.

6. All surplus moneys accumulating in the treasury of the society shall be expended in the purchase of seeds, plants and scions, for experiment and distribution among the members, or in the establishment of a library, as may be decided by the majority vote of the members present at any annual meeting; and in no case shall such funds be devoted to any other use.

7. This constitution may be amended at any annual meeting, by a two-thirds vote of the members present.

BY-LAWS.

ARTICLE 1. The president shall preside at all meetings of the society; call meetings of the executive board, and under its direction have a general supervision of the affairs of the society, and deliver an annual address upon some subject connected with horticulture. And he shall appoint a general fruit committee, composed of one person from each town within the jurisdiction of the society, at the close of each annual meeting.

ART. 2. The vice president shall preside in the absence of the president.

ART. 3. The secretary shall keep minutes of all meetings; have charge of its papers, books and reports; conduct the correspondence, and prepare and forward an annual report to the secretary of the State Horticultural Society before the 10th of January each year; and shall receive for so doing his necessary expenses for postage, stationery, printing and expressage, and shall render an annual detailed account of such expenses incurred, which shall be referred to a special auditing committee.

ART. 4. The treasurer shall receive and keep an accurate account of all moneys belonging to the society, and dispense the same upon the written orders of the president and secretary, which he shall retain and file as vouchers; and he shall make an annual report to the society of the receipts and disbursements, which, with the vouchers, shall be referred to the special auditing committee, as provided in section three.

ART. 5. At each regular meeting, a subject shall be selected for discussion at the next meeting, and one or more persons be designated to write an essay upon some subject having a bearing or influence upon horticulture.

ART. 6. It shall be the duty of each member of the fruit committee to make an annual report upon the fruit crop in his respective district, and the general condition of horticulture, and note the result of any experiments coming under his observation. And it shall be the duty of the committee at each annual meeting, to recommend for the consideration of the society, a suitable list of fruits for general cultivation.

ART. 7. These by-laws may be amended by a two-thirds vote of the members present at any annual meeting.

J. S. HARRIS,
Chairman Com.

DISCUSSION.

Mr. Brimhall moved that the report be accepted and placed on file, when the following discussion ensued:

The secretary stated that only one society reported its proceedings for the last transactions.

Mr. Harris. If it could get only one delegate from each county, the State society would have its usefulness greatly extended. Think there is a great demand for horticultural information, and if we could show the advantages arising from organization in connection with the State society, local societies would be organized.

Mr. Dart. These societies might die even after they were organ-

ized. It needs as many active horticulturists for a successful society as Olmsted county has, and not many counties can furnish that number. To strengthen this society we should do a good solid work that we shall not have to go back upon. Several years ago we got to recommending things that could not stand. The winters of '72 and '73 did not take that spirit out of us entirely. If we will say "if hardy, productive and good and not otherwise, we will recommend," we will gain the confidence of the people and credit with the legislature.

Olmsted County Society.

Mr. Pearce. Not many men are needed, but enough fair, honest men for officers. In Olmsted county we have such a society. We meet, and the reporters are present, and our proceedings get into the papers, and are copied elsewhere. Our society has thus been useful in giving us a reputation. If we can keep harmonious and industrious the society will continue and prosper.

Mr. Fuller. I take these notes home and they are published and distributed, and serve the purpose as well as a society could. A county society could do no more.

McLeod County Society.

Mr Storrs. Two years ago we organized a society and appointed a winter meeting, but could not get it, the officers having forgotten all about the appointment. I believe a society could do much good, because many want to grow trees, and do not know how, and might learn through such a society.

Mr. Underwood. Think perhaps in Wabasha and Goodhue we could find enough horticulturists to make a society, and I wonder if by complimentary letters and our own presence we would not greatly contribute to its value and success?

Mr. Gould. I believe this society can do some good by encouraging the formation of local societies. They would spread information. Most of the people not reached by the State Society do not know what to plant or how to find out. They ask if the fruit is good; not whether the tree will produce or stand. If they knew that the strawberry would grow anywhere it would be planted more. Local societies would spread information of this kind. Believe that when we recommend varieties we should except the western prairies.

Mr. Elliot. I am getting interested and would like to have the discussion continue. We have a society here, and it has become something of an effort to keep it intact and active.

Mr. Kenney. I believe by taking small boys and teaching them to set trees and take care of them is a good way to produce horticulturists. They do not give up the practice when they once learn how.

Mr. Gideon. I think that the horticulturist must be made by the education of the parent before the child is born.

Mr. H. E. Hawkey.—Think we should not depend on foreordination alone, but somewhat on the education of the child.

Hennepin County Society.

Mr. Elliot.—About a year ago we got up a society here and started with some enthusiasm, but now it is pretty hard work to keep it alive.

Mr. Hollister.—Had we better try to form these societies in advance of the want? Believe that when they are wanted they will be formed and maintained without so much effort.

Mr. Latham.—We need to press this knowledge upon the people, because they are very ignorant upon these matters, and subject to great impositions.

The motion to accept the report and place on file for publication was carried.

Mr. Latham.—If this report is simply printed in the transactions it will not be seen by many. I move the appointment of a committee to draft a suitable address to the people, and with a constitution and by-laws to offer for publication to the leading papers.

The motion was seconded.

Mr. Dart.—Our Fruit Lists distributed will do as much good. Don't think an exhortation to form societies will amount to much, since it appears that not more than two or three counties can support and maintain a society. People like to be humbugged, and will be, and we may as well pursue the even tenor of our ways. The motion was carried.

Motion was made and seconded to adjourn to 7:30 P. M. Carried.

TUESDAY EVENING.

The society was called to order by Pres. Smith at the appointed time. Motion was then made that the same persons act in connection with another, as the committee to prepare the address, constitution and by-laws. Mr. Pearce was elected as the third member. The full committee thus consists of J. S. Harris, A. W. Latham and M. Pearce.

MR. TUTTLE'S ADDRESS.

Rev. Mr. Tuttle was present and made a short address of which the following is a fragmentary report:

Mr. President and Gentlemen of the Society—

It is somewhat late for me to address you, since I should more properly have done so this morning, but I am nevertheless glad to be with you. A most elevating and humanizing vocation is that of horticulture. A lover of horticulture must be a companion of nature, and cannot be far from the Author of Nature. One in the circumstances of the horticulturist can't be either a very narrow or a very bad man. Hence I am glad to address you, because I know whom I address. The story tells of a tree that bore twelve manner of fruits. You seem by your display here to do the same even in mid-winter. It would not be surprising if you had met to confer on building ice-houses, or to tell of arctic explorations. But that you have met for the purpose set forth in your programme, testifies to your judgment, perseverance and faith. I am not myself much of a horticulturist. I came here and built because of the beauty of the place, and I planted only shade trees. Had I done differently I might have enjoyed more. I abandoned the idea of growing apples, believing it impracticable, and thinking I had enough enjoyments. But I heard of apples grown in Minnesota, then of bushels and then I saw them, and year by year my unbelief grew less, and now the sight of apples grown in Minnesota occasions no more surprise than in New York. I remember some years ago a picnic excursion to Minnetonka was advertised, and it was stated that along with sight of Indian bones the sight of an apple orchard would be afforded. It was an object of wonder, but now I shall not be surprised sometime to hear of a peach orchard in that region.

PRESIDENT SMITH'S REPLY.

President Smith replied to the remarks of Mr. Tuttle somewhat as follows:

We, the horticulturists of Minnesota, will do our best to realize these pleasant anticipations. We have proved that we can raise apples and we hope to raise plenty of them. The change in the condition of horticulture is hardly greater than in the city of Minneapolis, since I first placed foot in it, crossing the river by ferry. You, therefore, can hardly be as proud to entertain us as we are to be entertained by the city of Minneapolis.

MR. MENDENHALL'S PAPER.

At the close of these remarks a recess of ten minutes was taken to examine the fruit and other articles on exhibition. Upon coming to order Mr. Mendenhall was called upon for his paper on destructive insects, which he read as follows:

CURRENT AND GOOSEBERRY WORMS.

Importance of the Currant and Gooseberry.

As our climate does not admit of our growing all varieties of fruits without great expense, it behooves us, by judicious culture, to bring to the greatest perfection, as to quality and productiveness, such kinds as do succeed here. Among these the "small fruits"—currants, gooseberries, strawberries, raspberries and cranberries are our main dependence, and seldom utterly fail.

I put currants and gooseberries at the head of the list, on account of their hardiness, productiveness, marketable qualities and general excellence. Both these fruits are easily grown, and while they richly repay any extra care that may be bestowed upon them, will bear neglect, in matters of soil and situation, better than most other kinds. One sort of neglect, however, these shrubs will not long survive, and that is, *neglect of their insect enemies.*

It is my purpose at this time to call attention to some of the more conspicuous currant and gooseberry pests, from whose ravages our plants have already suffered or are likely to suffer within a few years. In order to guard against, or to fight advantageously any insect foe, it is very necessary that we should become acquainted with its appearance, its transformation and its habits. We can then strike at the most vulnerable point, and with vigilance and perseverance effect its practical extermination.

Imported Currant Worm—History.

The most destructive of all currant pests is the "imported currant worm," the larva of a medium-sized saw-fly called by entomologists *nematus ventricosus*. This insect was introduced into this country at several different points upon plants imported by nurserymen from Europe. These unconscious importers, in ignorance of the habits of the insect, failed to take proper precautions against it, and dearly have they had to pay since for their carelessness. Like many other imported pests (its natural enemies having been left behind in the voyage across the Atlantic) it multiplied with much greater rapidity in this country than it had ever done in Europe, and in 1865, four or five years after its first appearance, it had spread widely over the eastern States, and caused a great diminution in the currant crop. By 1868 both currants and gooseberries were nearly a failure

throughout the New England States, New York, Pennsylvania, Ohio, Indiana and Northern Illinois. The plants themselves, generally perished during the second or third seasons, from the repeated defoliations by this insect. The plants upon which it subsisted having thus generally died out, in the sections of the country mentioned, the pests were naturally "starved out," and for some years have practically disappeared. Nurserymen and gardeners have taken heart again and begun replanting. But it will require all their vigilance and industry to prevent a recurrence of their losses in a few years.

I am happy to say that the "imported currant worm" has not yet, to any great extent, crossed our borders, but we are in its "line of march," and may expect, sooner or later, to find its easily-read hieroglyphics on our currant leaves. Therefore, since being "forewarned is being forearmed," I will attempt to draw, for the benefit of those concerned, a pen and ink portrait of this most unwelcome fori_gner.

Description.

The worm which does the damage is a "false caterpillar," so called, in common with all the larvæ of a certain family of *Hymenoptera*, from its resemblance to the larvæ of butterflies and moths, which are the only "true caterpillars." It may be distinguished from the latter by the presence of *seven* pairs of prolegs, whereas true caterpillars have sometimes *less*, but never *more* than *five* pairs of prolegs. When first hatched it is of a dull green color, but after the first molt it becomes thickly studded over with shining black spots, and has a round black head. It acquires a length of about three quarters of an inch, and after the last molt it again becomes of a plain green color.

Habits.

It feeds upon the leaves of the gooseberry as well as the currant, but prefers the latter. It seldom gnaws the edges of the leaves, but cuts holes, at first small and round and afterwards large and irregular, in the blade. The first brood of this insect appears quite early in the spring, and devours the first leaves. About the middle of June the worms drop from the leaves and burrow an inch or so under ground, or conceal themselves under fallen leaves, and spin around themselves oval cocoons of gummy, brown silk. Within these they change to pupæ and in about two weeks the perfect insects emerge. These are four-winged flies, with broad wings, soft bodies, and are rather slow and heavy in flight. They are termed "Saw flies," from the saw-like form and manner of using the ovipositor. In this species the males are entirely black, while the females have a dull orange-colored body. The latter do not, like most other saw flies, cut slits in the tissue of the leaf in which to deposit their eggs, but place the latter in rows like strings of beads, along the mid rib and principal veins of the leaf. These eggs soon hatch and the second brood of worms appear simultaneously with the starting of the second growth of leaves. When full fed, they spin their cocoons and lie dormant through the winter, changing to flies early in spring.

Prevention and Remedy.

In order to prevent the introduction of this destructive insect into our State, nurserymen and all others receiving plants from the east, should take great care to shake off and burn every particle of earth and litter from the roots, before

planting, and should also burn the moss or straw in which they were packed. When the worms have once become established, there is no other remedy than to pick them from the bushes, where they very soon betray themselves by the holes they gnaw in the leaves, and to dust the leaves thoroughly with powdered White Hellebore.

Native Currant Worm—Description and Habits.

We are troubled to some extent by a Saw fly larva, closely allied to the one just described, which occurs throughout the more northern States, but only occasionally becomes a serious pest. This is the "Native Currant-Worm," (*Pristophora grossularia*, Walsh.) This worm is somewhat smaller than the imported species, and of a plain, green color, with a black head. It does not gnaw holes in the leaves but feeds from the edges. Likè the former species it is double brooded, but the second brood passes through all its transformations, and early in the fall the flies, both sexes of which are black—lay their eggs upon the twigs of the currant and gooseberry bushes—not upon the leaves like other the Saw fly. Hibernation therefore takes place in the egg state. This species probably originated upon the wild gooseberry and still prefers the gooseberry to the currant, but during some seasons is quite destructive to both.

Remedy.

Usually, however, its natural enemies, in the shape of various cannibal insects and parasites, keep it pretty well in check. Whenever observed in destructive numbers a liberal dose of white hellebore powder will rid the bushes of its presence.

Other Worms.

Besides these hymenopterous pests, the currant and gooseberry are sometimes considerably injured by the attacks of various caterpillars of the "measuring-worm" or "span-worm" family. Among these is a handsome "looper" of a bright-yellow color adorned with white lines and showy black spots. It is when full grown, an inch or more in length, of cylindrical form, and has but two pairs of prolegs in addition to the six pointed thoracic legs. This worm makes its appearance during the latter part of May, and feeds upon the terminal leaves and the racemes of flowers or setting fruit, sometimes seriously diminishing the crop. When full grown it conceals itself among rubbish around the roots of the plant, or burrows slightly underground and changes to a naked, oval, shiny-brown chrysalis, from which in about two weeks the moth escapes. The latter is of a dingy yellow color, having the wings marked with several indistinct leaden colored spots. The antennæ are feathered. This moth may often be seen fluttering about the bushes in the daytime, during the latter part of June or early in July. It is then engaged in placing its eggs on the main stems or large branches of the plant, where they remain without hatching until the following spring. It is easily kept in check by picking the worms from the leaves, or capturing the sluggish moths in a net.

Several other species of "measuring-worms" are found on the currant and gooseberry, but these seldom occur in such numbers as to do serious damage.

A large, dark, spiny worm is frequently found upon the plants under consider-

ation, during midsummer. This is the larva of one of our most common and handsomest butterflies, called, on account of a silvery, comma-shaped mark on the under side of the hind wings, the "Comma butterfly" (*Grapta progne*. Cram.) The chrysalis is suspended by the tail, is rather rugged-looking, of a brown color, prettily ornamented with silver spots.

Besides these worms that feed upon the leaves, the currant bush is subject to the attacks of two borers, which bore the stems and are sometimes so numerous as to kill out the plant. The first of these is an imported pest that has spread generally over the United States. It is a little clear-winged moth very much resembling a small wasp. This insect lays its eggs in the axils of the buds, and the little white grubs upon hatching penetrate the stems, and burrow up and down until they (the stems) are completely hollowed out. Before entering the chrysalis state the grub cuts a passage through the bark, leaving only their outer skin to cover the hole. This the moth when ready to come out easily breaks through. The second, and quite as destructive borer, is the larva of a small, narrow, brown beetle with a broad, oblique, yellowish band, above which is a white spot on the middle of each wing. The larva is footless, and feeds upon the pith of the stalks, thus killing them. The most sure remedy for these borers is to cut out the dead stalks, containing the pupæ, during winter, and burn them.

R. J. MENDENHALL.

DISCUSSION.

After the reading the following discussion was held:

Mr. Grimes. I move the report be placed on file for publication. The motion was carried.

Currant Borer.

Mr. Fuller. I have found many branches of currants hollow, and following up the stem have found a grub.

Mr. Dart. Would like to know if any variety is more subject to these borers than others. Have had the Cherry, and found that more subject to them.

Mr. Smith. The Cherry and Versailles are both more subject.

Mr. Elliot. All plants that are not perfectly hardy and vigorous, are more subject to insects than those that are.

Grape Bud Borer.

Mr. Harris. A steel blue beetle goes to work and eats out the buds of grapes. If numerous enough they will kill the vines. They sometimes go into the apple trees. Have eaten the buds from three Duchess trees. The only way known to destroy it is to shake down into a basin and pinch between the fingers.

Mr. Jordan. I have been bothered with the same insect. Have not seen it on the prairie. It continues to live through the summer, but does no harm, save when the vines are leaving out.

Mr. Gould. Have seen them for four or five years, and they have done more or less injury for several years. Think can see the eggs on branches when the vines are lifted, and by destroying these can check their work.

Mr. Mendenhall. I hardly think these eggs can be those of the beetle in question.

Since the adjournment of the meeting the following full description of the insect under discussion has come under the eye of the secretary, in the proceedings of the W. N. Y. Horticultural Society:

"There is an insect which gives the grower of grapes a good deal of trouble. It is about the size of the lady bug, of a brilliant metallic green; it makes its appearance when the buds first begin to swell, and eats out the centre; it lays its eggs at the roots of the leaves, and from the eggs come a brown slug, which eats the leaves and sometimes destroys the fruit. Few persons are aware that the slug and the fly are the same. In cool weather, or in early morning, or at cool of the evening, they can be easily caught; but they have a peculiar way of dropping to the ground when disturbed, and then it is almost impossible to find them. The only way to destroy them is by picking them off. Put one hand under where they are, and catch them with the other; if you miss it, it will drop into the hand below, and thus be secured."

Mr. U. S. Hollister read his paper on Variation of Plants Under Climatic Influence, as follows:

THE VARIATION OF PLANTS UNDER CLIMATIC INFLUENCE.

Under this head I shall include and consider as belonging to the subject all organic structures having the elements of plant life—whether it be a tree, a cereal, a vegetable or flower.

Nature.

Nature—in the creation of vegetable organism—is profuse in enigmas, strange freaks of hybridization, and consequent wonderful transformation, adaptation to climatic conditions, and the needs of men who live under like influence.

Nature has to do with our subject as the willing servant of the Creator, and as paying tribute to the skill of the horticulturist.

Nature stamps her imprint upon our mountains, lakes and rivers, and her pride is evidenced in her grandeur, but she is proudest when she stands among the trees, the fruits and the flowers of her kingdom.

Regard for Nature's Laws.

As horticulturists we must bear in mind the eternal fitness of nature's laws, and we of Minnesota long since learned better than to transplant a child of the tropics to our stubborn clime, but are compelled to look to our own latitude for valuable additions to our orchard and garden stock.

Other conditions being equal, southern latitudes are more exuberant of plant growth. That which our latitude lacks in this seeming extravagance, is made up in a quicker growth and hardier structure.

Plants vary in Nature according to Climate.

The white oak is typical of hardiness, of strength and endurance. It flourishes in the swamps of Tennessee, a gigantic, tough and wiry king of the forest—its texture as strong and flexible almost as steel. I have followed it north, through Kentucky, Illinois, Wisconsin and Minnesota, and find with each degree of latitude it assumes less proportions, is of slower growth and meaner texture, until at the northern limit of its growth it is a dwarfed monarch.

There is another tree, a beauty everywhere, of stronger growth south than at the north, that shows itself in a wide range of latitude, and an adaptability to circumstances that is wonderful. It is the red cedar. I have seen it in the bayous of the gulf, and in Georgia, upon the Cumberland mountains, resting upon the outcropping azoic rock, and sending its roots into the crevices for support; again upon the scant soil of the mountain side, then upon the rich alluvial soil of the bottom lands, and standing away out in the Tennessee river, its trunk above water, its roots forming weird arches of support; and under all these conditions its growth seemed about equal, and its bright green verdure the same. Its color there is vastly different from the shade here. In winter it is a bright grassy green, and is one of the most pleasing evergreens in the South. We find it in Louisiana, Georgia, Tennessee, Kentucky, Illinois, Wisconsin and Minnesota—a monster in its southern limit, a pigmy on its northern line. Hardy enough to stand the scorching sun of the tropics, and endure the blasts of an arctic winter.

The white pine reverses the order of growth, and is a monster in Minnesota, and a scraggy subject in Pennsylvania and Kentucky.

These illustrations are given to show that even the hardiest trees, and those of widest distribution, are subject to changes of climate to a very great degree.

Variation of Fruit Trees.

The fruit trees are more marked in sensitiveness. There is not one of our long list of apples but will grow south of the Ohio river, but not one in a thousand from that location will thrive north of forty-three and a half.

The season of ripening changes with changes of latitude, in fruits and vegetables. The autumn apple of Tennessee, if it could be transplanted here, would, in all probability be a winter apple and a good keeper. The Baldwin is a fall apple in Kentucky, and the Fameuse would come in about the season of our Duchess. The best keeping apples become perishable when grown in the South.

Small Fruits.

We find the huckleberry or blueberry all the way from Georgia to Minnesota, and our wild creeping or trailing blackberry is known in the southern states as the dewberry, and has there the same general characteristics as here.

The cranberry is not profitably grown south of the Ohio river, and this is a strange exception to the general rule. But to offset this advantage we cannot grow oranges, lemons, peaches, quinces, apricots, pawpaws, persimmons or mulberries.

That queen of small fruits, the strawberry, will do well under good culture wherever Indian corn will ripen. Just as good crops can be produced in Minnesota as in southern Illinois, and the same is true of our hardier Raspberries.

It is a remarkable ruling of nature's laws, that while we have hardly a tree or shrub but seems benefitted, by removal to a more southern climate, they have thousands that will not endure one blast of our northern winter. It seems as though much of the grand and the beautiful gave place to the strictly useful in our northern home.

Instead of the live oak with its wide, spreading arms, festooned with the gray beard of the forest, the wierd sycamore, with glamorous leaf and white trunk, the beautiful cypress, the lordly tulip tree, we have the pine, the oak, the maple, the ash and the elm, and our southern brethren have these also.

The magnolia gaudiflora, the most beautiful flowering tree in the world—the queen of them all—we dare not even imagine it might grow here.

Flowers.

Many of our familiar annual flowers, or such as are compelled to be annuals, if grown out of doors, become perennials in the south. The Antirrhinum and Dianthus will bloom until exhausted, in Florida, and our house ivies grow in luxuriant profusion over walls and gables in Tennessee.

Cereals and Vegetables.

The cereals and vegetables bear important testimony in way of illustration. These latter are not so marked in habit of growth as in time required to arrive at maturity.

They accommodate themselves wonderfully to circumstances, requiring a long or short season to arrive at maturity according to the location.

Earliness and Climate.

It has long been a theory that the further north the seeds are grown the sooner the product will come to maturity.

It is an established fact that cereals attain the highest degree of perfection near the northern limit of their growth, and the same is true of vegetable seeds.

This perfection of quality is of no use to the planter, unless some of the valuable characteristics follow the seed to the product.

If the earliness of a grain or vegetable in its northern home is carried to any marked degree to the product when planted south, a very important consideration is attained, and our theory can be made to represent something practical and profitable in agriculture and horticulture.

Earliness is often a prime factor in gardening operations. It is very easy to imagine that a week's time gained in the marketing of a single staple market crop, might double the profits of a market gardeners whole year's work.

Experiments with Wheat and Barley.

In the case of the grains we find some interesting facts demonstrated by the French Minister of Agriculture in regard to Norwegian seed grains.

One peculiarity noticed only in wheat and barley, is that the grain grown as far north as 70th parallel was very plump and heavy, and that when sown in France the crop was very much earlier than that grown from the native seed—but was also uniformly of inferior quality.

Wheat grown in Norway from seed from Alten, in the 70th parallel, ripened in seventy-four days from the time of sowing, while the product of seed grown further south required 105 days to ripen.

Barley grown at Alten was sown near Vincennes, France, on the 7th day of April and harvested the 18th day of June, or a gain of thirty-seven days over grain grown from French seed. Like experiments were made with peas, beans and corn, with very similar results, and it was proved conclusively that seed brought from a higher latitude uniformly matured the crop earlier. In the new north-west it is of importance to procure the earliest seed stock as a matter of self protection, and south of us just as highly important as a matter of profit.

This text, that the further north seeds are grown the sooner the product will mature, had been so lightly treated by southern seedsmen with whom I have been in correspondence, that I determined to test it to my satisfaction; and I will give the results of my experiments.

Experiments with Tomatoes.

The Trophy Tomato is well known as a very late sort, while the General Grant is as well known as the earliest big tomato. Last season I had occasion to change seed of the General Grant, in order to secure a more perfect type than I had been growing. The seed was procured from Central Illinois. And I might say here, that in all trials, seed of all the sorts was planted on the same day, transplanted at the same time, and in matters of soil and treatment served just alike. All other stock seed of tomatoes were Minnesota grown.

Our Trophy Tomatoes ripened at the same time as the Illinois General Grant, while plants grown from our own General Grant seed ripened their fruit five days in advance.

Experiments with Peas.

Tom Thumb peas were sold too close, and we were compelled to plant four bushels procured from Philadelphia. Stock grown from our own seed was harvested and threshed before the other was fit to pull; fully six days difference, and the latter were of more rampant growth, though both were of undoubted purity of stock.

Experiments with Corn.

Early Minnesota corn from Minnesota seed was five days in advance of Illinois seed. Early Crosby four days, and Moore's Concord six days in favor of home

grown seed. Dent corn from Southern Illinois did not ripen an ear, while the same type of Minnesota growth was ripe in ninety days from planting. Tomato seed from Tennessee, a large red, did not ripen until frost.

Squash—Watermelons.

Boston Marrow Squash gave a week in favor of Minnesota, from seed in competition with the product of Indiana seed. Gipsey Watermelon, from Minnesota seed, ripened in fair season, while an attempt to grow them from seed grown in Tennessee, was a failure. Phinney's Early Watermelon, grown from Minnesota seed, was ten days in advance of the product of seed from Southern Illinois.

There is no use in extending this list. The theory was based upon reasonable philosophy, and it is practically sustained.

Our State is rich in the varied conditions of soil, attitude, exposure, and in the right altitude. It is located to produce the cereals in the greatest perfection, to grow fruits of peculiar excellence, and vegetables of the finest quality.

The horticulturist in being obliged to labor for success, has no spontaneous growth to compete against honest endeavor. Our fruits are the product of our skill and intelligence, and no accidental success without work must be expected. What nature denies us spontaneously, she is willing to lay at our feet if we are worthy of it, as a reward for toil.

The paper was ordered on file for publication, with the remark that it was complete, without any debate.

FRUIT CULTURE IN OLDMSTED COUNTY.

Mr. Cotterell's report on Fruit Culture was read by the Secretary, the writer being absent. The following is the report:

DOVER, OLDMSTED Co., MINN., Jan. 9, 1879.

DEAR SIR:—I feel as though I was not competent for the task you have assigned me, but as you are so pressing on the occasion I will make an attempt. You will please observe that I do not make horticulture my study by any means; consequently I have not the time to spare, that I should wish, in that business. My farm of two hundred acres, all under cultivation, my stock and other things take up some of my time.

Beginning.

In 1856 I came to Minnesota and procured myself as good a claim as I could and commenced to raise wheat like my neighbors, did not feel very well satisfied until I began to plant trees—was successful in getting a good wind-break on the west and south of my dwelling. I broke up a few acres adjacent to that, raised one crop off it and the first apple tree peddler that came along I gave him my patronage for a small order; I met with great disappointment, my high prized apple and pear trees proved to be the smallest kind of Siberian Crabs, and other choice kinds, totally worthless; I still continued to buy and plant in a small way until I got a very nice orchard, although many of the kinds were too tender for this climate, as the years of 1872 and 1873 proved.

First Fruit.

The first fruit of any quantity I raised was in the year of 1865. The year 1866 I made my first exhibition of apples and pears at State fair at Rochester. I feel proud that I was at the organization of this society and gave my testimony in favor of apples being raised in preference to crabs. Since this society was formed we have met together to exchange views, and a great deal has been written on the subject until I have confidence that it is no trick to raise apples in Minnesota.

Preparing Soil, Planting and Care.

I have never taken any extra pains in planting. I prefer to prepare my grounds in good shape as for any other crop. I plant a little deeper than in the nursery; set the tree to lean a little towards the southwest. I cultivate a few years with some crop that will not shade the ground; mulch around my trees with a view to keeping the soil in a uniform moisture, also to retard the sap in early spring. I prune superfluous twigs, or rather buds, in the spring. I do not let the cattle or any quadruped mangle or in any way injure the tree, then I wait the result.

Protection.

The following will show that I am not very particular how or when I plant:

A. W. Sias came to me in the latter part of June, told me he had a lot of trees left on his hands in St. Charles, if I would plant them he would receive his pay the next spring, for what grew. I planted, was careful to mulch them, they all grew and produced fruit until the years of 1872-3, and invariably those that nearest to my windbreak on the west are alive, in good condition and are pronounced by parties this season to be the largest and best they have seen in Minnesota. Those consist of Red Astrachan, Sops of Wine, Talman Sweet, Greening, St. Lawrence, Haas, Golden Russet, Red Romanite, Calvert and some others.

Fall Planting—Varieties.

I have at different times planted in the fall and fail to see any disadvantage from it. The kinds that I have been most successful with are Tetofsky, Red Astrachan, Duchess, Sops of Wine, St. Lawrence, Haas, Fameuse, Golden Russet, and Talman Sweet, ripening in the order I have given them. I have other kinds growing and doing well, not forgetting the Wealthy, but they have not fruited. Situation slightly rolling towards the north. Soil is dark loam clay subsoil.

As I am situated on the prairie, I consider my windbreak of the utmost importance.

Profit of Fruit Culture.

You wish me to state, if no secret, the profits of fruit culture compared with my other crops. I have no accurate way of informing you on that.

I can only say that the profits of wheat culture in this section was minus this year, of 1878, the small amount we have brings 35 cents per bushel.

Our apples in the early part of the season met with ready sale at \$2.00 a bushel. About the middle of season we sold at \$4.00 per barrel, and when apples in the market from the South were a drug, we could sell at \$3.00.

Our net proceeds from apples were over \$300, besides supplying a large family and friends for the summer and winter, as my cellar will testify, besides several barrels of vinegar to sell next year.

R. L. COTTERELL.

DISCUSSION.

The report was ordered on file for publication, and the following discussion ensued:

Quality of Minnesota Apples.

Mr. Harris. I have seen the Red Astrachan from Minnesota, that would sell for \$1.00 more per bushel than the same from Illinois.

Mr. Jordan. It was evident at the Centennial that Northern apples were more highly colored and flavored than those grown further south. Canada and Minnesota apples were better than Nebraska, Kansas and Colorado apples. New York pears were better than California pears. The Wealthy is better than any Illinois, or even Michigan, apples. The crabs are poor and insipid when grown at the south.

Mr. Harris. The St. Lawrence, grown here, is a good eating apple. In Ohio and the east it is not a good eating apple.

Mr. Grimes. I agree in regard to the quality of Minnesota fruit, and the same holds in regard to vegetables. But it must be remembered that fruit shipped here must be picked before it is mature, which materially affects its color and flavor.

The Wealthy.

Mr. Elliot. When the Wealthy came into market last year, the grocery men said they could not pay \$1.75 per bushel. They took them, however, when I agreed to take back all that were left unsold. They came the next day for more, and said there was something about the Wealthy that their customers liked. I estimated that I handled 75 to 80 bushels of Wealthy last year.

Mr. Latham. Children choose the Wealthy before other apples, and note the difference between the green and the colored sides of the same fruit.

Communications from Messrs Peffer and Phillips were read by the Secretary, and a motion made to file for publication, which was carried. The following are the letters in full:

PEWAUKEE, WIS., DEC. 30th, 1878.

Thanks for Transactions of State Horticultural Society of Minnesota for 1878. I find them interesting. Have you ours for 1878? If not let us know.

Mr. Gideon's Wealthy is the hardiest and best tree *and fruit* for the Northwest. Duchess the same except the fruit. I have fruited Wealthy now six years in succession, and it is getting better every year; have not lost any trees by blight, except the first year, in nursery rows; set my first scions in 1870; top grafted Wealthy and Molly on one tree; also Utter's Red on same tree, twelve grafts each. Molly bore fruit first, but has proved rather shy in bearing; fruit irregular, sweet, has black spots and is worthless with me. Wealthy improves by age, as for size and also quality. We got it the second on our recommended first hardy list, and Plumb's Cider taken off and put on the last or sixth. In Pomological Society's session for 1877, it is with 2* for Wisconsin. Hope you will send a delegate to Nashville, fall of 1879, and see to it, as it is the worthiest of all ~~4~~or extreme Northwest, all things considered.

Cordially,

GEO. P. PEFFER.

WEST SALEM, WIS., Jan. 16th, 1879.

Prof. C. Y. Lacy, Minneapolis, Minn.:

DEAR SIR:—Until within a few days past I had intended to have been present at your annual meeting, but press of business prevents me. I have always anticipated a pleasant time at your meeting, and never as yet have been disappointed.

The Wealthy.

I am indebted to your society for many valuable experiences, and to one of your former members, the late lamented P. A. Jewell of Lake City, for several valuable varieties grown in Minnesota, the most valued of which is the Wealthy, with which I am much pleased. I had some very fine fruit the past season grown on trees set in the spring of 1876. Trees two years old when set. I urged the adoption last winter of a resolution at our Wisconsin meeting placing the Wealthy on our list of five hardiest varieties, and was gratified to see it placed there before the meeting closed. My Wealthy apples attracted much attention at our State fair last fall. They were fine. I had a very satisfactory crop of fruit the past season, my high location escaping the frost entirely.

Premiums.

I feel a great interest in the proceedings and discussions of your society, and thinking some of you might feel some interest in my progress, I give you a list of premiums awarded to my fruit at our State fair in 1878. I think there were fourteen competitors from the eastern and southern portions of our State. I speak of this to show that I still have faith in my location and soil. First I took second premium on best show, not to exceed thirty varieties. First, on best ten varieties adapted to Northwest. First on best five varieties adapted to Northwest. First on best ten winter varieties. First on best five varieties winter. Second on best ten varieties showy apples. First on best display of crab apples.

My Transcendents, Hyslops, Gen. Grant and No. Twenties were unusually nice. Took first on best plate of Transcendents, and first on best plate Hyslops, and first on best seedling apple. I raised every apple I exhibited, in my own orchard.

Pears—Amber Cane.

I raised some fine Flemish Beauty Pears for the first time last summer. I purchased seed and succeeded in getting a number of our farmers to try the Early Amber Cane, and it has given very satisfactory results both as to yield and quality of syrup. I anticipate the pleasure of meeting Mr. Gideon of your State at the meeting in Madison this winter.

Fruit vs. Fast Horses.

I see by your programme that he is to stir up a rivalry, and no doubt try to establish at least an equality in the vocation of raising fruit vs. fast horses. As Uncle Wilcox told me last fall, "It's a shame to our county fair; \$750 for premiums on horses and cattle, and \$8.00 for apples." Be up and doing, brother horticulturists, there is a work to do. My trees went into winter in fine shape, and so far seem all right, twenty-four degrees below being the coldest at my place. Mr. Stickney, of our State, spent a day with me last fall, which I enjoyed very much. My compliments to President Smith, Messrs. Grimes, Elliot, John Hart and the rest of your members. Wishing you a pleasant and profitable meeting that will result in good to us all, I am

Yours truly,

A. J. PHILIPS.

DISCUSSION.

Flavor and Color.

Mr. Fuller called attention to an article by Mr. Vick showing the importance of high color and its relation to flavor.

Mr. Hollister. The Ben Davis is an instance of the value of high color. Because of this it sells readily although quite inferior in flavor.

Mr. Dart. From 1½ acres I have received \$150 for fruit in addition to that used in my family. Have before received \$75 for fruit from the same trees.

Mr. Gould. I have some Wealthy that are highly colored and some that are not and the difference in flavor is also very wide.

Mr. Hollister. I have Baldwin's not colored and colored and can see no difference in flavor.

Profits.

Mr. Harris. I have two St. Lawrence trees from which I sold two or three years ago \$45 worth of fruit besides that used in my own family. The trees are 24 years old.

Mr. Dart. Our early apples come into market fresh while these foreign ones are not fresh. I have therefore been able to sell these early ones for enough to buy twice as much of the foreign fruit.

The Society adjourned to meet Wednesday morning at 9 o'clock.

WEDNESDAY MORNING.

PREMIUMS FOR FRUITS.

The society was called to order by President Smith at 9:30. The report of the Committee on premium list for horticultural products at State fair was read by E. B. Jordan, chairman. After the reading the report was made the subject of a discussion during which many objections were found and several suggestions were made. Motion was made and carried to refer back to the committee for further consideration.

TREES FOR FOREST PLANTING.

Mr. Pearce. I move that a committee be appointed to report a list of trees for forest planting. The motion was carried and Messrs. Pearce, Fuller and Elliot appointed such committee.

PREMIUMS FOR PLANTS.

Mr. Tyler. I think there should be a committee to report on mode of exhibiting or staging plants and premiums to be offered for the same. A motion to this effect was carried and Messrs. Tyler, Mendenhall and F. J. Kerridge successively nominated and elected. A motion was also made and carried that the committee be requested to report to-morrow morning.

FRUIT CULTURE AND FAST HORSES.

Mr. Gideon was called upon and proceeded to give his address upon Fruit Culture and Fast Horses. After he had read a well worded arraignment of the fast horse charging it successively with

the decline of nations and governments in Asia, Africa and Europe, and while he was proceeding with the discussion of social laws and relations, a motion was made to discontinue the reading as being irrelevant. The motion was not voted upon, but after several suggestions were made Mr. Gideon refused to continue the reading in the face of the objections urged.

FRUIT CULTURE IN GOODHUE COUNTY.

The report of Mr. Norquist upon his efforts at fruit growing was then read by the secretary, after which motion was made and carried to file for publication. The following is the report :

RED WING, MINNESOTA, JANUARY 20th, 1879.

Prof. Chas. Y. Lacy, Secretary Minnesota State Horticultural Society.

Location.

DEAR SIR:—I herewith give you a short report of my fruit farm. Eight years ago I bought forty acres of land two miles from this city, located on a round hill three hundred feet above the surface of the Mississippi river, sloping south, north and west.

Beginning—Varieties.

In the spring of 1871 I procured fruit trees and planted on the north side. Varieties I planted—Hyslop, Haas, Ben Davis, Tetofsky, Duchess of Oldenburg, Red Astrachan, Transcendent, Soulard and Wild Goose Plums. The hard winter of 1872-3, all of the Ben Davis and Red Astrachan were killed, the Haas partly injured. The Duchess, Tetofsky, Transcendent, Hyslop and Soulard, are to-day in a thrifty growing state, bearing fruit in abundance.

I have replanted partly of Conical, Orange, Early Strawberry, Hesper Blush, Wealthy, and Minnesota. All of these are doing very well; no blight, only on the Transcendent where the land was cultivated.

Of strawberries, Wilson's Albany, Col. Cheney, Kentucky, Monarch of the West, and Green Prolific, are the best on my land.

Of raspberries, Black, Seneca and Davidson's Thornless, Red, Turner and Brandywine, are all of them hardy and prolific.

Grapes.

My vineyard is located on a hillside sloping southwest, the soil a sandy clay, quick and warm. The vines are planted eight by eight, the rows running southwest and northeast. I cultivate three feet on each side of the rows, leaving two feet in the middle uncultivated, to prevent washing. In the fall the vines are laid down and covered four inches deep, taking soil from the uncultivated part. In the spring the soil is laid back when uncovered. I manure annually, with stable manure, composted being used alternate years with lime or ashes.

In the spring of 1871, I bought eight hundred vines, Concord, Delaware, Hartford, Clinton, Oporto, Eumelan, Rogers No. 15, Martha. These vines had been badly mixed in the bundle, some without labels, but the following winter labeled the tender vines; they were all killed. Concord, Delaware, Hartford, Northern Muscadine, Clinton, Oporto, are doing very well.

In the fall of 1877, from seven hundred vines, I sold in Red Wing market 4,700 pounds at ten cents. In the spring of 1878, part of the vines were frosted late in May, and bore no fruit. This crop of 1878, only 4,000 pounds.

Four years ago I added to the vineyard, for trial, Champion, Janesville, Rogers No. 4, Lady, Brighton, Newton, Moore's Early, California Seedling, Worden's Seedling.

Concord and Delaware are my best grapes for profit. The Janesville is a hardy early grape, but second in quality. Champion, the earliest of all is third in quality. Worden's Seedling ripening one week before Concord, better flavor and perfectly hardy. Lady, Brighton, Newton, Moore's Early, were planted last spring, only on trial. I may know something about them another year.

I have taken a lively interest in fruit culture for nearly fifteen years. During that time I have noticed many losses of fruit trees in this county, mostly from lack of hardiness in the trees. In the winters of 1872-3, the tender trees mostly killed out, but the Duchess and crabs are annually producing fruit. The blight has done no damage, only on level and cultivated ground, on Transcendent and Meader's Winter. The farmers are annually adding to their orchards crabs and hybrids, raising all the summer fruits needed.

I regret to state an instance of lack of knowledge as a step backward in fruit raising in this vicinity. A party from the State of Ohio, two years ago canvassed this county, representing themselves as nurserymen, raising fruit trees on purpose for Minnesota, recommending standard apples and pear trees, Weaver and Wild Goose plums, and Lady grape vines at three dollars each. This party delivered in Red Wing, in two days, five thousand dollars' worth of trees and vines. I have inquired of several parties about these trees, and the reply is nine times out of ten, "They are dead."

I will close this by saying that we will probably attain knowledge and profit by the losses of others.

Yours respectfully,

JOHN NORQUIST.

A brief discussion followed the reading:

Mr. Norquist. (In answer to question.) Have had some mildew on Oporto, Clinton and Rogers No. 4 and No. 15.

REVISION OF FRUIT LISTS.

It was then moved to take up the fruit lists for revision, and the motion carried.

The lists recommended for "general cultivation," for "planting in limited quantities," and for "general cultivation in favorable localities," were ordered to stand unchanged.

To the list recommended for "favorable localities in southern portions of the state," Mr. Harris moved that Red Astrachan be added, but the motion was not seconded.

To the list recommended for "general trial throughout the state," Mr. Harris moved that the Walbridge be added, but the motion was not seconded.

Messrs. Fuller and Smith. It has killed down entirely.

Mr. Dart moved that the Peach Apple be added, which motion was carried.

Mr. Jordon moved that the Walbridge be stricken from the list "recommended for trial," which motion was carried—5 for and 4 against.

It was moved to strike off the whole list recommended for "trial," which motion was carried unanimously.

To the list recommended for "trial by amateurs and pomologists," Mr. Harris moved to add Malinda, Walbridge, Yearly's Winter, Frosts Seedling and Hotchkiss Greening.

TERMS OF RECOMMENDATION.

Mr. Jordon stated the condition under which cions of the last named are offered is that they shall be used for testing only, and not for disposal to other parties by gift or sale.

Mr. Dart. Don't believe that we ought to publish the fruit on such terms.

Mr. Jordon. Would like an expression of the society on this point.

Mr. Hollister. Believe the originator ought to have an ownership in his new varieties, and that the condition is a fair and proper one.

Mr. Underwood. Think we may leave the owners to advertise their own new varieties.

Mr. Dart. There are numerous seedlings that we can put on the list without submitting to that condition.

Mr. Jordon. I move that Hotchkiss' Greening be placed on the list, subject to the condition.

The motion was lost. The motion to put on Malinda, Walbridge, Yearly's Winter and Frost's Seedling was then carried by a vote of 9 for and 1 against. See fruit list on page 13.

CRAB APPLE LISTS.

From the list recommended for "general cultivation" Mr. Harris moved to strike the Hyslop.

Mr. Dart. The tree is a poor bearer and the fruit is poor. The motion was lost, 5 for and 8 against, and the list left unchanged.

The list recommended for "planting in limited quantities" was continued unchanged.

Minnesota—Whitney's No. 20.

To the list recommended for "general trial" Mr. Brimhall moved that the Minnesota be added, but the motion was not seconded.

Mr. Jordon. It gives no fruit.

Motion was made to add Whitney's No. 20 which was carried, 7 for and none against.

General Grant.

To the list recommended for trial by amateurs and pomologists Mr. Harris moved to change the Gen. Grant from list for "general trial."

Mr. Fuller. The tree is fine and a good grower, and the fruit is fine. It has done well in my locality for five or six years. Shall continue to plant and cultivate it.

Mr. Jordon. Had hoped to make a funeral pile of it at this meeting.

Mr. Harris. The Gen. Grant among others could not be sold last fall.

Dr. Twitchell. My neighbor said to me that all the trees he put out next year should be Gen. Grant and Haas.

Mr. Dart. The Gen. Grant is a little liable to blight. This is its only objection. Think it should be retained somewhere.

Mr. McHenry. My two year olds killed badly last year.

Mr. Brimhall. Mine blighted and I would not want to set out any more.

Mr. Storrs. It is doing well west of here and giving satisfaction.

Mr. Pearce. It will be thrown out after ten year's trial.

Mr. Latham. I move to amend to strike from all the lists. The amendment was lost by a vote of 7 for and 7 against, and the motion was not voted upon.

The meeting then adjourned to 1.30 P. M.

WEDNESDAY AFTERNOON.

LETTERS FROM J. W. BOXELL AND JOHN HART.

The meeting was called to order by President Smith at 1.45. Letters from J. W. Boxell and John Hart were read by the Secretary and ordered on file. The latter discussing matters of programme, is given as follows:

WINONA, JAN. 20, 1879.

Prof. C. Y. Lacy, Secretary State Horticultural Society:

DEAR SIR:—I received the programme of your annual meeting, commencing the 21st inst., at Minneapolis. I am sorry to say I cannot attend. There is no use to form an excuse; the truth is best; I find that greenbacks with me are very scarce just now. For the last year our crop of fruit has been destroyed by the late frost in May.

Strawberries.

Even our strawberries, with some of the berries quite large, were all cut off. Instead of turning red they turned black. There were but very few berries to be seen at the time your committee visited our place. However, we are not discouraged in the least, as some of our loss, was caused by our own carelessness. Had we planted on higher ground than we did we were all right. Some of our neighbors who had fruit on the ridge and prairie, had good crops. All in the valleys and along the streams were destroyed. Not even a wild plum could we see last fall. I see you are going to have an address from the pioneer fruit grower of Minnesota, Mr. Peter M. Gideon of Excelsior. We are sorry we cannot have the pleasure to listen to the father of fruit growers of Minnesota.

Horticultural Exhibition.

I see what we think to be a very important question, asked in your programme: "Are special horticultural exhibitions practicable? are they desirable?" We should think they are, and the most important to fruit growers and others, especially the exhibition of small fruit in their season. We think there are two points in our state where an exhibition of small fruit might be held. We would name Rochester for southern Minnesota, and leave you to name a point for northern Minnesota. At present all the fruit growers of the east are holding exhibitions of fruit in their season, and why not we adopt the same plan with benefit to our state and ourselves.

Yours with respect,

JOHN HART,
Winona, Minn.

Mr. Harris then read his report on the horticultural exhibit at the State Fair. It was moved to file for publication, with such insertions as should go with it, which motion was carried. The report was as follows:

HORTICULTURE AT THE STATE FAIR OF 1878.

Purpose of Premiums.

The State Agricultural Society of Minnesota, with the view of encouraging the cultivation of fruits, plants and flowers among all classes of people, and to augment the resources of the State, and promote the moral and financial improvement of the producing classes, as well as to secure greater attractions to the annual fairs, have in time past offered and awarded certain prizes for the finest and greatest number of varieties of apples, the finest and best grown plants and most beautiful flowers.

Defect in Plan.

This plan though defective in that thus far it has not given scope enough in the classes to embrace the children of public and Sunday or mission schools, and those engaged in domestic service, without bringing them into direct competition with endowed institutions, professional horticulturists and people of wealth, is accomplishing a vast amount of good, and will undoubtedly add greatly to the morality and intelligence of our people and stimulate them to increase the beauty and comfort of many humble homes.

Value of Fruit.

Fruit has not only become a luxury but an almost indispensable article of human food, and must, as the quality is improved and quantity is increased so that there is enough and to spare to place it within the reach of all classes of society, do much toward diminishing the habitual use of intoxicating and stimulating beverages—a practice that is the direct cause of a large proportion of the pauperism and crime that now exists in our State—by satisfying that craving of the human appetite for something more refreshing and exhilarating than the plain bread and meat diet. And the increased cultivation of plants and flowers will have a humanizing effect, and be in many instances the means of producing desirable results.

Future of Horticulture.

I believe, as the noble art of horticulture continues to advance, it will yet become a branch of study in all our public schools, and that many of the greatest and best men of the future will arise from those who have learned lessons of patience and inward purity in the study and practice of this the first and best of the arts.

Results of Prizes and Exhibitions.

As the prizes are offered for the best articles, those who design to compete for them are stimulated to study and experiment to produce articles that are as near

as possible to perfection, and the thousands of visitors at the fairs being favorably impressed with the beauty and utility of the articles and learning something of the methods of growing them, will return to their homes fully determined to do likewise or even better, and that alone will prove an ample return for the labor and expense involved.

Progress Shown.

By comparing the last four with those of previous years, we see that a most wonderful progress has been made in the horticultural department. Less than twenty years since orchards, nurseries, and plant houses were almost unknown in this State. The earlier premium lists were largely copied from those of other states, and contained the offer of small prizes for the best fruits and flowers, which brought out a meagre exhibition, although the best available, of such fruit and flowers as would not at this time receive a passing notice, in fact at some of the fairs two square yards of table room was more than sufficient to hold the entire collection of fruits and flowers. We now have not a perfect but a liberal premium list for the department, and scores of men bring forward grand collections of fruits and flowers and compete for the prizes, and it requires a large hall to accommodate the treasures of Pomo and Flora that they may be shown to advantage.

Unfavorable Circumstances.

There were several circumstances that were considered unfavorable for having a great display of fruit at the last fair, September 2d to 7th, 1878. A severe frost having occurred in May after the trees had blossomed and set their fruit greatly lessened and entirely destroyed the crop in some sections of the State. The time of holding the fair was a few days too early for showing grapes and the later apples to the best advantage except by those having the most favored locations, as the former were scarcely ripe and the latter not well colored up, and last, but not least, the great exposition to be held in Minneapolis was expected to (as it did) call away many of the exhibitors of former years.

Number and quality of Entries.

Notwithstanding all these unfavorable impressions floral hall was tastefully decorated and put into very complete order and filled to overflowing with the fruits and flowers of Minnesota making a magnificent exhibition. There were 242 entries of apples and grapes, comprising about 2,000 plates of apples and more than 100 of grapes. There was in the exhibition over 100 of the named varieties of the apple, nearly as many more of seedlings, about 30 of Siberians and hybrids and over thirty of grapes. The very fair appearance of the apples and the good quality as far as tested, and the quantity as compared with the hardy and easily grown Siberian, must have a tendency to make a favorable impression upon the minds of the thousands who were in attendance at the fair, and doubtless many of them returned to their homes satisfied that fruit growing in Minnesota is a success, and tully determined to plant and own an orchard. The floral department, although limited to exhibitions chiefly in St. Paul and the immediate vicinity, was magnificent and spoke volumes for the taste and refinement of our people whose patronage warrants the extensive growing of such plants.

Suggestions.

The names of the exhibitors of fruits and what they had to show, and a list of the fortunate ones to whom were awarded premiums, and what they were awarded for, will be given before I get through. Permit me here to digress a little from the subject. The State Agricultural Society has given the control of the horticultural department over to the State Horticultural Society, while the entries in the department are made with the secretary of the former society. This practice is a fertile source of confusion and mistakes and I would recommend that hereafter if we continue to control the exhibition the entries be made direct with our secretary, and that we select the awarding committee and they also report to him. Again, every article competing for any certain prize should be arranged together to save useless labor and prevent unjust awards.

Exhibitors and Exhibits—Houston County.

The exhibitors from this county were J. S. Harris & Son, La Crescent, 225 plates of apples, including a general variety of autumn, winter and seedlings, also twelve varieties of Siberians. E. Evans, Mound Prairie, five varieties, as follows: Red Astrachan, Saxton, Duchess, Haas, and a seedling supposed to be Siberian, also other Siberians. B. Wooley, Hokah, two plates hardy and good seedlings, keeping all winter. J. Lottis, Hokah, four varieties, three of seedling apples of good size and fine appearance, one of them said to be a long keeper, and a seedling winter crab about the size of the Transcendent. Geo. Hartman, Hokah, ten varieties apples, one of Flemish Beauty Pears. Seven varieties of the apples were seedlings from medium to large size, equal to the same number of grafted varieties grown in the State; one a seedling of the Alexander, keeps until mid-winter. The pears were from a tree that survived the hard winter of '72 and '73, without injury, and has never blighted. The crop last year sold for \$2.00. Andrew Hartman, Hokah, twelve varieties, nine of Seedlings one of St. Lawrence, one Greasy Pippin, one Perry Russet. Seedlings very fine. Henry Gosset, six plates as follows: Blue Pearmain, Sweet Pear, Rawles Janet, American Golden Russet, Perry Russet, Gloria Mundi. Jacob Daboll, six varieties: Haas, Famuese, Golden Pippin, Golden Russet, Perry Russet, Gloria Mundi. Antoine Boshel, Hokah, four, viz: Perry Russet, Price's Sweet, Ben Davis and a Seedling. The orchards from which these exhibits were made had an aggregate fruitage this year of about 1,500 bushels of apples and 500 of crabs, and but for the frost in May would have more than doubled that amount.

Winona County.

The exhibitors were John Hart, George Clark, Mrs. H. Campbell and S. Brainerd. John Hart's collection comprised about twenty-five varieties, some of them rare and most of them fine. Arrived too late to compete for premiums. George Clark had in his collection 36 varieties, all very fine. Gloria Mundi and Utter's Large Red, magnificent. Mrs. H. Campbell, of Minnesota City, exhibited near 100 plates. Seventeen or eighteen varieties were grafted fruits, the remainder seedlings and crabs. J. Brainerd's exhibit was very fine Duchess. The Winona county fruit was mostly shown by an agent unacquainted with varieties of fruit, and consequently at a disadvantage.

Olmsted County.

R. L. Cotterell, of Dover, was the only exhibitor. He showed some twenty varieties of the hardy and best standard apples, and near a dozen of Siberians. He deserves honorable mention for so fine a display. Leading varieties were Sops of Wine, Red Astrachan, St. Lawrence, Haas, Duchess and Fameuse, the latter the best ever shown in the State. He made a serious mistake, which is not uncommon with amateurs, in packing his fruit for transportation, i. e. by mingling hard and soft varieties together in the same package. This greatly marred them by bruising the soft.

Rice County.

O. F. Brand was the principal exhibitor. Showed six varieties of Duchess Seedlings, all bearing strong resemblance to the parent, all as good as the Duchess and at least two of them better. Also showed Seedling Russets, Greenings, &c., and Minnesota Crabs nearly equal to Fameuse. One variety of the Duchess is on the tables at this meeting, is pronounced better than the Peankee. May we not hope that further experiment with Duchess Seedlings will soon give us the hard, good long keeping variety we so much need.

Nicollet County.

There were two exhibitors from Nicollet county. S. B. Carpenter, St. Peter, showed Duchess, St. Lawrence, Haas, and winter seedlings, &c. Ernest Meyer thirteen varieties Siberians and five common apples—all good.

Dakota County.

C. L. Vercount, Hastings, made a fine display of Duchess and winter seedlings. D. Benton, Rosemount, showed Duchess and seedlings.

Hennepin County.

The exhibit from Hennepin county was very fair but composed largely of Russian and Siberian varieties with but a light show of the famous Wealthy. J. T. Grimes showed ten varieties apples and a large fine collection of Siberians. H. Van Nest, Duchess only. Wyman Elliot showed Duchess and four varieties Siberians, several varieties Native plums and a choice collection of green house plants in bloom.

Washington County.

Washington county was represented by A. D. Roe and John Mars. Mr. Roe's display was of Native grapes, Standard apples, and Siberians; also some fine collections of flowers. John Mars's exhibit was chiefly Duchess and Seedlings.

Ramsey County.

As would naturally be expected Ramsey county furnished a goodly number of exhibitors who carried off a number of prizes on grapes, apples and flowers. Truman M. Smith, St. Paul, made a large and fine show of grapes, apples and

Siberians. His display was tastily arranged and kept in the most perfect order. Splendid bouquets of flowers were so interspersed with the fruits that the display was a center of attraction. R. Knaupheide, of Ramsey, the pioneer of grape growers in this State, and who received the first award for grapes ever made in the State at Fort Snelling, in 1860, made a fine exhibit of about thirty varieties grapes; a few of hardy apples and Siberians. The grapes shown by Messrs. Smith and Knaupheide were fully equal to the same varieties grown in the most favored localities in the older states. W. E. Brimhall had a good display of nine varieties apples and eight of Siberians; also vegetables and flowers. I. Odell showed seven varieties named apples and a seedling worthy of further trial. S. Nadeau, Little Canada, showed the First Premium Duchess of monstrous size, some Seedlings and Siberians. H. J. Brainard had twelve plates of fruit. J. S. Martella had several plates of Russian varieties. D. W. Ingersoll, native plums and Siberians. J. Marthaler, seventeen plates apples and Siberians. Peter Bohland, Transcendent and Hyslop Crabs. C. I. Staples, H. G. Brush, P. F. Staples, Albert Spanglinburg, G. W. Goldinburg, and some others, showed a few varieties of apples and Siberians much the same as those mentioned.

Northern Pacific.

There was a good exhibition of Duchess of Oldenburgh apples and Transcendent and Hyslop crabs from the line of the Northern Pacific railroad and other points of recent settlement, that was deserving of favorable mention. The Duchess were very large, solid and highly colored, and the Siberians marvels of beauty, and would do honor to any part of the State. Jas. Middleton, Frank Muleck, Center City; Otto Halmark, Chisago City, and James Merton, Pine City, were among the exhibitors.

Iowa and Wisconsin.

There were also three very fine displays of fruit from neighboring States. L. G. Clute, of Manchester, Iowa, showed thirty varieties of apples, besides Siberians and hardy seedlings. E. H. Smith, Dubuque, Iowa, had an extensive collection of Siberians. A. J. Phillips, Salem, Wisconsin, a fine collection of the apples and Siberians. The most extensive exhibitors of flowers and greenhouse plants were Wm. King, Mr. Lehmke, J. C. Fleischer, Wyman Elliot, and Mrs. L. M. Ford.

PREMIUMS AWARDED.

Apples—Collections.

Best and greatest variety, J. S. Harris & Son, La Crescent.....	\$25 00
Second best, L. G. Clute, Manchester, Iowa.....	20 00
Third best, Geo. W. Clark, Winona, Minn.....	10 00
Fourth best, A. D. Roe, Afton.....	10 00
Best show of Autumn apples, J. S. Harris & Son, La Crescent....	8 00
Second best, L. G. Clute, Manchester, Iowa.....	6 00
Third best, R. L. Cotterell, Dover, Olmsted Co.....	4 00
Fourth best, Geo. W. Clark, Winona.....	3 00
Best show of Winter apples, J. S. Harris & Son, La Crescent, Houston Co	10 00

Second best, L. G. Clute, Manchester, Iowa.....	8 00
Third best, R. L. Cotterell, Dover, Olmsted Co.....	6 00
Fourth best, Geo. W. Clark, Winona.....	5 00

Apples—Single Plates.

Best Duchess of Oldenburg, S. Nadeau, Little Canada, Minn.....	2 00
Second best, S. B. Carpenter, St. Peter.....	1 00
Best Tetofsky, W. E. Brimhall, St. Paul.....	2 00
Second best, W. E. Brimhall.....	1 00
Best Fameuse, R. L. Cotterell, Dover.....	2 00
Second best, J. S. Harris & Son, La Crescent... ..	1 00
Best plate of Haas, S. B. Carpenter, St. Paul.....	2 00
Second best plate of Haas, Mrs. H. Campbell, Minnesota City.....	1 00
Best plate of Wealthy, not worthy of premium.....	

Apples—Siberians and Hybrids.

Best collection Siberians and Hybrids, A. D. Roe, Afton	15 00
Second best, J. S. Harris & Son, La Crescent.....	10 00

Single Plates of Siberians and Hybrids.

Best Transcendents, C. F. Staples, West St. Paul.....	2 00
Second best, A. D. Roe, Afton.....	1 00
Best plate Hyslop, Miss Sarah Ramaley, St. Paul.....	2 00
Second best, C. F. Staples, West St. Paul.....	1 00
Best plate Virginia (name lost).....	2 00
Second best, J. T. Grimes, Minneapolis.....	1 00

Seedling Apples.

Best seedling apple for all purposes, Thos. Odell, St. Paul.....	5 00
Best seedling Autumn apple, Mrs. H. Campbell, Minnesota City.....	3 00
Best seedling Winter apple, deferred to the winter meeting of State Horticultural Society.	

(NOTE.—The rules regulating the entering of seedlings, and awarding prizes upon them, are vague and imperfectly understood, and should come up before this meeting for reconstruction.)

Grapes—Collections.

Best and greatest variety, R. Knaupheide, Reserve town.....	20 00
Second best, Truman M. Smith, St. Paul... ..	15 00
Third best, A. D. Roe, Afton.....	10 00

Grapes—Single Plates.

Best plate Delaware, R. Knaupheide St. Paul.....	\$2 00
Second best Delaware, Truman M. Smith, St. Paul.....	1 00
Best plate of Concord, Truman M. Smith, St. Paul.....	2 00

Second best plate of Concord, R. Knaupheide, St. Paul.....	1 00
Best plate Rogers No. 3, Truman M. Smith, St. Paul.....	2 00
Second best plate Rogers No. 3, R. Knaupheide, St. Paul.....	1 00
Best plate Rogers No. 4, R. Knaupheide, St. Paul.....	2 00
Best plate Rogers No. 15, Truman M. Smith, St. Paul.....	2 00
Second best plate Rogers No. 15, R. Knaupheide.....	1 00
Best plate Rogers No. 19, R. Knaupheide, St. Paul.....	2 00
Best plate Adirondack, Truman M. Smith, St. Paul.....	2 00
Best plate Martha, R. Knaupheide, St. Paul.....	1 00
Second best plate Martha, Truman M. Smith, St. Paul.....	1 00
Best plate of Creveling, Truman M. Smith, St. Paul.....	2 00
Second best plate Creveling, R. Knaupheide.....	1 00
Best Northern Muscadine, Truman M. Smith.....	2 00
Second best Northern Muscadine, R. Knaupheide.....	1 00

Flowers.

Best display greenhouse plants, E. F. Lemhke, St. Paul.....	\$25 00
Second best display greenhouse plants, J. C. Fleischer, St. Paul.....	20 00
Third best display greenhouse, Wm. King, St. Paul.....	15 00
Fourth best display greenhouse plants, Wyman Elliot, Minneapolis....	10 00
Best display geraniums, in bloom.....	8 00
Second best display geraniums, in bloom, E. F. Lemhke, St. Paul.....	6 00
Best single geranium in bloom, J. C. Fleischer, St. Paul.....	2 00
Second best geranium in bloom, E. F. Lemhke, St. Paul.....	1 00
Best double geranium in bloom, Mrs. Sarah Ramaley, St. Paul.....	2 00
Second best double geranium in bloom, J. C. Fleischer.....	1 00
Best display fuchsias, Mrs. L. M. Ford, St. Paul.....	8 00
Second best display fuchsias, J. C. Fleischer.....	6 00
Best single fuchsia in bloom, Wyman Elliot.....	
Best display of roses, J. C. Fleischer, St. Paul.....	8 00
Second best display roses, Wm. King, St. Paul.....	6 00
Best display of coleus, J. C. Fleischer.....	8 00
Second best display of coleus, E. F. Lemke.....	6 00
Third best display of coleus, Mrs. W. E. Brimhall, St. Paul.....	4 00
Best display of foliage plants, J. C. Fleischer.....	6 00
Second best display of foliage plants, E. F. Lemke.....	4 00
Best display of climbing and trailing plants.....	5 00
Second best display of climbing and trailing plant, J. G. Reihldaffer....	3 00
Best display of cut flowers, E. F. Lemke.....	10 00
Second best display cut flowers, Wm. King.....	7 00
Third best display cut flowers, Mrs. T. M. Smith, St. Paul.....	5 00
Best display dahlias, E. F. Lemke, St. Paul.....	5 00
Best display verbenas, A. D. Roe, Afton.....	6 00
Second best display of verbenas, Wm. King.....	3 00
Third best display verbenas, Mrs. W. E. Brimhall.....	
Best display gladiolus, Hollister, Castle & Co.....	5 00
Second best, A. D. Roe, Afton.....	3 00
Best display of tube-roses, E. F. Lemke.....	5 00
Second best, J. C. Fleischer.....	3 00
Best display pansies, Henry Voges, St. Paul.....	5 00

Second best, Wm. King, St. Paul.....	3 00
Best hanging basket.....	2 00
Best floral design, E. F. Lemke, St. Paul.....	5 00
Second best, Mrs. Truman M. Smith, St. Paul.....	3 00
Best display cactus, Mrs. F. M. Smith, St. Paul.....	2 00
Best display of greenhouse plants by amatuer, Mrs. A. Lastzir.....	25 00
Second best, Miss Sadie Ramaly, St. Paul.....	20 00
Third best, Wm. King, St. Paul.....	15 00

Amount of Premiums.

The total amount paid in premiums in this department is as follows:

Apples and Crabs.....	\$ 169 00
Grapes.....	72 00
Flowers and Plants.....	285 00
	—————\$ 526 00

It will be seen at a glance that there are not as many premiums in proportion to exhibitors on apples as there are on flowers by more that 100 per cent. If there is any blame for this it must rest upon the State Horticultural Society.

Insects and Birds.

In floral hall, although under the auspices of the Agricultural Society, was another exhibit that properly belonged to us. Mr. Eugene Harris, of Houston county, a young student in natural science, made an exhibition of insects (two cases) injurious and beneficial to the horticulturist, about eighty preserved specimens of the birds of Minnesota and several of the smaller animals. These specimens were mostly collected within a year and preserved, stuffed and mounted at odd times and on stormy days, times when numbers of the young men of our state are lounging about post offices, stores and shops in the villages exposing themselves to the contracting of habits of idleness and dissipation. His occupation being school teaching in winter, labor by the month in summer imposed upon the work many obstacles and hindrances, but the result is a good illustration of what may be accomplished by diligence and perseverance under difficulty. The exhibition was very attractive to the young and very few passed it by without special notice and favorable comments. Knowledge is what will invest the horticulturist with power. It will make him able to profit by his friends and conquer his enemies. He has a host of them in the world of insects and birds. Object teaching is the impressive and effectual method and more can be learned from such an exhibition with proper explanation than from whole libraries of written descriptions. It is possible for this society in a short period of time to secure a very complete collection of insects and of the birds of Minnesota, and the smaller animals, especially the rodents, many of which are especially hurtful to the fruit grower. Such collections would become the nucleus of a fine museum for perpetual exhibition. and if set up in cases convenient for transportation, would be one of the attractions of the annual meetings and prove a lasting benefit to us.

J. S. HARRIS.

The paper on House Plants by Mrs. E. Morse was called for and read by the writer, as follows:

HOUSE PLANTS.

What encouragement and discouragement we meet with in our efforts to cultivate them.

As the autumn days approach and we walk in our garden, among the flowers we have loved and tended through the summer, we understand how Bryant felt when he wrote—

“The melancholy days are come,
The saddest of the year,”

and we wonder if we cannot take some of them into the house, to delight and please us through the long, cold winter, which we know will surely come, here in the North. This often decides for us the question, “What *are* house plants?”

Ours are the plants we can successfully transplant from the garden to the house.

Now, if we had this in mind in the spring, and have been training some of them with this in view, happy and successful we may expect to be; but if not, disappointment awaits us; for a plant that has grown and blossomed all summer will not do so all winter, too, without a rest.

There are many of our garden plants that do well in the window; such as lobelias, nemophilas, othonna oxalis, and many others as basket plants. But first let us take geraniums. Henderson says: “For soil, rotted sod from a loamy pasture, and rotted refuse heaps, is what all his plants are grown and flowered in. Williams, in his “Window Gardening,” says: “A rich loam, sand and thoroughly decayed manure. These should be mixed in the proportion of one-half loam to one-quarter each of sand and manure. A good soil for plant-growing is not one that will hold water, but one in which water will pass away.” In our opinion this last sentence is of more importance in our culture of house plants than anything else. As for soils, we think our garden soil here in Minneapolis, as God has mixed it, is about as near perfection as can be found for most plants, if we have good drainage.

Take young plants of geraniums, pot them. Do not have the pots too large; for we know the pots must be filled with roots before we can expect any blossoms. Then sink them in some bed, where we can give them water as they need it, and remove the flower-buds as they appear, and by Autumn they will be ready to delight us, and will give us blossoms abundantly the whole winter.

We find there is a great difference in different varieties; some that are profuse in blooms out of doors will give no satisfaction in the house. The double ones that we desire so much are perfectly incorrigible, and will not bloom, save one exception, and that one almost makes up for the deficiency of the others by its beauty and good qualities. Of course we mean Asa Gray. We have tried so many kinds, and are still trying new ones, but thus far our preference lies with the following named, and we doubt if any new ones will ever be found that will do as well as these old ones. First, and above every other, stands the Queen of Geraniums, pale peach-bloom in color; second, and almost equal to it, is Louis Veillot, intense scarlet; Haidee, scarlet, with two upper petals crimson; Mrs. Whitey, pale pink; Blue Bells, dark pink with white eyes; Belle Helena, salmon color; Excellent and Queen of the West, both orange scarlet; White Clipper, white, and Mrs. Gladstone, white with pink eye.

Of course we want some of the sweet scented ones, and here we take our choice, for they are as varied and different as the spices, sweet herbs and fruits they are named after.

Then come heliotrope, mignonette and sweet alyssum, always blooming abundantly and sweetly. We wish we could include the violet among our sweet things, but they will not grow in the house for us. Can anyone tell us why, and if by perseverance we may in time succeed?

Roses and carnations are also very satisfactory, if we can give them plenty of fresh air, sunshine, and many baths. But, like ourselves, they cannot exist in health without these three things.

Here we will leave garden plants, and, as you must have discovered ere this, that we are not florists, but only lovers of flowers, we will offer no apology for the manner in which we shall mix green-house, hot-house, and garden plants, for we cannot confine ourselves even to cultivating the plants we are successful with, but are continually longing for and experimenting with all the lovely things that we can in any way obtain.

First comes the ivy, which will grow and look well, regardless of neglect, but if we desire it in perfection, let us remember,

"Of right choice food are his meals, I ween,
In his cell so lone and cold;
The walls must be crumbled, the stones decayed,
To pleasure his dainty whim,
And the mouldering dust that years have made,
Is a merry meal for him."

Dickens fully understood its culture when he wrote that, for no better instruction can or ever will be found for producing a luxuriant growth.

The calla we cannot say comes second, for we think it ranks first, too. If we give it a warm place, with plenty of warm water and sunshine, it will grow and bloom in a manner perfectly wonderful, never seeming to need a rest.

Then comes *Daphne odorata*, blooming almost constantly from December till spring in clusters of pearly whiteness, distilling a most delicious fragrance.

Laurestinus, yellow jessamine achania, abutilons, bouvardias, fuchsias, primroses, always in bloom. Several kinds of cactus which bloom towards spring, *hoya carnosa* and *bella* which bloom only in summer. *Dracena terminalis* and *Farfugium grande*, with such beautiful leaves that they do not need to bloom. Ferns, *lycopodiums*, *linaria* and *tradescantia*, with a few vines, *smilax*, *maurandia*, *cobeas*, *campsidium*, the clinging fern *Lycodium scandens*, and one beautiful vine for which we have no name, only Australian vine.

We also attempt orange tree, camellias and azalias; but after them we write "failure." They still live, but look as though they did not wish to and did not intend to much longer.

Begonias, in endless variety, some growing tall and blooming in tall, graceful drooping clusters, others as vines, and still others noted for their beautiful tropical leaves.

We read their name was given them by the great botanist Willdenow in honor of Michael Begon, a Frenchman, and patron of botany, who was governor of St. Domingo two hundred years ago, and that in this tropical country they grow in wondrous beauty.

There are now several hundred species named in botanical lists, and very many of these are suitable for the window-garden. There are but few of the Rex varieties that we succeed in growing with any degree of satisfaction. While some few fully repay our care, others grow smaller day by day, and in a little while are no more.

If they could only talk a little plainer and tell us just what they want, instead of saying as the little discontented boy in the fairy story did, "Oh would that something would come near and take me away from here," how gladly would we humor the beauties by giving them what they wanted, which we often think is a more even atmosphere, with moisture and warmth. We have several varieties of *Amaryllis*, but are not sure to what species they belong, except *Johnsoni*. They grow well, and sometimes bloom abundantly; but why do they not bloom every year when you give them the same treatment? To those who desire minute instruction regarding them, we would say we have found nothing so plain as a page in the January, 1878, *Botanical Index*, issued by L. B. Case, Richmond, Indiana. Several years ago we purchased a *Pancreatium Mexicanum*, and as it was a nice large bulb we looked anxiously for indications of bloom, but it did not grow as we hoped. One day in our reading we came across an account of a lady's travels in the South, and how she tried very hard to get a root of *Pancreatium*, but it grew so deep in the sand that she could not with the small, helps she had, succeed in getting it. We had planted ours as we did our *Amaryllis*, bulb partly exposed. We threw down our paper, and took the deepest pot we could find and put our *Pancreatium* bulbs as far down into it as possible. They liked it, for they began almost immediately to grow, and we are now hoping again for a bloom. We have another bulb, which we think must be *Pancreatium rotatum*. We obtained it with no other name than Florida Lily. We should much like to know if it is the same Phenix advertises as *Vanilla Lily*. The flower is white, sweet, and very unlike any other we ever saw.

We have left our especial favorite until the last, for we want information. What can we do to make our cyclamens grow and bloom as they used to? When children, wandering over the prairies of Illinois, we almost worshipped the beautiful *Dodecatheon Media* which grew in moist places among many other flowers, wild and lovely, and we think it must in some far away time have been the great grand parent of the *Cyclamen*, which a few years ago seemed to try its best to please us, but now, and for two years past, they have not done well although we have tried new bulbs and old ones, and have given them everything we could think of for their good. We almost forgot to say we want every spring hyacinth and narcissus bulbs which never fail to give us blooms. We may plant them in soil, or we may put them in damp moss or a glass of water, and in that way will delight us.

We hardly know, but think we have recounted some discouragements in these pages, and as yet have said nothing of the army of worms and insects that we have to fight continually. Some plants are more infested than others, but we think none are exempt entirely, without they are constantly watched and cleansed. If we keep them too cool and damp, then the green fly flourishes; if too hot and dry, the red spider is in his glory; if we give too much water the earth sours, and breeds angle and white worms abundantly. We use fertilizers very sparingly, for we don't like worms. Last fall we sent for some refuse hops, thinking they would be nice to put on my own benches to set the pots on, hoping they would also be death to worms and insects, but we found them so full of little white worms that we did not use them.

We do not know from whence comes the mealy bug, or the scale insects, but we do know that if you once give them a chance you must fight them valiantly or they will take everything before them. We have a small conservatory, but it was only a porch enclosed with glass as an experiment, and is not properly ventilated and has no conveniences for water, though the last deficiency we supply

by using one of Little's excelsior pumps, a very great improvement over a common watering pot. We would give more for a few squares of sky-light and good ventilation than anything else.

If people only knew and realized how plants loved to grow towards the clouds, they would use glass instead of shingles for covering their conservatories.

We often ask, when is the right time to water our plants? Last winter we tried watering them at night, and they did very well, but last summer a florist told us the best time to give water was when the room was at its highest temperature, when evaporation would be most rapid. This seemed to us the right way, and time, for we remembered things in the garden grow very rapidly after a nice warm rain. We think we might learn many a good lesson if we were only a little more observing of the manner in which nature treats her flowers and fruits, and where she originally grows them.

And now, if what we have so imperfectly said shall be the means of calling out words of wisdom and instruction from those here present, who make this their constant study, which shall enable us all to attain to a higher degree of success in the cultivation of flowers, we shall have accomplished all we hoped.

The love of flowers we have all inherited from our first parents, who were placed in that first garden to "dress and to keep it;" that perfect garden, for God planned and made it, made it for perfect happiness. May we not hope for much of earth, by happiness as we advance in understanding these

"Bright gems of earth, in which perchance we see
What Eden was—what Paradise may be?"

DISCUSSION.

Fumigation, Sprinkling and Immersion for Insects.

Motion was made to accept and file for publication, which was carried, and the following discussion ensued:

Mr. Underwood. My wife fumigated with tobacco but found it disagreeable. She thought of carbolic acid and tried it by various methods but was not successful. She has succeeded better with a mixture of carbolic acid with glycerine made and used as follows: One-half teaspoon carbolic acid put in cup with about two table-spoons of glycerine. *Mix thoroughly*, then pour into a pail of water. To use it dip the parts affected into the mixture or syringe with force pump. It may take more than one application to exterminate entirely, but it is more cleanly than tobacco in any form.

Mr. Harris. I find that the persistent use of hot water by an expert is a success. Place a piece of card-board over the pot and invert it bringing the top of the plant into the water. I think this good for both aphid and spider. Another insect is a hopper that does much injury to house plants. Hot water at 170 deg. Fahr. will destroy them when used two or three times. Irresponsible dealers are sending out plants covered with insects. Thus we get the

spider and mealy bug. Lime water will remove earth worms from pots. Have spent much time in trying experiments on the mealy bug. Am now trying ashes and I believe that lime or ashes can be used to rid plants of it.

Frosted Plants—Watering.

Mr. Underwood. Have immersed a large number of frozen plants in cold water a few moments until the frost was out and only a couple of them showed the effects of freezing.

Mr. Fuller. Have watered my plants this winter with hot water in the saucers. The water was nearly boiling hot. Have used soot water on soil and thus kept it free from insects.

Mr. Grimes moved that a vote of thanks be tendered Mrs. Morse for her paper, which was carried unanimously.

Mr. Grimes' report on the horticultural exhibit at the Minneapolis fair was called for and read by the writer, after which motion was made and carried to place on file for publication. The following is the report:

HORTICULTURE AT THE MINNEAPOLIS FAIR OF 1878.

Mr. President, and Gentlemen of the State Horticultural Society:—The exhibitions of this society are properly connected with that of the State Agricultural Society, yet the past season we have had the pleasure of witnessing two fairs—the State Fair, and that of the Agricultural and Mechanical Association of Minneapolis, both held at the same time and in close proximity to each other, which for completeness and success were perhaps never equalled in the history of agricultural fairs.

Of the horticultural department of the State Fair it is not my purpose now to speak, for that has been written up by an abler pen than mine.

Horticultural Progress.

But when we look upon the horticultural products exhibited at the Agricultural and Mechanical Association, the first week in September last, taken in connection with that of the State Fair held at the same time, we are struck with wonder at the rapid progress and development made in the cultivation and production of fruits in the past ten years. Gentlemen, when I look back to the time when about a dozen individuals who were thought to be insane on the subject, first met together and organized what they claimed to be the Minnesota State Horticultural Society, and although they were frequently admonished that fruits could never be successfully grown in this cold clime, yet they went on planting out trees and seeds, experimenting against all discouragement and hoping at times almost against hope, looking for a reward above that of dollars and cents; and some of those same gentlemen stand here before us to-day, and I am constrained to say that there has been no improvement in their mental condition since. But what has been the result? Let that diploma which was awarded us at the Cen-

ennial Exposition answer—one hundred and nineteen named varieties of standard apples, the fairest, finest and most beautiful specimens that nature ever produced. Why, sirs, a gentleman came to me at the time and said, please tell me by what secret process do you get that beautiful finish upon your fruit? I replied my dear sir, the secret is in the climate where it grew. I am certain from what I saw at our late fairs that we could now furnish a much larger collection than we did then.

Moulton's Russian Apples.

But my purpose is to write up the horticultural products of the late Minneapolis Exposition. I find that there were thirty-six exhibitors of apples, seven of grapes, four of plums, and seventeen of flowers and green-house plants. Of the number Thomas Moulton, of Minneapolis, had a remarkable collection of over one hundred varieties of Russian apples, some of them even larger than the Duchess. Mr. M. claims that he has fruited over two hundred varieties of those apples, some of them ripening as early as the first of July, and others continuing in succession until May.

He has many trees that he thinks much hardier than the Duchess, but this fact will have to be proven by further time and experience. Of this collection about fifteen varieties are winter fruit, in season from December to May. Now, just here is a point of great importance in our horticultural work. No one denies that winter apples can be grown in Minnesota, but it is well known that a late ripening fruit is also late in ripening up its wood, and consequently is not in condition to withstand the first shock of extreme cold weather, that sometimes occurs quite early in this climate, and consequently the trees are liable to be permanently injured or even killed outright. If we could get a good productive winter apple, perfectly hardy under all conditions of climate here, there would be millions in it for the future of our State. When this Russian collection comes to be sifted down by careful selection, no doubt we shall get something valuable out of it.

Minnetonka Exhibitors—Wealthy.

Some of the finest fruit on exhibition came from about Lake Minnetonka, and it is doubtful if any section of the State can produce better. The Wealthy apple was out in all its glory, Mr. Gideon, the originator, minus. Why does he still persist in keeping his light under a bushel, now that the State pays for the gas? But the Wealthy has suffered nothing in other hands. Messrs. Latham, Gould, and Mann, of Excelsior, had more fruit of this variety, and better specimens than I have before seen on exhibition. Indeed, the whole collection of fruit was very fine; whether it was owing to the season or to the increased amount grown from which to select, I cannot determine. I am sorry that I cannot particularize, and give the names of each variety, but as I took no notes at the time, and have no recourse except to the entry books, which only give the names of the persons entering and the fruits on which there was a special premium; all else being included in general collections.

Exhibits of Messrs. Gould, Latham and others.

Mr. Gould was awarded the first premium for the best collection of all kinds of fruit by one exhibitor. His display of Concord and Delaware grapes was very

fine. Mr. Latham also had the Duchess, Haas, Plumb's Cider and some other varieties of apples, and on grapes took a regular list of premiums; on Concord, Delaware, Iona, Rogers No. 4 and 15. His grapes were exceedingly fine in appearance, and more fully ripe than any other. It was suggested to me that girdling the vines, and clipping the smaller bunches at the proper time, would have a very beneficial effect for exhibition purposes.

R. Knaupheide, of Reserve town, Ramsey county, S. Ellington, Bloomington Ferry, Hennepin county, and one or two others, had very fine collections of grapes. John Hart, the old apple seed planter, made a very creditable show of summer, fall and winter apples, also a plate of seedling pears. Mrs Campbell, of Winona, sent up the Duchess, Haas, Fameuse, and a large collection of seedling apples, some of which were quite large and of good quality. Geo. W. Clark, of Winona, also had a good exhibit of apples, but as neither he nor Mrs. Campbell were present to arrange and classify their fruits, they perhaps did not receive the consideration that was justly due. W. B. Henry, of Dayton, Minn., displayed several plates of fall, winter and seedling apples. A. Stewart, of Richfield, presented a few plates of fall, winter and seedling *Ironclads*.

There are other exhibitors which I would like to mention, but even space must have a limit.

Iowa.

The management saw proper to throw all the doors of competition wide open to the world, and in the fruit department we find no less than six competitors from the State of Iowa.

E. H. Smith, of Dubuque, carried off the first prize for the largest collection of apples, but with this exception no premium was awarded to any fruit shown side by side in competition with that grown within our own State.

Decoration of Hall.

The fruit, floral and vegetable hall was very handsomely decorated with evergreens, showing admirable skill and judgment in projecting and carrying out this most difficult part of the work so as to harmonize in good taste with all the surroundings. But I cannot speak in too high praise of the ladies and gentlemen of Minneapolis, who have made horticulture part of their study, and are always ready for any emergency of the kind that skillful fingers and willing hands can do.

Floral Exhibits.

In the floral department there were seventeen exhibitors whose collections were made up chiefly of greenhouse, window and bedding-out plants, the most conspicuous of whom were G. A. Bracket, W. Elliot, Wm. Buckendorf and R. J. Mendenhall, of Minneapolis, J. E. Booth, of Minnehaha, and James Aldons. of Iowa City. Mr. Bracket made nine entries, consisting of green and hot-house foliage, decorative and specimen plants, fuchsias, begonias, colens, olander and plants in bloom.

Mr. Elliot, fourteen entries; specimen plants and plants in bloom, bedding plants, geraniums, rustic stands filled with growing plants, boquets and cut flowers, the whole being festooned with choice hanging plants. Mr. Buckendorf, nine entries. Display of specimen succulent, bulbs and bulbous, rooted plants,

tuberoses, hand, table, and bridal bouquets, funeral ornaments and floral designs. Mr. Mendenhall had a very choice collection of specimen and decorative plants. J. E. Booth made 21 entries, consisting of green and hot-house, foliage, specimen plants, plants in bloom, roses, bedding plants, succulent bulbs and bulbous rooted plants, also rustic stand filled with growing plants, bouquets and floral designs, roses and cut flowers. Mr. Aldon's collection consisted of thirteen entries, green-house, decorative and groups of plants in bloom, also roses, dahlias and house plants. The specimens were all in fine condition, and arranged to the best advantage for the inspection of visitors and judges. Of amateurs, or those growing a few plants for their own special use, I would mention C. A. Smith, whose collection consisted of foliage and decorative plants. Wm. Grimshaw, wardian case filled with flowers. Mrs. Lizzie Morse, stocked aquarium and group of plants, and wardian case of ferns. Mrs. Rachel Riddle, house-leek growing in basket, fine specimen. Henry A. Lovering, Oleander tree, and Mrs. I. Atwater, specimen plants and cut flowers. Of the class of plants above named, the collection was very near complete, and while we should regard them as household pets, and give them all necessary care and protection, we must not forget that there are other plants and flowers seldom seen at fairs that are perfectly hardy in all situations, and flourish with but little care, that are more suitable to adorn the surroundings of home with all their ennobling and refining influence, and make attractive the door yards of the rich and poor alike.

Vegetables—University Exhibit.

The vegetable section comprised no less than 262 entries, certainly very creditable, but not better than I have before seen on exhibition in the State, and in addition Prof. Lacy, of the agricultural department of the State University, presented a large collection of grains and vegetables, grown on the Experimental Farm. This collection was not entered for premium, but to illustrate the work in which the professor is engaged in his experiments as a scientific and practical farmer and to show the result of crops treated with and without fertilizers, and also the relative value of the same when applied to the growth of grains and vegetables, and also the results accruing from different modes of farming. This group was of more importance in a practical sense than all the overgrown specimens put together, because it teaches a lesson of demonstrated facts that may be learned even by the boy who is supposed to be too dull and stupid to make anything—but a farmer.

Northern Pacific—Hennepin County.

The Northern Pacific put in a good display of grains and vegetables, collected along the line of their road, by way of advertisement, showing that they are wide awake to their own interests.

The Hennepin County Farmers' and Gardeners' Association had a large pyramid or monument (I am not sure which) of vegetables that loomed up in magnificent proportions, showing what combined effort and artistic skill can accomplish.

Other Exhibitors.

But I must fall back to the regular patrons of the show, who exhibit for premiums and that alone, and pile up in embryo mountains Nature's monstrosities

and call them vegetables, too coarse for use, for man or beast, but the judges say it beats the world, and here's your premium. My friend Richard Poole, of Minneapolis town, had a full assortment of garden products, and I must say he well deserved the encouragement he received at the hands of the viewing committee.

And then there was D. C. Custer, Geo. H. Morrison, David Giles, Wyman Elliot, O. C. Chase and others, of Minneapolis, James Smith, of Lyndale, John Hooper, of Crystal Lake, James Archer, of Northfield, J. W. Mann, of Minnetonka, and a number of others, all of whom know what first-class vegetables are and did produce them, but then old birds are sometimes caught with chaff, or rather those men were like the men travelling from Jerusalem to Jericho who fell among thieves who beat, and left them upon the ground, without a cent to pay their tavern bills.

How this was done it is not for me to say, but by permission you can all refer to one E. H. Smith & Co., of Dubuque, Iowa, who carried off more honors than all the other competitors together.

Mr. Harris spoke of the abuse of premium taking on fruit collected and not grown by the exhibitor.

Mr. Dart asked if such were not liable to prosecution for so doing. The answer was in the affirmative.

FRUIT LISTS RESUMEED.

Blight.

The revision of the fruit lists was then resumed. It was moved that the votes be omitted in publishing the blight lists. It was moved to amend by stating in a note that there had been no blight the past year, and that these lists simply expressed the action taken at the last meeting. The amendment was carried.

Grape List.

It was moved to continue the grape list of last year which motion was carried.

Strawberry List.

It was moved to amend the strawberry list by adding Hart's Minnesota Seedling to the list for "general trial for amateur cultivation," which was carried.

Mr. Harris moved to recommend Kramer's Seedling "for trial" which was carried by a vote of eleven for and none against.

Raspberry List.

It was moved to continue the raspberry list of last year, which motion was carried unanimously and the following discussion ensued :

Mr. Harris. In Houston county we must drop the Doolittle. It is affected with a red rust.

Mr. Jordon. The rust has not yet reached Rochester.

Pres. Smith. Mr. Hollister says he will plant the Doolittle only.

Mr. Harris. The Seneca is not affected.

Mr. Grimes. Have grown the Ganargua for three years. It fruits well but does not produce plants. The fruit is large and better than any black-cap but not equal to the Turner.

Mr. Underwood. The Mammoth Cluster does better than any other with me.

Mr. Jordon. Of Davison's Thornless I got some several years ago but they killed down every year. Planted twice and have now discarded them.

Pres. Smith. I doubt the genuineness of Mr. Jordon's plants. Mine were hardy.

Mr. Grimes inquired concerning the Gregg but no one was prepared to give information.

Pres. Smith called attention to the Henrietta on exhibition.

Mr. Latham. I have got a few Highland Hardy. The fruit is better than the Turner, and the plants very prolific. Its hardiness I have not yet tested.

Pres. Smith. I had last year the finest prospect for a raspberry crop but the hot damp weather struck it and the berries did not fill.

VISIT OF THE LEGISLATURE.

In accordance with the invitation forwarded by the secretary, members of the Legislature had been coming in for some time and at this point Mr. Harris was called upon to address them, which he did briefly, alluding to the fact that the Horticultural Society as well as the Legislature was convened for a useful purpose, which would confer a benefit upon the people of the whole State.

A recess was then taken for the purpose of showing the articles on exhibition and for testing a basket of Wealthy apples which Wyman Elliot, Esq., had distributed among those present.

On calling to order, several members of the Legislature were called upon for remarks.

Senator Buck expressed pleasure and satisfaction at the quantity and quality of fruit on exhibition.

Mr. McCracken, of Fillmore county, expressed regret that so few members of the Legislature had come. He had no idea that such a good display of fruit would be made.

Mr. Johnson, of Faribault, gave utterance to similar sentiments.

Mr. Scriver, of Rice county, told his experience in setting trees

that were killed after coming into bearing by the hard winter. They were root-killed since they leaved out in the spring and then died. Had been thinking of the advantage of raising our own fruit to keep our money in the State. He said he was glad to have come. Was not disappointed, and promised any assistance he might be able to render in the Legislature.

The paper of H. M. Thompson, on Uses of Evergreens, was read by the secretary, after which motion was made and carried to file for publication. The following is the paper :

EVERGREEN TREES—THEIR USES AND MANAGEMENT.

H. M. THOMPSON, ST. FRANCIS, MILWAUKEE COUNTY, WISCONSIN.

The use of evergreen trees, and the extent to which they can be profitably planted, depends upon their adaptation for ornamental purposes, the value of the wood for economic uses, the extent of climatic modifications produced by forests, composed wholly or in part of evergreens, their adaptation to soil and locality, and in the knowledge, skill and care of the planter in sowing the seeds, the handling and planting of the trees, the form of planting, the subsequent cultivation and the management of the trees after becoming permanently established.

For Ornament.

In the use of evergreens for ornamental planting, their effectiveness will depend upon the situation and the extent of the area, the kinds of trees used, and the system of planting. Grounds of limited extent admit either of group, or isolated planting. If the trees are planted in groups, rapid growers, such as the Scotch, Austrian and white pines, the Norway and the white spruce, may be planted in the centre, and an admixture of slow growing kinds, such as the dwarf mountain pine, the arborvitæ, the red cedar, and the known hardy dwarf varieties of the spruce, arborvitæ and the juniper species.

In the isolated form of planting, the selection of the species and varieties will depend upon the area. The Austrian, Scotch and white pines, in favorable soils and situations will attain the height of 80 to 100 feet in 40 to 60 years, and require, therefore, a space of not less than fifteen feet in all directions horizontally from their base, to allow room for the development of the lower branches, and ensure a symmetrical form of growth, which is essential to preserve the beauty of single specimens of trees. When the grounds or portions of the grounds are too limited in extent to admit of the larger species, the dwarf species and varieties, can be planted singly or in small groups, due regard being had to the reservation of portions of the grounds, where the planting of flowering shrubs and dwarf deciduous trees will, by means of contrasts in form and foliage, add beauty to the display of nature in the summer, and enliven and brighten the winter scene, and thus afford pleasureable emotions, and shield the owner and the inmates of his dwelling from the effects of the winter blasts, now so common on the treeless plains of this continent.

For Manufacturing Purposes.

The value of evergreens for forest planting is not to be measured by their limited use for ornamental purposes, or by the present value of the marketable products, which owing to the low cost of timber lands, is far below the intrinsic value, taking into consideration the many centuries of time required to produce the primeval forest, and as compared with the supply, consumption and waste, and the future demands of an ever increasing population.

It is estimated that over fifty per cent. of the various kinds of wood consumed is of the resinous species, principally white pine, and that with the continuance of the same ratio of increase of population, consumption of manufactured products as in the two last decades, combined with the same proportionate waste of material in the process of the manufacture of the rough lumber, and the continued destruction by casualties of the primeval forest now within the reach of the manufacturing industries and the centre of population, must necessarily result in a scarcity of available supply and enhanced prices, at a period of time long before the trees, if now planted in cultivated forest, can be grown of sufficient size for manufacturing into dimension lumber.

For Protection,

Besides the economic value of resinous woods, cultivated forests composed in whole or in part with an admixture of evergreens, are important factors in their effects in modifying climatic conditions; the extent of these modifications being largely determined by altitude, the extent, the form, the distribution, and, to some extent the species of trees contained in the forests.

Form of Plantation.

The limits of this paper confine us to the consideration of that portion of the subject relating to the best form of planting and the most desirable species of evergreens to be grown. The method of planting forests in the square form seems to have been copied from the plan in vogue among the primeval forest pioneers, who having an imperfect knowledge of the climatology of forests, commenced making clearings on one side of the tract of land, and extending the clearing year by year, leaving the forest reserve on one side or one corner of the farm. The general result of this form of forest reservation and plan of planting forests, is to dot the surface of the country with groups of timber. The cleared fields between these groups are swept by winds moving at times with accelerated velocity caused by the divergence of the atmospheric currents deflected by the groups and their junction with the direct current moving between the groups. To these causes and to the summer heated surfaces and to the rarefied atmosphere of the treeless spaces may be ascribed the rotary motion of air currents and the increased frequency of the devastating tornadoes in Wisconsin, Illinois and Iowa, where the principal primeval forest reservations and the cultivated forests are in the group form.

The isolated or group form of planting is undoubtedly the best on the banks of streams to prevent their wear and caving, and upon embankments or hilly and broken surfaces, as a means of preventing their erosion, and the inundation and injury to the crop and soil of adjacent valleys and plains by the debris of sand and gravel, transported and deposited by torrents, and to preserve the soil

of the wooded surfaces by means of shade from excessive evaporation and thus prevent the drying of springs, and ensuring a more equable flow of water in the streams.

Effects of Shelter Belts on Temperature, Winds and Moisture.

The soil of rugged surfaces is usually thin and of inferior quality and only adapted to the growth of certain species of trees that naturally flourish in poor soils, and in such exposed situations, to which the Scotch pine is especially adapted and is recommended as one of the best evergreens for profitable planting.

In the so-called Western States we have fortunately but limited areas of lands not suited for general agricultural uses, hence the principal portion of forest planting must necessarily be done upon tillable soils, and as the extent to which evergreens can be planted with profit, depends upon the system or form adopted. It requires, therefore, a limited statement of the advantages to be derived from the general adoption of the shelter-belt system.

The soil of forests—as has been determined by a series of European observations*—being cooler in summer, and warmer in winter, than the soil of open fields, it is apparent, therefore, that heated air currents passing over forests must necessarily be reduced in temperature, and their capacity for saturation by moisture be correspondingly reduced and consequently a lessened evaporation of moisture from the soil, hence, with a properly systematized distribution of forests in the form of shelter-belts would tend to lower the summer temperature and increase the winter temperature of the surface air currents moving in any direction and thereby lessening the evaporation of moisture in the summer and reduce the radiation of heat in the winter.

Forests in the form of shelter-belts retard the velocity of surface air currents. The volume of evaporation of moisture from the soil is proportioned to the velocity of the winds as well as to the volume of atmospheric moisture. If by means of a system of shelter-belts, the velocity of surface winds is reduced one-half, a reduction in evaporation of moisture from the soil is effected, and the accumulation of moisture in the soil by rain fall in the autumn, winter and spring, in excess of evaporation, is thus held in reserve for the support of vegetation in July and August, when the evaporation is in excess of the rain fall, and thus ensues a more constant supply of moisture in the soil and be the means ensuring a larger yield of many kinds of farm crops.

Whatever effect forests may have upon climate, it is evident that, as the evergreens retain their foliage throughout the year, they must necessarily effect a greater modification in the winter than the deciduous trees, which have only their naked stems and branches to offer as a resistance to the winds. The degree of the modification of the winter temperature produced by evergreen trees would, aside from other climatic considerations, depend upon the form and extent of the forests.

It is a well known law that friction of any substances, liquids, gases or atmospheric air, generates heat. If it be supposed that there are two areas of land surface, each area to be two hundred miles square, having the same climatic conditions, and that the average velocity of the winter winds is twenty miles per hour; one of these tracts of land to be planted with shelter-belts of evergreens around each forty acres, and that when the belts attained a height of forty feet,

*Prof. F. B. Hough's Forestry Report, 1879.

the average velocity of the wind be reduced to ten miles an hour. According to the law of the radiation of heat, and the law above cited, two results must be obtained:

1st. By means of the reduced velocity of the winter winds, the shelter-belt area would show a *relative* increase of temperature due to the lessened radiation of heat from the soil, as compared with the treeless area.

2d. There would be an *absolute* gain in the increase of the temperature in the shelter-belt area, due to the friction of the air currents impinging upon the innumerable needle-like leaves of the trees composing the shelter-belts.

What the precise difference in the winter temperature would be can only be determined by a general series of observations extending over a considerable period of time.

Width and Composition of Shelter-Belts.

For the purpose of shelter, belts of one, two or three rows of evergreens will answer the purpose intended; but with a view to further profit the belts can be made seven or eight rods in width for the combined purpose of growing timber for farm use and market, and for shelter. In this form of planting cultivated forest, the evergreen can be grown at an enhanced profit, by a judicious admixture of larch, hickory, walnut and ash, etc., with the evergreens, and planting one row of Scotch pine or Norway spruce, or some other evergreen adapted to the soil and locality, upon each margin of the belts. By a series of systematic thinnings the hickory and the ash can be cut when they attain the size of hoop-poles, and these cuttings may be continued at subsequent periods for various uses, at a profit and to the benefit of the evergreens; their wood being of but little value until they attain considerable age and size.

The most valuable kinds of evergreen trees which have been tested and are known to be generally hardy or adapted to special soils and localities, and worthy of cultivation west of Lake Michigan, consist of the Scotch, Austrian, Pitch, Mountain and White Pines, Norway and White Spruce, American Arborvitæ and its hardy varieties, the Red Cedar and other species and varieties of the juniper family.

Some of these species and varieties are of great value for both ornamental and economic uses. The species readily being propagated from seed, and the varieties from cuttings by the experienced planter

Scotch and White Pines.

The Scotch pine, although of European origin, seems to be at home in the north-west, making a rapid growth in all dry soils, even when planted in the most exposed situation, and subjected to drouth, and great extremes of temperature. The wood of this pine is stronger in every way, and the tree grows as rapidly as the White pine, yet its wood is soft enough to be easily worked with ordinary carpenter tools, and the tree is subject to less percentage of loss in transplanting, and will prove more remunerative to the forest planter as a timber tree, and for the purpose of shelter, and should be largely planted in preference to the White pine, although the latter tree may be grown at a profit if carefully handled, and planted in proper soils and situations, or even in exposed situations, if protected by an admixture in the plantation of other kinds of trees.

Cost of Evergreens.

Small evergreen seedlings are now grown from seed at the forest tree nurseries in immense quantities, and are sold at prices varying according to the size and quality of the plants, ranging from \$5.00 to \$35.00 per 1,000. The cost of the plants of suitable size for permanent planting, for one row on the four sides of a 160 acre farm, if planted at the rate of 1,000 to the mile, would not—including cost of boxes, packing, freight charges and labor in planting—exceed \$100.00. Planters with limited means, not able to invest such a sum in one season, might extend the planting over a series of four years at an annual outlay of \$25.00 in each year.

Planting.

Evergreens may be shipped long distances with perfect safety if properly packed and transplanted, with as much certainty of success as so many apple trees, provided that before and while planting, the roots are kept constantly moist and the earth compactly pressed on the roots, with loose soil on the surface, always planting deeper than they stood in the nursery, and properly mulching before the approach of the dry season of the year.

Cultivation.

The subsequent cultivation need not extend later than when the trees cease growing for the season. The cessation of the growth of the pines, spruce and the fir, usually occur about the first of July. The subsequent growth of weeds with the aid of the mulch, will shield the young trees from the scorching rays of the sun and the effects of drouth in the months of July, August and September, and prevent the alternation of freezing and thawing of the soil in the late autumn, winter and early spring which so often proves injurious, or fatal.

The arbor vitæ and the junipers do not complete their season's growing until autumn, hence they require clean cultivation through the whole season.

Protection of Small Trees.

If the trees are of small size and are planted in nursery row or in permanent plantation the cheapest method of winter protection is to run a one-horse single shovel plow, with or without wings attached, according to the distance of the rows apart, and ridge the earth up to the plants. The next spring the ridge should be reduced to a level with the cultivator and hoe, and this method should be continued for three or four years, or until the trees become deeply rooted and no longer liable to be injured or killed by being drawn out of the soil by the alternate action of frost and heat.

Comparative Results.

In conclusion, it may be said that if the resinous woods are so largely required for economic purposes, and if the trees exert so important an influence upon climate, and that by the means of their shade a cool retreat in summer and a greater relative warmth in the spring and the fall, invites the early arrival and prolongs the stay and provides for the more general distribution of insectiver-

ous birds, and the effects of the shade and moisture retard the increase of noxious insects, and that all these causes tend to insure an increased yield of farm crops, and there results an increased value of the estate, based upon the attractiveness of a well proportioned forest containing a judicious admixture of evergreens, and the prospective value of the growing timber adds additional present value; it is believed that a cash investment in the judicious planting of evergreens will prove the source of much larger profitable returns than the same amount of money invested in forced improvements, or any other branch of farming.

DISCUSSION.

Influence of Evergreens.

Mr. Fuller. My experience is in harmony with the statements of the writer. Am satisfied that the influence of limited numbers is already showing results. I have rows of evergreens all around my grounds and in the orchard I set about three evergreens between each two trees.

Scotch Pine.

Mr. Kenney. I have great faith in the Scotch Pine.

Mr. Pearce. In a grove of young pines in my neighborhood I can see a great difference in temperature. Can set a pine as well as any tree. Would set pines, Scotch and White, on tree claims.

Mr. Fuller. Would set on the windy side one row and eight feet apart in the row.

Mr. McHenry. Farmers in my locality think better of spruce. There is a growing interest in evergreens.

Mr. Pearce. I sold one man 2,200 of them.

Sapsucker.

Mr. Dart. The Scotch Pine will bear all that has been said in its favor. Out of 150 set last spring I lost not one. It makes a rapid growth and is a beautiful tree. It has one enemy, the Sapsucker. It had nearly ruined a large number of trees before I discovered it last spring. It makes hole after hole around the trunk and sometimes goes upward as well. Am certain it is not after grubs or worms but the sweet sap of the tree. Never knew them on Scotch Pine till last spring.

Mr. Harris. Think there is no tree so valuable as an evergreen. Am pleased with the essay and this discussion. Had better be careful in destroying the Sapsucker that we do not destroy Wood peckers. Two of the latter very closely resemble it. The Sap-

sucker feeds on many trees. On evergreens, if it can find them, and on Austrian Pine more than any other. Think the Horticultural Society should get some one to write an essay on the subject. A few classes furnish most of the destructive animals. The King Bird is an inveterate insect enemy, but it feeds on Bees, also.

Remedy for Rabbits.

Mr. Dart. Would advise to put out corn in the ear for rabbits. I tried that this year and have not known of serious damage since. Believe it will have the same effect on mice.

Mr. Jordon. My rabbits began on trees in a corn field before the corn was gathered.

Mr. Underwood. Have used arsenic on sweet apples for rabbits, and cats for mice.

The Society adjourned to meet Thursday morning at 9.00 o'clock.

WEDNESDAY EVENING.

The parlors of the Y. M. C. A. having been retained for the presentation of the following paper before that body, the Horticultural Society held no session, but the members having generally accepted the invitation to attend the reading of the paper, Dr. Hatch has kindly consented to its publication in these Transactions

BIRDS OF MINNESOTA.

READ BEFORE THE HORTICULTURAL SOCIETY, JANUARY. 22, 1879,
BY P. L. HATCH, M. D.

Birds have always held a close relationship to man, whether economically or aesthetically considered. No one will question their presence in the Garden of Eden. A paradise of such material beauties as the pen of the inspired writer has given us, without birds, is inconceivable. We can have no doubt that at that sad hour

“When Nature from her seat,
Sighing through all her works,
Gave signs of woe that all was lost,”

the sound of departing wings was the first to break the breathless silence of the doomed Elysian.

It is also matter of sacred record that after the life-freighted ark had drifted upon the great deep that engulfed a world for one hundred and fifty days, the first to go forth over the turbulent, shoreless ocean, upon the errands of man, was a bird. Was service ever so grand, or message so priceless, as the olive leaves borne in the faithful beak of the returning dove-bird? Long before Poe discovered the raven over his chamber door, that sombre bird had fed the persecuted prophet in the wilderness, while another, by his cackling, had saved Rome.

Poets, of all ages, have drawn their sweetest inspirations from their knowledge of the birds, from Job to Whittier. Prophets clothe angels, cherubim and seraphim, of their mystic revelations, with their wings.

By the direction of the flight of aquatic birds over ice floes and arctic waters, as well as the contents of their crops, science has recently gathered a new promise of finding an open polar sea.

And so, from the eventful morning of creation until now, the bird has been conspicuous in almost every department of human events.

Before proceeding to speak of those of Minnesota in particular, let us briefly inquire, What are birds?

A complete answer to this question would consume too much time for this occasion, however profitable its consideration might be to you, or however gratifying it might be to me; yet, for many reasons, that will become obvious as we pass along, it will be desirable to have brought before us in a general way, their relations to the rest of the animal kingdom. To do so, we shall be under the necessity of referring to the classification of animals as a whole. Let us use a figure, which, if not the best that might have been chosen, and deficient in many respects, is still sufficiently appropriate to serve our present purpose. It shall be that of a tree. Let the trunk represent the entire animal kingdom. It has scarcely risen above the earth before it is divided into two huge lesser trunks or branches so dissimilar in almost every particular as to forbid belief that they spring from the same root, yet so they do, and science calls one the Vertebrate and the other the Invertebrate branch of the animal kingdom; the latter of which is a division with which we have nothing to do on this occasion. The former, as the name indicates, represents the entire list of animals possessed of a backbone. This is the typical feature of their structure, and is the revelation of a great plan.

Tracing this branch of our tree a little higher, we see it has divided into four sub-branches, called classes. These classes unfold four different methods of executing the plan, and are named in the order of rank upward, Fishes, Reptiles, Birds, Mammals. The fishes, like the others, have the backbone, but no arms, wings, or legs. They have appendages corresponding to legs and arms, called fins.

Reptiles have a larger proportion of this typical bone, some of them so much that the Creator has withheld from them nearly everything else. Many of them, however, have legs, and nearly all equally inhabit land and water; but we find above the entire class another, occupying not only earth and water, but the air: the Birds. This is the third class in the ascending scale of the Vertebrates, and stands next to the Mammals, the highest, and the one which embraces our own species, or is completed in Man.

Thus briefly have we sought and found the general relationship of the birds to the rest of the animal kingdom..

Of their earliest history very little is known. Paleontologists, who look to the rocks for testimony about the remotest history of our planet, and depend upon fossiliferous remains of once living organisms for the numbering of the pages of

the rocky history of the world, tell us that those remains of birds are found only so far back as the Cretaceous period. And this is far enough, if we accept the "æons" of modern speculation which have passed since then. Their earliest fossiliferous remains, so far as is yet settled among scientists, were obtained in the chalk formations of Europe, without some very recent discoveries should be found to antedate them; which is not very probable. These, as had been anticipated, were the lowest in rank of the class, as they were web-footed swimmers. Others a little higher in development, were obtained in the caves of Brazil, while those still higher were found in the upper Cretaceous, and extending into the lower Tertiary period. Looking still upward, they discovered that the Gallinæ (to which the domestic fowls belong) that were rare in the Tertiary, were abundant in the Diluvium. The Perchers, that embrace the sparrows, thrushes, &c., and the rapacious birds, such as owls, hawks and eagles, were obtained in both the Tertiary and Diluvium. Feathers and eggs have been rescued from the Tertiary of Europe. But we must bear in mind that not a single species of these paleozoic forms exists at the present time. Those of which we are now to speak have taken their places completely.

So far as known, the history of the birds of Minnesota begins with the notes of a few persons connected with the U. S. army stationed at the several forts. Ornithologists, like Audubon, and Nuttall, and Wilson, have visited this section, but they left us no records of their local observations. Mr. Trippe, a modern naturalist, made a small list of birds seen along the line of the preliminary survey of the N. P. R. R. which found its way into the records of an eastern society the name of which I do not now recall. Trappers and sportsmen early noticed the game birds, from whom items of surpassing interest have occasionally come down, if true, yet it is patent that sportsmen sometimes are afflicted with a sort of visual illusion by which they see things too much magnified for the uses of science.

Of all the earliest observers whom it has been my privilege to meet, the late Rev. Dr. Gear, of this city, was the most intelligent and reliable. Many years ago he was a chaplain at one of the forts. He never lost any opportunity to notice the habits or numbers of the song birds specially.

No systematic ornithological work was done until about 1860. Since then a large number of species and varieties have been carefully identified and recorded.

We will now notice some of the more characteristic habits of the principal birds of the State, including those that visit us at the different seasons of the year, and those which are permanent residents.

It is now autumn. The frosts have laid their blighting fingers upon the foliage, and it has turned to sober gray or solemn brown. The approaching winter already looks sternly down upon the chilled earth from the ides of November. Fitful gusts of northwest winds whirl the rejected leaves in wild disorder along the borders of the woods, behind the fences and outbuildings. The Snow Birds have arrived in force from their more northerly summer homes. They occupy every thicket and secluded nook where seeds of the spontaneous vegetation may be found. They are easily recognized by their dark leaden color which is abruptly changed to white on the under parts and outer feathers of the tail, the latter of which is so characteristic while the tail is spread in the act of flying, that a child could not mistake their identity. The name, *snowbird*, was doubtless given them on account of their autumnal migration about the time of the first snows.

This is the most numerous as well as the most extensively disseminated of all the feathered species that visit us in winter, their migrations extending from

beyond the Arctic Circle to the Gulf of Mexico, and from the Atlantic Ocean to the Black Hills, and northwesterly to Alaska. The most southern limit of their winter residence is about two hundred miles south of this city, so we see them but a few weeks before they have passed away from us.

Since the middle of September considerable flocks of Lapland Longspurs have attracted our attention to the plowed fields, where they spend much of their time until in December, when they, too, suddenly disappear in a more southern migration.

The Snow Buntings now arrest our observation by the sheen of their snowy plumage. They keep in close flocks from only a few to many hundreds, and fly compactly, wheeling and turning as if moved by a single impulse. These evolutions show to great advantage the characteristic whiteness of the predominant coloration. Although more noticeable for this reason, and the unity of their dashing flight, they are no more welcome for all reasons, at this sombre season or during the long and inhospitable reign of winter, than the Redpoll Linnets, a smaller but more numerous species of seed-eaters, that spend the winter amongst us. They have been here since the middle of October. Go wherever we may, on the prairies or in the woodland or brushlands, we see them in small and in large flocks, sweeping about, apparently as aimless as dry leaves before the fitful gusts of autumn winds. These flocks, alternated with those of the Snow Buntings, before mentioned, may be seen at the present time, wherever we go, outside the city.

The Linnets, which are smaller and darker plumaged than the Buntings, will be further distinguishable by the crimson of the head and breast of the mature males, while the females and young of the year, of both sexes, are wanting in this coloration which gives the species its common name, Redpoll. They remain all the winter, but leave for the north several weeks before the Buntings and Longspurs, and may be recognized in their flight at any time, by their call note, that is frequently repeated.

About the first of November, two species of Grosbeaks, formerly called Bull finches, put in their appearance—the Evening Grosbeak and the Pine Grosbeak the latter named from its habits of feeding upon the buds of the pines and other coniferous trees, is about the size of the Robin, but more compactly built, and has a large, stout bill, well adapted to the purpose of opening the cones and buds of the pines and firs. Until the attention has been arrested by these beautiful finches sufficiently to recognize their plumage, which is said to be the gayest of any of the land birds that frequent the inhospitable regions of the North, one might see them without surmising their identity or their comparative rarity.

The other species, the Evening Grosbeak, which ornithologists have exceptionally honored with one of the most euphonious names found in the categories of science, *Hesperiphona Vespertina*, is still more remarkable for the huge size of the bill, which is the largest and stoutest of all the United States fringilline, or seed-eating birds. The strongly marked particolors of black, white, yellow and olive green, make its appearance so marked as never to be mistaken.

Its summer residence is found to be, the "Rocky Mountains to the Pacific, north to the Saskatchewan, and east along the northern tier of States to Lake Superior." While with us, it remains mostly within the bounds of the taller, deciduous timber, and feeds upon buds principally. Nicollet Island, in the heart of our city, is a favorite resort, during a part of February and March, and sometimes as late as the middle of May, when they hie away to their more northern breeding places, or their equivalent by altitude on the inland mountains. Bear-

ing in mind that we are still in the latter part of autumn, or early winter, we will not forget to mention the somewhat irregular arrival of the Waxwing, or Bohemian Chatterers, as they are called in Europe. This bird is one of the few common to both Europe and America. The exquisite delicacy of its drab plumage and the presence of bright red appendages to some of the wing-feathers resembling sealing-wax are all that is especially characteristic, as they do not sing. But they are welcome, for they remain with us all the winter to cheer us with their presence, and help us bear our burden of patience while waiting for the tardy spring.

But we must not pass over those species which ever abide with us alike through the fervid heat of summer and the frigid cold of winter. Principal of these, we will only name the Pinnated Grouse or Prairie Chicken, dearest of all to the heart of the huntsman, and only more so than the Sharptail and the Ruffed Grouse or Partridge. Quails are scarcely to be mentioned as so few of them survive our severe winters; yet so they do, to a limited extent, and when favored by a succession of mild winters rapidly multiply again—a single nest having been known to contain 24 to 30 eggs. During some of the many winters I have spent here Woodcock, and one or two species of snipe, have been found in the vicinity of springs surrounded by marshy grounds, but this is not common.

The little familiar Shore Lark, that ought to have been called Road Lark, which flits out from under your horse's feet along almost any thoroughfare, especially upon the open prairie, and lights again just in front of you, is another waif of the winters here. Notice him closely, for he is confidently noticing you, and you will see two little pencils of feathers rise from his head like symmetrical horns, giving him a pleasing and grotesque appearance.

The little immortalized Chickadee will now insinuate himself upon our notice, as he goes from limb to branch on the shade tree, or a shrub, in search of the eggs and larvæ of insects, of which the eggs of the moth of the leaf-rolling caterpillar, the canker-worm, apple moth, and others equally injurious to vegetation are favorite food.

If so favored as to have trees near our dwellings, we can scarcely avoid becoming familiar with the Whitebellied Nuthatch and his less conspicuous cousin, the Redbellied, two of the busiest little bodies that ever you saw. You will know them at once by their habit of traversing the trunks and principal branches, head persistently downward in their search for the very same kinds of food as the last mentioned species. While these are thus employed, the Downy Woodpecker is not far away, and equally industrious in the destruction of the insect pests.

Turning now to the forests in midwinter, we everywhere meet the ubiquitous Jay along our brushland approach, and in the denser thickets embraced in the forests themselves. Be sure he will herald our coming by his clamorous cry from every bush and tree. Exquisitely beautiful in form and plumage, and undaunted by the rigors of a northern winter climate, which ought to secure for him the affectionate friendship of man for his constancy, and his admiration for his beauty, like some "birds of another feather," he is peculiarly unfortunate in the ostentation of his self-assurance, and turns those who would otherwise be friends, into relentless enemies. Knowing this he retaliates by attacking the eggs of others more welcome in summer, stealing from the corn-crib in winter, and in annoying the hunter, by forewarning every other denizen of the forest of his approach. But stay thou accuser, man! Be not too hasty in passing judgment on him whom better acquaintance may prove to be thy constant friend.

Although when pressed by hunger he may sometimes take the opening buds of shrubs in spring—who wouldn't—he is in your yard in search of the eggs of insects, cocoons, caterpillars, and other noxious forms, that are earliest to come forth when winter goes. His food is more varied than that of any other bird we have, which may lead him to stretch the tenth commandment and sometimes break the eighth, but on the whole he amply repays us for his poaching by the offsetting good he does.

When we have penetrated the silent forests sufficiently, we may catch a glimpse of the Black-back, three-toed Woodpecker, as he circles under the boughs of the evergreens, from tree to tree, but the chances are largely against us, and the loud hammering of the Pileated Woodpecker, in the echoing distance, may compensate us for our failure, by leading us by stealthy steps to where we may see this rare bird. He is the largest by far of his order, in our State, resembling the ordinary hen for size, but the hen must be shining black, with the head covered with its brightest blood, to complete the possible illusion. While we are softly wending our way toward the spot where we hope to see this magnificent bird, we almost laid our hand upon the tiny Saw-whet Owl, which flits away a few rods, and lights upon the horizontal limb of a sapling but a few feet above the ground. Just now, forty feet above us, we see a pair of huge eyes, that are staring down upon us only a moment before taking to flight, as noiseless as the departure of a spirit. This is the great Horned Owl. We may possibly see the Bared Owl, but the uncertainties multiply when we remember that his eyes are made for the daylight. These are all permanent inhabitants of the State, but the great Grey and Snowy Owls, the former of which is very rare and the latter more common, are only winter visitors from the arctic regions.

The Redtail Hawk, the terror of domestic fowls, and the Redshouldered Hawk, equally the terror of the squirrels, remain within the borders of the State to a considerable extent. The beautiful Goshawk visits Minnesota regularly in winter from the higher latitudes.

A single specimen of a Gyrfalcon, the famous bird of falconry, was obtained here a few years ago of a variety never before collected within the domain of the United States. It is common to northern Europe, and the higher latitudes of North America, breeding in Labrador, and about some portions of Hudson's Bay. The White-headed or Bald Eagle has an abiding home in Minnesota. The Golden Eagle is only a rare visitant, or certainly breeds here very rarely if at all.

But the winter is passing. The sun's altitude has begun to conquer the frosts which have held the world in their icy grip, and the mantle of snows that has covered the earth begins to show severe rents in many places. The Shore Larks multiply as they come forth from the sheltered coverts, and their unpretentious melodies touch our awakened ears. The snows have not all gone before their nests are completed and the duties of incubation entered upon. These have not been finished when the male Robins, in renewed plumage, suddenly come in parties of from ten to twenty. Their proclivities to cling to the vicinities of the habitations of man, make it possible to know with the utmost precision the times of their arrival, for they begin at once their most welcome songs. About the same time the Bluebirds appear, but less notably on account of their size, although scarcely less so by the singing. The females of both species soon follow, and about the 15th of April nesting has begun. Their insectivorous habits at this time are supposed to be so well known as to need no mention, and were it otherwise, time forbids; but I cannot refrain from asking a question or two which happily the statistics of science have answered.

How many persons are aware that the young Robin, while yet confined to the nest, eats forty-one per cent. more than its own weight of worms every day. "If laid end to end the length of these worms would be about fourteen feet, or ten times the entire length of the intestines? Man, at this rate, would eat about seventy pounds of meat, and drink five or six gallons of water, beer, whiskey, or something else every day to say nothing about the nights. As there are four young usually of the robins, and they bring out three broods each summer, a faint idea of the usefulness of this species may be obtained. Now, multiply the friends of the various interests of horticulture, agriculture, and so forth, by the numbers and proportionate size of all the insectivorous birds which rear their voracious broods within the limits of our State, and who is sufficient for the computation?

It is truly a "penny wise and pound foolish" philosophy that grumbles at the toll these friends levy upon our fruits and grains, when the great supply of their insectivorous food has been exhausted.

To return to our observations of the migrations of birds, we must divide our attention with the Tree Sparrows that have joined the others in celebrating the sun's transit across the Equator. On the partially denuded plowed field, along the roadways, and in the weedy patches where the potatoes have been grown, they are sometimes innumerable. Amongst the leafless trees in the openings and thickets they are more scattered or broken into small parties. They breed about the head of Lake Superior and migrate to the south again in the latter part of October. Sometimes they remain in small flocks all the winter.

Now begin to look for the Pigeons, in their long, sweeping lines of flight. But for want of more opportunity, we would follow them in all their habits during the entire season. Their modes of flight, feeding, nesting, rearing their young, consisting of only one individual at each of three and sometimes four sittings. Wilson, one of the most conscientious ornithologists that history has any record of, computed the numbers of one flock of these gregarious birds in their flight. He estimates their numbers upon an average of three to the square yard, their movement at a generally accepted velocity, and the length of time they were in passing a given point, and found the flock to contain no less than two billions two hundred and thirty millions two hundred and seventy-two thousand pigeons. This estimate he assures us was so far short of the actual number that no question could arise to the contrary. Now, let us pause a moment to inquire how much food would be required for the supply of this feathered host just one day. The answer to this question will afford a clew to the reason why they are provided with a form, wings and instincts that bear them along at the speed of sixty to ninety miles per hour. Caged pigeons are known to eat at least a half pint of acorns, nuts, &c., to each individual in twenty-four hours. If we adopt this ratio, it gives us a daily requirement of seventeen millions four hundred and twenty-five thousand bushels to supply Wilson's flock. These are not conjectures of the fancy but the sober facts of science, and an illustration of the truth of the old adage that "truth is stranger than fiction."

The season of migration having now been so far opened, the influx of various species is so great that to notice them separately would be impossible. We must be content to merely glance at them in groups. March has scarcely gone when ducks, geese, swans, pelicans, cranes, gulls, and but little later, herons, stilts, godwits, sandpipers, curlew, snipe, plover, and in short all the waders and swimmers, embracing mud hens, grebes, galinules and woodcock, are all here, denizens of different localities in the State. It will tax the naturalist to his

utmost to record them. About the middle of April, some of the earlier sylvicoline birds, or Wood-Warblers, flit into our midst in considerable numbers, to remain with us but a short time before they disappear as unobservedly as they came.

These are the Yellow-rump Warblers, and during their stay destroy as many of the eggs of insects hidden away in the bark of trees as any other known species. Few prettier sights are to be seen than when these birds are flitting from twig to twig, in the highest as well as the lowest branches of the trees in their critical search for food. He is a lively little industrious fellow with colors and patterns never to be forgotten after having been known.

The Butcherbirds or Shrikes are now here as becomes evident by the beetles, young mice, &c., found implanted on the thorns and bushes near where they are located. This is a very interesting species and will reward us for observing its distinctive habits. The Swallows immediately follow, and at once enter upon their ceaseless search for aerial insects upon which they feed while upon the wing.

The two migrations of Swallows have been called the two beats of nature's great pendulum that divides the year. We hail their return in prose and in poetry, as if they brought upon their wings the sweet and final assurance of inaugurated spring. Who has not felt like welcoming them back warmly after the long wintry months of their absence, and cheerfully paid them homage by watching their ceaseless wheeling and veering in graceful curves, upward and downward, hither and thither, in lines and circles which however varied always return the individual to us with unfailing certainty.

On some fine summer evening let us seek some secluded spot along the shores of our beautiful river, where we can command a close and uninterrupted view in all directions, and, selecting a single swallow, follow it in patience through its circuitous, zigzag, labyrinthine gyrations for a time, and while noting its unvarying return, let us calculate as best we may the distances passed over as if in straight lines, and see if the figures do not surprise us.

Allowing him only ten hours a day in which to fly—and he employs sixteen—and a minimum speed of one mile in one minute, which is much below his actual velocity, how far does he fly in a day, a week, a month, a year, and the ten years of his average life? Two millions one hundred and ninety thousand miles in a lifetime—equal to over eighty-seven times around the globe! What a life of motion! Who does not envy the Swallow his wings!

We could spend a whole evening upon the life history of this meteor amongst the birds. But I must hasten to mention the Flycatchers, a group of about twenty species not reckoned among the songsters, notwithstanding several of them are the finest of singers. Many, like the King bird, have very plain plumage and hence attract but little popular attention; but some of them, like the Green blackcap, are decorated in beautiful colors.

Most of this quite naturalized group build highly architectural nests, and rear their young here, quitting us only as the approach of frosts threaten their supply of insectivorous food, which is mostly obtained on the wing. Of their specific habits of feeding I would be glad to speak, in the interests of horticulture, but time forbids. It is an assured fact that they are the truest of friends to the farm and the garden, the orchard and the flowers. The first species of this group to arrive about the tenth of April, is the familiar, plaintive Pewee or Phoebe bird, that builds under the old bridge, or some open outhouse near to water. I pass from this interesting family, further represented, as the season advances into May, by the Great-crested, Yellow-billed, Black-cap, Blue, Grey, &c.

Now that the advancing sun has awakened the teeming earth to bring forth its varied productions and develop its hybernated insect life, the Thrushes and Warblers come, like a great living wave, ours only a part of it, which extends from ocean to ocean, that rolls northward from about the first to the fifteenth of May, varying with the seasons. Let us not imagine that this is visible to the closed eye. Our eyes, our ears and our hearts must be open if we are to witness it. Nobody can see it through the dust and cobwebs of a life absorbed by material gains. Like the approach of morning to the eye, eolian music to the ear, and the dawns of love in the heart, this sweetest, grandest revelation of spring steals upon and envelops us in its extatic wonders, or leaves us to oblivious slumbers upon the lazy couch of indifference, while it moves onward like an etherial tide. Nothing could more perfectly illustrate the appropriateness of these figures of speech we have employed than the arrival of the first thrush, called the Hermit. Some little time in advance of all the others, he comes the "avaunt courier" of the approaching hosts. "The dark, solitary cane and myrtle swamps of the Southern States are the favorite haunts of this silent and recluse species, and the deeper and more gloomy these are, the more certain are we to meet with this bird. So in migration, we must look for it in the shadows of dense forests, where the moist leaves and mosses have carpeted the sylvan halls of silence. But the Ruby crowned and Golden crested Kinglets, less cautious and in considerable numbers along the borders of streams, begin to break the silence; and then the little House Wren, the most thoroughly in earnest of all the song world, and just ready to burst if he doesn't open his mouth, jumps upon the stage like a little "prima donna," and fills the air with a solo that would wake the whole choir if only here. The concert thus preluded, is steadily swelled by the addition of another, and another warbler, until some morning early in May, a breath of coming summer suddenly opens the buds of many waiting blossoms, rendering the air fragrant with familiar aromas, the Mocking Thrush, or Brown Thrasher, as he is infelicitously called, peerless amongst American songsters, mounts the topmost branch of some isolated tree and pours forth a volume of melody, which, for fullness, variety and sweetness, is utterly incomparable, and challenges all attempt at description. The entire woods have now become vocal with song. The warblers in endless varieties of decoration more delicate and beautiful than art can imitate or pen describe, representing some thirty species, some of which are very numerous, and the Sparrows, some of which are scarcely inferior in song or plumage to the warblers, have registered themselves "present" in full by their songs or their busy appropriation of insects and seeds not already consumed by the winter species.

The gorgeous Baltimore bird, with notes as soft as a flute, the Orchard Oriole, Robin Redbreast, Grosbeak, a charming, soft, rich singer, the Cat Bird, than whom there is only one superior melodist, and that his regal relative the Mocking Thrush before mentioned, the Indigo Bird and Meadow Lark have each joined the grand chorus.

We listen, wrapt in astonishment and admiration. This wondrous mystery of the Divine goodness. The Bird! holds us spellbound. From the beginning to the end of its weird and wonderful life its history is one of surpassing charms and indiscribable fascinations.

The egg, its elliptical marble palace of embryotic infancy, the most comprehensible and symmetrical of forms, like a mirror hung athwart the portals of nature, flashes into our thought the startling problem of life. A charming pen calls it "a complete minature world, a perfect harmony from which nothing can

be taken away and to which nothing can be added. I conceive that under its apparent inertness it holds a high mystery of life and some accomplished work of God."

Cradled in the solitudes of the wild woods, the meadows, or the reedy morasses, and warmed by the love that foregoes the ceaseless activities of the wing, it opens its portals in due time to the exit of a new life—a *bird*—helpless as a new born infant upon the mother's breast. "It would die if it were not loved," says the same enamored friend. Loved! Every mother loves from the ocean to the stars." A few brief days and the warmth of the matured bosom has clothed it in downy robes, plumed its unfolding pinions and with a faith that honors the Infinite Goodness sends it forth upon the buoyant air, "a thing of beauty—a joy forever."

And what shall we say of wings? Wings! Everything in nature sighs for wings. Compared by the measure of his aspirations, wingless man is the most impotent of all. His utmost dream of freedom clothes him with wings which bask upon the clouds. He looks *down* upon a world and would feign embrace it with his love.

From the rudimentary wing of the Penguin of the southern pole to the triumphant pinions of the Frigate Bird of mid-ocean, which science, not poetry, declares able to measure the trackless wastes at the almost unimaginable rate of 240 miles an hour, we have a gathering prophecy of final freedom and immortality.

When the last mentioned bird so chooses, all distance vanishes, he breakfasts at the Senegal and dines in America."

THURSDAY MORNING.

TREES FOR FOREST PLANTING.

The meeting was called to order by the President at 9.00.

The Committee on trees for forest planting reported the following:

Deciduous Trees.

1. Cottonwood.
2. White Willow, on moist soil.
3. White or Rock Elm, on moist soil.
4. Sugar Maple.
5. White Ash.
6. Box Elder.
7. Butternut.

Evergreens.

1. Scotch Pine.
2. White Pine.
3. Red Cedar.
4. Arbor Vitæ.

DISCUSSION.

European Larch.

Mr. Grimes. Think the European Larch should be on the list. Think this tree one of the best for all soils that we have.

Mr. Hollister. It gives most satisfaction on sandy upland of any tree. I recommend that we place the Larch on the list.

Mr. Jordan. Mr. Thompson said we could move evergreens at any season, but the Larch can only be moved very early in the spring. Would plant Scotch Pine mostly. My last orchard is surrounded on three sides with Evergreens. Two roads run through it, and these are bordered with them, and every twenty-fifth row of trees is of Evergreens. I set 2,500 Scotch Pines and lost only two trees. The trees were from St. Francis nurseries, the roots immersed in water and then in a puddle of mud till the trees were set.

Mr. Grimes. I favor the Larch, but as it starts early it must be transplanted early. It is best to have the trees shipped in the fall, and heel them in for the winter, and make it the first business in the spring to plant them. Then you will have abundant success.

Mr. Pearce. We made that list for the people. The Larch is my favorite tree. I can set a thousand and save every tree. I trim up in transplanting. For protection would set 18 inches apart and let them grow. If planted further apart they will make fence posts in eight or ten years. I plant at any time by trimming up. Of 100 transplanted eight or nine feet high not one was lost. For evergreens I would set on a tree claim, Larch, Balsam Fir, Scotch and White Pines. For general planting no tree is so good as the Cottonwood. I have seen a row of them 20 feet high that we set only three years before. No tree can take its place for first planting. Next to Scotch Pine with me is Balsam Fir.

Mr. Dart. Don't think we should reject the Larch because of the ignorance of the people. Let them learn. I prune up my Evergreens well. Trim up Scotch Pine so that I can see under the branches.

Mr. Pearce. I do not take off the top, but I cut back all the limbs.

Mr. Storrs. As regards the Larch I believe there's something in the soil. It does well on the sandy soil of the prairie, but on the rich, black loam of timber regions it fails. Have tried it frequently. The Larch was added to the list by a vote of nine for and none against. Motion was made to adopt the list as thus amended,

Balsam Fir, Norway and Black Spruce.

Motion was made to amend by adding Balsam Fir, Norway and Black Spruce, which amendment was carried by a vote of nine for and one against, and the motion to adopt was then carried by a vote of ten for and one against.

Mr. Gould expressed doubt concerning the success of the butter-nut.

PRESIDENT'S SMITH'S ADDRESS.

Motion was then made and carried to take up the regular order of business which was the address of President Smith. At its conclusion motion was made and carried to file for publication, and a vote of thanks was tendered President Smith. The following is the address:

Gentlemen and Ladies, and Members of the Minnesota State Horticultural Society:—I am happy to again meet you at this our annual winter meeting, and hope that you have all brought abundant fruits of your experience for the past year that you can offer for the mutual benefit of all. I am also glad that we are to hold our meetings in and share the hospitalities of this city where the citizens and public are so noted for their love of and good taste in horticulture and rural adornments. I shall not take up your valuable time with a lengthy address, when I know that there are others here much more competent to address you, and those that this society are anxiously awaiting to hear, and those whose minds are amply stored with the knowledge of experience that they will gladly give for the benefit of all if the opportunity is offered them.

But I can not let this opportunity pass without again calling your attention to some of the wants of Minnesota horticulture as they occur to me after twenty years apprenticeship at the business here in Minnesota. Now if I should repeat many things that have been said before you must not think strange for there are many axioms or truths in horticulture as well as other callings that will bear repeating often, and thereby impress them upon the mind. Now we here in Minnesota are differently situated from most of our brother horticulturists in the other states of the Union in regard to soil, climate and markets, and, with perhaps the exception of western Wisconsin and northern Iowa, require different modes of treatment and different varieties for our markets from those of most of our other states.

Glutted Markets.

Now in regard to markets for such as grow fruits, flowers, vegetables, plants or trees for sale, hoping thereby to earn a living for themselves and families, I must say the prospects are not as good as I wish or as good as in some other localities, for here we have more competition and more to contend against and less certainty of remunerative prices than almost any other locality. Our markets have changed within the last ten or fifteen years. Before that we could calculate something about the supply and probable demand and the effect upon prices;

now Minneapolis, St. Paul and all other towns or cities of any size reached by railroads are supplied not by our local and surrounding farmers, gardeners and fruit growers and seedsmen, but the whole United States from Florida to California, and even Spain, Italy, and the West Indies and the Bermuda Islands all contribute to supply and overstock our small markets, and when once shipped here must be sold in this market for what it will bring, and being perishable and often far gone and unfit for food is often sold for much less than the cost of transportation, saying nothing about the cost to the producer. This is now the fact in regard to almost everything that is grown here by our horticulturists for sale. I have seen the past season many times car loads of such stock sent here and sold that was unfit for use, when there was plenty of our own home grown upon the market good and fresh, and could be purchased at very low prices; but as the imported stock must be sold it would generally find purchasers at some price. Now to enumerate some of those articles shipped here—asparagus, lettuce, radishes, rhubarb, peas, potatoes, beans, onions, squash, tomatoes, cabbage, celery, cauliflower, cucumbers, melons, strawberries, raspberries, blackberries, grapes, and in fact everything grown in this or any other climate that can be shipped here before being rotten and worthless. Now when we take into consideration that in the climate and soils several hundred or a thousand miles south of this, all these things, or most of them, can be produced much earlier in the season, if not cheaper than in Minnesota, you will say at once that the prospects of our horticulturists is hopeless, or at least not very flattering. I say not necessarily so. There are two sides to this question.

Remedy.

But the facts above stated do now exist, and require horticulturists to look them squarely in the face and to meet them like men. And as we cannot adopt a protective tariff or other legal means to protect ourselves, or make our business more profitable, so that we will not be compelled to give up the ship, we must look out for other means to put a stop to this immense amount of importing of what we have enough and to spare, and in some way bring our own productions into market, and create a demand for home-grown fruits, flowers, vegetables, trees, plants, vines, seeds, roots, bulbs, &c., &c. Now the great question for not only this society, but each individual thereof to solve is, how can this be done? How can we create a demand sufficient to enable our own nurserymen, seed growers, florists, fruit growers and market gardeners to sell stock enough at fair prices to support themselves and families in competition with all that is imported and sent here for sale on commission. Some, or the most of you men, think this is a very small matter, but with me I know with many others, it is one of the utmost importance, and one, in fact, upon which our bread and butter must depend. Now I have studied this matter most thoroughly for some years, and for me I can see but one way out, and I will briefly state that, and if any one or all of you can suggest a better one, I, for one, will be most happy to hear it. My remedy is this: that we shall, one and all, study our callings, and see what our land, soil, location, and markets considered, is best suited for, and what crops or fruits we can grow to the greatest perfection, each and every man for himself. Then plant no more than what he can most thoroughly and properly prepare the ground for, and no more than what he can cultivate and keep clean, mellow and free from weeds as long as the same requires, and no more than what he can harvest and market in the best possible condition, and in the most

careful and attentive manner. In other words let everything of Minnesota growth, offered for sale in our markets, be of vastly superior quality, in addition to being fresh and put up in the most attractive styles. Then in that case I think Minnesota horticulturists would not suffer so much as now from competition with imported stocks. As Daniel Webster once said about lawyers, "there was plenty of room on the upper shelf;" no competition there; or words to that effect. I have always found that whoever had anything for sale better than was to be found upon the market or in common channels of trade, always found plenty of customers when once known, at fair and firm prices. To illustrate my meaning, who does not know that at this time, with the millions of bushels of wheat in our State seeking a market, that if one man had any quantity of good, hard, clean wheat that would weigh 60 to 64 lbs to the measured bushel he would not want for customers, no matter how much he might have, at prices far above all market quotations, while the farmer having wheat that was unsound, dirty and only weighing 40 to 45 lbs. to the bushel would not find customers at any price. This is equally true of butter. I know of one farmer who sold butter in St. Paul market for 19 years at 40 cents per pound the year round and to one customer during the 19 years' time at this price, and he never has wanted for customers at this price, while thousands of tons of butter seeks a market at 3 to 10 cents per pound, and the same holds good in regard to all farm produce. The best not only commands the best price but is of the readiest and quickest sale. And why is this not true to a greater extent in fruits, vegetables, flowers, plants, trees, seeds, and all horticultural products, they as a general thing being much more perishable. Now we here certainly have this advantage, if we cannot grow any better fruits and vegetables (which I most emphatically deny) we can put them upon the market in a fresher state and in a more attractive manner, and thereby enhance the price and our own profits. Much might be said on this subject but one illustration will serve to convey my meaning. I last summer saw two farmers in St. Paul market with currants for sale; one had his currants in two bushel baskets, had brought them 12 or 14 miles. They were picked over ripe and in a careless manner, some stems &c., and were originally vevy fine currants, but looked rather dilapidated or worse for carriage. He offered them for 50 cents per bushel and could not find a purchaser on the market and had to leave without selling, while the other had extra fine currants carefully picked, just ripe, and neatly put up in quart baskets and sold readily for 10 to 12½ cents per quart or \$3.00 to \$3.50 per bushel. Now parties will tell me they are poor, they cannot afford to cultivate well and buy the best varieties, and what they do grow they cannot afford to buy crates and baskets for, cannot afford to put up in good shape for market. Now I will attempt to say no man who grows fruit or berries for market can afford to do otherwise than put it up in the best and most attractive manner if he wishes or expects to get a living at his business. Now to sum up I would recommend and think this society will sustain my views or most of them, that in order to succeed as a Horticulturist in Minnesota, requires,

1st. That a man love and take pleasure and pride in horticulture.

2d. That he should thoroughly understand or learn his business.

3d. That he should understand his soil, location and market in order to know what to plant.

4th. He should not attempt to raise more than he can cultivate in the very best manner, and harvest and market at the proper time and in the best and most attractive manner. Now, by observing these few simple rules, nearly all will succeed even here in Minnesota.

Obituary.

Since our last annual meeting one of our number and one of Minnesota's most active and intelligent pomologists has been called to higher, and, may we not hope, to a better sphere, and that our loss may be his gain. I refer to Dr. P. A. Jewell, of Lake City, and I hope at the proper time suitable resolutions will be passed and spread upon the record, and copies furnished his friends and family. His illness was reported at our last meeting, and all regretted his absence, and were in hopes he would soon be among us again, to give his ripe experience and counsel, and advise us new beginners. I trust the committee on obituary will see that one is prepared for publication in our next Transactions.

Retrospect.

In closing, may I not be permitted to glance over the past year of 1878, which, taking the year through, was remarkable for the moderate winter weather and the extreme heat and wet of July, that damaged the wheat crop to such an extent, and at the same time ruined our raspberry crop, or mine at least. It blighted as badly and as quickly as did the wheat. The late frost in spring destroyed a large portion of the fruit of all kinds, not only in Minnesota, but in many other States. Apples, plums and strawberries suffered severely in most parts of our State; still the supply of Minnesota fruits of all kinds, with exception of plums, was never as plenty in the St. Paul market as in 1878. Had it not been for the late frost I have no doubt the quantity would have been doubled.

Fruit at the Fairs.

The quantity of fruits and quality on exhibition at our State Fair and at the Minneapolis Fair, I see by the programme were to have been read and discussed ere this, but notwithstanding, I must call your attention to that magnificent bushel of cranberries raised and exhibited by Russell, Lane & Co. of Morristown, Rice county. They and the State might well feel proud of such fruit; and should it not encourage others to embark in the culture of cranberries. The cranberries were accompanied with a statement of their name and cultivation, yield per acre, &c., a copy of which I hope will be received from the secretary of the State Agricultural Society, for publication in these Transactions.

Agricultural College and State Reform School.

I will here express my thanks, and I think this society and the county at large should thank our Secretary, Professor of Agriculture, State University, for the display of vegetable and other products made at our State Fair; also the State Reform School, and the officers and young men thereof. Such displays from State institutions always help at our fairs, not only to make a display, but to spread information among our citizens, and to show that taxes paid for their support are not thrown away, and that we may yet expect great results from them in aiding agriculture and horticulture in our State. I hope that a committee will be appointed from this society to visit the University and State Reform School next summer, in the gardening season, and there learn all that will be of advantage to us of their new varieties and modes of cultivation, and show them that we appreciate their efforts, and that they can be of great and lasting benefit to

our State, if they properly instruct those in their charge in agriculture and horticulture. With my best wishes for the Minnesota Horticultural Society, its officers and members, I remain as ever,

Your humble servant,
TRUMAN M. SMITH.

Discussion on the address was passed over by unanimous consent.

COMMITTEE ON OBITUARY.

The Secretary moved that a committee to consist of J. M. Underwood, Dr. Twitchell and G. W. Fuller, be appointed to present suitable resolutions on the death of the late P. A. Jewell, and that the same committee be requested to prepare an obituary notice for the transactions. The motion was carried.

CATALPA.

Mr. Harris read a communication from Mr. Douglas, of Waukegan, on the Hardy Catalpa, and remarked that if the trees were hardy we ought to know it, and if not we ought to report the fact.

Mr. Elliot mentioned the fact that one had been growing on Mr. Pettit's grounds for several years.

Mr. Harris. I move that it be the sense of the Horticultural Society, that the Catalpa is not hardy in Minnesota, and that we do not advise the planting of it except for experiment. The motion was carried.

SECRETARY'S REPORT.

The secretary made his report, and motion was made and carried to file, for publication with the proceedings. The following is the report:

Mr. President, Ladies and Gentlemen:—The by-laws of our society make it the duty of the secretary to report at the annual meeting an abstract of the matter that has come into his hands. I suppose your president enjoys a monopoly of suggestions of general policy, of regrets at past misfortune, of congratulations over successes, and of glowing anticipations concerning the future. I might therefore be pardoned if my report were only a dry and colorless presentation of facts.

Some facts there are, however, which strike more forcibly the recording officer of your society than any one else. I trust you will permit me to make some observations on these also.

Progress.

In the early proceedings of this society there seems to have been a constant and repeated effort to establish the feasibility of growing fruit, especially the apple, in this State. Paper after paper appears to have been presented to show that there is nothing in soil or climate more difficult to overcome than in regions where fruit culture had attained considerable progress. Report after report was read showing the isolated instances in which fruit had been obtained in greater or smaller quantities. Enthusiasts argued with a zeal which seemed almost to indicate a desire to establish their own faith on a sounder foundation. As time passed this subject has received less and less attention and in the proceedings of the later years it has been almost as notably absent as it was notably conspicuous before. The possibility of fruit growing has been settled, not alone in the minds of the founders and members of this society, but likewise in the minds of many others in nearly all parts of the State. Papers are now produced to show the best varieties, the best methods of propagating and the best modes of culture. Reports are now read to show the success of different varieties and the various methods of culture. Speeches are now made in defence of particular varieties or particular modes of culture as they were formerly made in defence of fruit culture in general.

Growing Reputation.

The growing reputation of your proceedings abroad is another circumstance worthy of notice. In the last published transactions will be found a list of fourteen State and National societies in correspondence with your own. Nor is this an artificial and unfair exhibit, for this correspondence has been sought quite as often as it has been offered. Permit me in this connection to submit some of the letters that have been received.

Letter from Hon. P. Barry.

MOUNT HOPE NURSERIES, }
ROCHESTER, N. Y., February 21, 1878. }

Chas. Y. Lacy, Esq., Minneapolis, Minn.:

DEAR SIR.—Your favor of 16th inst. is received, also transactions of your State Horticultural Society for 1876 for which I am very much obliged. I find this to be a very instructive volume as regards fruit culture in your state. I will send as many volumes of ours as I can, but fear that will not be many, but I will gladly pay for your volumes.

With congratulations, I am,

Yours,
P. BARRY.

Letter from Hon. M. P. Wilder.

BOSTON, MASS., Feb. 22, 1878.

MY DEAR SIR.—I am much obliged for the copy of State Horticultural Society transactions for 1876 which you have the kindness to send me. The Minnesota Society is doing a good work, not only for the state but the country. It is

by just such careful, practical and enterprising labors as your members have put in action, that your state will soon enroll herself among those of greater age in pomological experience. Thus she will ascertain what fruits are adapted to her location and thus greatly enrich and bless her people. I shall be glad to receive the back volumes of your transactions.

I send by mail a package of pamphlets and when this volume of the American Pomological Society proceedings is out will send that also. Yours, as ever, with thanks for your notices of me.

MARSHALL P. WILDER.

Letter from Chas. Gibb, Esq.

80 AYLMER ST., MONTREAL, 23d FEB., '78.

To Prof. Chas. Y. Lacy, Sec. Minn. S. H. Soc.

DEAR SIR:—The reports of the Minn. S. Hort. Soc. are now upon the shelves of the Montreal Hort. Soc.'s library. They have been examined by many of our officers and members, and their worth to us in this like climate, is fairly understood.

At the request of the directors, in the absence of the secretary, Mr. H. S. Evans, I write to ask if the Montreal Hort. Soc. could obtain from your society (or through your society from your State government, as the case may be) fifty copies of your forthcoming report, and if so, on what terms? These copies might be, either in paper or cloth. Paper we would probably prefer.

This is all I am requested to ask, but if I may here express my personal views, I would venture to hope that in course of time some permanent arrangement might be made by which our horticulturists might thus profit widely by your written experience.

The M. H. Soc. are about to issue another report, of which we will send you copies about two months hence. Were these reports equal to those of your society, some arrangement might be made on the basis of exchange; but as they are not, and are not likely to be, such would never do, for no arrangement could be lasting unless lastingly beneficial to both.

Yours very truly,

CHARLES GIBB.

Letter from Chas. W. Garfield, Esq.

MICHIGAN STATE POMOLOGICAL SOCIETY, }
SECRETARY'S OFFICE, GRAND RAPIDS, APRIL 24, 1878. }

Chas. Y. Lacy, Minneapolis, Minn.

MY DEAR SIR:—Would you like to exchange a few copies of your last report (say ten) for a like number of mine? I am doing this with nearly all the State horticultural and agricultural organizations.

Again; is it possible for me to consummate an exchange of old reports with you? I can furnish you with nearly a complete set of ours.

Please reply at your convenience. My last reports are in store at Lansing, and I shall go up there in the course of two or three weeks, and will forward you ten copies, if you so desire.

Yours truly,

CHAS. W. GARFIELD.

Prof. W. J. Beal, of our Agricultural College, is anxious to get your reports, to use in connection with his teaching.

Foreign Fame.

I must also inform you that the spreading fame of your society is not limited by the shores of America but has crossed the Atlantic ocean, in proof of which I present to you the "Twenty-first Annual Report of the Horticultural Union of Bremen and vicinity for the year 1877." I would gladly give you a synopsis of its contents only that limited time and limited knowledge of German do not permit. I cannot forbear, however, calling your attention to the striking illustrations the volume affords of the value of scientific names for plants and animals. The scientific names are given in this volume and by reference to any botanical text book you, as well as I, can learn just what plant is meant. Were the popular German names employed, not even a German scholar could tell you what plant was meant unless personally acquainted with it, and no German dictionary would afford assistance.

Increased Membership.

The signs of growing interest and appreciation do not all come from without the borders of our own State. Many names are found on the list of members for last year that have not before appeared on the rolls of the society. Some of these have forwarded their membership fees without solicitation from any one. A larger number have renewed their membership though at first induced to become members by the efforts of others. The number of members though not so large as the year previous yet presents no cause for discouragement.

Doings of Other Societies.

Programmes of several horticultural meetings have been received. In most of them we note some subjects of interest to peculiar localities, and also some subjects in which we have an equal or even greater interest. In the programme of the Michigan Pomological Society "Yellows in the Peach" is the first subject proposed for discussion, while "Horticultural Implements," "Orchard Fertilizers and Cultivation," "Progress in Floriculture" and "Insect Enemies" are subjects that command or may command our own consideration. There are some subjects also which seem to invite more of speculative discussion than we are wont to indulge in. Of this sort I consider the topic "How shall we utilize our Rainfall."

At the meeting of the Ohio Horticultural Society "Pear Culture" seems to have been the peculiar topic, while the majority of the subjects treated would have been equally interesting to us. Some of them were "Culture and Diseases of the Grape," "Rules for Judging Fruits," "Utilizing Surplus Fruits," "Protection of Orchards," "Forestry," "Ornamental Planting about School Houses," and "Civilizing Influences of Horticulture."

The Iowa Horticultural Society met Tuesday but no programme has been received.

Tree Planting Laws.

I will spare you further observations of this nature, and confine myself to more relevant matter.

At the last meeting of this society action was taken favoring an amended tree claim law, and an act to provide for sending a commissioner to Europe to examine and report upon forestry on that continent. The Secretary was directed to notify the Senators and Representatives of this State in Congress. This was done, and answers were received, promising compliance with the request of the society.

Executive Committee.

The Executive Committee has met once since the last meeting of the society. There seeming to be occasion for it, a meeting was called on the State Fair grounds at St. Paul, Sept. 6th, when the following resolution was offered and unanimously passed:

Resolved, That no products grown in whole or in part by State aid, shall be awarded a cash premium at this exhibition, but that the judges in the different departments be requested to pass upon such exhibits, and to award such honorary commendations as may be found just.

Passed unanimously by the Executive Committee, Sept. 6th, 1878.

Library.

The library of the society has received important additions during the past year, among which the following are particularly worthy of mention:

Proc. of Am. Pom. Soc., session of 1869 and session of 1871; 10 Addresses and other papers from Hon. M. P. Wilder.

Proc. W. N. Y. Hort. Soc., 1874 to 1878, 5 volumes in paper, from P. C. Reynolds, Secretary.

Reports Mich. Pom. Soc., 1871 to 1877, 7 volumes, in cloth, from Chas. W. Garfield, Secretary.

Reports Mich. Bd. Agr., 1870 to 1877, 7 volumes, in cloth, from Prof. W. J. Beal, of Mich. Agr. College.

Owing to accumulations of reports and proceedings in paper binding, which are difficult to preserve in good shape, the secretary has taken the responsibility of having some of them bound together in leather, at an expense that will appear later in this report.

The following is a complete list of all the books and papers now in the library:

Transactions Illinois Hort. Soc., 1868 to 1874, 6 volumes, in cloth.

Entomology of Missouri, 1873, 6th report, 1 volume, in cloth.

Report of Wisconsin State Hort. Soc., 1869, 1 volume, in paper.

Transactions Wisconsin State Hort. Soc., 1871 and 1872, 2 volumes, in cloth.

Transactions Wisconsin State Hort. Soc., 1874 to 1876, 3 volumes, in cloth.

Pomology of Maine, 1873 and 1874, 1 volume, in cloth.

Pomology of Maine, 1875 and 1876, 1 volume, in leather.

Transactions and Papers of Nebraska State Hort Soc., to 1871, 1 volume, in leather.

Transactions Nebraska State Hort. Soc., 1872, 1 volume, in cloth.

Transactions Nebraska State Hort. Soc., 1877, 1 volume, in paper.

Transactions Kansas State Hort. Soc., 1872 to 1874, 3 volumes, in cloth.

Transactions Kansas State Hort. Soc., 1875, 1 volume, in paper.

U. S. Dept. of Agriculture, Report, 1876, 1 volume, in cloth.

Reports of Fruit Growers' Association and Entomological Society of Ontario, 1875 and 1876, 1 volume, in leather.

- Report of Michigan Pomological Society, 1871 to 1877, 7 volumes, in cloth.
 Reports of Michigan Board of Agriculture, 1870 to 1877, 7 volumes, in cloth.
 Transactions Iowa Hort. Soc., 1877, 1 volume, in cloth.
 Transactions Illinois Dept. of Agriculture, 1876, 1 volume, in cloth.
 Proceedings W. N. Y. Hort. Soc. 1874 to 1878, 5 volumes, in paper.
 Fruit List for Province of Quebec, 1 volume, in paper,
 Transactions and Second Report of Fruit Committee of Montreal Agr. and Hort. Soc., 1876, 1 volume, in paper.
 Proceedings of Am. Pom. Soc., 12th session, 1869, 1 volume, in paper.
 Proceedings of Am. Pom. Soc., 13th session, 1871, 1 volume, in paper.
 Nine Addresses by Hon. M. P. Wilder, 1 volume, in leather.
 Address by Hon. M. P. Wilder, at 15th session Am. Pomological Society, 1875, 1 volume, in paper.
 The Chronotype for February, 1873, containing Sketch of Life, and Portrait of, Hon. M. P. Wilder, 1 volume, in paper.
 Sketch of Life and Services of Hon. M. P. Wilder, 1 volume, in paper.
 History and Progress of Mass. State Board of Agriculture, with Report on Fruits, by Hon. M. P. Wilder, 1 volume, in paper.
 Catalogue of Phænogamous and Acrogenous Plants Found Growing Wild in the State of Michigan, 1 volume, in paper.
 Proceedings First Annual Meeting Minn. Hort. Soc., 1 volume, in paper.
 Transactions Minn. State Hort. Soc., 1866 to 1873, 1 volume, in cloth.
 Transactions Minn. State Hort. Soc., 1874 to 1877, 5 volumes, in paper.
 Fifth Report Vermont Board Agriculture, 1878, 1 volume, in cloth.
 Twenty-first Annual Report of Horticultural Union of Bremen and Vicinity, 1877, 1 volume, in paper.

It was moved that the society ratify and adopt the action of the executive committee on exhibition by State institutions. The motion was carried.

Judging Fruits.

The rules adopted by Ohio Horticultural Society for judging fruits were read by the secretary. A motion was made to adopt these rules.

Mr. Dart moved to amend by adding the point "hardiness of tree."

The secretary objected that it would be impracticable to observe it in making awards.

Mr. Harris. I would have some such condition apply to seedlings.

Mr. Elliott. There is much difficulty in keeping the fruit for the winter meeting, and I think it should be given to some one person to keep for the society.

Mr. Dart. There is no difficulty in getting a statement of the condition of the tree and its prolificness, and I move to amend so

that hardiness and productiveness of the true shall be taken into account in making awards on seedlings and Russians. This amendment was carried by a vote of eleven for and one against.

The motion to adopt the rules was then carried.

The following are the rules, with amendments:

General Rules.

1st. In all cases the judges are to be governed by the letter and spirit of the schedule under which the exhibitors have made their entries. The general appearance of the fruit, care in its selection, and taste displayed in its arrangement or grouping, each entry being distinctly separated from the rest; these are all elements of the highest importance, and should receive appropriate consideration by the committee.

2nd. In every group, whether the single plates, the threes, fives, tens, or larger collections of fruits, there should never be more than one plate of any variety in any one group. Lists of the names of varieties exhibited should accompany each group, and must be attached to the entry card, and have a corresponding number and designation—with or without exhibitor's name, according to the rule.

3rd. The same plates of fruit cannot compete for different prizes, except in the grand collection of largest display (sweepstakes): though the several entries for the best ten, best five, or other numbers, and the best plate, may embrace the same varieties, but not the same plates of specimens: in each case they must be duplicates, and in sweepstakes they will count for a single variety.

4th. When the schedule prescribes the number of each kind, usually 3 or 5, to be placed on exhibition, the exact number must be presented, neither more nor less.

5th. In general collections of fruit by individuals, counties or otherwise, when the several species of fruits are specified in the schedule, they must all be presented, or the collections may be passed by the committee.

6th. In all cases, but more especially in the display, or greatest and best collections, number of varieties is the *prima facie* test of superiority, other things being equal; but quality, relative value, their perfect condition, and tasteful appearance, will be considered, and should rank thus respectively:

1. Number.
2. Quality or value.
3. Condition, approaching perfection.
4. Taste in the display.

To illustrate: on a scale of ten.

	Rank.
No. 1 may have 100 plates—the largest collection.....	10
Quality, some inferior varieties.....	5
Condition of fruits, rather poor.....	5
Taste in the display.....	5
Total.....	25
No. 2 may have 90 plates—ranking.....	8
Quality, superior in most—ranking.....	8
Condition of fruit, perfect—ranking.....	10
Taste in the arrangement, good—ranking.....	9
Total.....	35

No 2 would, in this case, take the premium.

In the case of single plates of the several kinds named, or in a competition for the best plate, or basket of any kind of fruit, we may consider, condition, form, size, color, and texture with flavor.

On the same scale we may have two entries to decide thus:

No. 1.		No. 2.		
Condition.....	Perfect.....	10	Stem lost.....	8
Form.....	Abnormal.....	8	Perfect.....	10
Size.....	Overgrown.....	8	Uneven.....	6
Color.....	Perfect.....	10	Too pale.....	6
Texture and flavor.....	Superior.....	10	Insipid.....	5
Totals.....		46		35

This scaling might be used in deciding between any number of single plates of designated varieties, competing with one another for the best plate of any kind, or for the basket premium, with assortment or single variety according to the words of the schedule.

Special Rules.

The judges should have an ideal standard of perfection, in all cases, made up of the following particulars:

1st. The condition and general appearance of the fruit—which should be in its natural state, not rubbed nor polished, nor specked, bruised, wormy, nor eroded—with all its parts, stem and calyx-segments—well preserved, not wilted nor shriveled—clean.

2nd. The size in apples and pears, particularly, should be average and neither over-grown nor small—the specimens should be even in size.

3d. The form should be regular or normal to the variety and the lot even.

4th. The color and markings, or the surface to be in character—not blotched nor scabby.

5th. When comparing different varieties, and even the same kind, grown on different soils, the texture and flavor are important elements in coming to a decision. 5 points.

In judging Russian and seedling apples we must in addition to the above take into account 6th, hardness of tree, and 7th, productiveness; these to be obtained from written statement of exhibitor. 7 points.

In the class peaches, plums, etc., the important elements are size, form, color, flavor, and condition. 5 points.

In grapes we must consider and compare the form and size of the bunches, the size of the berries, their color, ripeness, and flavor and condition. 5 points.

In currants we shall have to examine the perfection and size of the bunches; and of the berries, their flavor and condition. 3 points.

In gooseberries we shall look to the size, color, flavor and condition of the fruit. 4 points.

In judging cherries we have as our guide, the size and form, the color, flavor, and condition. 4 points.

In judging strawberries we shall compare the size and form, color, flavor, firmness and condition. 5 points. They should be shown with stem and calyx.

Raspberries may be shown with or without the calyx. In this fruit we shall have to judge of the size, color, flavor and condition. 4 points.

Blackcaps must have size, color, flavor and condition. 4 points.

Blackberries must be tested according as they present size, color and form, flavor and texture, and condition. 4 points.

In all cases it is well to have a convenient scale of comparison, for which the number ten is found to be easily managed. The highest figure denotes perfection for the variety, and five is mediocre, below that is condemnatory. The total of the marks should exceed fifty per cent. of the possible number, or the entry must be passed as unworthy of award.

TREASURER'S REPORT.

The report of the treasurer was then called for. The secretary reported the absence of the treasurer, and made a statement of the condition of the treasury. The following motion was then made and carried.

Resolved, That since the treasurer has received no money since his last report, the report of that officer be now dispensed with.

ELECTION OF OFFICERS.

President.

It was moved, and the motion carried, to proceed to the election of officers by ballot, without nomination, and that ballots for president be taken.

On the first ballot Wyman Elliot received a majority of all the votes cast, and was declared elected, but positively declined to serve; whereupon a second ballot was taken, in which J. T. Grimes received a majority of all the votes, and was declared elected.

Mr. Harris moved to declare the election unanimous; which motion was carried.

Vice Presidents.

For vice president for the first district Mr. Fuller moved that the secretary be directed to cast the ballot of the society for E. H. S. Dart. The motion was carried and Mr. Dart declared elected.

In the same manner Ditus Day and U. S. Hollister were elected vice presidents for the second and third districts, respectively.

Secretary.

For secretary the third vice president was directed to cast the vote of the society for Charles Y. Lacy, who was accordingly declared elected.

Treasurer.

For treasurer the secretary was directed to cast the vote of the society for J. M. Underwood, and he was declared elected accordingly.

Executive Committee.

For members of the Executive Committee the secretary was successively directed to cast the votes of the society for—

J. S. Harris, of La Crescent.

Wyman Elliot, of Minneapolis.

T. G. Carter, of St. Peter, and

F. G. Gould, of Excelsior.

Delegates to Agricultural Society.

For delegates to the meeting of the State Agricultural Society—
Wm. E. Brimhall, of St. Paul.

T. M. Smith, of St. Paul.

Dr. R. W. Twitchell, of Chatfield.

M. Pearce, of Rochester, and

G. W. Fuller, of Litchfield, were successively elected.

It was moved that the delegation be empowered to fill vacancies, and the motion was carried.

MR. JORDON'S STATEMENT.

The secretary moved that Mr. Jordon's tabular statement on varieties of apples be republished in the transactions of the society.

Mr. Dart objected that it would be taken as the action of the society, but the motion was carried. The statement will be found in appendix.

MR. HARRIS'S FRUIT REPORT.

Mr. Harris offered his report as member of General Fruit Committee, and it was ordered to be filed for publication without reading.

The following is the report:

REPORT OF THE GENERAL FRUIT COMMITTEE, FIRST DISTRICT.

To C. Y. Lacy, Sec. State Horticultural Society:

Climate and its Injuries.

The lowest temperature at any time last winter ranged from eight to fourteen degrees below zero in different sections of the district, and continued at that but a few hours; and for weeks in succession did not drop down to zero. Little snow fell at any time, and quickly disappeared. Thaws were frequent. The prevailing winds were south and southwest. Moisture was abundant in the earth, and air mists and fogs occurred frequently, and consequently trees, plants and vines that were reasonably hardy survived the winter with little or no protection. Some Philadelphia raspberries were injured on southern exposures, probably from premature start in early spring. Spring commenced to open very early, but received check from cold weather in April, and fruit trees were not in bloom much in advance of their usual time, and came forward very slowly. Severe frosts occurred on the mornings of May 11th, 12th and 13th, cutting the fruit badly on low grounds and in the valleys, but doing very little injury on the bluffs and high grounds.

Blight, Insects, &c.

Much less blight has occurred than for many years past. Insect ravages have not been as extensive as in some past years, but the canker worm is on the increase, also the steel blue grape beetle. Birds were very plenty and very destructive to the fruit. Field mice and rabbits are a great pest, and at this time are making fearful havoc with the young forest and orchard trees.

Apples and Crab Apples.

The average apple crop was nearly as good as on any previous year, as the trees on the bluffs and ridges bore to their fullest capacity, making up for the deficiency in the valleys. The varieties that have come under my notice as fruiting the best are Duchess of Oldenburgh, St. Lawrence, Price's Sweet, Haas, Fameuse, Red Astrachan, Fall Stripe, Jeniton, Talman Sweet, Alexander, Sops of Wine, and some varieties of seedlings. In some cases the Russets bore well, but generally were shy in bearing. Ben Davis is doing well on some of the ridges. Crabs and Siberians have not done as well as in former years. The blight seems to have checked their fruitfulness and somewhat affected the quality of the fruit. Hyslops were fair, but the Transcendent seems to bring the best returns. The new varieties have not done well enough so far to create any great sensation. Apple trees made a fair and apparently healthy growth, and the fall being rather dry and frosts holding off late, except on very rich and low grounds, they have generally matured their wood, and are apparently in good condition to survive a hard winter, unless there may occur injury to the roots in sandy and gravelly soils from lack of moisture. The prospect seems to be good for a medium crop next season. The trees that were severely injured in the winter of 1872 and 1873, continue on the decline, and will soon all have perished, but the orchards planted since that date are doing well and look promising. The number of trees planted last spring exceeds that of previous springs for several years.

Pears.

As far as I know there are but two bearing trees in the district, both in the town of Hokah. They came through the hard winter without injury, have never blighted and are bearing good crops. Young trees have been planted in limited quantities, and are generally promising well. The variety is Flemish Beauty.

Plums and Cherries.

The cultivation of the tame plum has been mostly abandoned and the crop of native plums was mostly a failure; whether this should be attributed to insects or blight I am unable to say. Cherries are not much cultivated but bore a crop wherever the trees were found.

Small Fruits.

The strawberry crop was the best for many years and the season of bearing continued longer than usual. The Wilson, Charles Downing and Kramer Seedling did the best; Green Prolific and Col. Cheeney not of much account. Currants were a fair crop, although in some instances injured by spring frosts. Raspberries were a short crop. The prospect is that we shall be compelled to throw out the Doolittle on account of blight and red rust. The red raspberries were plenty for a few days; after which the birds took the whole crop. Among blackberries the wild were abundant, and the Snider is promising well.

Grapes.

Grapes in some vineyards were an abundant crop and remarkable for their size and quality, especially those of Brownville and La Crescent; in other towns the late frosts cut them and mildew and rot has prevailed more or less. The Concord is the most exempt from disease. Salem, Rogers 15, Diana and Isabella are among the most affected. Have not noticed the Janesville. All Hybrids suffered more or less.

Nurserymen.

Our principal nurseries have suspended operations. Their plea is that they cannot raise and furnish good trees at prices to allow them to compete with foreign nurseries, therefore this district is an open field for tree peddlers and humbugs. For our protection against all such we petition the State Horticultural Society to devise and perfect some mark to put upon the agent representing a responsible nursery, that we may be able to distinguish him from the smoothed-tongued frauds who doubly rob us by taking our money and our time in finding it out.

Varieties.

The following is a list of fruits we recommend for cultivation in this district. Apples for general cultivation: Duchess, St. Lawrence, Haas, Fameuse, Red Astrachan, Price's Sweet, Tallman Sweet. For trial: Wallbridge, Wealthy, Plumb's Cider, Sops of Wine.

Pears, for trial only, Flemish Beauty.

Siberians and *Hybrids*, Early Strawberry, Transcendent, Maiden's Blush, Pride of Minneapolis.

Grapes—Concord, Delaware, Clinton.

Plums—Only the best natives.

Currants—Red Dutch and White Dutch or White Grape.

Raspberries—Seneca Black Cap and Turner, red.

Strawberries—Wilson, Charles Downing, Downer's Prolific. For trial: Kentucky, Kramer's Seedling.

Respectfully submitted,

JOHN S. HARRIS,

La Crescent, Minn.

The society then adjourned to meet at 1:30 p. m.

THURSDAY AFTERNOON.

MINNETONKA FRUIT FARM.

The meeting was called to order by Pres. Smith at 1:45 o'clock, The Secretary was called upon to read Mr. Gideon's report to the Board of Regents, of operations on Minnetonka Fruit Farm.

It was moved that a copy be requested for publication in the transactions, which motion was carried.

The following is the report:

To the President of the University:

SIR:—As Superintendent of the experimental fruit farm, I herewith send the following report of my doings.

On the nineteenth of April last I got notice to proceed with the work. On the next day began the clearing, and by the sixth of May had the ground cleared, plowed, and 795 trees set, and two days later under good fence. The trees set were crown and root grafts. About three-quarters have done well, the growth ranging from one to five feet. The loss was occasioned by the heat and dryness where brush and logs had been burned.

The varieties set were our best hardy seedlings, alternating in row with the best long-keeping varieties that could be procured, all worked on hardy seedling stock. In same manner I propose to fill vacancies next spring, having on hand the best of stock to do it with.

On another part of the premises I set a few grapes last spring, about one-half being seedlings from our best grapes, the soil and location being all that could be desired, and I expect to set some five or six hundred more next spring.

Adjoining the grapery, and on top of the hill, I intend to set a pear orchard in the spring, the location and soil being just what I want for the purpose.

With respect,

PETER M. GIDEON.

EXCELSIOR, MINN., Nov. 12, 1878.

PRESIDENT SMITH RETIRES.

At this point President Smith proposed to retire and making some farewell remarks, in which he thanked the society for the kindness and courtesy he had received, he introduced his successor.

MR. GRIMES' ADDRESS.

On taking the chair Mr. Grimes delivered the following brief address:

Honorable Members of the Minnesota State Horticultural Society.

In assuming the duties of the chair I desire to return you my humble and sincere thanks for the honors you have been pleased to confer upon me. I assure you, gentlemen, that I accept this position with some reluctance in view of my inability to perform its duties so well as your worthy retiring president has done. But I know the members who compose this society, and I know, gentlemen, that you will sustain the work through your executive and other committees, and as individual members, and more especially through your worthy and efficient secretary, in whom I have implicit confidence. I accept the position you have assigned me, and will endeavor to discharge its duties to the best of my ability, trusting that you will sustain me, and render all the assistance in your power, and whatever I may lack in judgment, or my imperfections may be that you will overlook them in view of the great work we have before us.

Once more, gentlemen, I thank you for the honors bestowed upon me.

DISCUSSION ON FRUIT FARM REPORT.

Mr. Jordon explained that Mr. Gideon had grafted the hardiest, long keeping varieties of apples that we can grow, such as the Walbridge on his hardy seedlings, and planted these trees alternately with the seedlings.

Mr. Tyler. To get good results you must fertilize by hand and six pints of seed obtained in this way is worth six bushels of any other. We get in this way our best grapes and by it we can greatly improve our native plums.

MR. UNDERWOOD'S PAPER.

Mr. Underwood was called upon for his paper on the growth and

cultivation of nursery stock. Motion was made and carried to place on file for publication. The following is the paper :

GROWTH AND MANAGEMENT OF TREES IN THE NURSERY.

Mr. President and Gentlemen:—Having a deep interest in the work and success of a society to which I feel closely allied through the able representation of him, whose memory I cherish with many lasting regrets for his untimely demise, I thought I could do no less than comply with our worthy secretary's request as best I could, and leave the fitness of the appointment for others to decide.

Upon the growth and management of fruit trees in the nursery, those of you who are already engaged in the business can hardly expect to hear from me anything new or of particular interest. And to any one wishing to enter into the business I can not hope to make it clear how you may succeed in every particular in the limited space to which I must necessarily confine my remarks; but if I shall say anything that will be of interest to you in a general way I shall be satisfied.

Seeds and Planting.

Trees in the nursery are usually grown from the graft. Apple seed is procured at large cider mills, or of seedsmen, and is worth from \$5.00 to \$7.00 per bushel. It should be fresh and well prepared. You can mix it with damp sand and freeze it before sowing; or soak it in warm water until it swells, changing the water frequently so as to prevent fermentation. The ground on which to sow the seed should be high prairie land, and *new* is preferable as there will be less weeds. Plow it deep in the fall and subsoil; then harrow well and leave in good condition for early sowing, which should be in March or April, in drills twenty to twenty-four inches apart. Cultivate well until frost cuts the weeds, and just before freezing dig and pack in sand in the cellar.

Cions and Grafting.

Cions are better cut in November, or before very cold weather sets in and packed in new saw-dust or sand, care being taken that the temperature is not high enough to start their growing, and that they do not dry out.

The process of grafting I need not describe as it is familiar to all, but will say that after a great deal of experimenting, I am fully satisfied that a medium length cion of say three inches, on a root of the same length, or a long root and short cion, for the promptness and uniformity of starting, with the vigor of growth derived, will more than counterbalance the advantages claimed for any other method.

Perhaps the most important part of grafting is the manner in which the waxing is done. I would use thin manilla paper and lap so as to make it several times thick, to strengthen and secure the grafts for handling but more particularly for weeding and cultivating among, as it is here that the care taken will be amply rewarded.

Keeping the Grafts and Planting.

The care of grafts until time for setting should be much the same as that of roots or cions, with this addition that I would raise the temperature sufficiently

a fortnight before planting to knit well the union of the graft and swell the buds.

If possible select new ground on which to plant, that you may have less weeds, and where the snow will lie well during the winter; but if the ground is old it should be thoroughly enriched. Plow it deep in the fall and sub-soil it, then in the spring plow it again as soon as it is dry enough to work, drag thoroughly and roll or plank it. Mark out in rows north and south $3\frac{1}{2}$ feet apart, using a long rope stretched tightly and make the impression by walking on it.

For setting I prefer a flat iron or steel dibble which any blacksmith can make. It should be 8 inches long and 2 inches wide with the shank put through a short shovel handle with nut on the end.

In the field do not expose the grafts long to sun or wind, mud the roots in a mortar of rich earth; then make a hole with the dibble that will admit the graft without crowding it down, and by another insertion of the dibble press the earth against it very firmly at all points but more particularly at the bottom. Plant six inches apart, and leave only one bud in sight.

Cultivation.

As soon as the weeds show themselves, with a careful horse and a good cultivator, turn the surface ground away from and within two inches of the row. The best implement I have found for this purpose is one of my own devise. I took our Perry scarifier that we tried a season to find some use for, and put in teeth made the same as those in Van Brunt's seeder except that they are a little larger, and on the two corners I put a scraper tooth six inches long and four inches wide. Running one of these close to the row I can speedily put it in good shape for weeding.

The best and cheapest way to do this is to hire women or girls and boys, and give them one each of the two kinds of hand weeders sold by D. M. Dewey, Rochester, N. Y. With these they can speedily and safely clean the weeds and earth away. When the weeds start again, reverse the shovels in your cultivator and turn the earth back to the row.

The ground should be kept clean and stirred frequently until July, when usually it will be better to stop the cultivation and encourage the early ripening of the wood.

Aphis.

Should they be attacked by the Aphis, dip them in a weak solution of carbolic acid, saltpetre, or Paris green in water, or a strong decoction of tobacco. The latter we have used most, but I feel sure there is something better.

Cultivation Second Year.

In the fall, if you have cultivated as you ought and the season has been favorable, your trees will have grown from two to three feet high, and you will have a nice crop of weeds and pigeon grass to hold the snow, and protect the trees during the winter. If, however, you have not got a uniform growth, and many are only six inches or a foot high, you had better cut them back to the ground in the spring, and leave only the strong ones, which, if the winter has not been severe, will need cutting back to the first strong bud. Begin cultivating very early the second year, so as to turn the ground up to the sun for warmth, and

thereby encourage an early growth. After the ground is sufficiently dried out to warrant it, put on the cultivator with the seeder-like teeth, and pulverize it thoroughly. Next, to and between the trees use a narrow potato hook for cleaning out the weeds and loosening the soil.

Pruning.

This, I believe, covers all the essential points in cultivating during the period necessary to put trees on to the market, but to give directions for pruning trees is much more difficult, as it must necessarily vary. 1st, with the variety; 2nd, the particular condition they may be in; and 3d, the season, whether wet or dry; and each of these conditions being subject to greater or less variations. If your yearlings have made the extra growth mentioned, and have come through the winter without serious injury, you can, with the same success the second year, have a fine lot of trees ready for the market, one-fourth of which will be five to six feet; one-half, four to five feet; and the remainder three to four feet and culls. Some of the varieties will need to be kept trimmed up pretty well, and much can be done by rubbing off the leaves and sprouts before they get too old and need the knife; but bearing in mind that the leaves are the lungs of the tree, and that through them it must largely depend for sustenance, you will avoid taking off too much at a time, or you will stunt, rather than increase the growth.

Varieties like the Haas and Wealthy, in their habits of growth, will need very little pruning, and it will need to be done largely with the knife after the limbs are too large to rub off. The reason is, that while they are fast growers they do not form many limbs, and most of what they do have must be left for foliage. The Duchess and Tetofski need much the same treatment for the reason that they are slow growers, particularly the latter. Many kinds, however, will, from the upper limbs, throw out a vigorous growth of laterals, which will supply the needed want, and the lower limbs, and foliage can be kept rubbed and trimmed off. Two-year-olds that are not dug for market, will need to be trimmed in the spring to whips. Avoid cutting too close to the body, but of course do not leave any of the limb. Cut the top or central shoot back so as to have from six to eighteen inches of the last year's growth, cultivate and care for as in the second year, and spend your leisure time in looking for some one to buy them or else enter your farm under the "timber culture act." If you should have any three year old trees left on your hands you can, in the spring, cut the top off to the last or second bud on the previous year's growth, and keep on doing so each successive year; but what will be the final result, deponent saith not.

DISCUSSION.

Taking Up Trees in Autumn.

Mr. Pearce. I practice taking up trees in the fall, tying in bundles of a hundred, heeling in for the winter and planting again in the spring. The labor required does not exceed the loss by standing in the nursery row, and trees are obtained from this method in a very healthy condition.

Mr. Dart. I have tried wrapping the graft and setting without wrapping, and the latter does not answer with small ones.

Mr. Underwood. It pays to wrap to strengthen the graft in its place for the first weeding.

Mr. Pearce. By transplanting I also get the advantage of numerous fibrous roots.

Mr. Dart. If you transplant every winter how are you to know if you have got a hardy tree to sell? Then you don't want too short and fibrous roots.

Mr. Pearce. Mr. Sias and Mr. Somerville practice this method, and with the soil properly prepared they put in the trees almost as fast as a man can walk.

PREMIUMS FOR FLOWERS.

The committee on premium list for flowers and display then reported and the following discussion ensued :

Mr. Dart. I think too much is given to the florists as compared with the fruit men, and the latter ought to ask the florists to be just.

Mr. Tyler. The florists are looking out for themselves.

Mr. Underwood. I see that the florists have premiums for many things. This is right but the fruit men should have the same.

PREMIUMS FOR FRUITS.

A motion was made and carried to have the report of the committee on fruit premiums read before acting on this report.

The report was read by Mr. Jordon.

Wines and Vinegar.

Mr. Smith. I move to strike wines and vinegar from the list for the report assumes that they are worth less than the fruit is worth before manufacturing.

Mr. Jordon. I second the motion. I don't believe in having anything to do with them.

Mr. Hollister offered the following substitute, which was accepted by Mr. Smith.

Resolved, That the wine and vinegar list be referred to State Agricultural Society to be placed on list with domestic manufacturers.

Mr. Harris. I should drop them aside from these reasons.
The motion to refer wines and vinegar was carried.

Apples.

Mr. Harris moved to reduce the premiums on Duchess to five and three dollars; which motion was carried.

Mr. Harris moved to raise the premium on Wealthy to eight, five, and three dollars.

Mr. Jordon. That throws the larger premiums into the hands of nurserymen, for they have most of the Wealthy, while many Duchess are exhibited by farmers.

Mr. Smith. I move to amend so that we offer each and every other apple recommended by the society, three, two and one dollar; which amendment was carried.

The report as amended was then carried, and the report on apples adopted as amended.

Crab Apples.

A motion was made to adopt the report on crab apples.

Mr. Harris moved to amend to reduce premium on best collection of crabs to ten dollars; but this amendment was lost.

Mr. Smith moved to amend so as to make the premiums on all the varieties of crab apples recommended by the society, three, two and one dollar; which motion was carried.

The motion to accept the report of the committee on crabs, with the above amendment, was carried.

Seedlings.

Mr. Dart moved to amend the report so that fall and summer apples shall have the same premiums as winter apples; and the motion was seconded.

Mr. Harris moved to amend so that a statement regarding hardiness and productiveness shall accompany each entry; but this had already been adopted by the society.

Mr. Smith. The demand for fall apples is greater than for winter. The amendment was carried, and the seedling list adopted with this amendment.

Grapes.

Mr. Smith. I move to amend the report so as to offer premiums of three, two and one dollars for the varieties recommended by the society, and to reduce the premiums for best and greatest variety to fifteen, ten and eight dollars.

Mr. Fuller moved to amend the amendment so as to drop the best and greatest variety, but this was lost.

Mr. Dart moved to amend the amendment so as to reduce the premiums on best ten varieties to ten dollars, but this was also lost.

Mr. Dart moved to amend the amendment so as to make the premiums on varieties recommended for trial two dollars, but this was lost.

Mr. Harris moved to amend the amendment so as to make the premiums for best and greatest varieties, ten, eight, five and three dollars, which motion was carried.

The report on grapes was then carried with these amendments.

For premiums on seedling grapes the report of the committee was accepted.

Pears.

Mr. Dart moved to strike out premiums on pears, but the motion was not seconded.

Mr. Harris. I move to amend the report so as to make the premiums for the best collection five, three and two dollars, and for the best plate of any variety, five dollars.

The amendment was carried and the report as amended also carried.

Plums.

Mr. Dart moved to amend so as to make the premiums on the best plate of native plums five, three and one dollars, which amendment was carried.

Peaches.

The report of the committee was adopted.

Blackberries.

Mr. Smith. I move to amend the report so that a statement shall accompany entry, showing the hardiness of the bushes, which amendment was carried.

Mr. Harris. I move to amend so as to cut off the highest premium, which amendment was carried and the report carried as amended.

Trees.

Mr. Harris. Moved to offer for the best display of fruit trees grown in Minnesota of varieties adapted to the state, not less than two years old, premiums of ten and five dollars.

Mr. Jordon. Moved to lay this motion on the table, which was carried.

Mr. Jordon. Moved to adopt the premiums for cranberries as on the old list, which motion was carried.

Mr. Hollister. Moved the adoption of the report of the committee on flower exhibition, which motion was seconded.

Mr. Dart. I call for the proportion of money offered to professionals and to amateurs.

The motion was carried.

The following is a tabulated list of the premiums adopted by the society:

Premiums for Fruits at State Fair—Report of Committee, as amended and adopted by the Horticultural Society—All fruits exhibited for premiums must be grown by the exhibitors.

APPLES.	First Best.	Second Best.	Third Best.	Fourth Best.	Fifth Best.
Best and greatest variety, not less than five specimens each	\$ 25 00	\$ 20 00	\$ 15 00	\$ 10 00	\$ 8 00
Best show of autumn apples adapted to Minnesota	8 00	6 00	4 00	3 00	
Best show of winter apples	10 00	8 00	6 00	5 00	
Best plate of Wealthy	8 00	5 00	3 00		
Best plate of Duchess of Oldenburg	3 00	2 00	1 00		
Best plate of Tetofsky	3 00	2 00	1 00		
Best plate of Haas	3 00	2 00	1 00		
Best plate of Plumb's Cider	3 00	2 00	1 00		
Best plate of Price's Sweet	3 00	2 00	1 00		
Best plate of Saxton	3 00	2 00	1 00		
Best plate of St. Lawrence	3 00	2 00	1 00		
Best plate of Uter's Red	3 00	2 00	1 00		
Best plate of Famense	3 00	2 00	1 00		
Best plate of Talman's Sweet	3 00	2 00	1 00		
Best plate of White Astraehan	3 00	2 00	1 00		
Best plate of Elgin Beauty	3 00	2 00	1 00		
Best plate of Peach	3 00	2 00	1 00		
Best plate of Alaska	3 00	2 00	1 00		
Best plate of Julia	3 00	2 00	1 00		
Best plate of Molly	3 00	2 00	1 00		
Best plate of Claydon	3 00	2 00	1 00		
Best plate of Kimball	3 00	2 00	1 00		
Best plate of Hart's Seedling No. 7	3 00	2 00	1 00		
Best plate of Viola	3 00	2 00	1 00		
Best plate of Malinda	3 00	2 00	1 00		
Best plate of Walbridge	3 00	2 00	1 00		
Best plate of Queen of Elgin	3 00	2 00	1 00		
Best plate of Rollins' Pippin	3 00	2 00	1 00		
Best plate of Rollins' Russett	3 00	2 00	1 00		
Best plate of Rollins' Prolific	3 00	2 00	1 00		
Best plate of Wabasha	3 00	2 00	1 00		
Best plate of Hart's Seedling No. 11	3 00	2 00	1 00		
Best plate of Clara	3 00	2 00	1 00		
Best plate of Yearley's Winter	3 00	2 00	1 00		
Best plate of Frost's Seedling	3 00	2 00	1 00		
Best collection of Siberians and Hybrids	15 00	10 00	8 00		
Best five varieties of Crab Apples	10 00	8 00	5 00		
Best Winter Crab for Minnesota	5 00	3 00			
Best Crab for all purposes	5 00	3 00			
Best plate of Transcendent	3 00	2 00	1 00		
Best plate of Hyslop	3 00	2 00	1 00		
Best plate of Beach's Sweet	3 00	2 00	1 00		
Best plate of Orange	3 00	2 00	1 00		
Best plate of Early Strawberry	3 00	2 00	1 00		
Best plate of Comcal	3 00	2 00	1 00		
Best plate of Hesper Blush	3 00	2 00	1 00		
Best plate of Maiden's Blush	3 00	2 00	1 00		
Best plate of Power's Large Red	3 00	2 00	1 00		
Best plate of General Grant	3 00	2 00	1 00		
Best plate of Whitney's No. 20	3 00	2 00	1 00		
Best plate of Virginia	3 00	2 00	1 00		
Best plate of Beach's Red	3 00	2 00	1 00		
Best plate of Minnesota	3 00	2 00	1 00		
Best plate of Aiken's Striped Winter	3 00	2 00	1 00		
Best plate of Alaska	3 00	2 00	1 00		
Best plate of Brier's Sweet	3 00	2 00	1 00		
Best plate of Quaker Beauty	3 00	2 00	1 00		
Best plate of Woodland Winter	3 00	2 00	1 00		
Best plate of Hutchinson's Sweet	3 00	2 00	1 00		

SEEDLING APPLES.	First Best.	Second Best.	Third Best.	Fourth Best.	Fifth Best.
Best seedling winter apple for Minnesota.....	\$ 10 00	\$ 8 00	\$ 5 00	.....	.....
Best seedling autumn apple.....	10 00	8 00	5 00	.....	.....
Best seedling summer apple.....	10 00	8 00	5 00	.....	.....
Best seedling apple for all purposes.....	5 00	3 00	.....	.....	.....
Best seedling sweet apple.....	3 00	.....	.....	.....	.....
Best collection of Russian Apples.....	10 00	8 00	5 00	.....	.....
PEARS.					
Best collection of Pears.....	5 00	3 00	2 00	.....	.....
Best plate of any variety.....	5 00	.....	.....	.....	.....
PLUMS.					
Best plate of native Plums.....	5 00	3 00	1 00	.....	.....
PEACHES.					
Best collection of Peaches.....	5 00	3 00	.....	.....	.....
GRAPES.					
Best and greatest variety.....	10 00	8 00	5 00	3 00	.....
Best ten varieties for Minnesota.....	14 00	10 00	8 00	.....	.....
Best single variety for Minnesota.....	10 00	8 00	5 00	.....	.....
Best plate (5 bunches) Concord.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Delaware.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Hartford Prolific.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Clinton.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Rogers No. 15 or Agawan.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Eumelan.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Iona.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Janesville.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Rogers No. 4 or Wilder.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Rogers No. 9 or Lindley.....	3 00	2 00	1 00	.....	.....
Best plate (5 bunches) Rogers No. 19 or Merri- mac.....	3 00	2 00	1 00	.....	.....
Best show of foreign Grapes.....	5 00	3 00	.....	.....	.....
Best seedling Grape of Minnesota origin.....	10 00	5 00	.....	.....	.....
BLACKBERRIES.					
Best Blackberry hardy in Minnesota.....	5 00	3 00	.....	.....	.....
CRANBERRIES.					
Best peck cultivated cranberries, method of cultivation and yield per acre stated in writ- ting.....	15 00	10 00	.....	.....	.....

All seedlings shall be considered such until the name shall be adopted by the Minnesota State Horticultural Society.

Entries of blackberries must be accompanied by written statements showing hardiness.

Entries of seedling apples must be accompanied by written statements showing hardiness and productiveness.

Premiums for Plants and Flowers at State Fair as Reported by the Committee and Adopted by the Society.

FOR PROFESSIONALS.	1st Best.	2d Best.	3d Best.	4th Best.	5th Best.
Best display of Greenhouse Plants.....	\$ 20 00	\$ 15 00	\$ 10 00	.....	.....
Best 12 new and rare plants that have been brought out since 1st Jan. 1878.....	10 00	5 00	.....	.....	.....
Best 12 single (assorted) Geraniums in bloom.....	5 00	3 00	.....	.....	.....
Best 6 single (assorted) Geraniums in bloom.....	3 00	2 00	.....	.....	.....
Best 6 double (assorted) Geraniums in bloom.....	5 00	2 00	.....	.....	.....
Best double specimen Geranium in bloom.....	2 00	1 00	.....	.....	.....
Best single specimen Geranium in bloom.....	2 00	1 00	.....	.....	.....
Best 6 Tuberoses in bloom.....	3 00	2 00	.....	.....	.....
Best 12 varieties (assorted) Fuchsias in bloom..	7 00	5 00	3 00	.....	.....
Best 6 varieties (assorted) Fuchsias in bloom..	5 00	3 00	.....	.....	.....
Best single specimen Fuchsia, Double.....	2 00	.....	.....	.....	.....
Best single specimen Fuchsia, Single.....	2 00	.....	.....	.....	.....
Best 6 plants of any kind in bloom.....	5 00	2 00	.....	.....	.....
Best 12 Roses (assorted) in pots.....	7 00	5 00	3 00	.....	.....
Best 6 Coleus (assorted) in pots.....	5 00	3 00	.....	.....	.....
Best 3 specimens Coleus.....	2 00	1 00	.....	.....	.....
Best 12 varieties Foliage or Ornamental Plants suitable for bedding, and not more than 3 Coleus.....	5 00	3 00	.....	.....	.....
Best Climbing and Trailing Plants.....	3 00	2 00	.....	.....	.....
Best 12 Begonias (assorted).....	5 00	3 00	.....	.....	.....
Best 6 (assorted) Ferns.....	5 00	3 00	.....	.....	.....
Best single specimen Fern.....	2 00	.....	.....	.....	.....
Best 12 Dahlias (assorted) named.....	5 00	3 00	.....	.....	.....
Best 6 Dahlias (assorted) named.....	3 00	2 00	.....	.....	.....
Best 12 Verbenas (assorted) not less than three of each variety.....	3 00	2 00	.....	.....	.....
Best 6 Verbenas (assorted) not less than three of each variety.....	2 00	1 00	.....	.....	.....
Best display of Gladioli, not more than 1 spike of each variety.....	5 00	3 00	.....	.....	.....
Best 12 Asters (assorted).....	3 00	2 00	.....	.....	.....
Best 6 Asters (assorted).....	2 00	1 00	.....	.....	.....
Best display of Pansies.....	3 00	2 00	.....	.....	.....
Best Hanging Basket.....	3 00	2 00	.....	.....	.....
Best Rustic Stand, with bark.....	7 00	5 00	3 00	.....	.....
Best display of Cut Roses, true to name.....	5 00	3 00	2 00	.....	.....
Best 6 Roses, cut.....	2 00	1 00	.....	.....	.....
Best 3 Coxcombs.....	1 00	50	.....	.....	.....
Best assortment of Annuals.....	5 00	3 00	2 00	.....	.....
Best Bridal Bouquet.....	5 00	2 00	.....	.....	.....
Best Hand Bouquet.....	5 00	3 00	2 00	.....	.....
Best Basket Cut Flowers.....	5 00	3 00	2 00	.....	.....
Best Miniature Landscape—Villa Residence.....	15 00	10 00	.....	.....	.....
Best 6 Calladiums.....	5 00	3 00	.....	.....	.....
Best display of Pinks in bloom, not more than 1 variety of each, named.....	5 00	3 00	.....	.....	.....
Best display of Tri-color and Silver-edged Geraniums, (assorted).....	5 00	3 00	.....	.....	.....
Best display of Bronze Geraniums (assorted)...	5 00	3 00	.....	.....	.....
Best Double Petunias.....	3 00	2 00	.....	.....	.....
FOR AMATEURS.					
Best display of Green House Plants.....	15 00	10 00	5 00	.....	.....
Best 3 Geraniums (assorted) in bloom.....	5 00	3 00	.....	.....	.....
Best Double Geranium.....	2 00	.....	.....	.....	.....
Best Single Geranium.....	2 00	.....	.....	.....	.....
Best Double Fuchsia.....	2 00	.....	.....	.....	.....
Best Single Fuchsia.....	2 00	.....	.....	.....	.....
Best design for Natural Leaves, Ferns and Flowers.....	5 00	3 00	.....	.....	.....
Best Hanging Basket.....	2 00	.....	.....	.....	.....
Best display of assorted Roses, true to name.....	5 00	3 00	.....	.....	.....
Best display of Foliage Plants.....	5 00	2 00	.....	.....	.....

We would recommend that two directors be appointed to see that plants are staged in their proper classes and that all plants are staged in their proper places by 12 o'clock first day of show. Judges to commence at once. Cut flowers, bouquets, &c., to be on the tables by 10 o'clock next day. Also, that a committee be appointed to meet one month before the show to select three judges of competent men which shall be notified at once to give you time, if one refuse to act, to select another, and that no names be placed on any stand until after the judges have made their awards, under penalty of disqualification.

All 12 and 6 entries to be shown in uniform size pots, not over 8 inches.

RESOLUTIONS OF RESPECT.

Mr. Fuller reported resolutions on the death of the late P. A. Jewell, of Lake City; and the report was adopted. It was as follows:

Mr. President.

Your committee on resolutions expressive of the sense of this society in the loss of its fellow member, Dr. P. A. Jewell, of Lake City, would submit the following:

Tribute to the Memory of Dr. Jewell.

WHEREAS, It has pleased our Heavenly Father, since our last winter's session, to take from this life our highly esteemed associate and member, Dr. P. A. Jewell;

Resolved, That we do most earnestly mourn the loss, while in the strength and beauty of manhood, of one so dear to us as a devoted member of our society; and that we recognize it as a privilege to bear testimony to his exceeding worth.

Resolved, That in the life of our friend were brought to notice a laudable ambition, an untiring perseverance, a devotion to the best interests of horticulture; as well as that of all worthy demands of humanity, that calls forth our highest respect and admiration.

Resolved, That in his death, the interests of fruit-growing in the Northwest, as well as this society, have lost a most valuable contributor and friend, which, to all interested must be recognized as an irreparable loss.

Resolved, That in testimony of the respect in which we hold his memory, these resolutions be entered upon the journal of the proceedings of this society.

REPORT OF AUDITING COMMITTEE.

Mr. Hollister reported for the auditing committee, and the report was accepted. It was as follows:

The auditing committee having examined the account of disbursements made by the secretary during the last fiscal year, and the vouchers accompanying the same, find the total expenditure to be \$46.36, all of which is properly accounted for.

U. S. HOLLISTER,
WYMAN ELLIOTT.

ROOTS FOR STOCK.

P. C. Sherren's paper on the cultivation of root-crops, was placed on file for publication, without reading. It was as follows:

LAKE COMO, ST. PAUL, Dec. 30th, 1879.

Chas. Y. Lacy, Esq., Secretary of the Minnesota State Horticultural Society.

DEAR SIR:—Having accepted your invitation to read a paper on the Culture of Beets and Carrots for Stock, I below state my experience in doing so.

For some years in England, previous to my coming to this country I grew Mangel Wurtzel, which is a coarse kind of beet to feed to stock, and found them profitable to raise, as the yield is enormous. I have for many years here grown beets for market, and have always made a rule to grow an extra quantity of the different kinds of table beets to feed to my cows and pigs in the winter, believing it paid me well to do so.

The market price of vegetables the past season having been so unremunerative I considered my beets and carrots would be of most value to me to use them for food. consequently I reserved the whole of them for that purpose.

I raised this year over 100 bushels of the Improved Long Orange Carrots (seed bought of Hollister) on thirty rods of soil, which I considered well paid me to feed. I give each of my horses half a peck of carrots every day instead of a feed of oats. They eat them with a great relish, and it keeps them more healthy than if confined to all oats and hay. I feed carrots at noon, and oats night and morning. I am also now feeding some to my cows that are giving milk, and they are doing well on them. Carrots pay to grow for stock.

The various kinds of table beets may be grown profitably to feed to stock, the yield per acre being equal, if not more, than that of carrots.

The land intended for carrots should be heavily manured the previous year, for some other crop, as they will grow forked on freshly manured land. I usually raise my parsnips and carrots on land that potatoes have grown on the previous year. Freshly manured land will do for beets.

Mangel Wurtzel and Sugar Beets are the most profitable roots to grow for feed., the yield of them being so enormous when the land is well manured and well cultivated, from 800 to 1000 beets may be grown on an acre.

All kinds of roots should be sown in drill, and if grown in large quantities the rows should be wide enough apart to cultivate with a horse, to save labor, and must be kept clear of weeds the whole season, to ensure a good crop.

If you think the above worth reporting at the society's annual meeting, you are at liberty to present it. I am, sir,

Yours respectfully,

P. C. SHERREN.

HART'S MINNESOTA SEEDEING.

The report of the committee on Hart's Seedling Strawberry having come to hand was read and ordered on file for publication.

ROCHESTER, January 21, 1879.

To the Minnesota State Horticultural Society :

Your committee appointed to visit and report on John Hart's Seedling Strawberry did so last June. We were met at Stockton by Mr. Hart, who conveyed us to his home some three miles below. We were cordially received by his good wife and daughter who soon invited us to partake of a most sumptuous repast of strawberries and cream, and many other good things too numerous to mention. After satisfying the inner man to our heart's content, we proceeded to study into the merits of the new candidate for public favor, secretly wishing that we might be appointed a committee to visit the Hart's Seedling annually hereafter. On visiting the vines we found that owing to late frosts there was but a small showing of well matured fruit, but the vines were well laden with withered blossoms and fruit in the embryo state that had evidently been killed by the frost. Judging from these we should say it is a good bearer, better than the Wilson, Great American, Monarch of the West or Russell's Prolific, all of which we found growing in close proximity to it. The Hart's Seedling is a strong grower resembling in vine and leaf the Russell's Prolific, of which we judge it to be a seedling. The fruit is uniformly large, moderately firm, slightly conical and regular in form, color crimson scarlet, fruit stalks long and stout, leaves large and numerous, being from three to five leaflets on a stalk; blossoms large and perfect, vines hardy—standing summer's sun and winter's cold without apparent injury.

And now in conclusion we wish to congratulate Mr. Hart, and also the State Horticultural Society.

Mr. Harris. Last summer at the time of the May frost Mr. Hart's vines were literally loaded with blossoms and fruit. The berries are large and the texture better than the Wilson or Downing. The society is safe in recommending for trial. The season is the same as Wilson.

The meeting adjourned to meet at 7:30 P. M.

THURSDAY EVENING.

HORTICULTURE IN MCLEOD COUNTY.

The society was called to order at 7:45 o'clock.

The report of Mr. Storrs was called for and read by the secretary, after which it was ordered on file for publication. The following is the report :

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And now in conclusion we wish to congratulate Mr. Hart, and also the State Horticultural Society on the discovery of another new Minnesota Seedling Strawberry that, in our humble opinion, will prove a great acquisition to our already fine list of American Strawberries, and as we are unavoidably absent from the present session of the society, we hope you will give this new candidate the attention its merits seem to demand.

Respectfully submitted,

M. W. COOK,
A. W. SIAS,
GEO. W. MASON,
Committee.

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HORTICULTURE IN MCLEOD COUNTY.

The society was called to order at 7:45 o'clock.

The report of Mr. Storrs was called for and read by the secretary, after which it was ordered on file for publication. The following is the report :

WINSTED, MINN., Jan. 8, 1879.

Prof. C. Y. Lacy, Secretary of Minnesota State Horticultural Society:

DEAR SIR.—Your card of the 2d inst. at hand, requesting a short report of the condition of trees in my vicinity. I shall accordingly endeavor to condense my report as much as possible, and therein submit such facts as I deem most suitable for circulation. The last three winters have been quite mild and fruit trees have not suffered any to speak of, but the late frosts of last spring however, did considerable damage to the fruit crop. Apples, plums and cherries were almost an entire failure, except in some localities where the apple crop was medium fair. The currant and strawberry crop was good where the vines were properly covered, but grapes were not very abundant.

In general, however, the display of fruit at Hutchinson, at our county agricultural fair, was better than in any year previous.

Salt.

Cleanliness is a subject which I consider to be a very essential matter in orchards. Young trees should be washed at least once every year with strong soap suds which contain a few drops of carbolic acid in each pailful. I have used salt with marked success, putting it on the ground around the trees. It is about five years since I adopted that course, and can say that my trees look healthier and thriftier than ever before. I hold it to be a preventive of fire blight for the reason that I have never had a tree blighted since I commenced the use of salt. The quantity used should be not less than a pint, and more according to the size of tree. For the past three years we have been top working the most tender kinds on hardy crabs; and they are doing well. The Haas top worked on Transcendent makes the best union of any which I have tried up to this day.

Pears—Varieties.

The Flemish Beauty Pear is also proving itself worthy on Transcendent, Virginia Crab and Hebron. The Wealthy was growing very well here on the Mountain Ash, until destroyed by grasshoppers in 1877. Among the different kinds which have proved themselves most excellent, are the following: the Wealthy, Winstead Pippin, Tetofsky, Duchess and Haas; of crabs, Transcendent, Virginia, Whitney's No. 20, Early Strawberry, Orange, Conical, Brier's

Sweet, Stewart's Sweet, Maiden's Blush, Minnesota, Bachelor's Sweet, Metall and Boomer's.

The two last named are from Beaver Dam, Wis., where they originated. We are now testing from fifty to sixty other varieties, of which some prove to be valuable. As stated before, some losses were caused by late frost. We are, however, not discouraged in consequence of the casualty, but have introduced some of the hardier kinds, which move enables us to say that we are making fruit-raising a success.

Protection.

I have only a few words more to say, and those in regard to protection of some of our trees. It may be done with little trouble and expense if only economically managed. In the fall I set a strip of board on south side of tree long enough so as to reach from the limbs, and drive in the ground so that the wind will not blow it down. This I do just previous to the freezing of the ground. Then after the ground is thawed up and settled I gather them for the next fall. I have dispensed with mulching since I began the practice of deep planting, except the first year after setting. I deem mulching necessary on light, sandy soil, but in general I observed throughout this county and vicinity, that where orchards are mulched and manured they are more liable to blight than those that are otherwise treated. My soil is a black clay loam with clay subsoil.

I still might say more about the subject, but as brevity is required I will close. Hoping this will meet your demands, I remain

Yours truly,

O. D. STORRS.

DISCUSSION.

Salt, Pears and Pear Stocks.

Mr. Storrs. I apply dry salt broadcast on the surface to a distance of three or four feet from the trunk. Have had pears top-worked for only two years. Never have had any blight in my orchard save on two trees of Transcendent and General Grant, and when I used salt the blight stopped.

Mr. Spaulding. I had trees set for two years which began to blight. I poured a quart of salt water down the roots which stopped the blight, but on the other side of the fence where nothing was done the trees were killed to the ground.

Mr. Jordon. I grafted Flemish Beauty Pear on almost everything two years ago. The worst success was on Transcendent. It was better on Tetofsky and about the same on Duchess. It was better yet on Mountain Ash and White Thorn. Shall next use crab roots grafted, with White Thorn and the pear top-worked on this.

Mr. Storrs. I had unfruitful plum trees and a Hyslop also, and

I put two quarts of salt on the soil around each. Both bore full the next year. Then the next year I salted each alternate tree and have since used it more freely.

Mr. Jordon. I have known pears to do well on White Thorn. Have found that grafting by splitting sometimes gives no beetle, while if cut a beetle is produced.

Mr. Pearce. I am inclined to think we shall yet raise pears. I know of a man who had 300 to 400 before the winter of 1872-3. In the spring nine-tenths of them were killed. From those that lived he reserved twelve on quince roots. They are now ten feet high and have never killed. The others he gave away. Those that got them say that they are also alive. Mr. Sias raises a few pears every year. He has the pear on a Juneberry and supported by a trellis. Have seen another tree twelve feet high and full of fruit.

Mr. Harris. Have grafted many pears on thorn, but only one tree lived long enough to bear much fruit.

Mr. Jordon. Have had pear trees in a cooley for eight years which blossomed several years but had the blossoms killed by frost. In a similar location near by the Wealthy killed down.

Mr. Elliot. Was agreeably surprised when I saw Mr. Jordon's place last winter and remember saying I should plant pears on it.

Mr. Harris. Believe we may grow pears after experiments in grafting on different stocks.

Mr. Fuller. Before the winter of 1872-3 I had 300 pear grafts on Mountain Ash. Some of these are now a mixture of pear and Mountain Ash. But I have many fine pear trees now. One came through the hard winter.

Mr. Underwood. Have grown pears on Mountain Ash successfully. Think the Flemish Beauty as hardy as Fameuse apple. It has great recuperative power and those with any life at all recovered after the hard winter. Don't believe that it will be practicable to graft on Juneberry or Thorn. Don't think it practicable on the apple either. Have set many grafts on apple without success.

Mr. Dart. Don't think pears will do much on Mountain Ash. I had fifty on Mountain Ash which did badly; while those on pear roots did pretty well.

A partial report on articles on exhibition was read by Mr. Fuller and ordered to be filed for publication when completed. The report has not, however, come to hand.

HORTICULTURE IN NICOLLET COUNTY.

A report from Mr. Meyer, of St. Peter, was read by the secretary as follows:

ST. PETER, January 20, 1879.

Chas. Y. Lacy, Esq., Minneapolis.

DEAR SIR.—Our secretary, T. G. Carter, is prevented by sickness from sending you the report on the condition and progress of horticulture in our district which you suggest in your letter. This is to be regretted very much as Mr. Carter has been absent from home the greatest part of the year surveying lands in several counties, which gave him the best opportunity of collecting such information as would be of interest to your society. Asking me to-day to write to you on fruit culture, and having no time to find a more able person to do this for him, I have to comply with his wishes on this short notice, although I have been closely at home the whole year and have paid but little attention to this matter, therefore please excuse me for the meagre and short treatment of this important subject. Speaking in general I cannot report any progress at all of horticulture in this part of the state, say west of the Minnesota river. There are various causes for this deplorable fact. Great many farmers take little interest in planting anything but wheat, oats and corn, while others that have tried to raise fruit are entirely discouraged by those innumerable drawbacks which I presume are always to be found in a new country. During the last four or five years grasshoppers, rabbits and other vermin have been the cause of the destruction of many nicely growing orchards and where people succeeded in saving them, trees were injured by blight and other diseases, so with all their labor and expense farmers have but little to show in the line of fruit. In Le Sueur county where they had no grasshoppers things look a little more prosperous. They have also not been troubled as much by the blight, as we have on this side of the river. Speaking of my experience on my own place and the immediate neighborhood where more for the promotion of fruit culture has been done than in any other part of the county, I can also say but little that is encouraging. I lost last summer a great number of my old transcendentals, in consequence of yearly attacks of blight, by which they suffered the most in the summer of 1876. In the year of 1877 all those that finally died last summer, showed a sickly appearance. The leaves being of a yellow greenish color. Blight appeared again among my trees last summer, but to no such an extent. Many of my Soulards and old cherry trees also died, having been injured in the winter of 1877 by the unusual warm weather, followed by hard frosts. All of the latter were over fifteen years old. Looking around in my neighborhood I find more or less the same discouraging aspects. At Mr. Miner's place I noticed that his seedling crabs which have yielded him from five to twenty bushels to a tree of miserable little apples, with the exception of the Duchess, but even they have commenced decaying in several places. Looking at those beautiful apples raised on Mr. Carpenter's place, and exhibited at the State Fair, for which the first premium was awarded to him, most any person having no knowledge of the condition of the trees on which they have grown, would feel encouraged and hopeful for the prospect of fruit growing in our State, but those very trees I found decaying. The only thrifty orchard in this part of the county is that of Mr. Lambert, situated on the second bluff west of St. Peter, on a north-

eastern slope, protected by timber from the south and west, with a clay subsoil, consisting principally of Haas, Fameuse, Dutchess and Wintergreen, but as they just came into bearing, and trees generally remain thrifty until that time, I will not brag of it too soon. Remember, there is not one transcendent in the lot. The apple crop was injured by late frosts last spring, but where trees escaped the frost there was a large yield. This was also the case with small fruit. Currants and strawberries were injured, while red raspberries gave an abundant crop. Of the latter I cultivate three varieties. The Philadelphia, a wild raspberry, and the one brought from my native country. The latter I found the most prolific and best flavored, but too soft for market. Gooseberries were abundant. Black-cap raspberries kill down most every winter, and are of no use to me. Last year they did not kill, but the crop was poor. But I must close now. I am very sorry I cannot attend your meeting to-morrow. Hoping you will have an interesting discussion, I remain,

Yours truly,

E. MEYER.

It was moved to file for publication, and the motion carried, but not without objection, on account of its discouraging tone.

Mr. Storrs. I have a brother-in-law there who is growing fruits that I can't raise.

Mr. Jordan. Southwest of there at Winnebago City, they are growing fruit abundantly.

Mr. Pearce. I believe the trouble is with the men and not the locality.

Mr. Dart. I think if we ask a man to report we should give his paper due consideration, if we believe it to be true, and I have no doubt that report represents the facts as viewed by the writer.

Mr. Underwood. We began smothering yesterday, and I am sorry for it. Don't want to do it any more.

ARBORETUMS.

The Secretary read Dr. Warder's communication on establishing Arboretums, which was ordered on file. It was as follows:

To the Horticultural Society of Minnesota:

Greetings from an absent friend, from a friend who may never have seen any of you, and who yet claims friendship for all those, everywhere, who work in the same cause. Horticulture, in its broadest sense, is indeed a cause that is especially productive of good to the human race, not merely in an æsthetic sense, but in the most practical manner: so also in its specialties, from the floral adornments of the greenhouses, and of the parterres and shrubberies, or from the creature comforts of the vegetable garden and orchard; from the lawn, the avenue, the grove and the shelter-belt; and even from the larger plantations, that may aspire to the title of artificial forests: all, all may contribute to the betterment of our race.

So well has this been appreciated by the philanthropists of an older civilization than ours, that we find connected with the great seats of learning, their admirable *Botanic-Gardens*, *experimental nurseries* (*Baumschulen*) and *Arboretums*, where the students of any of the specialties of horticulture may find an indefinite fund of information and ample opportunity for observation and study.

In our wide and new West these admirable institutions have not yet had time to grow; indeed, their very germs have scarcely yet been deposited in our fruitful soils.

True it is, the thought germs were widely disseminated through the northwest during the discussion, already a quarter century ago, of the great topic of industrial education. Yes, those who advocated that great movement, which finally culminated in the noble grant of congress of lands for this purpose, did most fondly hope that their longings for the new education which "should provide a knowledge of things rather than of words," were indeed, now to be gratified. Alas, in too many cases, to be woefully disappointed! Where can we find among all the results of this legislation the model we had pictured to ourselves of industrial education? The answer is awaited with anxiety—but it comes not.

In such great institutions for learning things, the projectors and early advocates of the system, fondly anticipated seeing *Arboreta* established among the first advances in the new departure, and had that been done, we should ere this have had laid for us the broad foundations of an American Forest-Science, the A. B. C. of which must be a familiar knowledge of our own trees, the natives, and the desirable exotics.

In how few, alas, of our so-called agricultural colleges, are any such object lessons to be found. And where some attempts have been made to establish *Arboreta* and *Botanic Gardens*, how small, as yet, are the beginnings, and how feeble the support rendered them from the great fund provided by the bounty of the Nation.

These thoughts have been suggested, and these weary lamentations have been excited, by the receipt of the annual report of the Director of the *Arnold Arboretum*, and also of the *Botanic Garden* of Harvard University, at Cambridge, Massachusetts. Here, then, in an institution of learning, which was already established, and which is sustained largely by private munificence, must we look for the great results we had hoped to receive from the agricultural land grant, through the institutions which under its beneficence were to have given the people that for which they had so earnestly pleaded, *instruction in agriculture and the mechanic arts*.

From this report of the enthusiastic Director, Prof. C. S. Sargent, we learn that much work has been done in the Botanic Garden, and that the Arboretum is in progress, for the necessary planning of which alone, \$2,000 was at once raised by private subscription of twelve public-spirited individuals.

Among the results of the establishment of the *Arboretum* the director cites a large correspondence from those desirous of procuring information, "generally pointing to the solution of these two problems :

1. How shall the worn out and exposed portions of the Atlantic seaboard be covered with trees again in the cheapest and quickest manner.

How shall the treeless western states * * * be best rendered more habitable and productive through covering portions of them with forest growth, and especially what trees shall be selected for this purpose."

The director reports that he has succeeded in obtaining legislation in Massachusetts and Rhode Island exempting certain lands from taxation for the encouragement of tree planting.

“By the direct inspiration of the *Arboretum* nearly four hundred thousand trees have been planted during the year,” * * * “and through its correspondents in the Rocky Mountains, it has at last become possible to procure for cultivators in this country and Europe, large quantities of seeds of some of the peculiar trees of that region * * * which have heretofore been practically unattainable.”

Large interchanges of plants and seeds are noted, amounting to 18,919 plants and 1,267 packets of seeds, distributed during the past year. Valuable contributions from public institutions and private individuals have also been received.

And now, my good friends, while each is trying to advance the cause of American Forestry, let us all be thankful that one great institution of learning in our country (though not included in the category of those that were created by the congressional land grant already referred to) is still able and willing to advance so nobly the great interests of Sylvi culture in the United States, where, to promote the interests of one state or section, is happily to advance the interests of all.

Good hail to old Harvard! Let us emulate her good works!

Yours respectfully,

JOHN A. WARDER.

A LETTER FROM MAYOR RAND.

A letter from Hon. A. C. Rand was also read and ordered on file. It was as follows:

Chas. Y. Lacy, Esq., Secretary, &c.

DEAR SIR.—I very deeply regret that my business calls me away from the city during the days named for your annual meeting. On the 14th I will leave for Chicago and remain there for a week or longer. My business there I cannot postpone. There can hardly be any diversity of opinion as to the value of the work your society is engaged in, and I would esteem it a great pleasure to assure the society of my faith in the outcome of their good work and to welcome them heartily to our city. With a renewal of my regrets, I remain,

Very respectfully,

A. C. RAND, Mayor.

The secretary called attention to the exchange of reports mentioned in his report, and it was voted to refer the matter to the secretary.

PLACE OF NEXT MEETING.

An invitation was received from Mr. Fuller to come to Litchfield.

It was moved to refer the matter to the executive committee.

Mr. Harris spoke in favor of St. Paul or Minneapolis, as being more central and convenient.

Dr. Twitchell. I consider this the only suitable place, save Rochester and Winona.

Messrs. Elliot and Mendenhall extended an invitation to hold the meeting in Minneapolis.

A motion to amend so as to hold the meeting in Minneapolis was carried, and the motion carried as amended.

RESOLUTIONS.

Mr. Toan. I move to tender to the citizens of Minneapolis our hearty thanks for their kind entertainment.

The motion was carried unanimously.

M. Harris. I move that a vote of thanks be tendered to the various railroads that have favored the members with reduced fare.

The motion was carried unanimously.

The meeting adjourned.

A P P E N D I X .

APPENDIX A.

OBITUARY.

P. A. JEWELL.

DIED—At his residence in Lake City, on Saturday, May 25, 1878, PHINEAS ANSON JEWELL, aged 49 years, 4 months and 15 days.

The deceased was born in New York, January 10, 1829. At the age of twenty-five he entered Oberlin College, but subsequently changed to the medical department of the Michigan State University, where he graduated. During the war he answered the call for physicians in the Army of the Potomac, and entered the hospital at Washington, remaining there until disabled by severe illness. His health required him to discontinue the practice of his chosen profession. In 1863 he was united in marriage with Catherine J. Underwood, M. D., and located at Ann Arbor, Michigan, where he engaged in the nursery business. The subsequent failure of Mrs. Jewell's health led him to seek a home in Minnesota. He spent a year in looking over the State for a favorable location, and in April, 1869, settled in Lake City, establishing, in company with his brother-in-law, J. M. Underwood, the Lake Pepin Nurseries, that have since become so favorably known throughout this and adjoining States.

For a year or more his health had been very poor, and for several months he was confined wholly to his room, his recovery being deemed almost hopeless; receiving the best treatment and care that medical attendance and loving friendship could bestow. At his own request, a post mortem examination was made on Saturday, which was conducted by Dr. Edward A. Patton, assisted and witnessed by Drs. G. R. Patton and C. D. Vilas. The examination disclosed the fact, unknown and unsuspected by either Mr. Jewell or his physicians, of the existence of a large cancer in the stomach, which was undoubtedly the cause of his long illness and death.

Such, in brief, are the main features of biographical interest in the life of a prominent citizen just passed away, who was intimately known and sincerely respected in this community. His business gave him an extended acquaintance, being away from home a great deal in attendance upon pomological and horticultural meetings, in the discussions of which he always sustained an active part. He made a close study of our climate, and its adaptability to certain varieties of fruit and ornamental trees. His experience has been especially successful, and will in the future, as in the past, prove highly valuable to all interested in this

subject. Recognizing the necessity for new varieties of apples that were more hardy than those being set, with such repeated failures, in this State and Wisconsin, he resolved to go to Russia, and if possible, bring back something that would stand our climate, and to this end was making all his arrangements for the summer of 1868; but in the winter preceding, while traveling in the southern part of this State and in northern Iowa, he found, as he thought and has since demonstrated, a most valuable acquisition to the desired end, in a large collection of seedling Siberians; and in a letter to a friend he wrote, "I shall defer my proposed trip, as I have found a young Russia here."

He immediately secured the stock, and showed his confidence in it by planting and propagating it extensively, and as a result, we have many valuable varieties, both for their hardiness and improved quality of fruit, as many fine orchards throughout this country and Canada can testify. Perhaps no one act of his life tended more to establish confidence in the minds of many in the ultimate success of fruit growing in this northern climate than the planting for himself an orchard of five thousand apple trees, which now stand as a beautiful and lasting monument to his indefatigable energy and enterprise.

In the death of Dr. Jewell, the cause of radical temperance in Minnesota sustains an irreparable loss. Upon the platform he was more than ordinarily gifted, as a clear and forcible speaker, while in the ranks, as a temperance advocate and worker, he was active and influential. His heart beat responsively to every cause in the interests of humanity, tending to its educational improvement and moral elevation. Had life and health been longer granted him he intended before long to have entered more actively into the work in behalf of some of the many projects for human advancement.

In his personal and private life Dr. Jewell was one of the most lovable of men. His mild, unobtrusive manners, his uniform courtesy, shown alike to all, and at his home or elsewhere during his business leisure, his brilliant and genial conversational powers, will not soon be forgotten. If we were disposed to find fault with him it would be that he was perhaps too modestly exclusive, although adapted by education and every essential quality of practical excellence to adorn the highest public positions in the gift of his fellow men. It is unnecessary, however, to allude at any length to these things, or bestow any encomium upon the character of a man like Dr. Jewell, here where his life was so well known as a compendium of generous thought and practical goodness. The words of the funeral address are fittingly eloquent and comprehensive:

"He carried about with him everywhere an atmosphere of spiritual dignity, which was felt as a reproach to all meanness; of chastity, whose very presence rebuked vulgarity; of simplicity which made liars ashamed, and of moral enthusiasm, which inspired, encouraged and uplifted all weaker aspiring and all wavering souls with whom he came in contact."

The funeral tribute of love and honor was paid on Monday afternoon. The occasion was respectfully observed by a very large concourse of friends, who were present to mingle their offerings in the last rites that can be shown the dead by the living. The spacious rooms of the residence were filled with sympathizing friends, while many, unable to obtain admision, occupied settees that were placed on the lawn in close proximity to the parlor windows. The exercises partook of an unusual but nevertheless pleasing character, in being conducted by an intimate personal friend of the deceased, (not a clergyman) Dr. T. H. Evarts, of Rushford. His admirable address, which is, in its literary character and appropriateness, above comment or criticism, the tender grace and modest mein of his

manner that characterized the reading of it—all blended harmoniously with the solemn interest of the occasion. No notes of dissonance in the requiems sung by the choir were heard, but all was elevating, and as far removed as could be from the physical associations connected with “pall, and breathless darkness and the narrow house.” The remains were followed to their last resting place in the cemetery by a large procession of citizens, who administered the final rites of friendship in depositing the form of their late beloved townsman

“beneath the low green tent
Whose curtain never outward swings.”

“Peace to the true man’s ashes! Weep for those
Whose days in old delusions have grown dim;
Such lives as his are triumphs, and their close
An immortality: weep not for him.

“A practical rebuker of vain strife;
Bolder in deeds than words, from beardless youth
To the white hairs of age, he made his life
A beautiful consecration to the Truth.”

APPENDIX B.

MR. E. B. JORDON'S STATEMENT CONCERNING VARIETIES OF APPLES AND CRABS FRUITING IN HIS ORCHARD.

ROCHESTER, MINN., DECEMBER, 1878.

For the encouragement of the faint-hearted, I will give a list of the varieties of apples and crabs I have fruiting in my orchard, which covers about eighty acres. Be it remembered that the late frosts in May killed many of the fruit buds, and many of my trees are entirely barren of fruit.

The tabular list gives first, how grown, top grafted on crabs or root grafted, size of fruit, quality, hardiness of tree, origin if known, what grafted upon in case of being top grafted, with other remarks on fruitfulness of tree, etc., etc. The columns explain: t for top grafted, r for root, and t r for top and root grafts.

Size, l large, m medium, s small, v s very small.

Quality, g good, m medium, p poor, v very.

Season, e early, s summer, f fall, w winter, l late.

Hardiness, h hardy, which would not indicate that they would do to plant generally on the prairie, but v h would; t tender.

Origin given when known.

If top grafted T for Transcendent, H for Hyslop, being the best varieties used as a stock, or best suited as a stock.

LIST OF VARIETIES.

NAMES.	How grafted.	Size.	Quality.	Season.	Hardness.	Origin.	Best stock for top grafting.	REMARKS.
Duchess of Oldenberg.	r	l	gs	s	v h	Rus.	....	Very prolific.
Haas Apple.	t & r	l	m	e w	h	Mo.	....	Very prolific. [Prolific.
Wealthy (hybrid).	t & r	l	v	w	v h	R.	....	Top grafts well on Crabs.
Peach Apple.	r	m	v	s	v h	M.	....	Prolific.
White Astrachan*.	r	m	p	c s	v h	Rus.	....	[Hands.
Saxton	m	m	s	t			....	Favorite in clay and timber
Pewaukee.	r & t	m	v	l w	t		....	Not hardy enough for Minn
Goodenough.	r	m	v	w	t	Vt.	....	" " " "
Blue Pearmain.	t	l	v	l w	t		....	" " " "
Red June.	t & r	m	v	e s	t		....	Too tender for profit
Domenistic.	r	l	v	w	h	Rus.	....	Think it may prove of val.
Fancuse.	r & t	m	v	e w	t	Can.	....	Very prolific.
Ben Davis.	r & t	m	v	l w	t	Ky.	....	Have fine trees on trans.
Seek no Farther, Ohio.	t	m	v	w	t	O.	....	Not a success even on crab.
Rollins' Prolific.	t	m	p	w	h	M.	....	Very prolific.
Molly Apple.	t	m	v	w	h	M.	....
Early Harvest.	t	m	v	e s	t		....	Promises well.
Malinda.	t & r	m	p	l w	h	Vt.	....	Worthy; it keeps till July.
Worgunock, (No. 565).	t	m	v	f	h	Rus.	....	Has borne but this year.
Autumn Strawberry.	r	m	v	f	t		....	Not hardy enough for Minn
Northern Spy.	t	l	v	w	t		....	Not hardy; even crabs.
Tetofsky*.	r	m	v	e s	v h	Rus.	....	One of the best early.
Price's Sweet.	r	m	v	f	t		....	Tender, but prolific bearer.
Jeniton.	t	m	v	l w	t	Mo.	....	Proves hardy on trans.
Dickerman.	t & r	m	v	w	h	M.	....	New seed'g not fully test'd.
Plumb's Cider.	t & r	v l	m	e w	h		....	Not so hardy as others.
Talman Sweet.	r	m	gs	w	t		....	Very tender.
Crabs or Hybrids.								
Early Strawberry.	t & r	s	v	e s	v h	Ia.	....	Best early crab ever tested,
Transcendent.	r	p	v	s	v h		....	Subject to early blight.
Hyslop.	r	l	p	f	v h		....	[A good sort.
Conical Crab.	r & t	l	v	l f	h		....	Annual bearer; never fails.
Orange.	r & t	m	v	e w	v h	Ia.	....	A failure on trans.
Beech's Reed.	r	m	v	f	v h	M.	....	Can't be beat for all uses.
Beech's Sweet.	r & t	m	v	l f	v h	M.	....	Excellent for cider.
Beech's Green Winter.	r	m	v	w	v h	M.	....	Not fully tested.
Sweet Russett.	r	m	v	e w	v h	Ia.	....	Excellent qual.; shy bear'r.
Palmer's Sweet.	r	l	v	f	v h	M.	....	A little dry when over ripe.
Malakoff.	r & t	l	v	f	t	Wis.	....	A little tender.
Pride of Minneapolis*.	t	m	p	f	h	M.	....	Excellent for cooking.
Honey Sweet.	t	l	v	f	v h	Ia.	....	Sweet as honew.
Soulard.	r	l	v	w	h	Mo.	....	Fit only for cooking.
Sylvan Sweet.	r	m	p	f	h	Ia.	....	A little bitter.
Florence Gideon, No. 3	t	m	v	s	v h	M.	....	A prolific bearer.
Martha Gideon, No. 5.	t & r	l	v	f	v h	M.	....	A fine market sort.
Minnesota*.	t & r	l	v	e w	h	M.	....	[variety.
Gen. Grant.	r	l	m	f	h	Ia.	....	Blights too bad to be a safe
Meador's Harvest.	r	l	m	e s	v h	Ia.	....	Fine cooking; sour eating.
Meador's Red Winter.	r & t	s	v	w	v h	Ia.	....	Subject to blight.
Meador's Green.	r & t	m	v	w	v h	Ia.	....
Simmons' Harvest.	r	v s	m	e s	v h	Wis.	....	Of best stock to graft upon
Minnehaha.	r & t	l	v	f	v h	M.	....	Seedling of my own.
Akin's Green Winter.	r & t	v l	p	w	v h	M.	....	Not worth propagating.
Angular Crab.	r	s	v	f	v h	Ia.	....	Very productive.
Meador's Blush.	r	m	v	w	h	Ia.	....	Poor bearer while young.
Hesper Blush.	r	m	v	e w	v h	Ia.	....	A shy bearer with me.
Hesper Rose*.	t & r	v l	v	e s	h	Ia.	....	Too much subject to blight.
Quaker Beauty.	r	m	v	l w	h	Ia.	....	A shy bearer.
Evans Crab.	t	s	v	f	h		....	Am disappointed in size.
Wilhe Crab.	r & t	l	v	e f	h	M.	....	Seedling of my own.
Virginia Crab.	r & t	m	v	e f	v h	Va.	....	Very productive.
Picket's No. 3.	r	s	m	w	h	M.	....
" No. 5.	r & t	v l	v	l f	v h	M.	....
" No. 7*.	r	m	v	e w	h	M.	....	All very productive,
" No. 9*.	r	m	v	f	v h	M.	....
Badger State*.	r & t	m	v	f	v h	Wis.	....	Has not borne much.
Three new Seedlings not yet named.								

*Did not bear this year.

Besides the foregoing, we have growing in our experimental orchard over one hundred varieties of apples and crabs that have not yet borne fruit, which I may report upon in my next issue. Many of them Russians we are testing.

APPENDIX, C.

REPORTS OF COUNTY AND LOCAL SOCIETIES.

OLMSTED COUNTY.

ROCHESTER, MINN., AUG. 15, 1879.

Chas. Y. Lacy, Esq., Minneapolis, Minn.

DEAR SIR:—Your favor of recent date, asking for copy of proceedings of our County Horticultural Society, list of officers, etc., is received. I herewith send you a copy of the proceedings of the sixth annual meeting, held in March last, as published in the *Record and Union*; also copy of published proceedings of the June meeting, from which you can select such portions as you deem of importance or interest to horticulturists. Our county organization is not large, but is still maintained, despite all discouraging attendant circumstances. Our nurserymen and fruit growers have labored patiently for years to advance the interests of horticulture in this section of the State. Their efforts have been rewarded, thus far, with gratifying results. Repeated and numerous experiments have demonstrated the practicability of producing an abundance of choice apples and small fruit in Minnesota; and in spite of many partial failures and discouraging drawbacks, they are looking forward hopefully to the future, confident of greater success to crown their efforts.

As you are well aware, we have several fine nurseries here, all under the management of experienced and painstaking nurserymen. Mr. E. B. Jordon, of the Evergreen Nursery, also has some 15,000 trees in orchard, many of them in bearing. His trees are remarkably healthy, and almost entirely free from the blight which has been so prevalent and destructive this season.

Mr. A. W. Sias, one of the oldest nurserymen in this State, and I may say, one of the most reliable, has a fine nursery on College Hill, well stocked with hardy varieties of apples, as well as leading varieties of the strawberry, raspberry and other small fruits. He has experimented extensively with Russian and native varieties of apples, and propagates only the best and most hardy trees.

Mr. M. W. Cook, proprietor of the Rochester Nurseries, is our champion small fruit man, and I enclose you a brief item on "Strawberries," clipped from a recent number of the *Record and Union*.

The soil and climate of Southern Minnesota are very favorable to the growth of fruit of all kinds, and more attention should be given to horticultural interests. But the people are at last becoming better informed upon the importance of these matters, and learning, too, that their material prosperity largely depends upon the extent in which they engage in horticultural pursuits. Even this year we should have had a large quantity of fruit for local consumption, but for the unfavorable season. Still, several hundred bushels of delicious berries and barrels of choice apples were marketed by our fruit growers. At the end of another year we hope and expect to make a still more favorable report.

Hastily and very respectfully, yours,

S. D. HILLMAN,
Sec'y Olmsted Co. Hort. Soc.

Annual Meeting.

The sixth annual meeting of the Olmsted County Horticultural Society was held in the office of the *Record and Union*, on Saturday afternoon, March 18th, 1879. There was not a large attendance, but the proceedings were of an interesting character, especially to horticulturists, and we devote considerable space to a report of the discussions on fruit growing.

The meeting was called to order by the President, A. W. Sias, who stated the object of the meeting. The first business transacted was the election of officers for the ensuing year, resulting as follows:

- President—A. W. Sias, post office Rochester.
- Vice President—Wm. Somerville, Viola Center.
- Treasurer—M. J. Hoag, Rochester.
- Secretary—S. D. Hillman, Rochester.

The question for discussion was then taken up, to wit: "Foreign versus native fruits."

Mr. J. Bamber, of Rochester town, opened the discussion. He said he came to listen rather than to make any remarks. He had experimented with fruit in Minnesota, and had watched with a good deal of anxiety the progress made by others. He set thirty-six trees in 1855, and lost them all by the end of the second year. He next set thirty-eight more trees, bought from a Rochester, N. Y., nursery, with similar results; and his experiments were mostly failures, except with the Duchess and Transcendent. He thought our main dependence for fruit here must be upon native seedlings, whether raised from standard apples or hybridized from standards. There were some kinds of Canada fruits that might perhaps do well in this climate.

Mr. William Somerville said he would agree with Mr. Bamber, that our main dependence for fruit was in our Minnesota seedlings, but he did not think Canada varieties were well adapted to this soil and climate. In Canada the early frosts destroy the leaves and cause the wood to ripen for winter; while here the leaves were liable to remain on the trees, causing the sap to continue to flow until late in the season. It was necessary to raise varieties that would ripen early, and a few such kinds, like the Duchess, for instance, might be obtained from Russia. But that country afforded only summer and fall varieties, while the great need was to supply good standard winter varieties. Trees should be propagated from native stock which had been thoroughly acclimated. If this course were to be adopted he had no doubt the time would soon come when Minnesota would

become a fruit-growing State, and as fine fruit might be produced here as elsewhere.

Mr. M. W. Cook said the kind of tree that pays the best is the kind we want. The Duchess has done more for fruit growing in this State than any other variety. He remembered when they used to talk as discouragingly of fruit-growing in Michigan as some now do of Minnesota. They found out what were the best kinds by testing them. He favored Russian varieties.

Mr. Somerville said we needed more winter apples. It was well known that the fruit season of apples changed in different climates.

Mr. Sias said there was no doubt of that fact, as he had observed in his experience in the South. He then proceeded to read an interesting paper on the subject under discussion. He asserted that native varieties had always taken precedence over foreign varieties in the older States of the Union, and have in all respects been successful and remunerative. He cited as authority a letter recently received from Hon. M. P. Wilder, of Boston, and Dr. Haskins, of Newport, Vt. Native fruits stand higher in the estimation of those qualified to judge than foreign varieties; and as a rule, a variety attains its highest degree of perfection where it originates. The same was true of plums, grapes, gooseberries, etc. Those who advocated such ideas were accused of having an "axe to grind," which was magnified into a monstrous bugbear.

In conclusion he said it was hardly necessary in confirmation of these facts to cite what had been accomplished by Messrs. Cottrell, Rollins, Gideon, and others, in the good work of developing our native varieties, but suffice to say, "what man has done man may do."

Mr. M. J. Hoag said he understood the Duchess was a winter variety in Russia. He thought hardy varieties could be produced from native seedlings. We should pick out the best and hold fast to that. He inquired as to the opinion of others in regard to the plan of planting evergreens with apples, to protect them from the sun.

Mr. Cook said he would plant apple trees that were able to stand without evergreens, and put the evergreens where they belonged.

Mr. Sias exhibited specimens of canned fruit, and said he had one seedling which produced more apples than his fifty Russian varieties. The latter blossomed too early, and were injured by the frost.

Mr. Bamber inquired as to the St. Lawrence as a hardy tree.

Mr. Sias said he thought highly of it, but it had been mostly displaced by other varieties.

On motion of Mr. Hillman, it was decided unanimously, as the sense of the meeting, that, as a rule, native varieties of fruits should be given the preference over foreign varieties.

For general cultivation for five best varieties, the society recommended the Duchess, Wealthy, Elgin Beauty, Haas and Rollin's Prolific; for trial, Rollin's Pippin, St. Lawrence and Rollin's Russet; for general cultivation of the hybrid varieties, the following: Early Strawberry, Orange, Meader's Winter, Beach's Sweet, Beach's Red, Hutchinson's Sweet, Maiden's Blush, and Power's Crab.

On invitation of Mr. Cook it was decided to hold the next meeting at his residence, in the month of June next, at which time the subject of strawberries will be discussed.

The meeting then adjourned.

JUNE MEETING.

Strawberry Culture.

The Olmsted County Horticultural Society held a meeting last Saturday afternoon, June 27, by invitation of the President, A. W. Sias, at his residence on College Hill, to discuss the strawberry question. A very neat evergreen arbor had been erected for the occasion, just in front of his residence, affording ample shade and a cool retreat. Beneath this was spread a large table, ornamented with beautiful flowers and richly laden with refreshments, which the ladies know so well how to prepare. Fine specimens of the strawberry were exhibited from the grounds of M. W. Cook, A. W. Sias, J. M. Hall, and others. Mr. Hall's berries, mostly of the Green Prolific variety, were particularly fine; many single specimens measuring four inches, and one five inches in circumference.

After some informal discussion the meeting was called to order, and the merits of the berries and other good things were discussed in a practical way. Mr. Sias then arose and made some remarks. He said the object of the meeting was to discuss "Strawberries, the best methods of cultivation, etc." As for the successful cultivation of strawberries in a season when ice formed a quarter of an inch thick after they were in blossom, he preferred to take a back seat; but there were those present who could raise them under such discouraging circumstances. He was glad to see so many ladies present. The society had been trying for six years past to get up successful meetings unaided by the ladies, but had succeeded indifferently; but when they were well represented, as on this occasion, there was a vast improvement. The man who opposes his wife's attending horticultural and agricultural meetings, and who says she ought not to go, and that the proper place for women is at home to take care of the children, he would denounce as an old fogey. If he said she should not go, he denounced him as a tyrant. He said he wished to impress the fact upon the ladies that their help was needed. He said some of them were well posted upon the subject of floriculture, and he hoped hereafter to hear from them.

M. J. Hoag said he could raise strawberries, but he was not a speechmaker. Downer's Prolific had done the best with him. It stood the frost well. It was the most profitable berry, and of fine flavor. It was of medium size, very prolific, and stood the frost when the Col. Cheney was entirely killed. The Boyden also stood well. He mulched his vines well in the fall with clean straw. This was removed after the picking season, and the ground thoroughly cultivated. He considered 3,000 quarts per acre a fair crop, but said as high as 11,000 quarts had been produced. Failures were due to lack of cultivation.

Mr. Sias said he had been experimenting somewhat with the new variety of strawberry known as Hart's Seedling, and was highly pleased with it. From twenty-two plants set out a year ago, he now had over 1800 healthy plants growing. The berry is large, of good shape, fine flavor, and is very productive.

B. F. Perry said his experience was limited, but he recommended thorough culture; plant in May on clean, rich soil. He spoke highly of Hart's Seedling, and thought it the best variety to be obtained.

A unanimous vote of thanks was tendered the worthy President for the interest taken to make the meeting pleasant and enjoyable; after which the meeting adjourned.

NICOLLET COUNTY.

Prof. C. Y. Lacy, Sec. Minn. Hort. Society, Minneapolis, Minn.

ST. PETER, MINN., AUG. 12th, 1879.

DEAR SIR:—Yours received. Upon proceeding to copy minutes of annual meeting of Nicollet Co. Hort. Soc., I failed to be able to lay my hands on them. They have been mislaid, and having had several prolonged hunts for them, I must be content with sending you names of officers—Ernst Meyer, President, and T. G. Carter, Sec'y, re-elected.

I shall find the minutes, but too late for your report. One thing I recollect. Mr. S. B. Carpenter and S. D. Payne, who reside in Kasota, Le Sueur county, but who belong to our society, both reported that they had cured the blight by using ashes in the soil under the trees, and Mr. Payne, who dusted the trees with them when the dew was on the leaves.

You can mention above, if you think best; or simply give names of officers.

Hastily yours,

T. G. CARTER.

New York Botanical Garden Library



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