Trees, Fruits and Flowers of Minnesota, 1916 eBook

Trees, Fruits and Flowers of Minnesota, 1916

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TREES, FRUITS AND FLOWERS OF MINNESOTA

1916

[Illustration: *Monument erected in lobby of west hotel*, *Minneapolis*,

Place of annual meeting of the society, December 7 to 10. Height of monument, 10 feet. Number of bushels of apples used, twenty-five. Enlarged seal of the society on its front.]

Embracing the Transactions of the
Minnesota State Horticultural Society
from December 1, 1915, to December 1, 1916, Including the Twelve Numbers
of “The Minnesota Horticulturist” for 1916.

Edited By The Secretary,

A. W. *Latham*,

Office and Library, 207 Kasota Block,
Minneapolis, Minn.

Vol. XLIV.

[Illustration: *Minnesota state horticultural society* “*Perseverantia Vincimus*” *Organized* 1866.]

Minneapolis
Harrison & Smith Co., Printers
1916

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 *January*, 1916 No. 1

President’s Greeting, Annual Meeting, 1915.

Thos. E. *Cashman*, *president*.

This is the forty-ninth annual meeting of the Minnesota State Horticultural Society. Nearly half a century has elapsed since that little band of pioneers met in Rochester and organized that they might work out a problem that had proven too difficult for any of them to handle single handed and alone. Those men were all anxious to raise at least sufficient fruit for themselves and families. They had tried and failed. They were not willing to give up. They knew they could accomplish more by interchanging ideas, and, furthermore, if they were able to learn anything by experience they wanted to pass it on to their neighbors.

Those men built better than they knew. The foundation was properly laid, and the structure, while not finished, is an imposing one. A great many people believe that this structure has been completed, that we have reached our possibilities in fruit raising. This is only half true. We are still building on this splendid foundation erected by those few enthusiasts.

None of those men are left to enjoy the benefits of their labor. The present generation and the generations to come are and will be the beneficiaries, and I believe as a tribute to their memory and the good that they have done that we should fittingly celebrate our fiftieth anniversary. At this time I can not suggest how this should be done; I simply make this suggestion in hopes that it may be worked out.

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I was in hopes that a home for this society might have been erected this year or at least made ready for the 1916 meeting. This would surely have been an occasion worthy of the anniversary which we hope to celebrate.

The building committee appointed by the last meeting went before the legislature and tried with all the eloquence at their command to make the members of the legislature see the necessity of appropriating sufficient money to build a permanent home for this organization. The members saw the force of our argument, but we could not convince a majority of the appropriation committee that they should deviate from their plan of retrenchment which seemed to permeate their every act.

We were disappointed but not disheartened. We were promised better success in the 1917 session. So we are living in hopes, and I firmly believe that if our efforts are renewed at that time that this and the auxiliary societies may have an opportunity of meeting and transacting business in a home that, while it will belong to the state, will be for the use of these organizations, and that we may be able to take up our abode in it not later than the winter meeting of 1917.

Secretary Latham has prepared an excellent program for you. Many friends of this society are with us again, full of enthusiasm and vigor, and I know that we will have one of the most successful meetings ever enjoyed by this organization.

Owing to the fullness of the program, I should consider it an imposition on my part if I should attempt to make an extended address at this time and will hasten to call on the gentlemen who are to contribute to the success of this meeting.

[Illustration: New varieties of strawberries originated at the Minnesota State Fruit-Breeding Farm.]

Annual Meeting, 1915, Minnesota State Horticultural Society.

A. W. *Latham*, *secretary*.

Did you attend the 1915 meeting of this association, held in the West Hotel, Minneapolis, four days, December 7-10 inclusive? Of course as a member of the society you will get in cold print the substance of the papers and discussions that were presented at this meeting, but you will fail altogether in getting the wonderful inspiration that comes from contact with hundreds of persons deeply interested in the various phases of horticultural problems that are constantly passing in review during the succeeding sessions of the meeting. With such a varied program there is hardly any problem connected with horticulture that is not directly or indirectly touched upon at our annual gathering, and the present meeting was no exception to this. In all there were sixty-nine persons on the program, and with the exception of Prof. Whitten, whom we expected with us from the Missouri State University, and whom sickness kept at home,

and one other number, every person on the program was on hand to perform the part assigned to him. Isn't this really a wonderful thing where so many are concerned, emphasizing as it does the large interest felt in the work of the society?

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The meeting was held in the same room in the West Hotel which was used for the banquet two years ago. It seats comfortably 250, and was approximately filled at all of the sessions of the meeting. At the first session there were in attendance about 200 when the meeting opened at ten o'clock Tuesday morning. Later in the morning the seats were practically all filled. Making allowance for the change in the personnel of those in attendance at the various meetings, it is easily within the limit to say that between 400 and 500 were in attendance at these meetings.

Immediately adjoining the audience room on the same floor, and opening out of the spacious balcony, were the various rooms occupied by the fruit exhibit and the vegetable exhibit. The plant exhibit was in two alcoves on this balcony, and the cut flowers were displayed along either side of the balcony, making altogether a wonderful showing of nature's floral products. The accommodations for this meeting were almost ideal, and judging from the expressions of the members we have never been more happily situated than on this occasion. I have endeavored to draw a plan of the arrangements at this meeting and submit it to you, not for criticism, but to assist you in understanding the situation.

We were greatly disappointed that Prof. Whitten was detained at home by illness, but others from abroad took up the time so that there was really no interim as a result of his absence. We were fortunate in having with us the last day and a part of Thursday afternoon Sen. H.M. Dunlap and Mrs. Dunlap, and their parts on the program were listened to with intense interest, and I am sure much good was gained for our membership from the service they rendered the society, which it must be understood is a gratuitious one—indeed that applies to all of those whose names appear upon the program. That is one good thing about the horticulturist, he is willing to tell what he knows for the benefit of others. To hold any other view than this would be too narrow and selfish certainly for the true lover of horticulture.

The exhibits were in every case in excess of what we anticipated. Notwithstanding the light crop of apples in the larger portion of the state, there was really a fine showing, and quality was very high. Of boxes of apples there were shown eleven, and of barrels of apples six, for each one of which exhibits some premium was paid, as besides the first, second and third premiums in each case there was also a sum to be divided pro rata. There were twenty-nine pecks of apples exhibited, for which premiums were also paid in the same way. Four collections of top-worked apples were on the list. Premiums were awarded to forty seedling apples, an exceedingly good showing for the season. As to the number of single plates shown the record is not easily available, but the accompanying list of awards will give information as far as they are concerned, there being of course many plates to which no awards were made.

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The vegetable exhibit was an extraordinarily fine one and filled comfortably the convenient room assigned for its use. It was excellently managed by Mr. N.H. Reeves, President of the Minneapolis Market Gardeners' Association.

As to the flower exhibit under the fine management of W.H. Bofferding, it was so much better than we anticipated that it is hard to find words suitably to express our thought in regard to it. Besides the splendid collections of plants and the large display of cut flowers from the state, there was shown from several eastern parties rare flowers, many of them new productions, which had a great deal to do with the beautiful appearance of the balcony, where all of these flowers were shown.

[Illustration: Sketch showing arrangement of hall and adjacent rooms, &c., used at 1915 Annual Meeting, in West Hotel, Minneapolis.]

Mention ought to be made of the monument erected in the center of the lobby on the ground floor of the West Hotel, a structure ten feet high, containing at its base some dozen or fifteen single layer boxes of choice apples and on its sides something like twenty bushels of apples put on in varying shades of red and green with a handsome ornamental plant crowning the whole. The seal of the society decorated with national colors appears upon the front. The picture taken of this monument is shown as a frontispiece of this number. It is incomplete in that the photographer cut off both ends of it, which is unfortunate in results obtained. Nevertheless it helped materially to advertise the meeting and was a distinct ornament in the lobby.

As to subjects in which there was a special interest on our program, the only one to which I will here refer is that of "marketing," which received particular attention from a considerable number of those on the program or taking impromptu parts at the meeting. The Ladies' Federation assisted us splendidly on the Woman's Auxiliary program, one number, that by Mrs. Jennison, being beautifully illustrated by lantern slides.

Delegates from abroad as usual and visitors were with us in considerable number. Prof. F. W. Brodrick came from Winnipeg, representing the Manitoba Society; Prof. N. E. Hansen, as usual, represented the South Dakota Society; Mr. Earl Ferris, of Hampton, Ia., the Northeastern Iowa Society; and Mr. A. N. Greaves, from Sturgeon Bay, Wis., the Wisconsin Society. We were especially favored in having with us also on this occasion Mr. N. A. Rasmusson, president of the Wisconsin Horticultural Society, and Secretary Frederick Cranefield of the same society. If all the members of that society are as wide awake as these three the Minnesota Society will have to look to its laurels.

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I must not fail to mention Mr. B. G. Street, from Hebron, Ill., who was present throughout the meeting, an earnest brother, and gave us a practical talk on “marketing.” Our friend, Chas. F. Gardner, of Osage, Iowa, managed to get here Friday morning after the close of the meeting of the Iowa Horticultural Society, which he had been attending, and so spent the last day of the meeting with us. Welcome, Brother Gardner! The meeting would certainly have been incomplete without the presence of those old veterans and long time attendants at our annual gatherings, Geo. J. Kellogg and A. J. Philips, both from the Wisconsin Society. We need you, dear brothers, and hope you may long foregather with us.

As to that war horse of horticulture, C. S. Harrison, of York, Nebr., what would our meeting be without the fireworks in language which he has provided now for many of these annual occasions. The wonderful life and sparkle of his message survives with us from year to year, and we look forward eagerly to his annual coming.

There were three contestants who spoke from the platform in competition for the prizes offered from the Gideon Memorial Fund as follows:

First Prize—G. A. Nelson, University Farm School, St. Paul. Second—A. W. Aamodt, University Farm School, St. Paul. Third—P. L. Keene, University Farm School, St. Paul.

Their addresses were all of a practical character and will appear in our monthly.

Prof. Richard Wellington conducted a fruit judging contest, in connection with which there was a large interest, and prizes were awarded as follows:

D. C. Webster, La Crescent, First	$5.00
P. L. Keene, University Farm, St. Paul, Second	3.00
Marshall Hurtig, St. Paul, Third	2.00

At the annual election the old officers whose terms had expired were all re-elected without opposition, and later the secretary was re-elected by the executive board for the coming year, so that no change whatever was made in the management of the society. J. M. Underwood, being absent in the south, was nevertheless re-elected by the board as its chairman for the coming year.

A pleasant event of this gathering was the presentation of a handsome gold watch and chain to the secretary, a memento in connection with the termination of his twenty-fifth year as secretary of the society, which expression of appreciation on the part of the members it may well be believed was fully appreciated by the recipient.

The hall was brilliantly decorated with the national colors, which had never been used before at any of our annual gatherings. What can be more beautiful than the stars and stripes entwined with the colors of foliage and flower. Never has our place of meeting shown so brightly or been more enjoyed than in this favorable environment.

During the meeting upon the recommendation of the executive board there were five names by the unanimous vote of the society placed upon the honorary life membership roll of the society, as follows: John Bisbee, Madelia; J. R. Cummins, Minneapolis; Chas. Haralson, Excelsior; F. W. Kimball, Waltham, and S. H. Drum, Owatonna.

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The meeting closed with seventy-five members in the hall by actual count at 4:30, and we certainly hated to say the parting word to those whom we earnestly hope to gather with again a year hence.

What can we say about the crowning event of our meeting, the annual banquet? Two hundred and two members sat down together and fraternized in a most congenial way. Gov. W. S. Hammond was the speaker of the evening and greatly enjoyed. All the other numbers on the program were on hand to perform their parts. Here follows the program and you can judge for yourself. Why don't you come and enjoy this most entertaining event of the meeting?

Program.

Prof. N.E. Hansen, Toastmaster.

Grace Rev. J. Kimball, Duluth
Opening Song Trafford N. Jayne,

Minneapolis
Why Wake Up the Dreamers—Aren't They
Getting Their Share? Prof. E. G. Cheyney,
University Farm, St. Paul
Reading Miss Marie Bon, Minneapolis
What Joy in the Garden, Provided E. E. Park, Minneapolis
Every True Horticulturist Has a Private
Rainbow with a Pot of Gold at the End Mrs. T. A. Hoverstad,

Minneapolis
Song s. Grace Updegraff Bergen,

Minneapolis
The Joy of Service Gov. W. S. Hammond
What Care I While I Live in a Garden A. G. Long, Minneapolis
Song Trafford N. Jayne,

Minneapolis
Never Too Late to Mend—Unless You
Are "80," A. J. Philips, West Salem, Wis.
Reading Miss Marie Bon
Right Living and Happiness—You Can't Have
One Without the Other, T. E. Archer, St. Paul
Closing Song Trafford N. Jayne, Minneapolis

* * * * *

“DON’TS” *Issued to prevent forest fires*.—1. Don’t throw your match away until you are sure it is out.

2. Don’t drop cigarette or cigar butts until the glow is extinguished.

3. Don’t knock out your pipe ashes while hot or where they will fall into dry leaves or other inflammable material.

4. Don’t build a camp fire any larger than is absolutely necessary.

5. Don’t build a fire against a tree, a log, or a stump, or anywhere but on bare soil.

6. Don’t leave a fire until you are sure it is out; if necessary smother it with earth or water.

7. Don’t burn brush or refuse in or near the woods if there is any chance that the fire may spread beyond your control, or that the wind may carry sparks where they would start a new fire.

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8. Don't be any more careless with fire in the woods than you are with fire in your own home.

9. Don't be idle when you discover a fire in the woods; if you can't put it out yourself, get help. Where a forest guard, ranger or state fire warden can be reached, call him up on the nearest telephone you can find.

10. Don't forget that human thoughtlessness and negligence are the causes of more than half of the forest fires in this country, and that the smallest spark may start a conflagration that will result in loss of life and destruction of timber and young growth valuable not only for lumber but for their influence in helping to prevent flood, erosion, and drought.—U.S. Dept. Agri., Forest Service.

Award of Premiums, Annual Meeting, 1915, Minnesota State Horticultural Society.

The list of awards following will give in full detail the awards made in connection with the fruit exhibit:

VEGETABLES.

Carrots Chas. Krause, Merriam Park Second 2.00
Celeriac " " Third 1.00
Cabbage J. T. Olinger, Hopkins Second 2.00
Carrots " " Third 1.00
Onions (red) " " Second 2.00
Onions (yellow) " " Fourth .50
Celeriac Daniel Gantzer, Merriam Park First 3.50
Lettuce " " Third 1.00
Onions (red) " " Third 1.00
Onions (white) " " Fourth .50
Onions (yellow) " " Second 2.00
Onions (pklg) " " Second 2.00
Beets Karl Kochendorfer, So. Park Third 1.00
Carrots C. E. Warner, Osseo First 3.50
Onions (white) " " First 3.50
Beets Mrs. John Gantzer. St. Paul First 3.50
Cabbages " " Fourth .50
Onions (red) " " First 3.50
Onions (yellow) " " First 3.50
Beets Mrs. Edw. Haeg, Minneapolis Second 2.00
Cabbages " " Third 1.00
Celeriac " " Second 2.00
Carrots Alfred Perkins, St. Paul Fourth .50

Lettuce " " First 3.50
Onions (red) " " Fourth .50
Onions (white) " " First 3.50
Onions (yellow) " " Third 1.00
Onions (white) H. G. Groat, Anoka Second 2.00

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Onions (pickling) " " Fourth .50
Beets Chas. Krause, Merriam Park Fourth .50
Cabbages " " First 3.50
Lettuce Mrs. Edw. Haeg, Minneapolis Second 2.00
Onions (white pklg) " " Third 1.00
Onions (white) Aug. Sauter, Excelsior Third 1.00
Globe Onions (red) P. H. Peterson, Atwater First 3.50
Salsify Mrs. John Gantzer, St. Paul First 3.50
Turnips (white) " " First 3.50
Rutabagas " " Fourth .50
Parsley Mrs. Edw. Haeg, Minneapolis Fourth .50
Hubbard Squash " " Third 1.00
Potatoes C. W. Pudham, Osseo Fourth .50
Hubbard Squash " " Fourth .50
Potatoes Frank Dunning, Anoka Second 2.00
Pie Pumpkins " " First 3.50
Hubbard Squash " " Second 2.00
Turnips (white) Alfred Perkins, St. Paul Fourth .50
Potatoes Fred Scherf, Osseo First 3.50
Rutabagas " " First 3.50
Pie Pumpkins " " Fourth .50
Parsley Chas. Krause. Merriam Park Third 1.00
Parsnips " " First 3.50
Salsify Chas. Krause, Merriam Park Second 2.00
Turnips (white) " " Second 2.00
Parsnips J. T. Olinger, Hopkins Third 1.00
Turnips " " Third 1.00
Rutabagas " " Second 2.00
Parsley Daniel Gantzer Second 2.00
Parsnips " " Second 2.00
Pie Pumpkins " " Second 2.00
Parsnips Karl K. Kochendorfer, So. Park Fourth .50
Potatoes Aug. Bueholz, Osseo Third 1.00
Hubbard Squash " " First 3.50
Rutabagas " " Third 1.00
Parsley Frank L. Gerten, So. St. Paul First 3.50
Pie Pumpkins " " Third 1.00
Radishes " " First 3.50

E. O. *Ballard*, Judge.

COLLECTION OF APPLES.

Collection of Apples P. Clausen, Albert Lea $3.30
Collection of Apples Henry Husser, Minneiska 3.78
Collection of Apples D. C. Webster, La Crescent 3.96
Collection of Apples P. H. Perry, Excelsior 2.36
Collection of Apples F. I. Harris. La Crescent 3.48
Collection of Apples W. S. Widmoyer, La Crescent 3.12

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SINGLE PLATES OF APPLES.

Yahnke F. I. Harris, La Crescent First $.75
Utter W. S. Widmoyer, La Crescent First .75
N.W. Greening " " First .75
Malinda " " Second .50
Plumb's Cider " " First .75
Patten's Greening F. W. Powers, Minneapolis First .75
Duchess " " First .75
Malinda F. I. Harris, La Crescent Third .25
Peerless " " First .75
Wolf River " " Second .50
Wealthy " " Second .50
Antonovka " " Second .50
Fameuse " " Second .50
Gilbert " " First .75
Duchess P. H. Perry, Excelsior Third .25
Yellow Transparent " " First .75
Tetofsky " " First .75
Charlamoff " " Third .25
Yahnke " " Second .50
Evelyn " " First .75
Lowland Raspberry P. Clausen, Albert Lea Second .50
Hibernal " " First .75
Okabena Francis Willis, Excelsior First .75
Milwaukee " " First .75
Patten's Greening " " Second .50
Longfield " " Second .50
University " " First .75
Longfield P. H. Perry, Excelsior First .75
Fameuse " " Third .25
Hibernal E. W. Mayman, Sauk Rapids Second .50
Wealthy Sil Matzke, So. St. Paul First .75
Peerless " " Second .50
N.W. Greening " " Second .50
McMahon " " First .75
Yellow Transparent Henry Husser Second .50
Fameuse " " First .75
Walbridge " " First .75
McMahon D. C. Webster, La Crescent Third .25
N.W. Greening " " Third .25
Brett " " First .75
Gideon " " First .75

Superb " " First .75
Okabena M. Oleson, Montevideo Second .50

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Peerless " " Third .25
Hibernal " " Third .25
Longfield " " Third .25
University " " Second .50
Charlamoff Henry Husser, Minneiska Second .50
McMahon " " Second .50
Wolf River " " First .75
Jewell's Winter " " First .75
Anisim P. Clausen, Albert Lea First .75
Jewell's Winter " " Second .50
Antonovka " " First .75
Iowa Beauty " " First .75
Yahnke " " Third .25
Borovinca " " First .75
Patten's Greening P. H. Peterson, Atwater Third .25
Malinda " " First .75
Okabena " " Third .25
Lord's L. " " First .75
Lowland Raspberry " " First .75
Charlamoff " " First .75
Duchess " " Second .50
Tetofsky W. J. Tingley, Forest Lake Second .50
Wealthy H. B. Hawkes, Excelsior Third .25
Grimes' Golden P. H. Peterson, Atwater First .75

Jno. P. *Andrews*, Judge.

SEEDLING APPLES.

Early Winter—Arnt Johnson, Viroqua, Wis. $1.45
" " —W.S. Widmoyer, La Crescent 2.45
" " —J. Flagstad & Sons, Sacred Heart 2.15
" " —No. 96—Henry Rodenberg, Mindora, Wis. 1.55
" " —No. 32— " " 1.85
" " —No. 50— " " 1.55
" " —No. 82— " " 2.00
" " —No. 52— " " 2.40
" " —No. 64— " " 2.20

" " —Dr. O. M. Huestis, Minneapolis 1.55
" " —Jacob Halvorson, Delavan 1.55
" " —No. 102—Henry Rodenberg, Mindora, Wis. 1.15
" " —No. 138— " " 1.40
" " —No. 137— " " 2.00
" " —No. 131— " " 1.70
" " —H. H. Pond, Minneapolis 1.15
" " " 1.30
" " " 1.15
" " " 1.55
" " —Henry Husser, Minneiska 2.10
" " —O. O.—M. Oleson, Montevideo 1.85

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" " —O. K.— " 2.05
" " —G. N.— " 1.30
" " —G. S.— " 2.20
" " —E. T.—M. Oleson 1.70
" " —E. A. Gross, La Moille 1.15
" " — " 1.90
" " — " 2.25
" " —No. 1—Arnt Johnson, Viroqua, Wis. 1.40
Late Winter—No. 133—Henry Rodenberg, Mindora, Wis. 3.90
" " —No. 134— " " 2.75
" " —No. 135— " " 2.55
" " —No. 104— " " 3.70
" " —No. 49— " " 3.25
" " —No. 16— " " 3.80
" " —No. 12— " " 3.25
" " W. S. Widmoyer, La Crescent 2.30
" " —Chas. Ziseh, Dresbach 2.30
" " —J. A. Howard, Hammond 4.20
" " " 4.15
" " —F. W. Powers, Excelsior 4.00
" " —J. Flagstad & Sons, Sacred Heart 3.25
" " Henry Husser, Minneiska 3.25
" " —No. 23—Henry Rodenberg, Mindora, Wis. 3.35

Clarence wedge, N. E. *Hansen*, Judges.

COLLECTION OF TOP-WORKED APPLES.

Collection of Top-Worked	P. H. Peterson, Atwater	4.16
Collection of Top-Worked	P. Clausen, Albert Lea	11.45
Collection of Top-Worked	Henry Husser, Minneiska	5.23
Collection of Top-Worked	W. S. Widmoyer, Dresbach	4.16

Dewain cook, Judge.

PECKS OF APPLES.

N.W. Greenings Aug. Sauter, Excelsior .95
Wealthy H .B. Hawkes, Excelsior 1.10
Wealthy P. H. Peterson, Atwater .90
Fameuse Henry Husser, Minneiska .80
Wolf River " " 1.00
Peerless " " .75
N.W. Greening " " .75
N.W. Greening D. C. Webster, La Crescent 1.10
Wealthy " " .90
Bethel " " 1.00
Scotts' Winter " " 1.00
Wealthy W. P. Burow, La Crescent .85
N.W. Greening " " 1.10
Wealthy E. W. Mayman, Sauk Rapids .80
Hibernal E. W. Mayman, Sauk Rapids .85
Wealthy Francis Willis, Excelsior .90
Duchess " "

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.55
Okabena " " .55
Milwaukee " " .80
Wealthy P. H. Perry, Excelsior .85
Fameuse " " .80
Seedlings " " .80
Peter " " .85
Wealthy F. I. Harris, La Crescent .85
N.W. Greening " " .95
Seedlings T. E. Perkins, Red Wing .80
N.W. Greenings F. W. Powers, Minneapolis 1.00
Wealthy " " .90
Duchess R. E. Olmstead, Excelsior .55

Geo. W. *Strand*, Judge.

BUSHEL BOXES OF APPLES.

Wealthy—H. B. Hawkes, Excelsior 2.31
Wealthy—P. H. Peterson, Atwater 2.17
Wealthy—Henry Husser, Minneiska 2.43
Wealthy—D. C. Webster, La Crescent First 17.72
N.W. Greening—W. P. Burow, La Crescent 2.48
Wealthy—P. H. Perry, Excelsior 1.86
Wealthy—J. F. Bartlett, Excelsior Third 7.57
Wealthy—F. I. Harris, La Crescent Second 12.63
N.W. Greenings—F. W. Powers, Excelsior 1.98
Wealthy—F. W. Powers, Excelsior 2.08
Wealthy—S. H. Drum, Owatonna 1.77

W. G. *Brierley*, Judge.

BARRELS OF APPLES.

H. B. Hawkes, Excelsior 8.98
Henry Husser, Minneiska 3.52
D. C. Webster, La Crescent First 25.23
W. P. Burow, La Crescent 3.05
Wealthy—P. H. Perry, Excelsior Third 14.37
F. I. Harris, La Crescent Second 19.85

W. G. *Brierley*, Judge.

COLLECTION GRAPES.

Collection Grapes—Sil Matzke, So. St. Paul First 8.00

George W. *Strand*, Judge.

NUTS.

Walnuts Henry Husser, Minneiska First 1.00
Butternuts " " First 1.00
Hickory Nuts " " Second .75
Hickory Nuts D. C. Webster, La Crescent First 1.00

H. J. *Ludlow*, Judge.

PLANTS.

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12 Palms	Minneapolis Floral Co.	First	$10.00
12 Ferns	" "	Third	4.00
12 Blooming Plants	" "	Third	6.00
12 Ferns	Merriam Park Floral Co.	First	10.00
12 Blooming Plants	" "	First	12.00
12 Palms	L. S. Donaldson Co., Mpls.	Second	7.00
12 Ferns	" "	Second	7.00
12 Blooming Plants	" "	Second	9.00

CUT FLOWERS.

25 Carnations (pink)	L. S. Donaldson Co., Mpls.	Third	1.00
25 Carnations (white)	" "	Second	2.00
12 Roses (red)	Minneapolis Floral Co.	Third	1.00
12 Roses (white)	" "	Third	1.00
12 Roses (yellow)	" "	First	3.00
12 Roses (red)	N. Neilson, Mankato	First	3.00
12 Roses (pink)	" "	First	3.00
12 Roses (white)	" "	First	3.00
12 Roses (yellow)	" "	Second	2.00
12 Roses (pink)	Hans Rosacker, Minneapolis	Second	2.00
12 Roses (red)	" "	Second	2.00
12 Roses (white)	" "	Second	2.00
12 Carnations (white)	" "	First	3.00
12 Carnations (pink)	" "	Second	2.00
12 Carnations (red)	" "	First	3.00
25 Carnations (red)	Minneapolis Floral Co.	Second	2.00
25 Carnations (pink)	" "	First	3.00
25 Carnations (white)	" "	Third	1.00
12 Chrysanthemums (yellow)	John E. Sten, Red Wing	First	4.00
12 Chrysanthemums (any color)	" "	First	4.00
12 Chrysanthemums (any color)	Minneapolis Floral Co.	Second	3.00
12 Chrysanthemums (yellow)	L. S. Donaldson Co., Mpls.	Second	3.00
12 Chrysanthemums (any color)	" "	Third	2.00

FLOWERS.

Basket for Effect Minneapolis Floral Co. First $10.00
Bridesmaid Bouquet Minneapolis Floral Co. First Diploma
Corsage Bouquet Minneapolis Floral Co. First Diploma
Bridal Bouquet Minneapolis Floral Co. First Diploma

O. J. *Olson*, Judge.

Judging Contest of Hennepin County High Schools.

(Held at Annual Meeting, December 9, 1915.)

The contest consisted of the judging of three crops, apples, potatoes and corn. Two varieties of each crop were used.

Each school was represented by a team of three men. Each man was allowed 100 as perfect score on each crop or a total perfect team score of 900 points.

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Two high schools entered the contest, namely Central High, Minneapolis, and Wayzata High. Central High, of Minneapolis, won first with a total score of 697.8. Wayzata ranked second with a score of 672.

Minneapolis won on apples and potatoes, Wayzata winning on the corn judging.

Chester Groves, of Wayzata, was high man of the contest.

County Adviser K. A. Kirkpatrick, gives a banner to the winning school. Judges of the contest were: Apples, Prof. T. M. McCall, Crookston; potatoes, Prof. R. Wellington, A. W. Aamodt; corn, Prof. R. L. Mackintosh.

Fruit Judging Contest.

(At Annual Meeting, December, 1915.)

One of the important features of the Wednesday afternoon program of the State Horticultural Society was the apple judging contest. This contest was open to all members of the society and students of the Agricultural College.

The contest consisted of the judging of four plates each of ten standard varieties. The total score of each contestant was considered by allowing 10 per cent for identification of varieties, 40 per cent for oral reasons and 50 per cent for correct placings.

The prizes offered were: First, $5.00; second, $3.00; third, $2.00. D.C. Webster of La Crescent, ranked first; P.L. Keene, University Farm, second; and Marshall Hertig, third.

Score	
First—D. C. Webster	87-1/2
Second—P. L. Keene	81-1/2
Third—Marshall Hertig	77-1/2
Fourth—Timber Lake	76-1/2

There were twelve men in the contest.

Judges: Prof. T. M. McCall, Crookston; Frederick Cranefield, Wisconsin; Prof. E. C. Magill, Wayzata.

Annual Report, 1915, Collegeville Trial Station.

Rev. John B. *Katzner*, *Supt*.

It is with pleasure and satisfaction that we are able to make a material correction of our estimate of this year's apple crop as noted in our midsummer report. We stated that apples would be about 15 per cent of a normal crop, and now we are happy to say it was fully 30 per cent. We picked twice as many apples as we anticipated. Considering that, as Prof. Le Roy Cady informed us, the apple crop would be rather small farther south and that they would practically get no apples at the State Farm, we may well be satisfied with our crop. In general, the apple crop was not so bad farther north as it was farther south in the state. This may have been due to the blossoms not being so far advanced here when the frost touched them as farther south.

The best bearing varieties this year were the Wealthy, Charlamoff and Duchess, in the order named. These three kinds gave us the bulk of the crop. The Wealthy trees were not overloaded, and the apples were mostly fine, clean and large. The Charlamoffs were bearing a heavy crop of beautiful, large-sized apples and were ahead of the Duchess this year. The Hibernals, too, were fairly good bearers.

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Most other varieties had some fruit, but it was not perfect; it showed only too well the effect of frost. More than half of the blossoms were destroyed. Many flowers were badly injured and though they were setting fruit the result of frost showed off plainly on the apples. While some had normal size and form, many of them were below size, gnarled, cracked or undeveloped and abnormal. Most all of them had rough blotches or rings about the calix or around the body. Malformed apples were picked not larger than a crab, with rough, cracked, leather-like skin, which looked more like a black walnut than an apple.

Of plums only some young trees gave us a good crop of nice, perfect fruit. The old trees have seen their best days and will have to give place to the new kinds as soon as they are tested. We have quite a variety of the new kinds on trial from the Minnesota State Fruit-Breeding Farm and wish to say that they are very vigorous growers. Many of them made a growth of four feet and more. We expect that some will bear next year and we are only waiting to see what the fruit will be before making a selection for a new plum orchard. We have already selected No. 8 for that purpose, as one tree was bearing most beautiful and excellent plums, of large size and superior quality, this year. They were one and three-fourths inches long by five and one-half inches in circumference and weighed two ounces each. They kept more than week before they got too soft for handling and are better than many a California plum. It seems to us if a man had ten acres of these plum trees, he could make a fortune out of them. We will propagate only the very best kinds for our own use and may have more to say about them another year.

[Illustration: Cluster of Alpha grapes from Collegeville.]

Two or three of the imported pears bloomed again last spring, but the frost was too severe and they set no fruit. We have lost all interest in them and so, too, in our German seedling pears. The latter are now used as stocks and are being grafted with Chinese and hybrid pears. Of those already grafted this way some have made a growth of four and five feet. We have been successful in grafting the six varieties of hybrid pears obtained last spring from Prof. N.E. Hansen, of Brookings, S. Dak., and have trees of every variety growing. These, too, are very good growers, have fine large leaves and are promising. From the manner of growth in stem and leaf we would judge that at least two distinct Asiatic varieties have been used in breeding. We have gathered a little grafting wood and next spring some more German seedlings will lose their tops. It is only from continued efforts that success may be obtained in growing pears in Minnesota.

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Who would have thought it possible that in spite of all the frost and cold rains we would get a pretty good crop of cherries? And yet this is a fact. We have four varieties, and among them is one originated by the late Clem. Schmidt, of Springfield, Minn., which was bearing a good crop of very fine cherries while the three other sorts did not do a thing. To get ahead of the many birds we picked the cherries a few days before they were ripe and put them up in thirty-two half-gallon jars. As the cherries become very soft when dead-ripe, it was of advantage to can them when they were still hard. These canned cherries are meaty and most delicious. We never tasted any better. It is only a pity that this seedling cherry is not quite hardy.

As most everywhere in the state, our grapes were a complete failure. The early growth with its good showing of fruit having been frozen in May, it was well toward the end of June when the vines had recovered from the shock and were able to grow vigorously again. There were a few grapes on some of the vines, but they never got ripe. The Alpha showed the most fruit, and a few bunches were just about getting ripe when the frost spoiled them. This May freeze was more severe than we thought it was. The wood of the old vines was not injured, but the one year old wood of young plants was killed to the ground. The lesson we learned from this is very important. It may be stated that vines full of sap and in growing condition can endure very little cold, but when the wood is ripe and dormant the vines will seldom be injured by sub-zero weather. This injury to vines from frost might have been averted at least in part by precautionary measures. In other countries people start smoldering fires, making much smoke in the vineyard so that the whole is covered with a cloud of smoke. This raises the temperature a few degrees and keeps the frost out. Such preventive means might have been used here very well to save the grapes, but it was not done.

Our currants were not very good; they ripened unevenly and showed that they, too, were touched by frost. A few bushes were also attacked by the currant worm.

We never cultivated any raspberries before. But last year we planted Raspberry No. 8, sent to us from the Fruit-Breeding Farm. This sort is a very vigorous grower; some canes grew over six feet high. It fruited this year; it is very prolific; the fruit is very large and of good quality. It would be quite satisfactory if it were a little hardier. Not being protected more than half of the plants were lost last winter.

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But the everbearing strawberry No. 1017 received from the Fruit-Breeding Farm is a complete success. They were properly planted and well taken care of. All flowers were removed up to July 10th and then left alone. In early August the first berries were picked, and we kept right on picking till the frost killed the fruit stalks. The growing of this strawberry will be continued. A new bed will be planted next spring with young plants that were not allowed to bear last season. The fruit was all that could be desired, fine, large and of very good quality. It seems to be of greater advantage to grow the everbearing than the June-bearing sorts. The everbearing planted in spring will grow a large crop in fall and bear again in June next year. From the first we get two crops in fifteen months, from the second two crops in three years. And to fruit any sort oftener than two seasons is not considered very profitable.

Most all trees of apples, pears, plums, evergreens and grafts which were planted last spring, have done very well, and we don't know of any that failed to grow. The hybrid plums received last spring are all alive. The same may be said of the 50 Norway pine obtained from the Minnesota State Forester, W. F. Cox, not one failing to grow. If evergreens are handled right in transplanting they are just as sure to grow as any other trees. This year was especially favorable for transplanting on account of the many rains and cool weather.

This, too, was the kind of weather which pleased our vegetable gardener. He found it scarcely ever necessary throughout the season to apply water to the growing plants for their best development. All grew fine and large. Cabbage heads were grown that weighed thirty-five pounds; carrots, onions, beets, lettuce and in fact all the different varieties were first-class. Yet there was something that did not please the gardener nor ourselves, namely, the tomatoes did not get ripe. We had a few early kinds all right, but the bulk, the large, fine varieties, were hanging on the vines still green when the first heavy frost touched them. It was too cool for them to ripen. The same may be said of the melons. Not once did we have melons at table this year. They were too poor to be served.

Our floral plantings were a great success. The many artistic foliage designs developed wonderfully and were the admiration of all visitors. Our peonies were a mass of exceedingly beautiful flowers, filling the air with fragrance as of roses. We are not surprised that these flowers have gained so much popularity of late, for their great beauty and ease of culture recommend them to all lovers of flowers. The dahlias, too, were very excellent; in fact, we never saw them better. They are quite ornamental in flower and plant. The newer varieties have exceptionally large flowers, but the plants do not show off so well and bend down from the weight of the flowers. For symmetry and uniformity of growth the old varieties are hard to be excelled. Some of the roses were not so good as desired, the buds got too much rain at times and rotted away. The mock oranges, syringas and others were all very good, but the spireas suffered much when in flower from rains. As a whole, however, our lawns and grounds were beautiful and satisfactory and the new greenhouse has done good work.

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The growing of fruit this year has been a disappointment to many horticulturists. Indeed, some got quite a showing of fruit in favored localities, but the majority got not much of a crop to be proud of. Well, we cannot regulate the weather conditions, but we are pleased with the thought that such abnormal conditions are not of frequent occurrence in Minnesota. Yet there is one redeeming feature of the season and that is, the wonderful growth of plants and trees which gives promise that with the usual normal conditions our expectations for a better fruit crop will be realized.

* * * * *

Storing cabbage in the field.—In choosing a site for a storage pit, select a ridge, well drained and as gravelly a soil as possible. The pit should be 6 to 10 inches deep, the length and width depending upon the amount to be stored. It is well to have it wide enough to accommodate 3 to 5 heads on the bottom row.

In harvesting the heads, pull up by the roots. Break off only the dead or diseased leaves, and fold the remaining leaves over the head as much as possible to protect them. Overripe or cracked heads should not be stored. The heads are placed in the pit with their heads down and roots up. The second layer is also placed heads down between the roots of the first layer. It is well not to have more than two layers, on account of the weight having a tendency to crush the lower layer.

When the cabbages are put in place they are covered with a layer of earth. When cold weather comes, straw or manure can be added.

Cabbages can often be kept better in pits than in common cellars.—E. F. McKune, Colorado Agricultural College, Fort Collins, Colorado.

Wintering of Bees.

Francis Jager, *apiarist*, *university farm*, *st*. *Paul*.

The winter losses of bees in Minnesota are great every year. Bee keepers can reduce these losses by preparing bees for their winter-quarters.

The chief known cause for winter losses are: Queenlessness, smallness of number of bees in colonies, insufficient food, improper food, dampness, bad air, the breaking of the clusters, and low temperature.

More colonies die from lack of food and from cold than from all other causes. In fact, most of the other causes can be traced to lack of food and cold.

Queenless colonies will certainly die in a few months.

If the number of bees in a colony is small the clusters cannot generate enough heat or keep it generated and the bees will perish. To avoid this, small colonies should be united in the fall into one big colony.

Bees must have food in the winter in order to generate heat. About forty pounds of honey to the colony should be provided when the bees are put into winter-quarters. Should the colony be short of honey of its own, finished frames may be supplied early in the fall or sugar syrup may be fed. Bee keepers should keep about one well filled extracting frame out of every seven for feeding purposes.

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Dark (not amber) honey is poor food for bees in winter. All black honey should be removed and combs of white honey should be substituted. Experiments made by Dr. Phillips, in Washington, D. C., have shown that bees consume least honey and winter best when the temperature inside the hive is 57 degrees Fahrenheit.

Dampness in a cellar causes the comb and frames of the hive walls and cover to get damp and mouldy, and the bees perish from wet and cold after exhausting their vitality in generating heat.

Bees need fresh air. Foul air will cause excitement, causing an overheated condition; and the bees will scatter and die. Any excitement among bees in winter is fatal. Cellars on high ground, covered with straw over timbers, are best for wintering bees.

If the bee cluster divides or splits up during the winter, the smaller clusters will perish from cold. The present style of Hoffman frames divides the bee cluster into eleven divisions separated from each other by a sheet of wax comb, with no direct communication between different divisions except over, below or around the frames. If the bee cluster contracts during the winter on account of cold the divisions of the outside frames are sometimes left behind and die. Some bee keepers perforate their frames to keep an easy passage for bees from one compartment to another. If kept warm, even weak colonies may pass over or around the frames without much difficulty. When cold, only the strongest will be able to accomplish this difficult task. Wintering bees in division hives or in two story hives, which give them a horizontal bee space through the middle between the two divisions, is highly recommended for successful wintering.

[Illustration: Francis Jager, Professor of Apiculture, University Farm, St. Paul.]

In long-continued severe cold the bee clusters will contract into a very small, compact mass. The tendency of this cluster is to move upward where the air is warmer. If enough honey is stored above them they will keep in contact with it. If the honey is stored at the side, the bees sometimes lose their contact with it and die of starvation and cold. This is another argument in favor of wintering in two story hives. Often they will move towards one corner and die there, leaving the other corners filled with honey. If you must winter in one story hives give bees plenty of honey in the fall and place the cluster at one side of the hive so that they move necessarily toward the honey supply.

Bees should be kept in a cellar at a temperature of about 45 degrees. The difference in the temperature between the outside and the inside of the hive will be between 10 and 15 degrees. Very strong colonies, no matter where kept, will keep themselves warm and will survive any degree of cold, but there is no doubt that their vitality and ability to stand wintering will suffer a great deal thereby, causing dwindling in the spring. Cellar wintering is at present general in Minnesota. The bee cellar should be warm, dry, dark and ventilated. The bees should not be disturbed during their winter sleep by pounding,

jarring, shaking and feeding. Mice also may cause the bees to get excited and perish. A four to one inch wire screen in front of the entrance will prevent mice from getting inside.

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The fundamental principles to guide the bee keeper in wintering his bees are: First, strong colonies, at least six frames covered with bees when clustered; second, ample store, not less than forty pounds of honey; and third, a hive with not less than 57 degrees inside temperature. This temperature may be maintained outside in a double walled hive or in a hive lined with flax or felt, now manufactured for that purpose, or by packing the hives in leaves, straw or shavings—or by putting them into a warm cellar.

Bees in our climate should be put into winter quarters about November 15 and should not be put on their summer stands in the spring until soft maples are in bloom.

By following these suggestions winter losses may be reduced to an insignificant percentage, and these mostly from accidents and causes unforseen, for bees respond wonderfully to proper treatment.

The Currant as a Market Garden Product.

B. *Wallner*, *Jr*., *West st*. *Paul*.

The currant is essentially a northern fruit, therefore does well in Minnesota.

I plant my currants on a clay loam as it retains moisture and coolness, which the currant prefers. Their roots run somewhat shallow, and hence sandy or friable soils are not desirable. Soils such as will prevent a stagnant condition during heavy rainfalls are essential. I plant my currants early in spring as soon as the frost leaves the ground and a proper preparation can be secured. I plant them five by five feet apart, as they require a thorough cultivation the first two years from planting.

I plant mangels between the rows the first year; second year continued cultivation is practiced; third year I apply a mulch consisting of mushroom manure to a depth of from four to six inches, which answers a double purpose, to keep out weeds and to act as mulch at the same time. During a prolonged dry spell the soil is moist under this covering, and it makes it more pleasant for the picking, as it prevents the berries getting soiled after a rain during the picking season. You cannot fertilize the currant too abundantly, as it is a gross feeder and requires plenty of manure to get best results, as such fruit commands the best price on the market.

I planted my currants on ground previously well fertilized with well decayed barnyard manure.

I prefer strong well rooted two-year-old plants. The long straggling roots are shortened, and bruised portions cut off with a sharp knife. The tops are somewhat reduced, depending on the size of plants. I set them in a furrow, sufficiently deep to admit the

roots to spread out in a natural position, fill in with surface soil and pack around the roots, so that when the earth is firmly settled the roots will not protrude out any place.

In regard to pruning I find the best and largest fruit is produced on canes not over four years old, and if judicious cutting out of the old canes is followed nice, large, full clusters of fruit of excellent character will be obtained. This is a fact that I want to emphasize: if the market is glutted with currants, you can readily dispose of your product, providing they are qualified as extra large, which results can be attained by following these rules.

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Pertaining to insects and diseases, I spray my currants twice for the currant worm with arsenate of lead at the rate of two pounds to fifty gallons of water.

I also use hellebore (dry powdered form), especially valuable in destroying the worms when berries are almost ready for market, and on which it is dangerous to use arsenical poisons. I never was troubled with the currant worm cane borer. I attribute the absence of this dreaded insect to my keeping all old wood cut out, which is generally infested with it.

As to varieties I planted the following: Wilder, Victoria, Prince Albert, Red Cross, Diploma and White Grape. The Wilder is the best commercial berry, very productive and large, while the Diploma is one of the largest fruited varieties in existence, its main drawback consisting of a straggling habit of growth which requires either tying up the branches or pruning back somewhat short.

The Prince Albert is late and can be recommended for commercial use. Victoria is a prolific bearer, fair size fruit and requires little pruning. Red Cross is large fruited, but shy bearer. The White Grape meets with little demand as a market berry, fine to eat out of hand and an excellent table berry.

I also planted a few Black Champion; have not grown it long enough to know definite results.

The demand for black currants is limited, but the prices are fair. As to picking would say we pick them when not quite ripe, as the average housewife claims they jell better than when over-ripe. They must be picked by the stem and not stripped off—all defective, over-ripe and bruised berries should be eliminated at the picking.

When the box is being filled a few gentle raps should be given to settle the clusters into place, as they shake down considerably. All the conveniences and same character of boxes and crates used in handling of other small fruits are equally adapted to the currant.

* * * * *

Welcome the thrushes—these birds do the farmer little harm and much good.—That thrushes—the group of birds in which are included robins and bluebirds—do a great deal of good and very little harm to agriculture is the conclusion reached by investigators of the United States Department of Agriculture who have carefully studied the food habits of these birds. Altogether there are within the limits of the United States eleven species of thrushes, five of which are commonly known as robins and bluebirds. The other six include the Townsend solitaire, the wood, the veery, the gray-cheek, the olive-back, and the hermit thrushes.—U.S. Dept. of Agri.

Report of Committee on Examination of Minnesota State Fruit-Breeding Farm for the Year 1915.

Dr. O. M. *Huestis*, *Minneapolis*; *Frank* H. *Gibbs*, *st*. *Anthony park*.

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On the morning of October 12, 1915, your committee visited the State Fruit-Breeding Farm, was met at the Zumbra Heights Station, on the M. & St. Louis R.R., by Superintendent Haralson and were very soon in the midst of a plat of over 3,000 everbearing strawberry plants all different—some plants with scores of ripe and green berries as well as blossoms, others with few berries and many runners. The superintendent had already made selections and marked some 250 plants for propagation. In another plat of 1,000 varieties it was very apparent that No. 1017, a cross between Pan-American and Dunlap, was the superior, although others were choice, both as plant makers and fruit-bearers. No doubt many excellent kinds will come from those selected. It certainly was encouraging to be able, even after the heavy frost of a week before, to pick three quarts of large, well ripened berries, a photo of which we obtained on reaching the city and will appear in the Horticulturist.

[Illustration: Field of No. 3 June-bearing strawberries at State Fruit-Breeding Farm.]

Of the June-bearing varieties No. 3, a cross between Senator Dunlap and Pocomoke, would seem to surpass anything else we saw as to strength of plant and health of foliage. As to its fruiting ability, will refer to the display made at the last summer meeting of the society, which was so much admired. We have no doubt there is a great future for No. 3, as has been for its illustrious parent, the Dunlap. Next we went over to the raspberry field containing, it seemed, thousands of strong, straight, healthy plants, which would have to be seen to be appreciated and only then when in fruiting. No. 4 took our special attention. The canes were especially clean, well branched and healthy —a cross between Loudon and King. Many others seem to be very promising.

[Illustration: Everbearing strawberries, No. 1017. Minnesota State Fruit-Breeding Farm. Gathered October 12, 1915.]

Next we were shown a variety of everbearing raspberry from which we indulged in ripe fruit of good size and flavor and which it is hoped will be as valuable as the everbearing strawberry. Of the thousands of everbearing seedlings selections had been made of about 100 which were fine looking plants, well cultivated and free from disease.

We were then shown some hundreds of wild peach seedlings, seedlings of Burbank plums, thousands of hybrid plums of all ages, and a plat of thousands of plum seedlings which will be disposed of to nurserymen this fall and bring a nice income to the state; also wild pears from Manchuria with good prospects of being hardy and free from blight.

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We saw a number of nice plum trees, of which the superintendent told us the fruit would color before ripening and would stand long shipments, which so far promise well. Several hundred Beta grape seedlings probably even more hardy than the parent, many crosses in roses which if judged by the foliage must be seen in bloom to be appreciated, seedlings of Compass cherry crossed with apricot; Compass cherry crossed with nectarines; seedling currants, over 2,000 from which to select the best. Over a hundred commercial varieties of apples from East and West, and over 200 varieties of peaches from China and Manchuria, walnuts, butternuts and many dwarf apple trees on Paradise stocks, which fruit early. A good field of corn in shock, for feed for the horses. The old orchard on the place when bought, which had been top-worked to some extent, looked healthy everywhere. The farm seemed to be free from noxious woods, free from pocket gophers or moles and well cultivated, we thought, for the small number of men employed. Machinery and tools were well housed. We were also pleased to be shown through the new home of the superintendent, not yet occupied, which seemed to be complete in all its appointments.

We think the state has a great asset in the farm and recommend that as far as possible members of this society visit it during the coming summer and that the society use its influence with the Board of Regents that more land be procured as soon as possible in order that trial plants may remain longer to more definitely prove their worth and that a greater work may be done for the state. We notice in a report made just six years before, *viz*., October 12, 1909, by Brothers Wedge, Underwood and the then president of the society, Prof. Green, that even runnerless everbearing strawberries were represented and that they had the usual pleasure of picking strawberry blossoms in October. Had they been with us they would have had a large dish of No. 1017 covered with rich cream and served at the hand of Mrs. Haralson.

Mr. C. S. Harrison: Mr. Chairman, I think the slogan of this society should be “Urbanize the country and ruralize the town.” I see tremendous changes going on all the while. Can you think of the possibilities of Minnesota? About 40 per cent of the land under cultivation and that half worked. By and by there is going to be a crop of boys who will raise seventy-five to 100 bushels of corn to the acre where their dads raised twenty-five. You got to keep out of their way, you got to help them along.

Marketing Fruit by Association.

A. N. *Gray*, *Mgr*. *Bay lake fruit growers*’ *assn*., *Deerwood*.

Marketing fruit or any farm product by association is the modern farmer’s insurance of results.

A great deal might be said on this subject, but I shall tell you briefly what the Bay Lake Fruit Growers’ Association have accomplished.

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The first raspberry growing for market at Bay Lake was back in 1886. Nick Newgard, one of our first settlers, sold quite a few berries that year. Bay Lake is seven miles from Deerwood, the nearest railroad point, and at that time there was only a trail between these places, and it was necessary for Mr. Newgard to pack his berries in on his back. This same method was used in transporting supplies.

[Illustration: Strawberry field on place of A. N. Gray, at Bay Lake.]

Mr. Newgard told me recently that he received a very good profit on his berries the first ten years, but each year the acreage increased and each year the growers' troubles increased in disposing of the crop.

In 1909 there was an unusually large crop and, shipping individually, as we did at that time, it was a case of all shipments going to Duluth one day, flooding the market, then the next day every one shipping to Fargo and flooding that market, and at the end of the season when the growers received their final returns they found that they had received very small pay for their berries.

In the fall of that year the growers around Bay Lake called a meeting to see if some organization could not be formed to handle their berries and look after the collections. The result of this meeting was the incorporation of the Bay Lake Fruit Growers' Association.

When the berry season opened in 1910 we had a manager, hired for the season, on a salary, who worked under a board of five managing directors. It was the manager's business to receive the berries at the station, find a market for them, make the collections and settlements with the growers. The result of this first year was so satisfactory to the members that the total membership increased that fall to almost 100. This new system had eliminated all the worry, and we received a good price for our berries after the expense of our manager had been deducted.

We have just closed our sixth season, which by the way has been a very successful one, as the prices received have been above the average. We now have about 150 members, and we have two shipping stations, Deerwood and Aitkin. We market strawberries, raspberries, blackberries, currants, gooseberries, plums, Compass cherries, apples, sweet corn and celery.

We have a nice trade worked up and have little trouble in finding a ready market for any of our products.

It is our aim, as growers, to give our customers all A No. 1 quality. During the berry season we have an inspector whose duty it is to inspect the berries as they arrive at the station and any found to be of poor quality we dispose of locally for canning. The grower of these berries receives a credit for the amount we realize. In this way we keep

the standard of our berries up, and we have very few complaints from our customers on soft berries.

As for losses on bad debts, we have thus far had very few. We usually get a credit rating from the prospective customer's bank and ship to him accordingly. Our old customers file standing orders with us to ship them so many crates each day, and each year brings us new customers who have heard of the fine Bay Lake berries.

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In 1912 the association built a potato warehouse at a cost of about $2,500, and we store the members' potatoes for them at a nominal cost. In 1914 the association decided to put in a stock of flour and feed and keep the manager the year around. Our business in this line has been increasing all the time. It is very interesting to note that over 60 per cent of our flour and feed customers are not members of the association.

We are growing all the time and branching out. A few months ago we added a small stock of hardware and some groceries, and these have taken so well that we would not be at all surprised if eventually we find ourselves in the retail store business.

Evergreens for Both Utility and Ornament.

Earl Ferris, *nurseryman*, *Hampton*, *Iowa*.

As far as horticulture is concerned, the only touch of color on the Northwestern landscape during the coming winter will be furnished by the greens and blues of evergreens.

Did you ever pass a farm home in the winter that was protected by a good evergreen grove and notice how beautiful it looked? Did you ever stop to think of the difference in temperature that an evergreen grove makes, to say nothing of the contrast in the appearance of the place to that of a home with no grove?

[Illustration: A shelter of old Scotch pine at Mr. Earl Ferris'.]

When I was a small boy I was fortunate enough to be raised on a farm in Butler County, Iowa, that was well protected by a good Norway spruce, white pine and Scotch pine windbreak. The Norway spruce and white pine are still there and if anything better than they were thirty years ago. At that time my father fed from one to five carloads of stock every winter back of this grove, and I honestly believe that he fed his steers at a cost of from $5 to $15 per steer less than a neighboring feeder who fed out on the open prairie with a few sheds to furnish the only winter protection. I shall never forget the remark a German made who was hauling corn to us one cold winter day. As he drove onto the scales back of this grove, he straightened up and said: "Well, the evergreen grove feels like putting on a fur coat," and I never heard the difference in temperature described any better. Our evergreen grove moved our feeding pens at least 300 miles further south every winter, as far as the cold was concerned.

[Illustration: Thrifty windbreak of Norway spruce at Mr. Earl Ferris' place, in Hampton, Ia.]

Near Hampton, Iowa, we have three or four of the best stock raisers in the United States. Every one of them is feeding cattle back of a large evergreen grove. In recent years they have divided up some of their large farms into smaller places and made new

feeding sheds, and the first improvement that they made on each and every one of these places was an evergreen grove. They buy the best trees that can be obtained that have been transplanted and root pruned, and most of them prefer the Norway spruce in the two to three foot size. After planting, they take as good care of them as they do of any crop on the farm, for they fully realize that cultivation is an all important thing in getting a good evergreen grove started.

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Several days ago, I talked with one of these feeders who has time and again topped the Chicago market. He made the remark that the buildings on his farm cost thousands of dollars while his evergreen grove had only cost from $100 to $200, but that he would rather have every building on the place destroyed than to lose that windbreak.

As the price of land and feed increases, the farmers of the Northwest are waking up to the fact that an evergreen grove is an absolute necessity, and that they cannot afford to plant any other. The maple, willow, box elder and other similar trees take so much land that they cannot afford them. They are a windbreak in the summer, but a joke in the winter.

The time is not far distant when every up-to-date farmer in Minnesota, Iowa, Nebraska and other Northwest states will have a good evergreen grove which will be considered as much of a necessity as his barn, house or other outbuildings.

[Illustration: Evergreens adorn old home of Otto Kankel, at Fertile, Minn., in Red River Valley.]

Late this fall, my wife and I left Hampton for an automobile trip through Minnesota, North Dakota and into Canada. It seemed to me on this trip that the most beautiful thing we saw about the farm buildings were the evergreen groves that many of the farmers now have all through Minnesota and Dakota. I was certainly very much surprised at some of these windbreaks and at some of the varieties of evergreens that were being grown successfully as far north as Fargo. Near Fargo we found some extra good specimens of Norway spruce, which I consider the best of all windbreak makers. We also found the Scotch pine doing well 100 miles northwest of Fargo, and other varieties which were naturally to be expected being planted to a considerable extent.

As far as usefulness is concerned, the farmer of the prairie states is bound to get more real value from an evergreen than any other person, but I am very glad to say that the homes of the wealthy in the cities each season are being improved more and more by the planting of the more ornamental evergreens. Cities like Detroit, Cleveland, Buffalo, Boston, St. Paul, Minneapolis, and other large cities of the United States are using thousands of evergreens every season to beautify the homes, of not only the wealthy but of the laboring man also. The price of evergreens at the present time is within the reach of everyone owning a home, and there is no other improvement that can be placed upon a piece of ground at so little expense and so little labor that will add so many dollars in real value to that property as will the evergreen, either as a windbreak or in landscape work.

Annual Report, 1915, Executive Board.

J. M. UNDERWOOD, CHAIRMAN

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The report of the executive board is necessarily brief from the fact that the machinery of our society is kept in such excellent condition by our secretary, that there is little left for our board to do. His monthly issues of the “Horticulturist” keep the membership posted on all important items of interest and are a splendid examplification to the public of the value of our publications and of the meetings of our society. Your executive board meets twice a year to verify the accounts of the secretary and treasurer and at other times when there is something of importance to attend to.

We wish to call your attention to the fact that your board is practically self supporting. The members work for nothing and board themselves, which is a mighty good way to do.

There is a work of very great importance for the *members* of our society to do the coming year. That is to help in every legitimate way to *secure an appropriation* by the next legislature with which to build for our society a *home*. We should have had it provided so that we could celebrate our semi-centennial a year from now in our own home. If we were a private society, we would have had a home years ago.

We should be closely affiliated with the horticulture of the State University. Our home should be located on the grounds of the Agricultural College, where the building could be used for other purposes when not needed by our society. Let every member of our society interview the senator and member of the house from his or her district next fall and secure their promise to support a bill to appropriate $50,000 for building us a home.

Annual Report of Treasurer, 1915.

Geo. W. *Strand*, *Taylors falls*, *treasurer*.

RECEIPTS.

1914.

Dec. 1. Balance on hand $4,948.35
Interest on certificate of deposit, six months, to November 1, 1914 126.15

1915.

Mar. 1. Semi-annual allowance 1,500.00
Apr. 5. Interest on deposit, six months, to April 1 85.96
A. W. Latham, receipts secretary’s office, November 25, 1914 to June 21, 1915 3,290.74
Sept. 4. State Treasurer, semi-annual allowance 1,500.00
Dec. 1. A. W. Latham, receipts secretary’s office June 21, 1915,

to December 1, 1915 1,064.30

$12,515.50

DISBURSEMENTS.

1914.

Dec. 12. Order 229, A .W. Latham, Revolving Fund $600.00
Dec. 12. Order 235, Premiums Annual Meeting 596.50

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1915.

Mar. 1. Order 230, A. W. Latham, first quarter salary 450.00
Apr. 5. A. W. Latham, interest on deposit 85.96
June 1. Order 231, A. W. Latham, second quarter salary 450.00
June 21. Order 232, A. W. Latham, expenses secretary's office
November 25 to June 21, 1915 3,290.74
June 25. Order 236, Premiums Summer Meeting 1915 172.00
Sept. 3. Order 233, A. W. Latham, third quarter salary 450.00
Dec. 1. Order 234, A. W. Latham, fourth quarter salary 450.00
Dec. 1. Order 237, A. W. Latham, expenses secretary's office
June 21, 1915 to December 1, 1915 1,064.30

$7,609.50
Dec. 1. Balance on hand 4,906.00

$12,515.50
Deposits, Farmers & Mechanics Bank $4,276.15
Deposits, First & Security National Bank 629.85

$4,906.00

Annual Meeting, 1915, N.E. Iowa Horticultural Society.

C. E. SNYDER, PRESTON, DELEGATE

Your delegate arrived at Decorah at nine-thirty, Wednesday, November seventeenth. Full accommodations offered by the Winneshiek Hotel made the trip complete and homelike to delegates and members.

The convention was held in the old Marsh Hall, a very suitable place, offering ample room with all necessary accommodations for such a gathering.

Decorations showed much time and skill, resulting in a beautiful display of shrubbery-boughs, evergreen, *etc*.

The area of a table about one hundred feet long and six feet wide, running through the center of the hall, contained a great variety of apples surprising for this season. Many, including C.H. True, of Clayton county, proved themselves successful orchardists.

[Illustration: Mr. C. E. Snyder, Preston.]

On various other tables large displays of agriculture, apiary, greenhouse and garden products completed the harmonizing of horticulture, floriculture and agriculture, including mentioned decorations appearing as a striking feature and an encouragement to the cause.

The meeting was called to order shortly after ten o'clock by President Geo. S. Woodruff. The mingling of many instructive papers with humorous selections and music proved the program well arranged. Same carried out very successfully held the interest of a not large but fair attendance throughout. A paper and address by Wesley Greene, of Des Moines, should have reached the ears of every Iowa and Minnesota citizen. A striking selection on "The Tree," by J. A. Nelson, was descriptive, instructive, humorous and poetic.

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A topic of great interest was the everbearing strawberry, which persistently bobbed up every now and then in interesting discussion. Brother Gardner, with his practical experience, was right at hand, a leader and authority on this fruit. Clarence Wedge, who always contended that the Progressive was away ahead of all others, was endorsed by every man that grew them in this convention, by a vote on merit of varieties.

Reports from the different districts showed a heavy rainfall throughout the season, resulting in rust and scab. Sprayed orchards showed better results than others. Small fruits were abundant and good.

Shortly after four o'clock Wednesday afternoon automobiles drew up and took delegates and members over beautiful Decorah, stopping at Symond's greenhouses, and on through the most beautiful park in this section, then to the palatial residence of John Harter, where a very bountiful banquet was enjoyed.

During convention Secretary Black's and Treasurer True's reports showed the society in flourishing condition.

All officers were re-elected, place of next meeting to be chosen later by the executive committee.

* * * * *

Handling raspberries.—In 1911 the Government investigators made comparative tests of the keeping qualities of carefully handled raspberries and commercially handled raspberries. Several lots of each kind were held in an ice car for varying periods and then examined for the percentage of decay. Other lots were held a day after being withdrawn from the refrigerator car and then examined. The results are most significant.

After 4 days in the ice car it was found that the carefully handled berries showed only 0.4 per cent. decay, while the commercially handled fruit had 4.6 per cent. After 8 days in the car the difference was vastly greater. The carefully handled fruit showed only 2.2 per cent. decay, but with the commercially handled this percentage had risen to 26.7, or more than one-quarter of the entire shipment. When the fruit was examined a day after it had been taken out of the ice car, the evidence was equally strong in favor of careful handling. Carefully handled fruit that had remained 4 days in the car was found a day after its withdrawal to show only 1 per cent. of decay against 17.5 per cent. in commercially handled berries. Carefully handled fruit left in the car 8 days, and then held one day, showed only 8.1 per cent. of decay as against 47.6 per cent. in commercially handled fruit.

The following year experiments were made with actual shipments instead of with the stationary refrigerator car, and the results confirmed previous conclusions. It was found, for example, that there was less decay in the carefully handled berries at the end of 8 days than in the commercially handled berries at the end of 4. Carefully handled fruit that was 4 days in transit, and had then been held one day after withdrawal from the refrigerator car showed less than 1 per cent of decay, whereas commercially handled berries subjected to the same test showed nearly 10 per cent.

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Orcharding in Minnesota.

Richard Wellington, *Asst*. *Horticulturist*, *university farm*, *st*. *Paul*.

This paper is purposely given a broad title so that it may cover any questions which come under the head of orcharding. Many of you who have been pestered with an "Orchard Survey Blank" can easily guess what subjects are to be taken up. Thanks to many of the members of this society and other fruit growers for their hearty co-operation, a large amount of data has been collected from fifty-three counties, representing most of the districts within the state. As would be expected certain counties have contributed much more information than others, probably owing to their greater interest in orcharding. For example: Thirty-one replies have already been received from Hennepin County, seven from Goodhue, six from Renville, five each from Houston, Meeker and Rice, four each from Chippewa, Dakota, Mower, Polk and Wabasha, three each from Blue Earth, Nicollet, Ottertail, Pine, Ramsey, Steele, Washington and Watonwan and one or two each from the remaining counties. Perhaps if the right parties had been reached the low-standing counties would have a higher ranking.

The best way to present the data is an enigma. If all the information was given at one time we would need a whole day instead of fifteen minutes. Of course much of the material is a repetition, and a general summary will cover the main facts in most cases. Nevertheless it is not feasible to take up all of the subject matter in this short period, and therefore the first two topics on the survey blank have been selected, namely, orchard sites and protective agencies. At a later date, if you are sufficiently interested in dry facts other subjects, as soils, dynamiting, orchard management, stock of fruit trees, methods of planting and pruning, varieties for various localities, *etc*., will be taken up. Some of the subjects, like sites and soils, will be treated as state problems, while others must be considered as sectional.

Minnesota, as you all know, contains many different climatic conditions, and consequently its orchard practices and recommendations must vary accordingly. To meet this problem the writer, in consultation with Prof. Cady, divided the state into six sections, namely, the southeastern, east central, northeastern, northwestern, west central and southwestern. Many counties are, of course, in an intermediate position and might be thrown into either of the adjoining sections, but an arbitrary line must be drawn somewhere. Freeborn, Waseca, Rice, Goodhue and all the counties east of them are placed in the southeastern section. Nicollet, LeSueur, Sibley, McLeod, Wright, Isanti and the counties to the east are included in the central east, and Pine, Mille Lacs, Morrison and the counties to the north and east are placed in the northeastern section. Beltrami, Hubbard, Ottertail and the counties to the west are placed in northwestern section; Traverse, Douglas, Todd, Stearns, Meeker, Renville, Yellow Medicine and the enclosed counties in the west central, and the remainder to the south and west are in

the southwestern section. Thus, when the various sections are mentioned, you will know what part of the state is being referred to.

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Site of Orchard. By site of orchard we refer to its location, that is, whether it is on rolling, level or hilly ground, and the direction of its slope, provided it has one. From past experience it is believed that an orchard situated on a north slope is ideally located for Minnesota conditions, as its blossoming period is retarded and consequently the liability of injury from late frosts decreased. But all people who want orchards do not possess such a slope, so they set out their orchards on the most convenient location. A few growers have orchards sloping in all directions, and their opinion on the influence of slope on hardiness and retardation of the blooming period should be valuable. It is of interest to note that, out of 108 reporting on the levelness of the orchard ground, only twelve had level ground, two level to nearly level, one level to decidedly rolling, twenty-nine nearly level, seven nearly level to slightly rolling, three nearly level to medium rolling, twenty-nine slightly rolling, four slightly rolling to medium rolling, eighteen rolling and three decidedly rolling. A glance at the figures shows that the majority of orchards are on nearly level to slightly rolling land. In addition to the numbers given thirteen reported a slight slope, one a slight slope to a medium slope, two a slight to a steep slope, sixteen a medium slope, one a medium to a steep slope, and five a steep slope—the emphasis being laid on the moderate rising ground. No grower reported an orchard location entirely at the base of a slope, but six reported orchards extending from the base to the top of the slope, two from the base to midway of the slope, twenty-five at midway of the slope, seven from midway to the top and twenty-two at the top of a slope—the high ground evidently being preferred for orchard sites. As a general rule, as would naturally be expected, those who reported their orchards on the top of the slope usually reported their ground as either high or medium. Of ninety-six reports on the elevation of the orchards only four reported low land, and two of these were on top of a slope, two low and medium, one low and high, forty-six medium, fourteen medium and high, and twenty-seven high—the medium taking the lead. These figures have been given of the state as a whole, but when the sections are considered the southeastern and the west central take the lead in the highest percentage of high ground in comparison with the lower ground; the southeastern and east central, for the greatest amount of rolling land; and the southwestern, for the most level or nearly level land.

[Illustration: Down the long row. View in well cared for orchard of J. M. Barclay, Madison Lake.]

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As for the effect of direction of slope on hardiness, there were many varied opinions. Thirty stated without question that the direction had an effect, thirty-one stated that it had no effect, and seventy-two admitted that they did not know. Of those answering in the affirmative only seven had two or more distinctly different slopes, while fifteen of the negatives had two or more slopes for comparison. Nine of those who stated they didn't know had two or more slopes upon which to base their judgment. In summing up the direction of sites preferred, seventy-seven recommended a northerly slope, nine had no preference, one preferred southeast, one west, one west and east, two east, one north and east, one northeast or east, and sixty-four expressed no opinion. Two growers stated that the north slope prevented early bloom and thereby lessened liability to injury from late frosts, two growers stated that northern slopes decreased the loss of moisture, and one stated that the northeast slope gives the largest fruit and the west the best colored.

As a brief summary of the reports on orchard sites, it may be stated that high ground, rolling or sloping to the north, is preferred by the majority of growers who filled out these orchard survey blanks.

Protective Agencies. Under this heading comes windbreaks of all kinds, whether hills, natural timber or planted trees, and bodies of water which ameliorate the climate. Out of fifty-four replies from the central east section, sixteen reported that their orchards were favorably affected by lakes, the benefit coming in most cases from the prevention of early and late frosts. One grower attributed the cooling of the air during the summer as a benefit and two stated that the bodies of water furnished moisture. Two growers in the southeast section received favorable influences from the Mississippi River, and one in the southwestern and two in the west central sections thought they received beneficial effects from lakes. According to this data, orchards in the east central section, owing largely to the influence of Lake Minnetonka, are greatly benefited by the presence of water.

Windbreaks are a very important factor in successful orcharding in Minnesota, even though one party in the southeast section and three parties in the central east noted no beneficial effects. According to reports from the central west and southwest sections they are of great benefit and in some cases indispensable to apple growing. As would be expected by any one who is acquainted with Minnesota, the planted windbreaks are a more important factor in the prairie country than in the natural wooded and hilly regions. In the southeast section, five orchards were reported as protected by bluffs and hills, three by both hills and natural woods, two by natural woods, two by both natural and planted woods, and twenty-one by planted woods; in the central east section, one by a hill and a planted windbreak, one by a town, fifteen by

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natural timber, two by natural and planted timber, and nineteen by planted windbreaks; in the northeast section, two by natural and four by planted windbreaks; in the northwest section, three by natural and two by planted windbreaks; in the west central section, one by a hill and natural timber, five by natural timber, two by natural timber and planted windbreaks, and eighteen by planted windbreaks; and in the southwest section, one by a hill and natural woods, one by a hill and planted windbreak, two by natural timber, and fifteen by planted windbreaks. If Meeker County, which has natural timber, was not included in the central west—and perhaps it should have been included in central east—this section would have only one orchard protected alone by natural timber; and if Blue Earth County was eliminated from the southwest, this section would have no orchard protected alone by natural timber.

The beneficial effects from windbreaks may be summed up as follows: Twenty-five reported that they prevented fruit from being blown off trees, nine that they prevented trees and limbs being broken by winds and storms, ten that they protected trees from injury by winds without specifying the kind of injury, four that they reduced injury from frosts, ten that they either prevented or reduced winter injury, four that they helped to retain moisture, five that they helped to hold snow, eight that they prevented snow drifting, five that they protected orchards from hot and dry winds, three that they permitted the growing of apples, and one that they supplied all advantages.

The kinds of trees recommended for windbreaks and the methods of planting are numerous and variable and to discuss them at length would take too much time. However, the principal facts may be briefly enumerated.

In eighty-five reports that listed set out windbreaks, it was found that fifty-seven growers had used evergreens, thirty-seven willows, twenty-nine box elders, twenty-five maples, seventeen cottonwoods, thirteen ashes, eleven elms, eight poplars, four oaks, four plums, three nuts and one apple. The evergreens consisted of thirteen Scotch pine, eleven evergreens (not named), eight Norway spruce, five spruce (not named), three balsam, three Austrian pine, two white pine, one yellow pine, two cedar, two white spruce, two pine (variety not named), two fir, two jack pine, one Black Hills spruce, and one tamarack. In the willows were given twenty willows (variety not named), two laurel-leaved, seven white and eight golden; in the maples, sixteen soft maples, two hard maples, one silver-maple and six maples (kind not named); in the poplars, five Norway, one Carolina, two poplar (kind not named); and in the nuts, one black walnut, one butternut and one walnut. The major part of the box elders, cottonwoods, willows and ashes were noted in the central west and southwest sections. Thirty-seven experienced growers of windbreaks, the most of them living in the

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southwest, west central and southeast sections, recommended the following trees for windbreaks in the given proportions, twenty-four evergreens, fifteen willows, seven maples, six poplars, five elms, five box elders, three elms, two plum, two cottonwood, three hedges, one oak, one hackberry and one black walnut. The evergreens are decidedly the most popular, and among the varieties mentioned Norway spruce takes the lead for those recommended, and the Scotch pine for those planted.

There are about as many different systems of planting used as growers. The main point in all cases was to have a planting that would stop the wind and storms. A few growers advocated the use of a hedge or plum trees to fill in under the windbreak, while one grower desires a circulation of air under the branches of his trees. Cultivation and intercropping of windbreaks are also recommended in a few cases. The distance of planting varies, of course, with the trees or shrubs used. For example: one grower recommends 8 ft. x 8 ft. for large deciduous trees, and another grower, 6 ft. x 12 ft. apart in rows and two rows, 12 ft. apart. For Scotch pine one grower advocates eight feet. In some cases a mixture of many kinds of trees is recommended, and then again only one kind. One very solid windbreak is made up of a lilac hedge, four rows of jack pine, four rows of Norway poplar and one row of willow. Another is one row willow, one of evergreen, one of willow and one of evergreen.

Various distances between windbreak and orchard were used and recommended. A large number of orchards were started at about twenty feet from the windbreak and a few as close as one rod, but these distances proved to be too close. One grower, however, recommended close planting and later the removal of a row of trees in the windbreak when more space was needed. The recommended distances for planting varied from thirty to 500 feet, although seventy-five to 100 was satisfactory in most cases.

More details have been given in regard to orchard sites and windbreaks than many of you are probably interested in, but for one who is planning to set out an orchard they should prove of value and profit, as they are based upon the experiences of many of Minnesota's best orchardists.

My Experience with a Young Orchard.

Roy Viall, *spring valley*.

About ten years ago we acquired some land three and one-half miles north of Spring Valley. This land is very rough and was originally covered with heavy timber, in fact, about one-third of our large orchard was cleared and grubbed out the fall before planting.

When I became interested in fruit growing one of the first things I did was to join the Horticultural Society and to the knowledge obtained through this membership we owe in large measure what success has come to us.

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The eighteen acres selected for our main orchard slopes quite abruptly to the north and northeast. In fact, the slope is so steep that the ground, if kept under cultivation, would wash badly, and this was the real reason for seeding down our orchard at the time of planting. The orchard is now seven years old, and the trees have never had a particle of cultivation. Part of this ground was in grain and seeded to alsike and timothy the year before; the balance was the new land referred to, which we had broken and immediately seeded down to alsike and timothy, with oats as a nurse crop.

Our first problem was what varieties to plant, in what proportion and where to buy them. In this we adopted the recommendation of this society at that time, choosing Wealthy, Duchess, Patten Greening and Northwestern Greening, with fifty Malinda and fifty Iowa Beauty. We now have in addition two small orchards with nearly forty varieties altogether. The varieties, for the large orchard were divided as follows: 250 Duchess, 250 Patten Greening, 300 Northwestern Greening, 1,000 Wealthy. Were I to set another commercial orchard of the same size it would contain 500 Duchess and the balance Wealthy. While the Patten Greening is an ideal tree and an early and prolific bearer, there is with us a much larger per cent of imperfect and diseased fruit than of any other variety. Tree for tree, I believe the Duchess will produce *more* saleable *fruit*.

Where to buy our trees was decided for us in one of our first numbers of the Horticulturist, *viz*., at the nearest reliable nursery. That this was good advice is evidenced by the fact that out of the 1,900 trees we have found but two that were not as ordered.

Our next problem was, at what distance to plant the trees. The more information we sought the less sure were we of the best plan. We were advised to plant all distances from 12 feet by 16 feet to 24 feet by 32 feet. We finally concluded to take about an average of them all and decided on 20 feet by 20 feet, and so far have had no reason to regret it. We have put up the alsike and timothy every year for hay with the usual machinery, and there has not been over a half dozen trees seriously damaged. Our trees were nearly all three years old, 5 to 6 feet, and we find they do much better in sod than a smaller tree.

Having the orchard set out the next thing was to protect the trees from mice and rabbits. This we did by making protectors out of wire cloth, using different widths, from 18 to 24 inches, cutting it in strips 10 inches wide and holding it about the trees by three pieces of stove pipe wire at the top, middle and bottom. Not counting the time of making and putting them on these cost us from 1-1/2 cents to 2-1/2 cents each, and lasted from three to four years. We used a few made of galvanized wire cloth, which lasted much longer.

Three years ago we commenced replacing these protectors with a wash of white lead and raw linseed oil mixed to the consistency of separator cream. The first year we painted only fifty trees, the next year 100, the next 300, and this last year we painted

every tree on the place. We can see no bad effects, and it certainly protects against mice and rabbits and, what is equally as important, against borers also, and the cost per tree, including labor, is much less.

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We have also used the lead and oil with splendid results in treating trees affected with canker. We had quite a number of Wealthy so affected, and we cut out the affected bark and wood and then covered the wound with lead, and in almost every case it has proved a cure, that is, stopped the spread of the canker.

The second year our orchard was set out we began to mulch the trees with grass cut in the orchard, clover straw, pea straw—anything we could get. We were unable to mulch the entire orchard that year, and before we got the balance mulched you could tell as far as you could see the orchard which trees were mulched and which were not. The former not only made a better growth, but had a healthier look. Now I do not want you to get the idea that I am advocating the sod system except in locations similar to ours. Were our orchard on more level ground I not only should have cultivated the first three years, as advocated by most authorities, but would have continued the cultivation in some degree at least.

Nevertheless, on account probably of the very favorable location, I think our orchard will compare favorably with any cultivated orchard of the same age. Having the orchard set out, protected against mice and rabbits and mulched, we found that the real work of raising an orchard had just begun. First came the gray beetles the following June, and they ate the new growth off several hundred trees before we discovered them. At that time, not knowing what else to do, we hand picked every one we could find and destroyed them. These beetles we found came from oak groves on the south and west, and the next year we sprayed with arsenate of lead six or eight rows of trees on that side of the orchard, and as we have since then sprayed the entire orchard each year we have had no further trouble.

Next came pocket gophers, and before we learned how to stop them we had lost a number of trees by their chewing off the roots just beneath the surface of the ground. By opening their runways and placing well down in them a piece of carrot or potato in which has been placed a little strychnine we succeeded in getting rid of them entirely. Next came the woodchucks. They were very destructive with us, chewing the bark above the protectors as well as the roots. Trapping is the most successful method we have found, and by keeping a half dozen traps out all the time we held them in check. Eternal vigilance must be the motto of the successful orchardist.

In the year 1913 we picked our first crop of apples, that is, in sufficient quantity to be considered in a commercial way. Our Duchess we sold in barrels at $2.00 net. Wealthy we packed in bushel boxes, making two sizes, the larger, three inches and over, we called No. 1, and they sold for $1.25 per box net. The balance or smaller ones were also sold in boxes and brought us $1.00 per box net. Patten Greenings brought us 80 cents and Northwestern Greenings, 90 cents per box. Our neighbors, who sold to the local and transient buyers in bulk and in barrels, received 75 cents to 90 cents per hundred pounds, or $2.00 per barrel.

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The past year we had only about 75 bushels of all kinds. With the exception of Duchess and possibly Patten's Greening we shall certainly sell our next crop in bushel boxes.

We are top-working about 50 Patten's Greening to Jonathan, Delicious, McIntosh Red and King David. As the work was only started a year ago last spring I cannot tell you of its success or failure. So far the best results seem to be with the Jonathan.

We also have about thirty varieties of plums, including many of Prof. Hansen's new hybrids. Of these the Opata seems to be the most hardy and prolific, but it is subject to brown rot, which, this past year was so bad that we lost more than half the fruit. We have it top-worked on several varieties of native plums, and it was similarly affected there also. This was the only variety in our orchard of 150 trees that was so affected. We have fifteen Surprise plums, set seven years, that have not yielded altogether a peck of plums. Only lack of time kept me from grubbing them out last spring. This past season they were so heavily loaded that we had to prop the limbs and then thin out the fruit.

We endeavor to spray all our trees twice with commercial lime-sulphur and arsenate of lead—the first time immediately after the blossoms fall, the second two weeks later. Our spraying outfit consists of a Morrill & Morley hand pump, fitted in a 100-gallon tank, which we mounted on a small, one-horse truck. We operate it with three men, one to drive and pump and one for each line of hose, spraying two rows of trees at once. With this outfit we can spray 400 to 500 trees (of the size of ours) a day.

* * * * *

The national forests—besides being the American farmer's most valuable source of wood, which is the chief building material for rural purposes, are also his most valuable source of water, both for irrigation and domestic use. In the West, they afford him a protected grazing range for his stock; they are the best insurance against flood damage to his fields, his buildings, his bridges, his roads, and the fertility of his soil. The national forests cover the higher portions of the Rocky Mountain ranges, the Cascades, the Pacific Coast ranges, and a large part of the forested coast and islands of Alaska; some of the hilly regions in Montana and in the Dakotas, Oklahoma, and Arkansas, and limited areas in Minnesota, Michigan, Florida, and Porto Rico. In addition, land is now being purchased for national forests in the White Mountains of New England and in the southern Appalachians. In regions so widely scattered, agricultural and forest conditions necessarily differ to a great degree, bringing about corresponding differences in the effect of the national forests on the agricultural interests of the various localities. Wherever agriculture can be practiced, however, the farmer is directly benefited by the existence of national forests and by their proper management.—U.S. Dept. of Agri.

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GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by *Mrs*. E. W. *Gould*, 2644 Humboldt Avenue So.
Minneapolis.

Some suggestions for the use of coal ashes—

This is the time of the year when the unsightly heaps of coal ashes are likely to appear in one's back yard—eyesores and apparently useless.

Yet there are several ways in which they can be used to advantage about the garden.

They should first be sifted, using a quarter-inch wire mesh. The rough or coarser parts are well adapted for use on paths and driveways, forming a clean, firm surface with use. These paths are especially good in the garden, for weeds do not grow readily in them, and they dry off quickly after a rain.

Such parts of the ashes as will pass through an inch mesh will make a very good summer mulch about fruit trees and bushes that require such care. This mulch will conserve the moisture at the roots of the tree or plant at a time when it is very necessary to have it.

About a pyramid of these coarse ashes one may plant anything that requires much water. The roots of the plants will run under the ashes and keep moist and cool. Through a drought a little water poured upon the ashes will be distributed to the roots without loss.

The fine sifted ashes will render the tougher hard soils more friable, their chief virtue being lightening it. In a very mild degree they are a fertilizer, though in no degree comparable in this respect to hardwood ashes. Yet it has been proved that soil to which sifted coal ashes had been added grew plants of richer, darker foliage. They must be very well mixed with the soil by a thorough spading and forking.

The following experiment was noted in the Garden Magazine: A soil was prepared as follows: One-eighth stable manure, one-eighth leaf mold, one-quarter garden soil (heavy), one-half sifted coal ashes. Plants grown in this soil surpassed those grown in the garden soil next to them.

Coal ashes would not be advised for a light soil.

* * * * *

Watch this page for announcement of Garden Flower Society meetings.

January 20th, Public Library, Minneapolis, Tenth and Hennepin, Directors' Room, 2:30 p.m.

Subjects:

Hotbeds, coldframes, management and care of the young plants, Mr. Frank H. Gibbs.

The Minnesota Cypripediums. Can they be successfully cultivated? Miss Clara Leavitt.

Five-minute talks on "The Best Things of 1915."

Members are urged to bring their friends to this meeting. No one who contemplates having a garden this year can afford to miss it. Let us be generous and share our good programs with as many as possible. Each member is host or hostess for that day.

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SECRETARY'S CORNER

Annual meeting Wisconsin state horticultural Socy.—This meeting is to be held at Madison, Wis., on January 5-7. Mr. Chas. Haralson, superintendent of our State Fruit-Breeding Farm, is to represent this society at that meeting. We may look for an interesting report from him in the February issue of our monthly.

Is your annual fee paid?—If not, won't you please send it in promptly, remitting by a $1.00 bill, which is a safe medium of payment, instead of using check unless you draw on a bank in one of the larger cities of the state. Checks on country banks, as a rule, can only be collected here by a payment of ten cents, which the society can ill afford to pay for so many members.

Annual meeting S.D. *Hort*. *Socy*.—The annual gathering of this sister association will be held in Huron, S.D., January 18-20. Quite a good many of our members live so near the state line that they may find it convenient to attend this meeting, which will certainly be a profitable one. Prof. N. E. Hansen is secretary. Mr. Wm. Pfaender, Jr., of New Ulm, is to be the representative of this society at the South Dakota meeting.

Annual meeting southern Minnesota Hort. *Socy*.—This very wide-awake auxiliary of the state society will hold its annual meeting in Austin, January 19th and 20th next. The program of the meeting is not yet at hand, but you may be sure that it will be an interesting and practical one. If the reader is living anywhere within convenient range of Austin by all means attend this meeting and get inspiration and help for the work of another season.

You are not forgotten.—This refers to members of the society who have paid their annual fee for 1916 and are wondering why they have not yet received the membership ticket. There is always a little unavoidable delay in sending out these tickets after the annual meeting. First the tickets must be printed, and then the society folder that goes out with them must be prepared, and the material making up this folder comes from quite a number of sources, and it takes more or less time to get all of these matters together and in shape. You need not be solicitous in regard to membership fees remitted, as the chance of loss in transmission is approximately nothing; hardly half a dozen instances of the kind have come up in the twenty-five years of service of the secretary.

Passing of Michael Bendel, *Sr*.—This old member of our society and resident of Madison has just been called away, December 23rd, at the age of seventy-nine years. While not an attendant at our meetings he was a most loyal member of the society, and especially conspicuous in the western part of the state, where he lived, as a successful experimenter in orcharding, in which work he had a large experience. His portrait and a brief sketch of his life appear in the 1914 volume of our report, on page 150. Mr. Bendel

was for many years president of the Lac qui Parle County Agricultural Society, was always greatly interested in everything to improve the interests of his community, and especially those pertaining to farm life. He has left an enviable record.

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Farmers and home makers week.—University Farm, midway between Minneapolis and St. Paul, have prepared a royal program for all interested in agricultural work and life, including the needs of the household, filling all of next week, from January 3rd to 8th, inclusive. Seventy-nine professors and instructors by count are on the program for the week, and it is so arranged that those attending pass from one lecture room to another, from hour to hour, selecting the subjects that they have a special interest in. Horticulture, or subjects closely akin, have a place on this program Monday afternoon, Tuesday forenoon and afternoon, Wednesday forenoon and Thursday forenoon; Thursday afternoon the horticultural program is devoted entirely to vegetables; Friday forenoon and afternoon; and Saturday forenoon altogether spraying. When this magazine is received it will be too late to send for a program, but not too late to attend the meetings, which we hope many of our members may have the opportunity to do.

Attendance at annual meeting.—The badge book, which is issued at every annual meeting, containing the list of those who notify the secretary of a purpose to attend the meeting, is a pretty good index of the attendance. This year the badge book contained 442 names. Of course not all of these were present at the meeting, but a great many who were there had not sent notice of attendance and whose names were not in the badge book, so that the figures given elsewhere in this magazine as to attendance, estimated at from 400 to 500, are certainly not any too high.

Of this number not to exceed fifteen members, including vice presidents and superintendents of trial stations living at a distance, receive their railroad fare to and from the annual meeting, which is the only compensation they receive for their work in operating the trial stations and preparing the annual or semi-annual reports connected with their positions. This is not in fact any compensation for service but rather a recognition of the large obligation under which the society rests towards them for such gratuitous service.

Plant premiums for 1916.—On the inside front cover page of this monthly will be found a list of the plant premiums offered to our membership the coming spring. This list is also published in the society folder, of which copies will be sent to each member and which can be supplied in any number desired by application to the secretary. The list of plant premiums includes a considerable variety of plants both ornamental and otherwise useful. Those of special interest this year are the new fruits being sent out from the State Fruit-Breeding Farm, including No. 3 June-bearing strawberry, which gives promise of being a very valuable fruit for Minnesota planters; No. 1017 everbearing strawberry, the kind which has been selected from thousands of varieties fruiting at the station, a good plant maker and also

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a prolific fruiter of high quality berries; No. 4 raspberry, a variety of extraordinary vigor and hardiness, large fruited, and a prolific bearer; and several varieties of large fruited plums. Every member of the society with facilities for growing fruits should be interested in trying these new varieties, which of course are still being sent out on trial, and we desire to hear from our membership as to their measure of success with them.

[Illustration: A. W. *Latham* O. C. *Gregg Chas*. G. *Patten*

From photograph taken in front of Administration Building, at University Farm, on the morning of January 8, just before presentation of certificates referred to on opposite page.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 *February*, 1916 No. 2

OPEN LETTER TO MEMBERS

OF THE

Minnesota State Horticultural Society

From its secretary.

Probably members of the society very generally noticed a few weeks since in the daily papers of the Twin Cities and elsewhere an announcement that “certificates of award for special meritorious services in the advancement of agriculture” would be made by the Minnesota State University to Mr. O. C. Gregg, Hon. W. G. LeDuc, Mr. Chas. G. Patten and Mr. A. W. Latham.

These certificates were awarded Saturday, January 8th, 1916, at the closing exercises of the Farmers Week at the University Farm before an audience of twelve hundred people, gathered in the chapel in the Administration Building. Appropriate exercises were conducted by the President, Geo. E. Vincent, and the Dean of the University Farm, A.F. Woods, in the presence of Hon. Fred B. Snyder, President of the Board of Regents of the State University, and other members of the Board and a large

representation of the professorship of University Farm School, also occupying the platform.

Dean Woods read a sketch of the life of each one of the recipients, and the certificates were formally presented to each in turn by the President of the State University. All the persons who were to receive this honor were in attendance except Gen. LeDuc, who was probably unable to be present on account of his extreme age.

When this matter was first called to my attention I felt that it would be entirely out of place, being its editor, that I should make reference to it in the society monthly, but as the fact has been widely published throughout the state, and whatever honor is connected with this presentation is to be shared with the members of the Horticultural Society, I have changed my view point in regard to this, and it seems to me now that the members of the society should be fully informed as to what has taken place.

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Mr. O. C. Gregg received this distinction on account of his connection with the farmers' institutes of the state, of which he was the pioneer, and in connection with which he remained as superintendent for some twenty-two years.

Gen. LeDuc was for a number of years Commissioner of Agriculture at Washington and introduced many important reforms in the management of that department.

Mr. Chas. G. Patten is well known to our members of course as the originator of the Patten's Greening apple, although this is quite an infinitesimal part of the work that he has done in connection with the breeding of fruits, the results from which the public are to profit by largely, we believe, in the early future. At his advanced age of eighty-four we feel that this honor has been wisely placed.

"Mr. A. W. Latham has been secretary of the Minnesota State Horticultural Society for twenty-five years, during which period its membership has advanced from one or two hundred to thirty-four hundred, making it the largest horticultural society in the country, and probably," as stated by the Dean in his address, "the largest in the world."

While this distinction has been conferred upon the secretary of your society it is not to be considered as so much a personal tribute to him as a recognition of the splendid work done by the society as a whole, in which every member has had some share. To express fully my thought in this I will refer briefly to the organization of the society, just half a century ago, when a handful of earnest men united their efforts under the name of the Minnesota State Horticultural Society in an endeavor to solve the difficult problems connected with fruit growing in this region. None of the men who at that time organized this society are now living, but others have taken their places, and the important service that was so well cared for by the earlier membership is being equally as well prosecuted by those who have succeeded them.

My personal connection with the society began the third year of its existence, so that I had the high privilege of enjoying personal acquaintance with practically all those earlier workers in the society, and indeed most of them were still alive when I came into the secretaryship twenty-five years ago. It will not be out of place to speak here particularly of a few of those who are no longer with us: John S. Harris, that staunch friend, one of the original twelve, whose medallion hangs on the wall of the horticultural classroom at University Farm; Peter M. Gideon, whose self-sacrifice gave us the Wealthy apple, now of worldwide planting—he in whose memory the Gideon Memorial Fund was created; Col. John H. Stevens, that large hearted man of unquenchable public spirit; P.A. Jewell, searcher for new fruits and founder of the Jewell Nursery Company; Truman M. Smith, seven years president during many dark days; Wyman Elliot, one of the original twelve, well called by one "King of the Horticultural

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Society"—so recently taken from us. The institution of learning conferring this distinction upon us has contributed a full share of workers now no longer with us; W. W. Pendergast, first principal of the University Farm School, and for many years president of the society until stricken with a fatal illness; and Prof. Saml. B. Green of blessed memory, whose loss we shall never cease to mourn. There are many others who did great service to the society that I should be glad to speak of here if space would permit.

In the list of those who are still with us and have served with such self devotion and courage in advancing the interests of the society, and that for which it stands, are to be found the names of many men prominent in various walks of life in our state. It would be out of place for me to select from this list a few and give them special prominence where hundreds have contributed to the life and growth of the association all these many years until the present enviable place now occupied by the association has been attained. To the executive board of the society, most of whom have been members of the board for a long period of years, of course the success of the association is especially due. Men of initiative in an ambitious and unselfish way working for the success of the association, they have had very much indeed to do with its progress.

As I endeavor to recall the personality of those who have been of special service to us I find the list almost without limit. With what pleasure and satisfaction have I been permitted to serve with the members of this society! What willingness to perform the duties suggested has ever characterized the assistance that has been rendered by the membership of this society! It has been an exceedingly rare thing for any member to offer an objection to undertaking any service asked of him, and with such support as this so readily and heartily given, and often at large expense to the member, what can be expected other than such success as has come to our society. I wish I had the ability to express at this time the thought that is in my heart as I recall all of these helpful brothers and sisters to whom indeed belongs as much as to the writer any distinction that comes to the society as a result of these years of labor.

Notwithstanding the State University have seen fit to refer to this in a way to indicate that our society has reached some certain vantage ground, it must not be lost sight of that the real work of the society is still before it. Whether to be carried on under the present management or under a changed management we have a right to look ahead and anticipate the definite and widely expanding results that are still to come from the services of the members of the society, which we are sure in the future, as in the past, will be heartily rendered.

A. W. *Latham*, Secy.

June-Bearing Strawberries.

Geo. J. *Kellogg*, *retired nurseryman*, *Janesville*, *wis*.

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Any fool that knows enough can grow strawberries, which reminds me of the preacher in York State who both preached and farmed it. He was trying to bore a beetle head and could not hold it; a foolish boy came along and said, “Why don’t you put it in the hog trough?” “Well! Well!” the preacher said. “You can learn something from most any fool.” The boy said, “That is just what father says when he hears you preach.” I don’t expect to tell you much that is new, but I want to emphasize the good things that others have said:

Soils. I once had twenty-one acres of heavy oak, hickory, crab apple and hazel brush, with one old Indian corn field. I measured hazel brush twelve feet high, and some of the ground was a perfect network of hazel roots; the leaf mould had accumulated for ages. The first half acre I planted to turnips, the next spring I started in to make my fortune. I set out nineteen varieties of the best strawberries away back in the time of the Wilson, than which we have never had its equal. The plants grew well and wintered well, but they did not bear worth a cent, while just over the fence I had a field on ground that had been worked twenty years without manure that gave me two hundred and sixty bushels to the acre. It took three years with other crops to reduce that loose soil before I could make strawberries pay. My fortune all vanished.

Last June while judging your strawberry show, I found a large collection of twenty-five kinds of the poorest strawberries I ever saw, grown on the college grounds. I visited the field, found over a hundred varieties, well tallied, well cultivated, on new oak opening soil. First crop, the soil seemed ideal, every thing good except the plants and the fruit. The foliage was defective and the fruit very poor. Was it the new soil?

I have always found good garden soil would produce good strawberries; the best beds were those that followed potatoes. Cut worms and white grubs seldom follow two years of hoed crops.

[Illustration: Mr. Geo. J. Kellogg ten years ago]

Preparation. Preparation for the best strawberries should be started three years before planting. Using soil from sand to clay, well drained, well manured, sowed to clover, take off the first cutting of clover, then more manure plowed under deep with the second crop of clover, as late as can before freezing up, to kill insects and make the soil friable and ready for a crop of potatoes the next spring. After harvesting 300 bushels of potatoes to the acre use a heavy coat of well rotted manure without weed seed, plowed under late in fall. The following spring, as soon as the ground will work, thoroughly disk and harrow, and harrow twice more. Then roll or plank it, mark both ways two by four feet, set by hand either with dibble or spade, no machine work. Crown even with the surface, with best of plants from new beds, leaving on but two leaves, and if the roots are not fresh dug, trim them a little. Firm them good.

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Now start the weeder and go over the field every week till the runners start, then use the nine-tooth cultivator with the two outside teeth two inches shorter than the others. Cultivate every week till the middle of October. Use the hoe to keep out all weeds and hoe very lightly about the plants. Weeds are a blessing to the lazy man, but I don't like to have it overdone. Don't let the soil bake after a rain. Keep the cultivator running. In garden work a steel tooth rake is a splendid garden tool.

Volume 1905, page 230 (An. Report Minn. State Hort. Society). Mr. Schwab gets an ideal strawberry bed, then kills it with twelve inches of mulch. If the ice and snow had not come perhaps the plants would have pulled through. Volume 41, page 390. Mr. Wildhagen gives an ideal paper on strawberries, it will pay you to read it again and again. Instead of one year's preparation, I would have three.

Winter Protection. Unless in an exposed place, marsh hay is the best and cleanest mulch, but high winds may roll it off. Clean straw away from the tailings of the machine is next best. For small acreage if one inch can be put on as soon as the ground is frozen a half inch, it will save the many freezings and thawings before winter sets in. For large acreage it is not practical to cover till frost will hold up a loaded wagon. Two inches of mulch, that covers the plants and paths from sight is enough, but I see you cover deeper, from four to twelve inches in Minnesota, and often smother the plants. If we could have a snow blanket come early and stay on late in spring, that would protect the plants, but we want the mulch also to protect from drouth and keep the berries clean. A January thaw is liable to kill out any field that is not properly mulched.

A two inch mulch will not hinder the plants coming through in spring; four inches will require part of the mulch raked into the paths; if plants don't get through readily loosen the mulch. I have known some successful growers to take off all the mulch from the paths in spring and cultivate lightly but thoroughly, then replace the mulch to protect from drouth and to keep the berries clean, but I don't think it pays.

Weeds. In the best fields and beds I ever saw there will come up an occasional weed in spring, and it pays to go over the ground with a spade or butcher knife and take out such weeds. We almost always get a drouth at picking time, better a drought than too much rain. A good straw mulch will usually carry us through.

Irrigation. If irrigation is attempted the fields must be prepared before planting to run water through between the rows. Sprinkling will not do except at sundown. Rain always comes in cloudy weather; you cannot wet foliage in sun in hot weather without damage. A good rainfall is one inch, which is a thousand barrels to the acre, so what can you do with a sprinkling cart? Showers followed by bright sunshine damage the patch.

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If your plants are set too deep they rot, if too high they dry, if not well firmed they fail. When I have used a tobacco planter I have had to put my heel on every plant. Of course you know that newly planted June varieties must have the blossom buds cut out, and everbears bearing must also till July.

Picking. The man who has acres to pick must secure his boxes the winter before and have at least part of them made up if they are to be tacked. I have found a boy can make up boxes as fast as thirty pickers can fill. If you use the folding box no tacks are needed. Too many boxes made up ahead are liable to be damaged by the mice.

Pickers. Engage your pickers ahead; agree on the price and that a part of the pay is to be kept back till the close of the season, which is forfeited if quitting before time. If pickers are too far away, transportation must be furnished—free boxes of berries are appreciated by the pickers.

Marketing. Sometimes the marketing of the fruit is harder than the growing of it. If enough is grown form an association to sell it, get advice from a successful association how to form and how to run it. Sometimes a well made wagon, a good team and a good man can sell from house to house in the country and city and make good returns. In this way you get back your crates and part of the boxes. I know a successful grower in Iowa, who sold his crop of ten acres to the farmers and city people, they doing their own picking and furnishing their own boxes, at a given price. All the proprietor had to do was sit at the gate and take in the cash. It is worth a good deal to know how to grow the best of strawberries and often it is worth more to know how to turn them into cash.

What Varieties? Dunlap and Warfield have a general reputation for profit, can be picked together and sell well; dark color, good canners and good shippers. If you want a third variety take Lovett. Some of your growers want nothing but Bederwood, but it is too light and too soft to ship, though it is a good family berry. I expect Minnesota No. 3 will soon be the only variety you will want of the June kinds.

Insects. Winter drouth often injures the roots and some lay it to insects. The winter of 1899 was the worst winter drouth I ever knew; it killed every thing. If you are troubled with the crown borer, root lice, leaf roller or rust, grow one crop and plow under, or move your fields a good distance from the old bed. What shall be done with the old bed? If you have insects or rust plow under and get the best place to start a new bed, and don't set any of your own plants if you have insects or rust—and be sure you buy of a reliable grower.

Old Beds. If the first crop is big, plow under, if light and you have a good stand of plants, no insects or rust, you can mow and teddy up the mulch and in a high wind burn it over—a quick fire will do no harm. Then you can plow two furrows between rows and drag it every way till not a plant is seen. Soon, if the rows are left a foot wide, the plants will come through. Then manure (better be manured before plowing), and you may get a

good second crop. Some mow and rake off and burn outside the bed, then with a two horse cultivator dig up the paths and cultivate and get the ground in condition. Put on the manure and hoe out part of the old plants.

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I like the plan of Wildhagen; mow, burn and then cover three inches deep with one hundred big loads of manure to the acre and don't go near the patch till picking time next year. He gets a nice early crop, and if berries are a little small it pays better than any other way. Try it! I have known some fields carried to fourth crop, and amateur beds kept up for ten years. It takes lots of work to keep an old bed in good condition. J.M. Smith, of Green Bay, Wis., almost always took one crop and plowed under. If the first crop was injured by frost, he took a second crop. He raised four hundred bushels to the acre.

Wm. Von Baumbach, of Wauwatosa, Wis., raised from five acres less ten square rods seventeen hundred bushels big measure beside quantities given the pickers. I have had beds and fields where I have timed my boys picking a quart a minute. I had one small boy that picked 230 quarts a day. But in all my sixty years growing strawberries I never properly prepared an acre of ground before planting. I could take a five acre patch now, as young as I am, and beat anything I have ever done.

Mulch.—For mulch for small beds, if straw or marsh hay is not handy, use an inch of leaves, then cut your sweet corn and lay the stalks on three inches apart and your plants will come up between in spring and give you clean fruit. Cut cornstalks are good for field covering, also shredded cornstalks. I have used the begass from the cane mill, but it is too heavy. Evergreen boughs are very good if well put on for small beds.

In my paper, Vol. 1911, page 180 (Minn. Report), it should read five bushels to the square *rod, not acre*. Who ever heard of five bushels an acre!

Big Yields.—You all know of Friend Wedge's 74-3/4 quarts from one square rod of Everbearers the season of planting. I believe that can be beaten. Let our society put a few hundred dollars in premiums for best yield of square rod of everbearers and of June varieties, and of a quarter of an acre; also the best product of one hill, and the best product of one plant, and its runners fourteen months from planting. I believe one plant of everbearers can produce a quart the season of setting. I know of the five bushels to the square rod, and the other fellow had four and a half bushel of Wilson.

Surprise Plum a Success.

C. A. PFEIFFER, WINONA.

I realize at the outset that I am treading on delicate ground in undertaking to defend the Surprise plum, on account of it having been discarded by our fruit list committee, but after seeing our young trees producing this year their third consecutive heavy crop I feel justified in taking exception to the action of the committee. My first experience with the Surprise plum dates back to 1897, when Mr. O. M. Lord, of Minnesota City, probably the best authority on the plum in the state in his time, presented me with one tree, which at

that time were being sold at $1.00 each, and I was cautioned against giving it too much care or I would kill the tree, and that is just what happened to it.

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[Illustration: C. A. Pfeiffer, Winona.]

The following year, 1898, I bought twenty-five trees from Mr. Lord and planted them late in March, on very sandy land on a southerly slope, pruning the trees back almost to a stump. These trees were very slow in getting started but made a satisfactory growth before the season was over. They commenced to bear the third year after planting, and are still producing good crops, but it is my more recent experience with this variety that finally induced me to prepare this article. In the spring of 1909, we set out 160 plum trees, on rich, black, loamy soil on low land, nineteen of them being Surprise, the other varieties being, according to numbers, Terry, Ocheeda, Stoddard, Hawkeye, Bursota, Wolf, Omaha also a few Jewell, DeSoto, Forest Garden, American and Stella. The Surprise trees bore a crop in 1913, again in 1914, and 1915, making it to the present time not only the most productive but the most profitable variety on our place. While we did not keep an accurate record of the exact yield in 1913 and 1914, some of the trees produced fully five 16 quart cases in 1913. A fair average would perhaps be about four cases per tree. In 1914 the crop was somewhat lighter, yielding an average of three cases per tree. This year we picked and sold eighty-five cases, which brought us a gross revenue of $79.60. We lost part of the crop on account of continual rain in the picking season, or we would have had fully 100 cases. Nine of the trees being in a more sheltered location than the other ten held their fruit better during the growing season, and produced a relatively heavier crop than the ten that were exposed to our fierce winds all summer.

We have never been able to supply the demand for them, at good prices, while other varieties went begging at any kind of a price. Among their good qualities with us are productiveness, good size, extra fine quality and attractive color. They are delicious to eat out of hand just as they are ripe enough to drop from the tree. They are fine for canning, preserving or jelly. They are practically curculio proof, and have never been affected with brown rot as have some other varieties. Aphis never bothers them, while Terry and some other varieties nearly had the whole crop ruined by this pest in 1914. The branches form good, strong shoulders at the trunk and do not split or break down in heavy storms or under their heavy loads of fruit, as the Terry and Forest Garden do. The flower buds and fruit form as freely on the new growth as on the old spurs. The crop is therefore about evenly distributed all over the tree, and while we picked almost eight cases from one tree this year it did not appear to be overloaded, as some varieties frequently are, the Surprise tree always being capable of maturing all the fruit that sets.

We have shipped them 300 miles by freight with perfect success, but we pick them from the tree before fully ripe. If allowed to ripen on the tree they drop badly, which bruises and damages them. The trees are thrifty, vigorous growers with beautiful glossy foliage that can be distinguished from all other varieties.

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You would note on examination of the buds that we have promise of another crop next year, but this will depend somewhat on the weather during the blooming season. We attribute one of the reasons for our success with the Surprise plum to the fact that they are planted among and alongside of varieties that have the same season of blooming, and which undoubtedly are good pollenizers, namely the Bursota, Wolf, Ocheeda and Omaha. The bloom of Surprise being almost sterile, they will not be a success planted alone.

[Illustration: A Surprise plum tree growing on the place of Prof. A.G. Ruggles. It bore in 1914 four bushels, having been well sprayed with arsenate of lead and bordeaux mixture.]

You will perhaps ask if there are no faults or diseases they are subject to, and we will state, for one thing, the fruit drops too easily when ripe, and you will either have to pick them before fully matured or find a good many of them on the ground. They are also occasionally subject to blossom blight, which was rather a benefit, as it thinned the crop out to about the proper proportion. We also had considerable plum pocket and fungous growth one season about ten years ago. Such has been our experience with the Surprise plum—and will again repeat that until the society finds a plum equally as good or better, instead of discarding it on account of unproductiveness and recommending such poor quality varieties as Wolf, DeSoto and some others, our learned horticulturists should make a special study of this variety and ascertain the cause of its unproductiveness, and also to what localities in the state it may be adapted.

Mr. Pfeiffer: Right here I will say to those gentlemen who are looking for a cure for brown rot or curculio, they had better plant Surprise plums. (Applause.)

Pres. Cashman: I am glad the Surprise plum has at least one good friend in this audience. I think it has several.

Mr. Ludlow: What has been your experience with the Ocheeda? I see you mention it.

Mr. Pfeiffer: The Ocheeda at the present time, I am sorry to say, I am disappointed with. I planted some fifteen years ago, and they were nice large plums, as you have described, and they were on sandy soil. I have twenty Ocheeda trees now, and they are quite badly subject to brown rot. Their quality is very nice to eat from the tree out of hand, nice and sweet.

Mr. Street: I want to second everything Mr. Pfeiffer has said. I joined this society about twelve years ago, and it was through studying the reports of this society that I got interested in the native plum. The Surprise plum does very well with us in Illinois. Professor Hansen is one of those that are responsible for my starting in with the Surprise. It was years ago at our state meeting that he mentioned that as one of the

good plums for Northern Illinois. Well, I put it alongside of the Wyant and the native plums that are of the same sort. I may state the

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conditions under which we grow them. We always cultivate before bloom, cultivate thoroughly. Before the growth starts we give them a very thorough spraying with lime-sulphur spray; then just before the bloom, just before the blossoms open, as late as we can wait, we use about 1 to 40 or 50 of the lime-sulphur solution, also put in three pounds of arsenate of lead. Then after the blossoms fall we use the same spray again, perhaps two weeks after that again, and we keep that up for about four times. We have had abundant crops, and they have been very profitable.

Pres. Cashman: I am very glad to know that the Surprise plum has friends in Illinois, and we are also pleased to know that Mr. Street is with us and we hope to hear from him later. The president of the Wisconsin Horticultural Society, Mr. Rasmussen.

Mr. Rasmussen: I will say the Surprise plum has given just about the same results with us—it is the most profitable we have.

Mr. Sauter: I was over to the Anoka county fair; it was the first part of September, and all the other plums weren't ripe, all the stuff they had in was green. But all the Surprise were ripe, so that certainly must be an early ripener.

Mr. Pfeiffer: Not especially early.

Mr. Hall: I was certainly glad to hear Mr. Pfeiffer so ably defend the Surprise plum. The Surprise plum was the only one I got any good from. The DeSoto, Wolf and Stoddard and all those, the brown rot got them, but the Surprise plum had perfect fruit. I am surprised that it has a black eye from the society.

Mr. Pfeiffer: Your location is where?

Mr. Hall: Sibley County.

Mr. Kellogg: Thirteen years ago I set out a root graft that made about five feet of growth and just as quick as it got big enough to bear it was loaded with Surprise plums, but since then it hasn't been worth a cent.

Mr. Miller: If Mr. Pfeiffer had been in my orchard he could not have given us a better description of it than he did, of the Surprise plum. I set it out about fifteen years ago. I think I paid sixty cents for those seedlings, they stood about three and one-half feet. I never had brown rot in them. When I set them out I put them with other varieties and set them so the inside ones would fertilize the outside ones. Afterwards I set these on the east side of the orchard, where they got protection from the west wind. They have borne almost every year, and this year they are the only ones we had a crop on.

Pres. Cashman: I think we get as near to agreeing on this question as on most others. It is suggested that we find out how many have had success and how many have had failures with the Surprise plum. All those who have been successful in raising Surprise plums will please raise their hands. (Certain hands raised.) Now, hands down. Those who have been unsuccessful will please raise their right hands. (Other hands raised.) It seems there were more successes than failures.

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A Member: It has been mentioned that the frost this year killed the plum crop. I noticed in my orchard previous to that frost when we had a snow storm, I noticed that the blossoms dried up and fell from the trees before that hard frost. I think the question of success or failure with the Surprise, as with other plums, is sort of comparative. I don't know of any plum of the Americana type that we have a success with every year any more than any other. So it is relative. I would like to ask if anyone had the same experience with the blossoms drying and falling off the trees before that frost.

Mr. Crawford: Perhaps the gentleman will recall the fact we had two nights in succession of quite severe frost. The first night it was almost a freeze, and the second we had the snow storm which is given credit for the plum failure.

Mr. Anderson: The gentleman who read the paper, he is from Winona, where he has a very much better location for any kind of fruit than the general run of the state. The other gentleman is from Illinois. Now, this good location near Winona and the temperature down in Illinois, does that favor the Surprise plum, and has it anything to do with their success and our failure?

Pres. Cashman: We will have to leave that to the audience.

Mr. S.D. Richardson: Down in Winnebago I got three trees from the originator of the Surprise plum, and while I was at the nursery I never saw any plums, but I propagated some from there and a man in our town has some Surprise plums from it, and since I left the nursery I think the man has had some plums from them. I got them from Mr. Penning when they were first originated, but they never bore plums for me. I had no other plums around there. Perhaps if they need pollen from other plums they didn't get it, and this man that has had the first success with them he had other plums near them. Perhaps that is the secret. The tree is hardy and good, and if you can get a crop of plums by having something else to fertilize them, the Surprise plum is all right.

Pres. Cashman: I think Mr. Richardson has struck the keynote to a certain extent, we must put them near another variety to pollenize them.

Northeast Demonstration Farm and Station.

W. J. THOMPSON, SUPT., DULUTH.

Last May the Station orchard was set out, the same consisting of about 516 apple trees with a fringe of cherries and plums. The apples consisted of year old stock (purchased the year preceding and set in nursery rows) and included these six varieties: Duchess, Patten's Greening, Okabena, Wealthy, Hibernal, Anisim. Good growth was made the past season and the stock went into winter quarters in good shape. However, 20 per cent died, the loss being in this order: Wealthy, Anisim, Hibernal, Pattens' Greening—-

Okabena and Duchess were tied for smallest loss. In addition to the above, we made a considerable planting of small fruits, principally

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currants and gooseberries, together with a limited quantity of blackberries and raspberries. Twelve varieties of strawberries were set out, each including 100 plants. All made a splendid growth this season. An interesting test is under way in the dynamiting work. Alternate trees have been set in blasted holes, a stick about one and one-half inches long being sufficient to make a hole three feet in diameter and perhaps twenty inches in depth. It is yet too early to measure the results of this work, but owing to the nature of the subsoil in this region, we are looking for splendid results. With regard to the stock secured from the Fruit Farm, we have not been uniformly successful. Much of the stock seems to be weak and dies readily from some cause unknown to us. Next season we should be able to render a more complete report, as our work will then be fairly started.

Annual Report, 1915, West Concord Trial Station.

FRED COWLES, SUPT., WEST CONCORD.

[Illustration: Fred Cowles at home.]

Of the new varieties of plums that I received from the Fruit-Breeding Farm most all have done well. The only one that has borne is No. 21. This one had two plums on last season, and several this. They were a medium size red plum, very good flavor, and seem to come into bearing very young. No. 17 is a very thrifty grower, but when it bears that will tell what it is worth. Hansen's plums are doing well, but we believe they are more adapted to a better drained soil than we have here, as we are on a heavy prairie soil. But these varieties are very thrifty and bear so young.

The grapes have all stood the winter with no protection and have not killed back any. We expect some fruit next season.

The raspberries that we received have all done well. No. 4 seems to take the lead for flavor and is a good grower.

Notwithstanding the cold season our strawberry crop was very good, and we are much impressed with No. 3, it is so strong and healthy; it is just the plant for the farmer, as it will thrive under most any condition. I believe it will fight its way with the weeds and come out ahead.

We reported very favorably on the Heritage when it was in bloom, but it does not set enough fruit to pay for its space. The berries are large but very few on my grounds. I will discard it.

Our apple crop was very good, especially Duchess, Wealthy and Northwestern Greening. We have been trying some of the tender varieties top-worked. Northern Spy

gave us five nice apples on a two year graft. We also have Jonathan, Talman Sweet and King David doing well. Delicious grafted three years ago has not fruited yet.

This has been a splendid summer for flowers, and they seemed to enjoy the damp, cool season, especially the dahlia. If you have not tried the Countess of Lonsdale you should; it is a cactus dahlia and a very free bloomer. Everblooming roses did well—we had them in October.

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PLANT LICE ON BLOSSOMS.—Aphids infesting the apple buds appeared in serious numbers during the present season in the Illinois University orchards when the buds began to swell. They were also observed in neighboring orchards. In 1914, apple aphids caused serious damage in certain counties in Illinois, and some damage was reported from many sections of the state.

The aphids attack the opening buds, the young fruits, the growing shoots, and the leaves, sucking the plant juices from the succulent parts by means of long, very slender, tube-like beaks, which they thrust through the skins of the affected organs into the soft tissues beneath. They weaken the blossom buds by removing the sap; they dwarf and deform the apples so that varieties of ordinary size frequently fail to grow larger than small crab apples, and the fruits have a puckered appearance about the calyx end; they suck the juice from the growing shoots, dwarfing them; and they cause the leaves to curl, and if the insects are present in large numbers, to dry up and fall off. They are more injurious to the growth of young trees than of old trees. In old trees their chief injuries are on the fruit.

This species of aphids are easily killed in the adult stage by certain contact sprays. Winter applications of lime sulphur cannot be depended on to destroy eggs. Poison sprays such as arsenate of lead are not eaten by this type of insect, and consequently are ineffective remedies for aphids. Kerosene emulsion is effective but is uncertain in its effect on the foliage of the trees. The best available sprays are the tobacco decoctions, of which the one most widely in use is “Black Leaf 40,” a proprietary tobacco extract, made by the Kentucky Tobacco Products Company, Louisville, Kentucky. This material is used at the rate of one gallon in one thousand gallons of spray. It may be combined with lime sulphur, lime sulphur arsenate of lead, Bordeaux, or Bordeaux arsenate of lead, not with arsenate of lead alone.

The ideal time to spray for these aphids is just as soon as all or nearly all the eggs appear to have hatched. Observations made in the University orchards this season indicate that all the eggs hatched before the blossom buds began to separate. After the leaves expand somewhat and the blossom buds separate, the aphids are provided with more hiding places and are more difficult to hit with the spray. Unfortunately, spraying at this time would require an extra application in addition to the cluster bud (first summer) spray (made for scab, curculio, bud moth, spring canker worms, *etc*.), and would thus add seriously to the cost of the season’s operations. Spraying for aphids at the time of the cluster bud spray is, however, highly effective, and in general it is advised that this method be followed. If, however, previous experience has shown serious losses from aphids, or if they are present in extremely large numbers, the extra application may be well worth while.—Ill. Agri. Exp. Station.

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Annual Report, 1915, Duluth Trial Station.

C. E. ROWE, SUPT., DULUTH.

[Illustration: A rosa rugosa hybrid rose grown by C. E. Rowe, Duluth.]

Although this was an off year for apples, results were probably as good here as in other sections of the state. The spring gave promise of an unusual crop, but the constant dropping of fruit during the summer months left us with about two-thirds as many apples as were harvested in 1914. The quality was much poorer, owing to extremely cool weather and the presence of scab in many localities.

The plum crop failed almost completely, and many trees were injured from aphis attacks. I have never known the aphis so hard to control as they were last summer.

Nearly all fruit trees made an excellent growth this season, and the new wood was well ripened when the freeze-up came. The fall rains provided plenty of moisture, and our trees should come through the winter in excellent shape.

Raspberries and currants produced about one-half the usual crop this year, probably owing to our May freeze.

Strawberries were almost a failure, largely due to winter-killing. Last winter did more damage to perennial plants than any other winter within the recollection of the writer. The fall was rather dry, and our snow covering did not come until January.

We received from Supt. Haralson for trial four plum trees, variety No. 1; and fifty everbearing strawberry plants, variety No. 1017. Both plum trees and strawberry plants made a good growth. Although the strawberries were set heavily with fruit, but little of it ripened before the heavy frosts came. The plant is very vigorous, and the berry is large and of excellent quality.

Annual Report, 1915, Vice-President, Tenth Congressional District.

M. H. HEGERLE, SUPT., ST. BONIFACIUS.

On May 18th we had several inches of snow accompanied by a fierce northwest wind, and orchards without any shelter suffered seriously, and both apples and plums in such orchards were scarce and of a rather inferior quality. A few orchards had a fair crop, while a couple of others with a natural windbreak had a fairly good crop, but on an average it was the lightest apple and plum crop we have had for some time.

Mr. Beiersdorf and Mr. Swichtenberg report a good crop of Wealthy and Peter. Their orchards are close to a lake and are well protected on the north and west by a natural grove.

Of the twenty-four report blanks sent out, eleven were returned properly filled in, and they all report conditions about as above outlined.

Cherries and grapes suffered even more from the cold than the apples, and that crop was very light. My Homer cherry trees look healthy and are growing fine, but the past two years had not enough fruit to supply the birds.

Raspberries and strawberries were a good crop and of exceptional fine quality, but the currants and gooseberries were a total failure in my garden as well as elsewhere, according to all reports received.

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There were not many fruit trees planted in this district the past year. For instance, at this station the deliveries last spring consisted principally of bundles containing one-half dozen or a dozen trees each, and the total number delivered in that way did not exceed 200 trees and, according to all information, the planting throughout this district was very light.

I know of only one new orchard started with 700 four and five year old trees. About 500 are Wealthys and the balance Patten Greenings. The trees made a good start but were somewhat neglected during the summer, the field being planted to corn and some to barley, and all was handled rather rough.

There was very little blight in this district the past year. I noticed just a little on two or three Transcendents, and Mr. Jos. Boll, who has about 1,500 bearing trees, reports no blight at all.

I did no spraying this year, did not consider it worth while, as there was no fruit, and most others felt the same way. Other years though a lot of spraying is done, and the more progressive ones spray two and three times.

There is plenty of moisture in the soil, and the trees are going into winter quarters in good shape, therefore prospects for apple and plum crop the coming season are excellent.

[Illustration: Residence of M. H. Hegerle, St. Bonifacius.]

Probably a hundred or more different kinds of apple and plum trees and berries of all kinds are grown here. Farmers in the past usually bought what the salesman recommended, just to get rid of him; lately though they are taking more interest in the selection, and the Wealthy, Patten's or Northwestern Greenings, Okabena, Peter and perhaps a few Duchess are about the only apple trees planted now. Surprise plums, Dunlap and everbearing strawberries are the leaders.

Ornamental shrubs are found here of all names and descriptions and colors, and they all seem to do well.

* * * * *

HONEY VINEGAR.—Vinegar made from honey has an exceptionally fine flavor and is not expensive. A small amount of honey furnishes a large amount of vinegar. Follow these directions: Dissolve thoroughly in two gallons of warm, soft water one quart jar of extracted honey. Give it air and keep it in a warm place, where it will ferment and make excellent vinegar.—Missouri College of Agriculture.

Thirty Years in Raspberries.

GUST JOHNSON, RETIRED FRUIT GROWER, MINNEAPOLIS.

Of the growing of fruit, it may well be said, “Experience is a good teacher, but a dear school.”

When I began fruit growing, some thirty years ago, I did not begin it merely as an experiment. I was interested in every branch of the work and, being very much in earnest about it, I felt confident of success.

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Thinking that the failures and drawbacks sometimes experienced could be easily overcome by a thorough understanding of the work at hand, I began by getting all the information possible. I found that great books such as by Downing, Thomas, *etc*., were more suitable for the advanced fruit grower, but I studied all the pamphlets and books obtainable during the winter months and put this knowledge into practice during the summer. Of course I could not put into practice all I had obtained from this reading, but I remembered distinctly the advice to all amateur fruit growers to start out slowly. This was particularly suited to my case, for the land was covered with timber, some of which I grubbed each summer, gradually adding acres as I cleared the land.

My first venture was in planting raspberries, planting potatoes between the rows the first year. One delusion I had was in planting as many different and untested varieties as I could afford to buy and not confining myself to those that had been tried and had proven satisfactory. Fortunately for me, the high cost of plants at this time did not warrant my buying as many different varieties as I desired, and I had to be contented with fewer plants. From the most promising of these, I saved all the plants possible.

I had an idea that I could do better by sending to some of the Eastern states for my plants, but here again I was mistaken, for the plants often did not arrive until late in May, and by the time they had reached their destination were practically all dried out. The warm weather then coming on, I lost the greater part of them, although I had carefully hoed and tended them in the hope that they would finally revive. Here I might also mention that the express charges added considerably to the cost of these already expensive plants.

As a beginner I put much unnecessary labor on these plants. While I do not wish to leave the impression that hoeing and caring for them is not all right, still there should be a happy medium which I later learned as I became more experienced along this line. I must admit, however, that this rich, new land thus cultivated certainly yielded some wonderful fruit.

As time went by, I kept adding to my plantation, and owing to the large yield and the good demand for the black caps I took a fancy to raising them. When the Palmer variety was first introduced, I planted quite a field of them. I shall never forget the way these berries ripened, and such a lot of them as there were. Practically every one by this time having planted black caps, their great yield soon overstocked the market, and berries finally dropped as low as 65c or 70c a crate.

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Having decided to dig up these black caps, I began paying closer attention to the red raspberry. I noticed that the raspberries growing wild on my place grew mostly in places where big trees had been cut down and young trees had grown up, thus partly shading the plants. Having this fact in mind, I planted the raspberries as follows: I planted an orchard, having the trees in parallel rows, and between the trees in these same rows I planted the raspberries. By planting in this manner, the cultivation would benefit the trees as well as the smaller plants. Of course after the trees began bearing heavily, the plants nearest the trees had to be removed, and later the other plants likewise were removed.

As a beginner it was a puzzle to me which varieties I should plant. All varieties listed in the numerous catalogs were so highly recommended as being hardy, large yielders, good shippers, *etc*., that the selection of plants was not an easy matter.

The speed with which a new variety of raspberry is sent out over the country and discarded is surprising. The most popular sort at this time was the “Turner” variety. I did not, however, fancy this variety, for it suckered so immensely that it required continual hoeing to keep the new plants cut down. The berries were unusually soft and settled down in the boxes, which greatly detracted from their appearance in the crates. There were also at this time a few of the “Philadelphia” variety being planted. They are a dark, soft variety and somewhat similar to the Turner.

Just at this time there was being sent out a new variety, known as the Cuthbert, or Queen of the Market, and queen it was indeed. This was a large, firm berry, and after ripening it would remain on the plant a long time without falling off. These plants grew up in remarkably long canes, but not knowing how to head them back they would often topple over during a heavy storm. This added another valuable lesson to my increasing experience, which resulted in my pinching of the new canes as soon as they had attained a height of from three to four feet. This made the plants more stocky and more able to support their load of berries without the aid of wire or stakes.

Next came the Marlboro, plants of which sold at as much as a dollar apiece in the east. I then set out a bed of Marlboro, which proved to be even better than the Cuthbert, previously mentioned. They could be picked while still quite light in color, thus reaching the market while still firm and not over-ripe. There was only one possible drawback, and that was the fact that I had planted them on a southern exposure, while they were more adapted to a colder or northern exposure. This variety on a new field, as it was, practically bore itself to death.

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About this time, there originated in Wisconsin a berry known as the Loudon. A committee of nurserymen having gone to see this variety returned with the report that the half had not been told concerning this great berry. Wanting to keep up with the times, I decided to plant some of this variety in the spring. The yield from these plants was immense, and the berries large, but unlike the Marlboro already mentioned they could not be picked until very dark and real ripe. This variety was more subject to anthracnose than any I had seen, and served to give me a thorough understanding of the various raspberry diseases, which I had heretofore blamed to the drouth. The leaves would dry up and the berries become small and crumbly when affected by anthracnose. It might be said of this variety as regards public favor, that it went up like a rocket and came down equally fast.

I next tried the Thompson Early as an experiment, but this variety proved a failure, or at least a disappointment. These berries ripened very slowly, just a few at a time, and did not compare favorably with either the Marlboro or the Loudon.

A party close by had at this time planted out a large field of a variety of raspberry which I had not seen before. These plants produced a large berry, more like a blackberry in appearance. Having by this time had experience with so many kinds of raspberries, I examined this new variety carefully, and all in all decided that this was the coming berry. Here, too, I also noticed the first signs of disease. The plants had only begun to bear fruit, however, and judging from the strong, tall canes, they looked good for at least fifteen years. This disease, however, practically destroyed the entire field within two years. Before too badly diseased, I had obtained and planted out a couple of acres of these plants and immediately began spraying them. The following spring I sprayed them again, and although the plants became perfectly healthy, I sprayed them once or twice during the summer, and it is needless to say the result was a berry which, considering all its good points, was certainly deserving of the name it bore, which was “King.” In fact, I do not hope to see anything better in the raspberry line during the next thirty years, that is, any seedling having all its merits: a strong growth, hardiness of cane, an immense bearer and a good shipper. It’s only fault is that the berries will drop from the plants when real ripe, but if you are on the job this can easily be averted.

As far as anthracnose is concerned, I have found that there is not a variety of raspberry standing out in an open field, unsprayed or partly shaded, that will stand up under a heavy crop without being affected by this disease.

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After increasing my plantation, as I had by this time, I found I required more help. Ability in managing my helpers was a necessity. My experience with them in the field was that when I set them to hoeing a newly set raspberry field if not watched they would destroy half the roots, loosening the little hold the struggling plants had, by cutting close and hoeing the soil away from the roots. I have seen supposedly intelligent men plowing alongside of the plants, thinking they were doing their work so much more thoroughly, but if they would dig up one plant before plowing and another after, they would readily see the results of their plowing.

A born farmer assumes that everybody knows how to handle a hoe or a plow, but why should they, not having had practical experience? When put to work such as hoeing, they would make the most outlandish motions with the hoe, often destroying valuable plants, not being able to distinguish them from the weeds. Though they may labor just as hard, they cannot possibly accomplish as much as the expert who can skillfully whirl a hoe around a plant in such a manner as to remove every weed and yet not injure the plant in the least. In other words, the best efforts of the novice cannot possibly bring the results so easily accomplished by the more skillful laborer. Except in a few cases, I have found inexperienced help a discouragement.

In hiring pickers who had to come quite far each morning, I found that if the morning had been wet and rainy, but had later turned out to be a nice day, they would not come at all. The sun coming out after these showers would cause the berries to become over-ripe and to drop from the bushes, or if still on the bush would be too ripe for shipping. These same pickers, when berries were scarce, would rush through the rows, merely picking the biggest and those most easily acquired.

Having tried pickers as mentioned, I decided that to get pickers from the city and board them would be the better plan. While they seemed to work more for the pleasure connected with life on the farm than with the idea of making money, yet after a little training and a few rules, most of them would make splendid pickers, and my berries being carefully picked and in first class condition, would readily sell to the best trade.

Leaving the subject of berries and berry picking, I will dwell briefly on my experience with the winter covering of the plants. At first I would cover the canes in an arch-like manner, which would require more than 18 inches of soil to cover them, and it was necessary to shovel much by hand. In the spring I found it quite a task to remove all this soil and get it back in place between the rows. After I learned to cover them properly, that is flat on the ground, I found it required but a small amount of soil to cover them, and in the spring it was only necessary to use a fork to remove the covering, and with a little lift they were ready to start growth again.

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After getting more and more fruit, I found I could not dispose of it in the home market, and tending to the picking and packing of the fruit did not leave enough time to warrant my peddling it. I had been advised to ship my berries to two or three different commission houses in order to see where I could obtain the best results. I frequently divided my shipments into three parts: consequently some of my fruit would meet in competition with another lot of my fruit, and not only would one concern ask a higher or lower price than the other, but they would not know when to expect my shipments, which they would receive on alternate days. I finally came to the conclusion that I would send all my fruit to one party, and I found that it was not only more of an object to them, but people would come every day to buy some, knowing they were getting the same quality each time.

Although it has been my experience that the raspberry is never a failure, still I have found that it is a good policy not to depend entirely on the raspberry, but to extend the plantation in such a way as to have a continuous supply of fruits and vegetables in season, from the asparagus and pie plant of the early spring to the very latest variety of the grape and apple ripening just before the heavy frost of fall, when it is again time to tuck them all away for the winter.

Mr. Ludlow: Do I understand that you have to lay down and cover up those red raspberries?

Mr. Johnson: Yes, sir; otherwise you only get a few berries right at the top of the cane, and if you cover them the berries will be all along down the cane.

The President: Do you break off many canes by covering them?

Mr. Johnson: No, it is the way you bend them. When you bend them down, make a kind of a twist and hold your hand right near them. You can bend them down as quick as a couple of men can shovel them down.

Mr. Anderson: Do you bend them north or south or any way?

Mr. Johnson: I generally bend one row one way and the other the other way. Where you want to cultivate, it is easier for cultivation; you don't have to go against the bend of those plants. That bend will never be straight again, and when you come to cultivate you are liable to rub them.

Mr. Anderson: How far have you got yours planted apart?

Mr. Johnson: About five feet.

Mr. Sauter: What is your best raspberry?

Mr. Johnson: I haven't seen anything better than the King.

Mr. Sauter: Do you cover the King?

Mr. Johnson: Yes.

Mr. Sauter: We don't do it on the experimental station. I never covered mine, and I think I had the best all around berry last summer.

Mr. Johnson: That might be all right when they are young, but I find it pays me.

A Member: Don't they form new branches on the sides when you pinch off the ends?

Mr. Johnson: Yes, sir; then you pinch them off.

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A Member: Don't they break right off from the main stalk in laying down?

Mr. Johnson: No, no.

A Member: We have a great deal of trouble with that. How do you get these bushy bushes to lie down?

Mr. Johnson: I take three or four canes, and kind of twist them, give them a little twist, and lay them flat on the ground.

Mr. Anderson: Don't you take out any dirt on the sides?

Mr. Johnson: No, sir; sometimes I might put a shovel of ground against them to bend the canes over.

Mr. Rogers: Do you plant in the hedge row or in the hill system?

Mr. Johnson: In the hedge row. I think it is better because they protect one another.

Mr. Ludlow: How far do you put them apart in the hedge row?

Mr. Johnson: Four feet. That is the trouble with the King, if you don't keep them down, your rows will get too wide.

A Member: I heard you say a while ago you covered these. Do you plow them after you get them down or do you cover them with a shovel?

Mr. Johnson: I cover mostly with a shovel. Sometimes I take a small plow through.

A Member: Don't you think in covering them with a plow you might disturb the roots?

Mr. Johnson: That is the danger.

A Member: I saw a fellow covering up twelve acres of black caps and he plowed them shut. After I heard what you said I thought maybe that he was injuring his roots.

Mr. Johnson: You know the black cap has a different root system from the reds. The roots of the reds will run out all over the road.

Mr. Willard: How thick do you leave those canes set apart in the row, how many in a foot?

Mr. Johnson: I generally try to leave them in hills four feet apart, not let them come in any between. About three or four in a hill. I generally try to cut out the weak ones.

Mr. Willard: You pinch the end of the tops, I think?

Mr. Johnson: Yes, sir.

A Member: When do you cut those sucker canes?

Mr. Johnson: I generally hoe them just before picking time and loosen the ground in the row. That is very important, to give them a hoeing, not hoe down deep, but just loosen that hard crust there and cut all the plants that you don't want, and then generally, after the berries commence to ripen, your suckers don't come so fast, and you keep on cultivating once in a while.

Mr. Brackett: I have some King raspberries, and I never covered them up in ten years. I will change that. The first year I did cover a part of my patch, at least one-half of them, and that left the other half standing, and I couldn't see any difference. Around Excelsior there are very few people that cover up the King raspberry. But the King raspberry has run out; all of the old varieties have run out. We have at our experiment station the No. 4—you can get double the amount of fruit from the No. 4 than from the King. The

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best way to grow the King raspberry or any other raspberry is to set them four feet apart and cultivate them. If you grow a matted row you are bound to get weeds and grass in there, you are bound to get them ridged up, but by planting in hills and cultivating each way you can keep your ground perfectly level. As far as clipping them back my experience has been it is very hard to handle them—they will spread out. It is a big job to cover the plants and then to uncover them again. I know it is not necessary with the No. 4; that is hardy. That is what we want. Hardiness is what we want in a berry, and you have it in the No. 4.

Mr. Hall: I would like to ask you what you spray with and when you spray?

Mr. Johnson: The bordeaux mixture. I spray them early in the spring and just before they start to ripen.

Mr. Wick: With us the Loudon raspberry seems to be the coming raspberry.

Mr. Johnson: Is it doing well now?

Mr. Wick: Yes, it is doing well.

Mr. Ludlow: How many years is the planting of the King raspberry good for?

Mr. Johnson: I think it would be good for fifteen years or more if they are handled as I do it. Keep at the plant, hoeing and spraying them twice a year; trim out the old wood and keep them healthy.

The President: You take out all the old wood every year?

Mr. Johnson: Yes, sir.

Mr. Ludlow: When do you do that?

Mr. Johnson: In the fall. I figure this way, every extra cane that you grow on the plant is a waste. If I see a cane a little higher than the others I just stop it, and it throws the sap back.

Mr. Berry: Do you fertilize and how and when?

Mr. Johnson: I found I didn't need much fertilizer. I put on wood ashes and such things when I burn the trimming of the berries and such things.

A Member: When do you spray?

Mr. Johnson: I generally spray in the spring after they get started and just before they are starting to ripen. I spray them sometimes when they are starting to ripen, and the berries would pick up in one day.

A Member: You mean to say you could grow them for fifteen years without fertilizing?

Mr. Johnson: Yes, sir.

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KNOWLEDGE of the temperature of the pantry and cellar is important, in order that one may make improvements in conditions. Putrefaction will start at 50 deg., so that a pantry or closet where food is kept should have a temperature at least as low as that. Cellars where canned goods are stored should have a temperature of 32 deg. or over. Apples are frequently stored in outside cellars, where the temperature should be kept at 31 deg. or 32 deg.; but apples may be kept satisfactorily at 34 deg. or 36 deg. When stored at the higher temperatures, the fruit should be placed there soon after being picked.

Annual Report, 1915, Nevis Trial Station.

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JAS. ARROWOOD, SUPT., NEVIS.

We would say that the station is in good condition; all trees and shrubbery have done well; no complaint as far as growth is concerned. This being an off year for fruit in this section, the fruit crop in general was light, the late frost and heavy rains destroying most all, both wild and tame fruits.

The strawberries, raspberries and currants were fairly good; plums and apples were very light, except some seedlings, both apples and plums, which seemed to hold their fruit. Most all the large apples were destroyed by the freeze, such as Duchess, Wealthy, Greening and Hibernal. There were some of the Duchess seedlings that seemed to stand all kinds of freezing.

[Illustration: Jas. Arrowood in his trial orchard, at Nevis, in Northern Minnesota.]

Now in regard to the fruits that were sent here from Central station. The majority are doing fairly well, especially in regard to strawberry No. 3, which is doing splendidly and points to be the coming strawberry of northern Minnesota. It is a good runner and has a large, dark foliage. Plants that we left out last winter without covering came through in splendid condition and made a heavy crop. In regard to the fruit, it is of the best quality, large and firm and a good keeper. In regard to raspberries, Nos. 1, 4 and 7 did very well, and stood the winter without laying down, and bore a good crop.

In regard to the eighteen plum trees I received three years ago, Nos. 1, 4, 5, 6, 7, and 12 have done very well and have made a good growth, but have had no fruit so far.

The sand cherry that was received the same year, No. 2, has done very well and bore some fruit this last year of a fair quality.

Hansen cherries are doing fairly well and bore some fruit this year.

Now in regard to plums that were received in 1914 Nos. 2, 3, 8, 10, 13, 20, have all made a good growth. What was received in 1915 have all grown.

The grapes that we received two years ago have made but little growth. There were no grapes in this section this year; they all froze off about twice.

I received at the county fair about sixteen first prizes on apples and plums this year. We did considerable top-working, mostly on Hibernals and native seedlings, which are doing very well. Some of our seedling cherries are commencing to bear and show to be perfectly hardy. They are of the Oregon strain of sweet cherry.

In regard to gardens, they were fairly good throughout the section. Corn crop a failure.

In regard to the condition of the trees and shrubbery, this are going into their winter quarters with lots of moisture and with a large amount of fruit buds, with a good prospect for fruit next year.

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DESTROYING PLANT LICE.—According to the results of experiments a 10 per cent kerosene emulsion should prove effective against the green apple aphis. The kerosene emulsion made either with 66 per cent stock, 10 per cent, or with naphtha soap and cold water, seemed to kill all the green apple aphides. The 40 per cent nicotine solution, with a dilution up to 1 to 2,000 combined with soap, were likewise effective aphidicides. The kerosene emulsions under 10 per cent were not satisfactory, neither were the soaps at the strengths tested, except that fish-oil soap, 5 to 50, killed 90 per cent of the aphides. Laundry soap, 3 to 50, was effective against the young aphides only. Arsenate of lead alone, as was to be expected, had little or no effect upon the aphides. The combination of arsenate of calcium with kerosene emulsions is not a desirable one, since an insoluble calcium soap is formed, thereby releasing some free kerosene.—U.S. Dpt. of Agri.

New Fruits Originated at Minnesota Fruit-Breeding Farm.

CHAS. HARALSON, SUPT., EXCELSIOR.

The subject on which I am to talk is rather difficult to present at this time, but I will mention a few of the most promising new varieties.

[Illustration: The new and valuable hardy raspberry No. 4, growing at State Fruit-Breeding Farm.]

We have developed several hundred new varieties of fruit since we started fruit-breeding at the State Fruit Farm. Many of them are very promising, but it probably will take several years before we really know what we have that will be of value to the public.

We have been growing thousands of seedlings of apples, plums, grapes, raspberries, strawberries, gooseberries and currants, from which valuable varieties have been selected. All of them have been put under propagation in a small way for testing at the Fruit Farm, trial stations and many other places. Some very favorable reports from several places have been received during the last year from parties who have fruited these new creations. We also have some hybrid peach and apricot seedlings which have stood the test of the last two winters. Some of them blossomed very freely last spring, but on account of the hard freeze in May they did not set any fruit. I hope to be able to report on these another year.

[Illustration: Hybrid plum No. 21—at Minnesota State Fruit-Breeding Farm.]

The results of breeding strawberries have given us one everbearing and one June-bearing variety, which have been tested in many places throughout the state. The June-bearing variety has been introduced as Minnesota No. 3. The berries are almost identical with Senator Dunlap in color and shape, but somewhat larger and, I think,

more productive. The plants are equal to Dunlap in hardiness, or more so, a stronger plant, and a good plant-maker. The fruiting season is about a week earlier than Dunlap. It is a firm berry and stands shipping a long distance. My belief is that this variety will make one of the best commercial berries for the Northwest.

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The everbearing variety is known as No. 1017. It is a large, round berry, dark red color, and is of the best quality. This variety is strong and vigorous and a good plant-maker when blossoms are picked off early in the season. It is also very productive. The blossoms and berries on a number of plants were counted in October, and we found all the way from 200 to 345 berries and blossoms on single plants. This is, of course, a little more than the average, but it shows what it will do under ordinary conditions. This variety has been growing next to Progressive, on the same soil, with the same cultivation, and I think that persons who have seen it this summer will agree with me that it is far ahead of Progressive in size and productiveness. I will say right here, if you expect to have a good crop of fruit in the fall, keep the most of the runners off. If you encourage them to make runners, or plants, you will have less fruit.

The raspberries sent out as Nos. 1, 2, 3, 4, 5, 6 and 7, are all worthy of trial. The No. 4 has fruited several years and gave the best showing so far. The fruit resembles the Marlboro somewhat, but the color is darker. It is not one of very high quality, but the size of the berry and its appearance will more then make up for this. The canes and foliage are generally healthy and very hardy. This variety will be planted very extensively just as soon as enough stock can be supplied to fruit growers.

The Burbank crossed with Wolf, hybrid plums. There have been several of these sent out to trial stations, and as premiums to members of the Horticultural Society. I will mention them in order as to size of fruit. No. 5, 12, 4, and 6 will measure 1-3/4 inch in diameter. Nos. 21, 10, 17, 9, and No. 1 are nearly as large. The kinds which have given best all around satisfaction up to the present time, are Nos. 1, 6, 9, 10, 12, 17, 21 and 25. One or two years more trial should give us an idea which ones will be worthy of general propagation.

There are also several varieties of Abundance and Wolf crosses which have fruited for several years. The quality of the fruit of these hybrids is probably somewhat better than the Burbank and Wolf hybrids, but the fruit in most cases runs smaller. No. 35 is probably one of the best; its fruit is about 1-1/2 inch in diameter, colors up all over before it is ripe, and will stand shipping a long distance, as they can be picked quite green and still are colored up all over. There are several numbers equally, or nearly, as promising as No. 35.

Sand cherry X Satsuma plum No. 145 is in the same class as Sapa. The color of the fruit is bluish black when ripe, the flesh purple, pit small and nearly freestone; fruit ripens first part of August. This tree is a strong grower and makes a large tree. We also have another plum, Compass cherry X Climax, about the only variety which fruited this year. The color of the skin is almost blue when fully ripe; the meat is green and of a very pleasant flavor. The pit is small and clingstone; size of fruit is about 1-1/2 inches in diameter. The tree is a strong, upright grower. This variety has been propagated this summer. I will not try to describe any more as there are some 2,000 hybrid plums on the place and only a small per cent have fruited.

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[Illustration: Ornamental Purple Leaf Plum, originated at State Fruit-Breeding Farm.]

In grapes we have several varieties worthy of propagation, but I will just mention two varieties. One is a red grape about the size of Wyoming Red. The bunches are large and very compact; the season for ripening is about with Moore's Early; the quality is good enough to make it a table grape. The vine is just as hardy as Beta grape, of which it is a seedling. It has good foliage and the vine is a rank grower. The other variety is black when ripe, nearly as large as Moore's Early. The fruit is ripe first part of August; the vine is vigorous and hardy.

Strawberries and raspberries were a good crop this year, but all other fruit was a total failure on account of the killing frost and snowstorm on May 18th. Apples were in full bloom at the time, and a good crop of plums had set on the trees, but all fell off a few days later. There were no currants or gooseberries and only a few grapes.

Mr. Waldron: What do you think the male parent was of the red grape?

Mr. Haralson: I couldn't say. We don't know what the cross is.

Mr. Waldron: Did you have any red grapes growing there?

Mr. Haralson: I presume there were quite a number of varieties growing near by. In the Beta seedlings we find a number of grapes that ripen green and also some black and a number red, but not a great many, I would say from five to seven per cent of the seedlings.

Mr. Wellington: Have you been able to cross the European plum with the Japanese?

Mr. Haralson: We have one or two varieties, but the fruit is very small, the fruit isn't very much larger than the Compass cherry. The tree is a very strong grower and makes a large tree, but the fruit is not up to what it should be.

Mr. Cook: What number do you hold that red grape under?

Mr. Haralson: The red grape is No. 1.

Mr. Sauter: Which is the next best raspberry besides the No. 4?

Mr. Haralson: I couldn't tell you at present. I thought the No. 2, but from reports I have had from several places some think No. 1 is better. No. 4 is the best of them all so far.

A Member: I would like to ask which of those raspberries is the best quality.

Mr. Haralson: They run very much the same, very little difference in the quality. The quality I should say compares very favorably with the King.

The President: Those of you who know of the wonderful work done by Mr. Haralson can not help but say, “Well done, good and faithful servant.” He has surely accomplished wonderful results out there, and the people of this state and adjoining states will all in time enjoy the fruits of his labor. (Applause.)

* * * * *

KILL WILD ONIONS IN NOVEMBER.—The secret of the vitality of the wild onion lies in the two sorts of underground bulbs. Each plant produces one large bulb, which germinates in the fall, and four or five small ones, which start growth in the spring.

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Late fall plowing, followed by early spring plowing and planting the infested land to some clean cultivated crop destroys the wild onion pest by killing both sorts of bulbs as the growth from them appears and before they have a chance to multiply. The fall plowing should be deep, and care should be taken to completely bury all green tops of the onion. If very much top growth has been made, a harrow run before the plow will facilitate the thorough covering of the tops.

Another interesting and valuable point about the wild onion is that the spring bulbs rarely produce heads; consequently, if the infested land is plowed in the fall, a spring oat crop practically free of onions can always be secured. But for complete eradication of the onion, both fall and spring plowing is necessary, and November is the best time to do the fall work.

Annual Meeting, 1915, Wisconsin Horticultural Society.

CHAS. HARALSON, EXCELSIOR, MINN., DELEGATE.

The meeting was held January 5, 6 and 7, 1915, in the Assembly Room of the State Capitol in Madison, Wis. Your delegate was present in time for the opening session and given a chance with other delegates to deliver the greetings of their societies.

The opening address by Governor Phillip was very interesting. He told of the possibilities the State of Wisconsin offered fruit growers in a commercial way with markets all around them. He advocated honest grading and packing to obtain the top prices for the fruit. He also urged every farmer to have a small orchard and fruit garden for home consumption.

Spraying and spray mixtures, illustrated, was ably presented by Professor Geo. F. Potter, University of Wisconsin.

A speaking contest by ten students from University of Wisconsin competed for prizes of $25.00, $15.00 and $10.00. This brought out almost every phase of horticulture and was one of the most interesting sessions.

Commercial orcharding in the middle west was shown with moving pictures and explanations by Sen. Dunlap, Savoy, Ill. These pictures illustrated spraying, cultivating, harvesting, grading, packing, caring for the fruit and marketing the same, and several other operations in connection with uptodate commercial orcharding. He also gave a talk on spraying and spraying materials. He said lime-sulphur is preferred in his locality.

A half hour question and answer session was led by Professor J.G. Moore, University of Wisconsin, on pruning. This brought out a very lively discussion about how to prune young orchards and what age of trees to plant for commercial orchards. This question

was not settled, as some preferred one year old trees, while others would plant nothing but two year old trees.

M. S. Kellogg, Janesville, Wis., spoke of nurserymen's troubles. His paper was very interesting from a nurseryman's standpoint with all their troubles and what they have to go up against.

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C. O. Ruste, Blue Mounds, Wis., spoke about the farmer's orchard, what to plant and how to care for the same.

The writer gave a paper, telling what is being done in the line of fruit-breeding at the Minnesota Fruit-Breeding Farm.

The program was very full and interesting. The attendance, however, was not very large. A very good exhibit of apples was on display in the fruit room. The fruit was clean, well colored and up to size. Many varieties, such as Jonathan, Fameuse, Baldwin, Windsor, Talman Sweet and Wine Sap were on display in great quantities.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So. Minneapolis.

At the annual meeting the following officers and members of the Executive Committee were elected.

Officers—Mrs. E. W. Gould, President, 2644 Humboldt Ave. S., Minneapolis; Mrs. Phelps Wyman, Vice-President, 5017 Third Ave. S., Minneapolis; Mrs. M.L. Countryman, Secretary-Treasurer, 213 S. Avon St., St. Paul.

Directors—Mrs. F. H. Gibbs, St. Anthony Park; Mr. G. C. Hawkins, Minneapolis; Miss Elizabeth Starr, Minneapolis; Mrs. H. A. Boardman, St. Paul; Mr. F. W. Bell, Wayzata; Mr. F. F. Farrar, White Bear; Mrs. R. P. Boyington, Nemadji; Mrs. J. F. Fairfax, Minneapolis; Mrs. H. B. Tillotson, Minneapolis.

After a thorough discussion, it was unanimously agreed that more frequent meetings would be advisable. Our program committee has, therefore, planned for a meeting each month, alternating between St. Paul and Minneapolis. It was, of course, impossible to set the dates for the three flower shows so early in the year, or to announce all of the speakers. The program in full for each month will appear on this page, and we hope to save our secretary a great deal of routine work as well as considerable postage to the society. So watch this page for announcements. We hope the following program will prove both interesting and profitable, and that our members will bring friends to each meeting, all of which will begin at 2:30 o'clock *promptly*.

PROGRAM FOR 1916.

February 24. Wilder Auditorium, 2:30 p.m., Fifth and Washington St., St. Paul.
Soil Fertility, Prof. F. J. Alway.
Birds As Garden Helpers.

March 23. Public Library, Minneapolis, 2:30 p.m.
Work of the State Art Commission, Mr. Maurice Flagg.
How Can the Garden Flower Society Co-operate with It?
Our Garden Enemies.
Cultural Directions for Trial Seeds.
Distribution of Trial Seeds.

April 27. Wilder Auditorium, St. Paul, 2:30 p.m.
Native Plants in the Garden.
Roadside Planting.
Use and Misuse of Wild Flowers.

May. Date to be announced. Mazey Floral Co., 128 S. 8th, Minneapolis.
Informal Spring Flower Show.
What Our Spring Gardens Lack.
Good Ground Cover Plants.

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June. Date to be announced. University Farm, St. Paul, Joint Session with Horticultural Society. Flower Show.

July. Date to be announced. Minneapolis Rose Gardens, Lake Harriet.
Picnic Luncheon, 1:00 p.m.
Roses for the Home Garden.
Our Insect Helpers in the Garden.

August. Date to be announced. Holm and Olson, 2:30, 20 W. Fifth St., St. Paul. Informal Flower Show.
How to Grow Dahlias.
The Gladiolus.

September 21. Public Library, Minneapolis, 2:30 p.m.
Fall Work in the Garden.
Vines.
Planting for Fall and Winter Effect.

October 19. Wilder Auditorium, St. Paul, 2:30 p.m.
What Other Garden Clubs Are Doing.
How My Garden Paid.
Reports on Trial Seeds.

November. Date to be announced. Park Board Greenhouses, Bryant Ave. S. and 38th St., 2:30 p.m. Chrysanthemum Show.
Hardy Chrysanthemums.

December. Annual Meeting.

Program Committee. {MRS. PHELPS WYMAN,
{MRS. N. S. SAWYER,
{MISS ELIZABETH STARR,
{MRS. E. W. GOULD,

BEE-KEEPER'S COLUMN.

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

QUEEN BEES FOR BREEDING.—Queen bees for breeding purposes will be sent to beekeepers of the State from University Farm during the coming summer with instructions how to introduce them and how to re-queen the apiary. Mostly all bees in the state at present are hybrids, which are hard to manage. In many localities bees have been inbred for years, making the introduction of new blood a necessity. All

queens sent out are bred from the leather colored Italian breeding queens of choicest stock obtainable. The price of queens will be fifty cents for one, and not more than three will be furnished to each beekeeper. Orders with cash must be sent directed to the “Cashier,” University Farm, St. Paul, Minnesota. The queens will be sent out in rotation as soon as they are ready and conditions are right.

SECRETARY’S CORNER

MEMBERSHIP NUMBERS CHANGE.—A good many members when sending in annual membership fee give the number of their membership for the previous year. Members will please note that membership numbers change each year, as all members are numbered in the order of their coming upon the membership roll. The only number that we care about in the office, if for any reason it is necessary to give it, is the number for the current year.

A WORD FROM PROF. WHITTEN.—Prof. J. C. Whitten, of the University of Missouri, who was on the program at our annual meeting for three numbers, and at the last moment was taken ill and unable to be with us, has written describing the condition of his illness and expressing his deep regret at his enforced absence from our meeting, and a hope that at some other time he may have an opportunity to be with us. We shall look forward to having him on our program another year with eager anticipation. Prof. Whitten ranks as one of the most prominent of professional horticulturists of the country, and we are certainly fortunate in being able to secure his attendance, as we hope to do another year.

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MEMBERS IN FLORIDA.—Quite a number of members of the Horticultural Society are spending the winter in Florida. Some of these the secretary knows about, but addresses of only two are at hand. J. M. Underwood, chairman of the executive board of the society, and family are at Miami, Fla., for the winter. Mr. Oliver Gibbs, at one time secretary of the society for a number of years, is at Melbourne Beach, on the east coast of Florida, where he has been now for some ten winters—and some summers also. His health makes it necessary for him to live in so mild a climate. We have the pleasure of meeting him here often during the summer. Now in his eighties he is nearly blind but otherwise in good health and always in cheerful spirits.

NEW LIFE MEMBERS.—Since the report of 1915 was printed, in which there will be found on page 520 a list of life members of the society, there have been added to the life membership roll fifteen names; five of these were made honorary members by the unanimous vote of the association for valuable service rendered to the society, and were well deserving of this honor, as follows: Chas. Haralson, Excelsior; S. H. Drum, Owatonna; F. W. Kimball, Waltham; J. R. Cummins, Minneapolis; John Bisbee, Madelia.

To the paid life membership roll there have been added ten names as follows: E. G. Zabel, LaMoure, N.D.; Roy E. McConnell, St. Cloud; O. F. Krueger, Minneapolis; L.A. Gunderson, Duluth; Mr. and Mrs. F. H. Gibbs, St. Anthony Park; Herman Goebel, Wildrose, N.D.; T. Torgerson, Estevan, Sask.; Law Swanson, St. Paul; Rev. Saml. Johnson, Princeton.

Don't you want your name added to this life roll? If you have already paid an annual membership fee for this year a further payment of $4.00 made any time during the year will be received as first payment for a life membership fee. That is, the amount of the annual fee already paid may be deducted from a life membership fee paid any time during the current year.

SEND IN A NEW MEMBER.—Have you noticed the advertisement on the inside of the back cover page of this and also the January issues of our monthly? There never was such an opportunity to secure valuable new fruits as this presents to you and to your neighbor, many of whom we feel sure would gladly take advantage of the opportunity if it were presented to them. Take an evening off and do yourself and your neighbors this good service—and the society as well.

NUMBER THREE STRAWBERRY.—Very few of those who have so far selected plant premiums for next spring's delivery have chosen Minnesota No. 3 June-bearing strawberry. Our members will surely make a mistake if they do not secure for next spring's planting a quantity of this splendid new berry, which seems likely to supplant the Senator Dunlap as the June-bearing variety in the near future. It is a very vigorous grower, equally attractive, of good quality, holds up well and is a healthy, hardy plant. Do not leave this out of your list of selection for plant premiums.

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APPLE SEED OF LARGE VALUE.—A considerable quantity of apple seed has been secured of Mr. John Bisbee, of Madelia, Minn., from his orchard, top-worked, as it is, with many varieties of long keeping apples, so that this seed is almost certainly crossed with something that will keep well as well as of high quality. It will be found especially valuable to plant for growing seedlings. It would be well to secure this seed soon, mix it with damp sand and leave out of doors where it will freeze, keeping the package which holds it covered from the air so that it may not dry out. Every member should have a little corner in his garden for growing apple seedlings. It is an enticing experiment, and such seed as this is likely to give good results. We are still looking for the $1,000 apple. You may grow it from some of this seed. Package of twenty-five seed at ten cents, to be secured of Secy. Latham.

A FAVORABLE WINTER FOR FRUITS.—The ground was in good condition last fall, with a reasonable amount of moisture, fruits, both trees and plants, well ripened up, and now with a fairly good blanket of snow and no long continued severe weather, we have to this point in the winter a very certain assurance of a good yield of fruit the coming spring. To be sure the thermometer was down in the neighborhood of thirty degrees one night, but it was there so short a time that it scarcely seems possible that any harm could have been done by it. The horticulturist should be a natural optimist and always anticipate something good ahead, which is one pretty sure way of getting it.

MINNESOTA NURSERYMEN GIVE MEMBERSHIPS.—A considerable number of the nurserymen of Minnesota are again giving memberships this year as premiums to purchasers of nursery stock in quantity of $20.00 or upwards. This is a commendable enterprise, not only on account of its material assistance in building up the membership roll of the society but more especially because it brings in the kind of members who have, or should have, a large practical interest in the workings of the association, and we believe also that it is like “casting bread upon the waters;” those receiving these memberships will have a warm feeling for the nurserymen which present them. If you who read this are Minnesota nurserymen and are not in the list of those who are doing this service for the society, don’t you want to take advantage of an immediate opportunity to align yourself with those who are showing so large an interest in the welfare of the association?

[Illustration: GATHERING THE APPLE CROP IN HAROLD SIMMONS’ ORCHARD—AT HOWARD LAKE.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

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Vol. 44 MARCH, 1916 No. 3

My Orchard Crop of 1915 from Start to Finish.

HAROLD SIMMONS, ORCHARDIST, HOWARD LAKE.

In anticipation of a crop of apples for 1915 we commenced the season with the regular annual pruning in March. We begin pruning as soon after the 25th day of February as the weather is mild enough for us to work comfortably, as the pruning of fifteen hundred trees requires considerable time when one is obsessed with the idea that nothing short of a first class job will do, and that to be accomplished mainly by the efforts of one individual.

We have endeavored to grow our trees so that they should all have from three to five or six main limbs, and any tendency of a limb to assume the leadership is suppressed. A tree grown upon this principle has the faculty of growing a great many laterals, necessitating an annual pruning. As far as possible we prune to prevent laterals from becoming too numerous, from growing so as to overtop or shade lower limbs, to let in light and sunshine, so as to get the maximum amount of color on the fruit and in a measure to help in thinning the fruit. Having in view the idea of an annual crop instead of a biennial one, one essential point always in mind is that we want an open headed tree, and we also wish to insure our trees against blight, and so we eliminate all water sprouts. Apparently, no Minnesota orchard is immune against blight.

Some objections are raised to this type of tree, one criticism being that the tree is structurally weak from the fact that if one limb breaks off at the trunk the tree is about ruined. We offset the possibility of such a break by careful training and by wiring the trees, a plan I gathered some years ago from a Mr. Mason, at that time president of the Flood River Apple Growers Association.

[Illustration: Young trees in full bloom in Mr. Simmons' orchard.]

We use No. 14 galvanized wire, a half inch galvanized harness ring, and screw-eyes with stout shanks and small eyes. Locating up the main limbs what might be called the center of effort, or where the main pull would be when loaded with fruit, put in a good stout screw-eye in every main limb, eyes all pointing to the center of the tree, and then wire them all to the harness ring in the middle of the tree. When finished the ring and the wires are like the hub in a wheel with the spokes all around. We tried this first on our N.W. Greening trees, and results were so satisfactory that we have applied it to a great number of other varieties with equal satisfaction. Once put in a tree, it is good for the life of the tree.

Our objection to a tree with a central leader is that it is very difficult to create an open head, and if the blight strikes the leader it generally means the loss of the tree. Low

headed trees we have found by experience, are easiest cared for; they are the most economical for thinning, harvesting, spraying and pruning; they also shade the trunk and main limbs.

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After pruning all brush is removed from the orchard and burned.

The next operation is spraying, and our first spraying was done when most of the petals were down, using a Cushman power sprayer, running at two hundred pounds pressure, with two leads of hose and extension rods with two nozzles on each. Spraying solution, six gallons of lime and sulphur, twelve pounds of arsenate of lead paste to each tank of water containing two hundred gallons. We aim to cover the tree thoroughly from top to bottom and spray twice each season. However, the past season half the orchard only was sprayed twice, the other half only once, the second spraying being applied about two weeks after the first, when we use lime and sulphur only, and then five gallons instead of six, in each tank of water. We use angle nozzles, the better to direct the spray into the calyxes.

The orchard was mowed twice during the summer, early in June and the middle of July. A heavy growth of clover covers most of the orchard, and none is ever removed, all is left to decay just as it is left by the mowers.

The next thing in line to take our attention is thinning the fruit. The past season we thinned the Wealthy and top-worked varieties only; another season, we expect to carry this work to every tree in the orchard. The trees were gone over twice in the season, although the bulk of the work is done at the first operation. We use thinning shears made expressly for the purpose.

By the end of July the trees in many instances were carrying maximum loads, and unless rendered assistance by propping in some way, the limbs, great numbers of them, must soon break. To get props to prop hundreds of trees, needing from five to six up to a dozen per tree, and apply them, looked like a big job. To purchase lumber for props the price was prohibitive; to get them from the woods was impossible. We finally solved the problem by purchasing bamboo fish poles, sixteen and twenty feet long, and by using No. 12 wire, making one turn around the pole at the required height, turning up the end of the wire to hold it and making a hook out of the other end of the wire, using about seven or eight inches of wire for each. These made excellent props at small expense, the ringlike excresences on the pole preventing the wire from slipping. We propped as many as four and five limbs at different heights on one pole. This method carried the heavily loaded trees through the season in good shape. Anyone afflicted with too many apples on their trees should try it.

Next in line came the harvesting of the crop. We use the “Ideal Bottomless Bag” for a picking utensil, and almost all the fruit is picked from six foot step-ladders. We pack the apples in the orchard. Fortunately we have had the same people pick our apples year after year, from the first crop until the last one of the past season.

[Illustration: Apples by the carload at Howard Lake.]

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In packing we aim to use the kind of package the market demands. The crop this season was all barreled. The pickers have been on the job long enough so that they are as able to discriminate as to what should go into a barrel and what should not as I am myself. However, our system is to always have about twice as many barrels open ready for the apples as there are pickers. The barrels are all faced one layer at least, and two layers if we have the time, and as the pickers come in with approximately half a bushel of apples in the picking sack, they swing the sack over the barrel, lower it, release the catch and the apples are deposited without bruising in any way.

The next picker puts his in the next barrel, and so on, so that each succeeding picker deposits his apples in the next succeeding barrel. In that way I personally have the opportunity to inspect every half bushel of apples, or, I might say, every apple, as a half bushel of apples in a barrel is shallow, making inspection a very simple matter. When the barrels are filled they are headed up, put in the packing shed until sufficient have accumulated, and when that point is reached they are loaded out, billed to Minneapolis, where practically all our apples have been sold for years. All fruit up to date has been sold on a commission basis, the crop for the past season aggregating five carloads, or approximately 800 barrels.

We feel that we have worked out a fairly good method to handle both our trees and our apples, but we have not reached the conclusion that our methods in any way guarantee us a crop of apples, although in ten years, or since the orchard came into bearing, we have never had a season that we did not have a fair crop of apples. In 1913 we sold seven carloads, in 1914 four carloads, in 1915 five carloads, and the trees as far as they are concerned promise us a fair crop for 1916. We are working as though this is assured, but in the final analysis it is up to the weather man.

A Member: I would like to ask Mr. Simmons in regard to his wiring. We are raising our trees in the same manner, the open-headed trees, and I wanted to ask him where the central ring is placed, in the crotch of the tree or where?

Mr. Simmons: The ring is suspended by the wires in the center of the tree. It makes an excellent arrangement. You can stand on that wire and gather the apples from the topmost limbs of the trees. The screw-eyes should be put in at what might be termed the center of effort or pull, when the limb is heavily loaded. If not put in high enough, it causes a rather too acute angle where the screw-eye is inserted and the limb is likely to break.

A Member: We had considerable difficulty with broken branches.

Mr. Ludlow: Are the rings put on the outside or the inside of the trees?

Mr. Simmons: On the inside, so that the screw eyes all point towards the center of the tree. After three or four years you can’t see the screw eye, it grows right into the tree.

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Mr. Ludlow: I want to ask if you recommend the bamboo poles for general propping of trees?

Mr. Simmons: Yes, sir; most emphatically I would. It is the best and most economical prop you can use. Of course, it is the general opinion among expert fruit growers that the crop should never be too heavy for the tree. The bamboo prop is the best we found. With reasonable care, bamboo poles will outlast common lumber.

It is the general opinion among expert fruit growers that the tree should carry all fruit possible, but should not be permitted to be loaded so heavy as to need propping.

Mr. Dyer: I have an orchard of 70 acres and it would take a great many bamboo poles to prop that orchard. I use pieces of board, various lengths, 4 inches wide and 1 inch thick, of various lengths. I get them 14 to 16 feet long and sometimes I cut them in two. My trees are large, twenty-five and thirty and thirty-five years old, and that has been my most successful material to prop with.

Mr. Simmons: What is the cost?

Mr. Dyer: Well, you know what the lumber is, I paid about $24.00 a thousand.

Mr. Simmons: When I tried to buy the props from the lumber yard they would have cost me twenty cents each. I bought the twenty foot bamboo poles for $7.00 a hundred and the sixteen foot poles for $4.50 a hundred.

A Member: I didn't get where his orchard is located, and I would like to ask about the variety of apples he had the best success with.

Mr. Simmons: The orchard is located at Howard Lake, forty-three miles west of Minneapolis. We grow Duchess, Patten's Greenings, Hibernals and Wealthys.

Mr. Ludlow: What is your average cost per tree for thinning?

Mr. Simmons: We have for years thinned the Wealthy trees and our top-worked varieties, but I never kept any accurate account of the cost of thinning.

Mr. Ludlow: How old are your Wealthys?

Mr. Simmons: Fourteen years old.

Mr. Huestis: Mr. Simmons stated that he used the wire and the ring and the screw-eyes. If he used that, why does he need props? I used the same thing this summer on some Wealthys and thinned them besides, and I didn't need any props because I used the wire from the center ring to the branches.

Mr. Simmons: Well, the wire supports support the main limbs but there are a great many laterals. For instance, you have the main limb going up here at an angle of 90 degrees and the limbs that come out of that are not supported. The props I use are supporting the laterals.

Mr. Anderson: Are your returns satisfactory shipping to the Minneapolis market?

Mr. Simmons: Always have been very satisfactory; that has been my only market.

* * * * *

FIGHTING MOTHS WITH PARASITES.—Over 12,000,000 specimens of two parasites which prey on the gipsy moth and brown-tail moth were released in 201 towns in Maine, New Hampshire, Massachusetts and Rhode Island during the fall of 1914 and spring of 1915, according to the annual report of the Bureau of Entomology, United States Department of Agriculture.

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As a result of the successful establishment of colonies of these and other parasites which feed on the gipsy and brown-tail moths, marked progress is being made in reducing these pests. Effective co-operation is being afforded by the States, which carry on as much work as possible within the infested areas, thus allowing the Federal authorities to carry on field work along the outer border of infestation, so as to retard the gipsy moth's spread.—U.S. Dept. of Agri.

Annual Meeting. 1915, S.D. State Horticultural Society.

WM. PFAENDER, JR., NEW ULM, MINN., DELEGATE.

Arrived at Huron, S.D., Monday night, January 17, 1916. The officers as well as the members gave me a very fine reception and, although I am a life member, I was made an honorary member of the society, and during my stay was entertained very agreeably.

I attended all meetings. The society had three meetings each day, except Thursday, the 20th, when there was no meeting held in the evening. On account of the very cold weather the attendance from outside was not as large as it should have been.

Some very interesting papers were read. Mr. E. D. Cowles, of Vermillion, in his paper on "What to do when your grape vines freeze back," advocated to break off the shoots (do not cut them off) near the old wood, so that new shoots would start from the same bud or eye and would produce a crop.

The papers by the president, Rev. F. A. Hassold, "Relation of Horticulture to Home-Making" at the meeting, and "Community Effort in Rural Life" at the banquet, were very fine and much appreciated by the audience.

Professor N. E. Hansen in his paper, "New Fruits," stated, among other things, that he had made a large number of crosses with Chinese sand pears and other pears, and that he expects to get from the crosses varieties that will be blight proof, and that he intends to continue experiments along this line.

Two very able and much appreciated papers at the banquet were: "Landscape Gardening," by Miss Hazel J. Kent, and "Transforming a Place Into a Home," by Mrs. Geo. H. Whiting, both of Yankton, S.D.

Governor Byrney was present at the banquet and in his address congratulated the horticulturists of South Dakota on what they have attained and encouraged them in their difficult undertakings.

Your delegate was asked to give notes on "Minnesota Fruit Culture," which he did to the best of his ability. The discussions after each paper were interesting and instructive.

The meeting was a very successful one and all present appreciated the fact that these gatherings assist in developing this great Northwest in horticulture, forestry and many other ways.

Annual Report, 1915, Sauk Rapids Trial Station.

MRS. JENNIE STAGER, SUPT.

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Warm weather this last spring came quite early, and with bated breath we waited for the usual frost, but still it came not. The plum orchard became a wilderness of bloom; the buds of the apple trees began coyly to unfold their dainty loveliness; pussy willows flaunted their sweetness on the air—while the birds sang their love notes from trees and bushes. Then frost came—not once, but night after night. Thus our hopes, which had risen with every promise of a bountiful harvest, fell with the thermometer far below zero. When fall came both plum and apple orchards made so poor a showing, not only here but all around this part of the country, that we had hardly enough fruit for our own uses.

[Illustration: Mrs. Stager's grandchildren among the roses of one year's growth.]

We had a great deal of rain, all through the spring and into the summer. Strawberries, that generally do well in wet weather, did not bless us with their usual abundance. Currants and gooseberries also left us in the lurch—but the Snyder blackberries were loaded with luscious fruit, while raspberries—why the berries of the Golden Queen bent the stalks down with their weight. Prof. Hansen's Sunbeams were covered with berries, as were all of the seedling raspberries sent from the Breeding Farm three years ago, Nos. six and seven, of the red ones, bore the largest and firmest berries. I had quite a time keeping the blossoms off the everbearing strawberries sent here in the spring from the State Breeding Farm. Although I had bought and planted three named—and very much extolled—other kinds of everbearers, none of them were as prolific in plants, and extra large berries, as those unnamed ones from the State Breeding Farm. We had our first berries from them in August.

When we had our fair here, the last of September, I made quite a showing of them, from the size of a bean (green) to a crab apple (ripe), surrounded by leaves and blossoms. They were still covered with bloom when the hard frosts came.

The two small hybrid plums sent did not make much growth. Most vegetables that have always grown so well in other summers did very poorly this year. Out of four hundred and seventy-five tomato plants, taken the best of care of by Inez, my granddaughter, for the state tomato contest, we did not get one bushel of good ripe ones. Lima and other table beans were planted three times (on account of rotting in the ground) and then did not ripen. No ripe corn. In fact, about all the vegetables that came to fruition were peas, cauliflower and cabbage.

Of flowers, sweet peas, pansies and early lilies were fine, although growing things were late. Paeonies had very few flowers. However, roses were masses of bloom. Moss roses did the best ever, also large bushes of Rosa Rugosa (you see this year, we had neither the ubiquitous potato bug, rose bug, caterpillar or any other varmint to war against); quite a number gave us blooms all summer. Then most of them threw out strong new plants, as do the raspberries, from the roots. On the whole, with our bounteous harvest of grain and so forth in this blessed country, we can be thankful we are alive.

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KEEP YOUTH ON THE FARM.—“What can we do to keep our young people free from the deceiving lure of the city and contented to remain on the farm?”.

The following was prepared by C. W. Kneale, of Niwot, Colo., a student in civics in the Colorado School of Agriculture, as a part of his regular class work. Young Kneale, although a student, has some excellent ideas which “Father” and “Mother” might do well to ponder carefully:

“Get good books, magazines and farm papers for them to read.

“Have some kind of lodges for them to go to, such as the Grange.

“Arrange it so they can have a party or entertainment once in a while.

“Go with them to church every Sunday.

“Arrange it so they can have one or more picnics every year.

“Teach them how to do all kinds of farm work, by giving them a small tract of land to farm for themselves and showing them how to raise their crops, and have them help you with your work.

“Give them a horse which they can ride or drive when they haven’t anything to do, or when they want to go anywhere.

“Teach them to love and be kind to animals.”

Ravages of the Buffalo Tree Hopper.

“Mr. Latham recently sent me some twigs of apple tree very badly injured with what we call the buffalo tree hopper. These scars are made entirely by the female in the act of egg-laying. This process of egg-laying takes place from the last part of July until the leaves drop in the fall. The eggs hatch the following spring. The young forms do not feed at all upon the apple but get their nourishment by sucking the juices from the weeds and grasses in the immediate neighborhood of the orchard.

[Illustration: The Buffalo Tree Hopper and its work]

“The injury of this particular tree hopper is bad because the insect in egg-laying makes two slits, side by side, afterwards poking the eggs beneath the bark. As the tree continues to grow, the area between the slits dies, making a very rough appearance of the bark and an area into which spores of disease and bacteria may enter. The twig

that is badly scarred very often dies, and sometimes young trees just set out are marked so badly that they succumb.

“The only practical remedy against such a pest is clean cultivation of the orchard, as one can readily work out from knowing the life history. It is possible that some of the sprays like Bordeaux mixture, or self-boiled lime-sulphur, sprayed and kept active on the trees during the month of August would deter these hoppers from laying eggs. However, we have had no practical experience along this line, although we do know that trees under clean cultivation are not affected.”—A. G. Ruggles, Head of Section of Spraying and Tree Insects, University Farm, St. Paul.

* * * * *

MINNESOTA NO. 3 STRAWBERRY.—A communication from Peter Jackson, Cloquet, says: “I had my first trial of the Minnesota No. 3 strawberry last year and they did finely. I had one hundred twenty-five quarts from sixty plants.” Who can do better than that?

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Growing Tomatoes in Northern Minnesota.

REV. GEO. MICHAEL, WALKER, MINN.

Sow seed in hotbed about April first, in rows five inches apart and five inches apart in each row. Transplant in garden one week after danger of frost is past. The day before transplanting soak the hotbed thoroughly with warm water. In taking them up to transplant use a sharp butcher knife; the ground thus cut out will form a cube five inches in diameter. This block, should be set in a hole ten to twelve inches deep. The ground around the block must be made very firm. This block will be four to six inches below the surface. *Fill the hole with warm rainwater* and three or four hours later rake in loose dirt to fill the hole, being careful not to pack it in the least.

How to prepare the ground. Manure heavily; plow very deep; harrow thoroughly. Then in forming the hills place two shovelfuls of fine manure and one-half shovelful of hen manure for each hill. Spade this in from twelve to eighteen inches deep and eighteen to twenty inches wide. Cultivate often.

The plants should be staked at first to keep the wind storms from injuring them. When one and one-half feet high they should be trained over poles placed on each side of the row one and one-half feet from the ground. Plant hills four feet apart, and *train each plant to four or five vines*, cutting off all side shoots and a few of the leaves. *Never cut off* the top of a vine to hasten the ripening.

Make the ground *as rich as possible, plough deep, plant deep, set deep and prune carefully*. If you do not use poles or a trellis the vines thus managed should spread over the ground as pumpkin vines grow, and instead of “going all to vines” the tendency will be to go all to tomatoes.

A big story. Over $3,000 per acre. In 1910 I had three rows each forty feet long and four feet apart, *i.e*., a row 120 feet long, or 480 square feet. More than $35.00 worth of ripe tomatoes were taken from these vines, the price never more nor less than five cents per pound. If 480 square feet will produce $35.00, 43,560 square feet would produce $3,175.

During the tomato season I was away from home when a neighbor gathered bushels which are not counted in the above figures, and our family used and gave away several bushels more.

Annual Report, 1915, Vice-President, Fourth Congressional District.

J. K. DIXON, NORTH ST. PAUL, MINN.

The fourth district fruit crops—with the exception of strawberries and raspberries—were conspicuous by their absence this season of 1915.

A festive blizzard that came prancing our way the 17th of May effectually destroyed what promised to be a bumper crop of apples and plums. The trees were for the most part past the blossoming stage, and the fruit had started to develop. Currants and grapes met the same disastrous fate. Only in favored situations, adjacent to large bodies of water, were there any apples, plums, grapes or currants to speak of.

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[Illustration: Mr. J. K. Dixon, North St. Paul.]

In my orchard, at North St. Paul, we burned wet straw smudges every second row on the outside of the orchard, allowing the wind to drift the smoke through trees. This was done by adding the wet straw at intervals to the burning piles in order to create a continuous dense smoke. When daylight appeared we noticed the ground covered with a beautiful blanket of frost, and decided two men smoking pipes would have been as effective treatment as the smudge.

In this, however, I have since concluded we were mistaken. As the season advanced we noticed the first three or four rows in from the smudges gave us our only apples, whereas the further one went in the fewer were found, until they finally disappeared entirely.

Question: If the above treatment had been given every second or third row throughout orchard, what would the results have been?

Strawberries and raspberries proved their superior ability to withstand the assaults of King Boreas and Jack Frost. Strawberries were in blossom and were saved from total loss by a two or three inch blanket of wet snow that fortunately preceded the frost. Consequently they are reported as fair to good crop. Raspberries, owing to the abundant and regular rainfall, are reported from all over the district as a fair crop. One grower having one-half acre of the St. Regis everbearing red raspberry reports having ripe berries from the last week in June to the 8th day of October, when a big freeze-up put them out of commission. This one-half acre produced 2,000 pints, that sold for fancy prices. Also the everbearing strawberries are reported as making good and proving their claim to recognition as an established institution in the fruit world.

A few of the largest growers report spraying with lime-sulphur and arsenate of lead. However, the rainfall was too abundant at the right time (or wrong time) to get best results.

Very little blight is reported as present the past summer, and what little there was yielded readily to the pruning knife applied five or six inches below infected wood, being careful to sterilize tool in solution of corrosive sublimate. The most serious injury from blight is caused by its attacking tender sprout growths on trunks or large branches. The blight runs very rapidly down the tender wood, penetrating to the cambium layer, where it causes cankers, often girdling entire trunk and killing tree outright. This is especially true of the Virginia crab and Wealthy apple.

Trees and plants came through last winter in A1 condition as a consequence of a mild winter, and this fall they go into winter quarters with abundance of moisture and well ripened wood.

Considerable nursery stock was planted last spring with excellent results, due to plentiful supply of moisture from spring to fall.

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While fruit growing in Minnesota is not so extensively engaged in as in some reputed fruit growers' paradises we read about, I wish to state that the South and East (to speak in the vernacular) "has nothing on us." I have reliable information that the same freeze that cleaned us out up here in the North did the same trick for growers at Mobile, Alabama. Therefore, I advise members not to yield to discouragement. Plant and care for varieties recommended in the society planting list and emulate the society motto, "Perseverantia Vincimus."

From replies to letters sent out the following list of varieties appears to be in favor as the most desirable to plant in this district:

Apples: Wealthy, Okabena, Duchess, Patten's Greening.

Crabs: Florence, Whitney, Lyman's Prolific.

Plums: DeSoto, Hawkeye, Wyant, Wolf.

Raspberries: King, Sunbeam, Minnetonka Ironclad.

Currants: Perfection, Prince Albert, Long Bunch Holland, Wilder.

Gooseberries: Carrie, Houghton, Downing.

Grapes: Beta, Concord, Delaware.

Hardy Shrubs: Spirea Van Houtii, Hydrangea P.G., Snowball, Syringa, Tartarian Honeysuckle, Lilac, High-bush Cranberry, Barberry, Sumac, Elderberry, Golden Leaf Elder, Buckthorn for hedges.

Hardy Perennials—Flowers: Delphinium, Campanula, Phlox, Paeonies, Iris, Hermerocallis, Tiger Lilies.

Tender Plants: Dahlias, Gladiolus.

Annual Report, 1915, Mandan, N.D., Trial Station.

W. A. PETERSON, SUPT., MANDAN, N.D.

In the spring of 1914 a number of plums, grapes and raspberries were received from the Minnesota Fruit-Breeding Farm. The larger part of the plums were winter killed in 1914-15. Those that survive after a few more winters may be considered as practically hardy. Those remaining made a good growth in 1915, but did not bear.

The grapes lived through the winter in good shape, although they had been covered. These are all Beta seedlings.

The raspberries Nos. 3, 7, and 8, were partly covered and partly left exposed—all three numbers died to the ground when not protected. No. 4 was received in the spring of 1915 and made a good growth.

Strawberry No. 1017 was received in spring 1915 and bore heavily this fall but made only a very few runners.

Extensive experiments are being carried on in plant-breeding, pomology, vegetable gardening, arboriculture and ornamental horticulture, and in the course of time a lot of valuable information will be gathered.

On the whole the season was backward in spring and the summer was abnormally cool. There was sufficient rainfall for all crops.

Fruit Growing a Successful Industry in Minnesota.

A. W. RICHARDSON, FRUIT GROWER, HOWARD LAKE, MINN.

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It is now about eighteen years since I conceived the idea of fruit culture as a competency for old age, being then, as now, employed as representative for some concern and required to travel over this state, earning a livelihood for myself and family. The nature of my first work on the road necessitated my attendance (a large portion of the time) at Minnesota farmers' institute meetings, where I came in contact with those gentlemen employed in that work, and among the number our friend Clarence Wedge, of Albert Lea, and other personal friends, such as O. C. Gregg, the founder of the institute work, Mr. Greely, Mr. Trow and others. It was among these gentlemen I got my first desire for a piece of land, and was advised by them several times to get a piece of land, and if I could not afford to buy a large piece, to buy a small piece, which latter course I was compelled to adopt. I became imbued with a desire to grow fruit and was particularly interested in the subject of horticulture, and eagerly devoured all the literature obtainable on the subject, and listened very attentively to all discussions on the subject at these meetings.

In 1897 I moved to Howard Lake and succeeded Mr. E. J. Cutts in the nursery and fruit growing business. Mr. Cutts was well known to a great many. He died just prior to my residence in Howard Lake, where I got in my first practical experience in the fruit-growing business. After conducting this business for about twelve months, I disposed of it and bought a home in another part of town and at once set out about 200 apple trees and other small fruit. Gradually I acquired more land and set out more trees, until today I have about 1,600 apple trees, about 1,000 of which are at bearing age. I made one grand mistake however, as a great many other growers have done and are still doing, I planted too many varieties. I used the list of tried and recommended sorts issued by the State Horticultural Society (long before I became a member) and planted accordingly and, like many other growers, have my quota of Hibernals, Minnesotas, Marthas and other sorts which experience has demonstrated are not nearly as desirable as other varieties.

I have demonstrated to my entire satisfaction that it is profitable and perfectly proper to grow also small fruits in a young orchard. In my second orchard, containing about 600 trees, I planted the trees 15x30 feet and later the same season set out raspberries 3x6 feet, occupying all the space in the rows and between the rows, and for two successive seasons I grew a third crop between the raspberries, which plan works admirably. One mistake I made, however, was in planting a little too close to the apple trees, requiring more hoeing around the apple trees to keep the raspberries in subjection, which could have been obviated to a large extent by not planting so closely. I grew raspberries about seven years in this orchard. My returns after the second year brought me $500.00 to $700.00 annually, and I sold enough plants to more than pay me for all the labor expended on the orchard, to say nothing of corn, beans, cabbage, *etc*., raised the first two years between the raspberries. Now the trees are about ten years old and all bearing. I have discontinued the cultivation and have seeded to clover, which we usually mow and allow to lie and rot.

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[Illustration: Residence of A. W. Richardson, at Howard Lake.]

I figure that outside the investment I have brought my orchard into bearing with practically no expense, having had a revenue every year since planting the trees, which are composed of Patten Greening, Hibernal, Duchess, Wealthy, Peerless, Minnesota, Virginia, Okabena and Whitney. My last orchard of 625 trees consists principally of Wealthy, and trees are set 20x20, and I am following the same plan of growing a crop between. The year 1915 makes four crops taken from this young orchard, now four years old. About two more seasons will follow this year, and then about the time for bearing I will discontinue the planting of any crop and sow it to clover.

I plant one or two year old trees trimmed to a whip, digging a much larger and deeper hole than is really necessary to accommodate the roots, but I am sure this plan gives the roots a much better start than if they are crowded into a small hole, and particularly if the ground is hardpan or similar soil. Pinching off the buds the following year or two, when you commence shaping your trees to your liking, is good, thus eliminating severe pruning. I have endeavored to follow up this annual pruning when possible, often being compelled to hire additional help for this purpose, as the nature of my regular business keeps me from home when I should be pruning. I am sure you will agree with me so far that “fruit growing in Minnesota is successful.”

Four years ago or more I decided that in order to receive the top price for the products off my place I must produce a first class article, and so to that end I have worked. I bought a gasoline power sprayer, costing me about $300—by the way, the first one in Howard Lake, although two of us there each bought one the same spring, and now there are three power sprayers in our village. I have demonstrated that it is possible to get the top price of the market in more ways than one by furnishing a first class article. You will ask me how it is possible for me to do this and be away from home so much. I have been ably assisted by my wife, who sees that my general directions are carried out as I have outlined.

This year we have marketed something over 300 barrels and have received the top market price, netting me about $500.00. I tried out a new plan this year, selling through a reliable commission firm. I have heretofore sold direct to the retailer with splendid results. 1913 was a bumper year and the market flooded everywhere with poor unsprayed stuff. I sold about 250 barrels and received an average of $3.25 per barrel, F.O.B. Howard Lake, and in 1914 about the same amount was realized. There is always a good demand for a good article, carefully picked and honestly packed, discarding all bruised and scabby or wormy apples, or those undersized or less than 2-1/2 inches in diameter.

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This season I sprayed my trees three times, the first time early in April, using what is known as a dormant spray, using commercial lime-sulphur solution 32 degrees Baume, 20 gallons to a tank of 200 gallons of water, or four times as strong as the two subsequent sprayings, after the blossoms fall, at which later time I use in addition arsenate of lead, 10 pounds to a 200 gallon tank of water, and work under 200 pound pressure—and by doing thorough work can produce apples almost entirely free from any disease or worms. My last shipment of apples this year was October 2nd and consisted of 196 barrels, one-third each of Hibernals, Patten Greenings and Wealthys, which brought top prices.

[Illustration: Mr. A. W. Richardson, Howard Lake.]

I am a firm believer in co-operative marketing and think it is the only logical way to market any crop, but to conduct a successful marketing organization there should be stringent rules compelling all who join an association for marketing to spray thoroughly if nothing else, as I am firmly convinced that you cannot grow apples and compete with other localities without doing so, and doing so every year, whether a prospect for a good crop exists or not. I can prove this, as I only partly covered my entire orchard in 1913 with spraying. You could easily see which had been sprayed and which not. Excessive rain at the vital time prevented my completion of the work. I am convinced by experience, too, that the dormant spray, usually neglected by most growers, is very necessary and am sure better and healthier foliage is obtained by this practice, and by it the scale can be controlled in a large degree.

I had eight to ten Patten's Greening trees that had been attacked by a disease called by some "oyster scale." The trees abnormally lost their foliage early in the season, and I had about decided they were dead when, after a dormant spray the following spring, they entirely revived and are now as healthy as any trees on my place.

I have practiced top-working to some extent and for the past three or four years have been able to put down in my cellar, several bushels of Jonathan, Grimes Golden, Delicious and other varieties. Have now about 125 Jonathan trees top-worked on Hibernals, and except for some blight they have done splendidly.

There is no room for discussion, no room for argument in any way, why fruit-growing in Minnesota is not a very successful business to be engaged in. I have demonstrated, I am sure, that if I can bring an orchard into bearing and hold down a good, fairly lucrative position at the same time and do so with very little expense, and others can do the some thing.

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Now I am going to criticise some one and let the criticism fall where it belongs. There has been a great injustice done the commercial fruit grower, or those trying to grow fruit commercially, by advising, urging, or anything else you choose to call it, the farmer or small homekeeper to buy more fruit trees and plants than this class of individual needs for his own use. In order to receive some returns for this surplus, he rushes it into town and sells it to the best advantage, delivered in sacks, soap boxes, *etc*., carelessly handled and bumped into town in a lumber wagon. The merchant is loaded up with a lot of unsalable stuff and often finds himself overloaded and barrels up some and sends it to the commission row and expects some returns, which vary from nothing to a very small amount. Why, last season I knew a large general merchandise concern in a town a little west of Howard Lake that thought they had struck a gold mine. They employed a packer or two, bought barrels, rented a building and bought this class of stuff right and left, offered at any old price, $1.50 per barrel to anything they could get, and sold clear up to the Canadian line. I saw the stuff a great many times after it reached its destination, and it was hardly fit for sale at any price. This indiscriminate selling of nursery stock by eager salesmen and nurserymen is doing more to hurt the commercial fruit growing industry than any one thing. The only salvation for the grower making his living out of the business is to produce a better article, better picked, better packed and marketed through the proper channels. This matter just referred to I have often discussed by the hour, and during the past winter my views were thoroughly endorsed by prominent men in the extension work of our state.

In conclusion will say, comparing the fruit industry in Minnesota with that greatest of all industry, raising grain, it is so much easier (if ordinary care be exercised) to produce a finer article, more attractive in appearance, better packed and marketed properly, than the other fellow does, while in growing grain this is not the case, as all the grain is dumped into the hopper and bin, and the individuality of the grower is forever lost. The demand for the apple has increased wonderfully the last few years, and it is quite likely to be further increased owing to the European demand for American apples, which for the next fifteen or twenty years will increase by leaps and bounds, owing to the devastating of so many of the great orchard sections in parts of Austria and northern France. This authentic information came through Mr. H. W. Collingwood, many years editor of the Rural New Yorker, and according to Mr. Collingwood's idea there has been no time in the history of the United States when the outlook for commercial orchards was so bright. He advises the widespread planting of commercial orchards to meet this new demand which has shown itself already in Europe and will greatly increase after the war is over.

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[Illustration: A two-acre field of Dunlap strawberries on place of A. W. Richardson, at Howard Lake.]

Mr. Ludlow: I would like to know what you advise for that commercial orchard, what varieties?

Mr. Richardson: Wealthys, all the time. (Applause.)

Mr. Ludlow: I would like to ask for the comparative prices you received for the three apples you mentioned, Wealthy, Greening and Hibernal.

Mr. Richardson: The Hibernal sold for around $3.00 a barrel and the Wealthy sold for three something. Mind you, I never sold apples at all until this year to Minneapolis markets. I can sell all the apples I can grow myself without any trouble if I have the proper men to pick them and pack them at home. I had a son that was doing that until a few years ago, and he followed my instructions and would place nothing but first class stuff in the barrels and would sell my samples without any trouble and get the top market price. I run across down in my cellar some of last year's crop of Northwest Greenings, just two of them left, one of them partially decayed. Something I never had known to happen before. They lay in the cellar just wrapped up.

Mr. Ludlow: It wasn't embalmed?

Mr. Richardson: No, sir. Gentlemen, you need not be afraid of growing fruit in Minnesota.

Mr. Ludlow: What peculiar method have you for keeping those apples?

Mr. Richardson: Just wrapped in paper only.

The President: What temperature do you keep in your cellar?

Mr. Richardson: 40 degrees about this time.

The President: You have a heater in your cellar?

Mr. Richardson: Yes, sir, but this is shut off from that, though the pipes run through.

A Member: Are your trees still as far apart as they were at first?

Mr. Richardson: No, sir. I neglected to say that I sent East and got some roots, and I was advised to set them out between. I have part of my orchard set 15x16, but that is too close together.

A Member: If you were going to do it again would you put them 30x30?

Mr. Richardson: 20x20, that is, Wealthys, particularly. Of course, for the Hibernals, you got to put them farther apart.

A Member: You mentioned the Delicious. What is your opinion of the Delicious?

Mr. Richardson: My experience has been so little with them. I have about 150 Jonathan trees coming on that will be all right.

* * * * *

MARBLE PILLAR TO FAMOUS MCINTOSH TREE.—Perhaps one of the most curious monuments in existence has recently been built in Ontario by Canadians. The farmers have just erected a marble pillar to mark the site on which grew a famous apple tree.

More than a century ago a settler in Canada named McIntosh, when clearing a space in which to make a home in the wilderness, discovered among a number of wild apple trees one which bore fruit so well that he cultivated it and named it McIntosh Red.

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The apple became famous, and seeds and cuttings were distributed to all parts of Canada, so that now the McIntosh Red flourishes wherever apples grow in the great dominion. In 1896 the original tree from which this enormous family sprang was injured by fire, but it continued to bear fruit until five years ago. Then, after 15 years, it died, and the grateful farmers have raised a marble pillar in honor of the tree which has done so much for the fruit growing industry of their land.

The story of this apple tree illustrates the African proverb that though you can count the apples on one tree, you can never count the trees in one apple.—January Popular Science Monthly.

Report of Committee on Horticultural Building.

S. P. CROSBY, CHAIRMAN, ST. PAUL.

As you know, at the last legislature there was a bill prepared and introduced asking for an appropriation of $40,000 to build a new home for this society. It was provided, that that home should be located on the grounds of University Farm or upon the grounds of the State Agricultural Society, and that was to be left to the discretion of the executive board of this society. The bill is a very well drawn bill, and the committee appeared before the legislature some four or five times. We went before the committee of the senate and before the committee of the house and senate, and as a matter of fact the result was that the bill never came out of the committee.

The cry last year, as it is every year, was that of retrenchment and low taxes. Now, that is all right as a general proposition, but Minnesota is not a poor state. In the cities of course we think we have all the taxes we ought to have, and we think they are pretty high; perhaps you gentlemen living in the country think you have as high taxes as you ought to have, but that the state, for instance, has over $30,000,000 in the school fund, probably reaching up to fifty or sixty millions some day, with other figures which can be given here, shows that Minnesota is not a poor state. On the other hand, it shows that Minnesota is a rich state. Certainly there is no good reason why it should not provide a good home for this society, which has earned it and is nearly fifty years old.

Now, ladies and gentlemen, I simply want to say one thing. Don't depend upon the committee to do all this work. While we didn't get our bill through last year we came away full of courage, and just as sure as night follows the day we are going to have a new home for this society one of these days. (Applause.) But I want it distinctly understood that every member of this society, men and women—and I certainly include the women because oftentimes they are the best politicians, and they know how to talk to people and get things—when the next legislature is elected must use his or her influence with the senators and representatives of the various districts of the state and make an impression upon them and get a promise out of them to vote for and support the bill. A bill will be introduced into the next legislature, and it will probably be this

same bill, and if you don’t forget this, but simply do your duty in seeing these representatives and taking the matter up, why there isn’t very much doubt in my judgment but what we will be successful and have our bill passed.

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We have members, I think, in every county of the state, haven't we, President Cashman?

The President: Yes.

[Illustration: Mr. S. P. Crosby, St. Paul.]

Mr. Crosby: If we only have two or three in some counties, if they would make an effort to see every representative and senator and talk the matter over, that is what is going to count. It is a year or something like that before the legislature meets again, but it don't want to be forgotten, and if every live member of this society will put his shoulder to the wheel, I don't think there is any possible doubt but what we will succeed and have the bill pass.

We broke the ice last winter and got acquainted with some of the people. And another thing I want to say, and that is if that bill the next time is not reported favorably out of the committee I would be in favor for one of having it reported to the house or senate without any recommendation of the committee. I talked with probably fifteen or twenty, I should say, of the different members of the senate and house about that bill, and it had a great many friends both in the house and senate. Some of them came to me and said: "Crosby, why don't you put it in the house, and we will show you how we will vote." There was a whole lot of feeling that way, because if men investigate and find out what the society is standing for and what it has done they will know it is a perfectly meritorious bill. I think with a reasonable amount of work we will accomplish a great deal, and we shall succeed eventually in having the bill passed.

Another matter that is proper to speak of now is to see where the members of this organization stand. I am going to tell you something. I didn't hear it personally myself, but I did hear it from Mr. Yanish. He is a man of veracity and he told me. He said in the last legislature the Hennepin delegation used all the strength they could against this bill. If it is a rivalry between the two cities, St. Paul and Minneapolis when we propose to put the building in neither Minneapolis or St. Paul, but practically midway between the two cities, if that rivalry can go to that extent, it seems to me mighty small business.

We were very careful not to conflict in any way with the state university in getting any of those appropriations they were asking for. They wanted big sums of money. We didn't conflict with them, we didn't do anything against them. We made a gentlemanly campaign and put our case before the committee. There were a number of members who were favorable, but of course there were thousands of bills in there, and it didn't get out of the committees, as I said.

We see more and more every year what great necessities there are for a home for this organization. We ought to have a building like as the plans given in Mr. Latham's last report, a building that would have a fine auditorium, a fine exhibit room, a place where

we are at home instead of going from place to place and meeting at different places and not having the adequate facilities we ought to have.

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STORE VEGETABLES FOR THE WINTER.—The basement is often the best place on the farm for storing vegetables, says R. S. Gardner, of the University of Missouri, College of Agriculture. It must be properly built, and the temperature, moisture, and ventilation conditions kept right if the best results are to be obtained. If it is too warm the vegetables will dry and shrivel, and if the ventilation is poor, drops of water will form and the vegetables will be more likely to decay. If there is a furnace in the cellar, the storage room should be far enough away so that it can be kept cool, and during very cold weather the door may be opened to prevent freezing.—Mo. Exp. Sta.

Tomatoes for the Kitchen Garden.

C. W. PURDHAM, MARKET GARDENER, BROOKLYN CENTER.

The first and most important thing in raising tomatoes is good seed. To raise good tomatoes does not depend so much on the variety you have as it does on the seed.

In the fall select your best tomatoes and save the seed. Then about the first of April sow your seed.

You can sow them in a box behind the stove, and as soon as they are up give them all the sunlight you can. When they are about two inches high, have some four-inch flower pots and transplant, giving them a good thorough wetting before removing them from the seed box to the flower pots.

By this time it will be warm enough to have a cold frame, which may be prepared by nailing four boards together any size desired. One three by six feet will hold about 150 plants. Shelter it well from the north and slope it a little to the south with enough dirt in the frame to hold your pots.

You can cover them with storm windows or cloth tacked onto frames. Keep well covered nights and give all the sunlight possible through the day. After danger of frost is past, set them out. Sandy loam is best, which must be well pulverized and fertilized.

After you have removed the plant from the pot and set it in the ground, place the pot about two inches from the plant, also about two inches deep in the ground. Then throw a small handful of dirt in each pot and fill with water as often as necessary.

This is the best way of watering that I know.

Mr. Sauter: What kind do you think is the best for an early variety?

Mr. Purdham: Well, the Earliana is extensively raised and the Dwarf Champion.

Mr. Sauter: What do you think of the Red Pear?

Mr. Purdham: I don't know anything about that, but for a late variety of tomato the Ponderosa is quite a tomato; it is a very large tomato.

Mr. Sauter: How about the Globe?

Mr. Purdham: That is a good tomato.

Mr. Sauter: What do you know of the paper cartons instead of flower pots?

Mr. Purdham: I have never tried the cartons; I should think they would be all right.

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Mr. Miller: In saving your seed from year to year, is there any danger of the seed running out in time?

Mr. Purdham: I don't think so. If you take your best tomatoes I think you will improve them.

Mr. Miller: I should think the germination of that seed would run out?

Mr. Purdham: That may be, I can't say as to that. There are people that make a specialty of studying that.

Annual Report, 1915, Vice-President, First Congressional District.

F. I. HARRIS, LA CRESCENT, MINN.

In making a report for the First Congressional District, I will say at the beginning, that all my observations and interviews were taken in Houston and Winona counties, an especially favored locality this year, and I am well aware that the conditions and results are exceptional and do not form a just estimate for the district and are certainly very much above the average. The apple crop in the section named was a record breaker, and where trees were at all cared for and properly sprayed the quality and size of the fruit was very superior and remarkably free from insect pests and disease.

[Illustration: Bridge on Lakeside Drive, at Albert Lea, in First Congressional District.]

The yield of several orchards in this vicinity was from 1,000 to 15,000 barrels of marketable fruit, an increase of nearly 100 per cent above the largest previous crop. From this station twenty-one carload lots of apples, averaging 200 barrels per car, were shipped, besides nearly as many more sold in the local markets of La Crosse and Winona and shipped in small lots by freight and express. The prices obtained were in all cases good, considering that the varieties grown are mostly summer and fall and had to be sold in competition with Iowa and Illinois fruit. While all markets were over-supplied, the demand for the quality of fruit grown here in the commercial orchards was greatly in excess of the supply and attracted buyers from Chicago and the Twin Cities and has built a permanent market so long as the quality keeps up to this year's standard.

At the same time, I am more than ever impressed with the necessity for some manner of utilizing the surplus and low grade fruit with which the local markets are flooded. It seems a great waste to have thousands of bushels of apples fed to hogs and left to rot on the ground which would be a large asset if converted into vinegar or canned. More than one-half the fruit brought from farms is only fit for such use and by being forced on the market serves to lower prices and demand for good fruit. I visited one farm orchard within twenty miles of here and saw at a low estimate 400 bushels of apples lying on the

ground, all of which could have been utilized in a factory, but not having been sprayed were not fit for barreling, and the owner had turned the hogs in to get rid of them. This is a condition that is sure to become worse in view of the many small orchards recently set, besides the commercial orchards that are just coming into bearing. From the reports received, in reply to circulars sent out, I gather that the crop varied from nothing to 100 per cent and the quality in corresponding ratio, depending in most cases upon whether orchards were properly sprayed or neglected.

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Scab and other diseases caused a large proportion of the fruit set to drop, and the remainder was unsalable in unsprayed orchards. Considerable blight is reported in a number of orchards, especially where cultivated. Trees growing in sod were noticeably free from it. Practically nothing is being done to prevent its spreading. While cutting out the affected wood may in some cases check it, I am satisfied a better remedy will have to be found before it is wiped out. In my own orchard just a few trees located on low land and under cultivation were affected, and not a single case in sod.

There is from all reports an abundance of moisture in the ground, and trees are in good condition to stand a hard winter, except that in some cases the buds started during the warm days of November.

The crop of strawberries was generally a very light one on account of blossoms being injured by late frosts and winter killing, but a few correspondents report a full crop.

Other small fruits, including currants, raspberries and blackberries, were a practical failure and light crop.

The crop of grapes was very light and in only a few favored localities ripened before killing frosts. Plums, except in a few instances, were a failure, the exceptions being in case of the Hansen hybrids.

[Illustration: Residence of S.H. Drum, Owatonna, in First Congressional District—a veteran member of the society]

While more varieties of apples are successfully grown in this vicinity than elsewhere in the state, and some correspondents recommend a long list, my experience and advice is to set only a few varieties of known commercial value, and while far too many early apples are being grown, this condition is better than planting winter apples of unknown hardiness and quality. The Northwestern Greening is the most profitable winter apple here, but I understand it is not hardy in some localities in the state.

* * * * *

ALASKAN BERRY HYBRIDS.—At the Sitka Experiment Station in Alaska a strain of hardy strawberries is in the making, the result of crosses between the native of the Alaskan coast region and cultivated varieties. Several thousand seedlings have been grown, all very vigorous and most of them productive and of high quality. The native variety of the interior of Alaska is now to be used in similar crosses.

The Cuthbert raspberry has been crossed with its relatives, the native Salmonberry (*Rubus spectabilis* Pursh.) and the Thimbleberry (*R. parviflorus* Nutt.). The only interesting fact so far developed is that the hybrids of the two species first named are almost entirely sterile.

Annual Report, 1915, Vice-President, Seventh Congressional District.

P. H. PETERSON, ATWATER, MINN.

From the answers received on blanks sent out I find there was a fair crop of apples raised throughout this district, with the trees in good condition for winter. Wood is well ripened up, leaves all shed and plenty of moisture in the soil.

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[Illustration: A productive strawberry field at P. H. Peterson's Atwater fruit farm.]

All report none or very little blight this year. Spraying is not done generally, but those few who do it are getting results. In our own orchard, which was sprayed twice last spring, we have not found one wormy apple.

Plums, none or a very few. Mr. Bjornberg, of Willmar, reports the Surprise plum a full crop, others a total failure. Compass cherry bore a fair crop, but with me it rotted badly, as also did Prof. Hansen's plums, Sapa and Opata.

Grapes: Not many are grown except the Beta, which bore a heavy crop in spite of the late spring frosts.

Blackberries: Nothing doing.

Raspberries and strawberries were a light crop. Strawberries especially were badly damaged by late spring frosts—with me they were nearly a total failure except the everbearing, which gave us a good crop. And I want to add that they are here to stay for home use, and possibly as a market berry. Plants are fully as hardy as the June-bearing sorts. No matter how many times the blossoms are frozen off in the spring they will come right out again and give us berries until it freezes up in the fall.

Currants and gooseberries were a fair crop.

From the reports I gather that less nursery stock has been planted here than usual, but with good results, as the season has been favorable for plantings.

The fruit list recommended by the State Horticultural Society can be relied on in this locality.

There is a good deal of interest shown here in top-working the better quality winter apples onto hardy trees with good results, and the Hibernal seems to be the best stock to use—it certainly ought not to be planted for any other purpose. The apple is a drug on the market, and those who planted largely of this variety find it difficult to dispose of the crop at any price.

* * * * *

STUDYING FRUITS IN ILLINOIS.—Many seedling apples are being grown at the Illinois Experiment Station. Reciprocal hybridizations between standard orchard varieties and various species of the genus Malus have been made, fifty-seven species and varieties which are not of commercial importance having been obtained from the Arnold Arboretum at Boston. Direct improvement through these violent crosses is not anticipated, but it is hoped to acquire valuable information regarding the affinities of the various species used, and also to produce material for use in back crossing. Reciprocal

crosses between standard orchard varieties are also being made in large numbers, while a difficult piece of work has been attempted in the reciprocal crossing of different strains of the same variety, and different individuals of the same strain. C.S. Crandall writes: “This project has aimed at the selfing of particular individuals, and the use on trees here of pollen from trees of the same variety in orchards 100 miles away

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and grown under quite different conditions. Considerable effort has been expended in the prosecution of this project, but up to the present time we have recorded no successful pollinations. We have not as yet a very wide range of varieties, but as far as we have gone we have encountered complete sterility in the selfing within the individuals and in the attempt to use pollen of the same variety brought from a distance. The unfortunate feature about all the hybridizing work with apples is the mongrel character of the plants on which we work. We know nothing of the parentage of any of our varieties, and it seems quite useless to speculate on what the segregation of characters may be in crosses between different varieties. A further discouraging feature in apple breeding is the long period required to get results from any particular cross. Effort is being made to shorten this period by grafting scions of hybrid seedlings on dwarf stocks and growing the plants in pots. This will help some, but at best the attainment of results is some distance in the future. We are endeavoring to maintain a reasonably complete record of every step that is taken so that a complete history may be available for those who may later continue the work.

"In pursuing the projects as outlined above there are a number of minor problems that are receiving some attention: such as the retention of the vitality of pollen, the period of receptivity, the seed production in hybrid fruits, and the time for and percentage of the germination of seeds. On all of these points we are accumulating considerable information that it is hoped may be of some practical value."—Journal of Heredity.

Spraying the Orchard.

HON. H. M. DUNLAP, SAVOY, ILLS.

I don't know whether I am out of place with this topic of mine or not with a Minnesota audience, but I came through the exhibit rooms as I came up to the hall, and whether you spray or not you certainly need to, for I saw all sorts of fungous diseases upon your fruit. I presume that these are not the poorest specimens you have—very few people, you know, bring the poorest specimens they have to an exhibition place, Mr. President, and I presume that if these are the best you have the poorest must be pretty bad in the way of fungous diseases.

Of course, people don't like to have their faults told them, but if we have anything the matter with us it is best for us to find out what the matter is and then get rid of it. It is better than to do as many did in the commercial fruit-growing states a number of years ago about the San Jose scale, those that were interested in having that fact suppressed, or at least thought they were interested in having the fact suppressed that they had San Jose scale within the confines of their state. They didn't want that information to get out, so they didn't discuss the matter of San Jose scale in their societies.

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In Illinois we took a different view of that proposition, and it was, that we had the San Jose scale and we thought the thing to do was to stamp it out, to get after it. So we agitated that subject in our society and talked about it. We had the state entomologist canvass the entire state to find out where the San Jose scale was doing its work and gave him authority to go in and spray those places or cut down the trees and get them out of the way. The effect of that work is very evident.

The people of other states would point to us saying that they did not have the scale but that we had because we reported the fact, but I know they now have it a great deal worse than we do because of this neglect.

In this matter of spraying and spraying materials, if we go back in history—we have to look for truth wherever we find it, whether it comes from low or high sources. As a matter of fact thieves and sheep ticks and ignorance are largely responsible for our spraying and the spraying materials of today. It doesn't sound very well in a scientific body to talk that way, but truth is truth wherever you find it, whether it comes from the university professor or from the farmer. If we recognize truth, from whatever source it comes, then we are open-minded and can take advantage of things that will be greatly to our benefit.

In the matter of spraying materials: They were discovered through accident, in an effort to prevent thieving in the vineyards of Bordeaux, France. It seems that workmen on the way to their places of employment were in the habit of foraging on the vineyards of the farmers along the way. To prevent that some of the fruit growers conceived the idea it would be a good thing in order to scare them to get blue vitriol and mix it with water and spray it on the fruit along the roadside. Later in the season, very much to their surprise, they found that the grapes that were treated in that way were not affected with the brown rot. So they tried it again to see whether they were right about that being the cause, and it wasn't long before they used it for that purpose. They stopped the thieving, but they also discovered a scientific truth, that the Bordeaux mixture was a fungicide and that fact has been of immense value to the world since then.

When the San Jose scale came into this country from the west, some man who had used sheep dip for sheep ticks, said: "If it is a good thing against sheep ticks, why isn't it good against this little vermin they call the San Jose scale?" He tried it on the trees, and he found that it was an effective remedy for the San Jose scale. So we have lime-sulphur today as one of the spray materials in very common use.

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Among other things the scientists told us we couldn't use lime-sulphur and arsenate of lead together, that they would have to be sprayed over the orchard in separate sprays, that is, we would have to go over the orchard with lime-sulphur and then again with arsenate of lead, that when you combined the two the chemical combination was such that it deteriorated the lime-sulphur. Some farmer who didn't know about that scientific proposition determined to put them both on together, and he found that it not only worked all right but that the two were really more effective when combined than if put on separately. So you see it was thieves, sheep ticks and ignorance that are responsible for three of our most successful ways of spraying at the present time.

Now, scientific men have come in and given us a great deal of information along various lines in regard to spraying, and I don't decry science in any sense at all. These men, while they were not scientifically educated, discovered scientific truths, and it is truths we want after all.

Just what your position on this spraying proposition is here in Minnesota, whether you have commercial orchards up here or not, I have not been able to discover. I presume that your plantings here are very largely that of the farmer and amateur rather than the commercial orchardist. In Illinois we have our large commercial orchards, and we have gotten beyond the question of whether it pays us to spray or not. For a man to be in the commercial apple business in Illinois and not spray means that he doesn't accomplish very much and his product doesn't bring him any profit.

Now, whether you spray commercially or whether you spray for your family orchard in an amateur way, it doesn't matter so far as the spraying is concerned—you should spray in either case. If you have a community where you have few orchards and they are small, it behooves you to get together and buy a spraying outfit, combine with your neighbors and buy a good spraying outfit, and then have some man take that matter up who will do it thoroughly in that neighborhood and pay him for doing it. In that way, if you hire it done, it doesn't interfere with your farming operations and gets your spraying done on time. I have noticed this with stockmen and with grain farmers, men who are not directly interested in fruit but combine it with their regular business, that they consider fruit growing a side line and such a small part of their business that they usually neglect it altogether. In the matter of the spraying they keep putting it off until tomorrow. When the time arrives for spraying you must do it *today* and not put it off until tomorrow.

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Time is a very essential element in spraying. To give you an illustration: A few years ago, in spraying a Willow Twig orchard, consisting of eighteen rows of trees, I sprayed nine rows of those trees, or about half of the orchard, we will say, the first part of the week, the first two days. And then there came on a two or three days' rain, and the balance of those eighteen rows was sprayed the very last of the week or the first of the following week. The two following sprayings went on just at the right time for them, but when it came to the harvesting of that crop the trees that were sprayed first, that were sprayed immediately after the bloom fell, produced 175 bushels of very fine No. 1 fruit, free from scab, while the other nine rows, equal in every respect so far as the trees are concerned and the amount of bloom there was, produced seventeen bushels of No. 2 fruit, no No. 1 fruit at all.

The Willow Twig is one of those varieties that is very susceptible to scab, and of course this is a marked illustration of what happens if you don't spray at the right time. Notwithstanding the fact that the nine rows, the last ones, I speak of, were sprayed with the two following sprays at the same time that the other part of the orchard was sprayed, the results were entirely different because the first spraying, which was really the important one so far as the scab is concerned, was not put upon the tree at the right time.

The scab fungus, which seems to appear on your apples out here, is one of the most insidious diseases we have in the whole fruit industry. I think that scab fungous disease is probably the one that affects you the most. Now, scab fungus will not be noticed particularly in the spring of the year. The time that those spores are most prevalent, the period of their movement as spores in the atmosphere and the lodging upon the fruit, is right at the beginning, right about the time of the blossoming or immediately following. For a period of about two weeks at blooming time and after is the time that you have that condition.

And the trouble is—it is just like typhoid fever. You let typhoid fever get into a family, and they do not think anything of it except to take care of the patient properly if he has it, but it doesn't scare the neighbors, it does not interest them. But let the smallpox break out in a community, and everybody is interested and scared to death for fear they are going to get the smallpox.

Well now, as compared with things of a fungous nature, the scab is a good deal like typhoid fever. The latter is insidious and it will destroy more—I take it there are more people die in the United States of typhoid fever every year than die of smallpox, ten to one. I haven't the statistics but I have that in mind, that it is a fact that they do, and yet there isn't half the fuss made about typhoid fever that there is about smallpox.

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Now, that is so about the scab fungous disease. In Illinois, to illustrate, we have what is called the bitter rot fungus in the southern part of the state. If any one has the bitter rot they are scared to death, they think they are suffering untold misfortune. The bitter rot attacks the apples when nearly grown. The ground is covered with the rotted apples, and you can see them in the trees, but this little bit of scab fungus, they do not seem to notice that.

The reason is this, that scab comes from very minute spores that appear upon the apples in May or June, and as the summer advances they spread more and more. It depends, of course, upon the amount of moisture there is present, but it begins its work when the apples are very small. If it gets upon the stem of the apple it works around the stem and the apple drops off, and you have apples dropping from the time they are the size of peas until the very last of the fall, and while it looks in the month of June as if you are going to have a good crop of apples when it comes harvest time your crop has diminished greatly or to nothing, and you wonder where it has gone. With this scab fungus they just keep dropping, dropping, all through the season; whenever you have a little rain or wind these apples that are affected will drop off. You don't notice them very much because they go so gradually, one at a time or so, and you don't notice you are having any particular loss until it comes fall, and you find that your crop is very small.

That is why I say, you should wake up to the fact that it is necessary for you to spray if you are going to have perfect fruit and plenty of it—and I doubt not you could increase the amount of fruit you have in the State of Minnesota by ten times in one year by simply spraying your orchards thoroughly at the proper time with fungicide.

To do this, as I said, you must have a spraying outfit, individually or collectively, in your neighborhood, and if you get one individually you can take the contract to spray your neighbor's trees, if you wish, and get back enough to pay you for the outlay. If you have only a few trees and you have some one who understands it, you could just as well spray a few other orchards in the neighborhood and get your spraying done for nothing in that way, charging them enough to cover the cost and enough for some profit. That is done in some sections and is a very satisfactory way.

The only way, however, that I would do this, if I were you, would be to enter into a joint arrangement of not less than five years, because if you do it from year to year, if a man has good fruit one year, he may say, "I guess I don't want to go to that expense this year; I will drop that." You know how it is. If you make a contract for five years then you can make your plans accordingly and get your material and your spraying outfit and everything. I wouldn't trust to a one-year plan because they get "cold feet," as the saying is, after the first year, and perhaps they have not noticed any great advantage and they back out, but if they keep it up five years they wouldn't be without it.

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In a small way it isn't necessary to have a high power, high pressure engine to do this spraying with. A *good* hand pump, as they make them now, has a very efficient force in applying this spray. It is not the force with which the spray material is applied that makes it effective, so much as it is the thoroughness with which it is done. You have to do a thorough job. In spraying you are providing insurance for your apple crop. That is just what it means, and not to spray is like doing without fire insurance on your buildings. You do that, not because you want fire, but you are doing it for protection, you are going to be on the safe side. You are doing like the darkey woman when she was about to be married. She had been working as cook, and the day came for her to be married. That morning she brought a roll of bills down to the boss. She said: "Mr. Johnson, I wish you would keep this money for me. I's gwine to be married." He said: "Is that so? But why do you come to me with this? I should think having a husband you would have him take care of it for you." She said: "Lord a' massy. Do you think I was gwine to have that money around the house wid dat strange nigger there? No, sir." (Laughter.)

That lady was taking the precaution of being on the safe side, and that is what we do when we spray our orchards, we are going to be safe.

There are a great many kinds of spraying materials. There is the bordeaux, one of our best fungicides, but we find in Illinois that it also, while it is a good fungicide, has the effect sometimes of burning the fruit if the weather conditions are just right. If you have pretty fair weather conditions up here and don't have too much rain, you probably would not get your fruit affected too much, and if you are not growing it for market it doesn't matter so much because all it does is to russet the fruit. It doesn't do any particular harm except when the scab fungus is especially bad, for then it does injure the foliage more or less. On the whole, in Illinois, we are using the lime-sulphur in preference to the bordeaux, and our commercial orchard growers there have completely abandoned the bordeaux except for bitter rot fungus or blotch fungus, which comes late in the season. The spray just before the bloom is a very important one for the scab fungus. After you can see the pink of the bloom on the trees as they begin to look pink, before the blossoms open, put on your lime-sulphur, or you can use bordeaux mixture at that time if you prefer it, without injury to your fruit.

(To be continued in April No.)

Everbearing Strawberries.

GEO. J. KELLOGG, JANESVILLE, WIS.

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A few words about this new breed. Progressive, Superb and Americus are the best three I have found in the last ten years—don't confound American with Americus. Pan-American was the mother of the whole tribe. This variety was found in a field of Bismark, by S. Cooper, New York, and exhibited all through the Buffalo World's Fair. There is where my first acquaintance with it was formed. From this one plant and its seedlings all the ten thousand everbearers have been grown. But Pan-American don't make many plants. There are a great many good kinds in the ten thousand, and a great many of them worthless. So look out when and where you buy. I have great hopes of your No. 1017, but kinds do not adapt themselves to all soils or climates.

I have not found any success with the everbearers south of the Ohio. I have tried them three years in Texas. I sent plants to Bro. Loring, in California, and they failed to produce satisfactorily. Missouri grows almost all Aroma; California but two kinds commercially; Texas only Excelsior and Klondike for shipment. I hope our No. 3 Minnesota June-bearing and our No. 1017 Everbearing, will have as great a range as Dunlap.

Friend Gardener, of Iowa, has a lot of "thousand dollar kinds." I hope some of them will do wonders. He sold 5,000 quarts of fruit after August 15. A firm at Three Rivers, Mich., this season advertised 30,000 cases in September, but perhaps it was only 3,000; I have known printers to make mistakes. My boy's beds of Superb, Progressive and Americus were loaded with ripe and green fruit and blossoms October 1st this year. Most, if not all, know the fruit must be kept off the everbearers the season of planting till the plants get established, usually two or three months, then let them bear. If you want all fruit, keep off the runners; if all plants, keep off the fruit. Beds kept over that have exhausted themselves will need rest till July to give big crops. Beds kept over will fruit a week earlier than the June varieties, rest a few weeks, then give a fall crop, but don't expect too much unless you feed them.

There are ten thousand kinds of new everbearers, so don't buy any that have not been tried and proven worthy. There are thousands that are worthless. Friend Haralson only got No. 1017 out of 1,500 sorts. He has now 3,000 new kinds, set out four feet apart each way, he is testing. From what many growers are doing this breed will pay commercially, but it will be by experts. I have not time to advocate cultivation in hills or hedge rows; if you want big berries this is the way to get them. Be sure your straw mulch and manure mulch are free from noxious weed or clover and grass seeds. Everbearers need the same winter care as June varieties and a good deal more manure. Don't cover with asparagus tops unless free of seed. Put manure either fresh or rotted on the old bed with a manure spreader or evenly by hand. There is a possibility of manuring too heavily.

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[Illustration: A typical everbearing strawberry plant as it appears in September.]

Mr. Durand: What is the best spray for leaf-spot and rust in strawberries?

Mr. Kellogg: Cut it out and burn it, but then there are some sprays with bordeaux mixture that will help you, but you have got to put it on before the rust shows itself.

Mr. Miller: I would like to ask Mr. Kellogg if he advises covering the strawberries in the winter after snow has fallen and with what success?

Mr. Kellogg: If the snow isn't too heavy you can do it just as well after the snow comes as before, but if your snow comes early and is a foot deep you have got to wait until the January thaw before you can successfully mulch them. That snow will protect them until it thaws off, until the ground commences to freeze. If the snow comes early and stays late it is all the mulch you need.

Mr. Franklin: Are oak leaves as they blow off from the trees on the strawberry beds, are they just as good to protect them as straw would be—when there are lots of oak leaves?

Mr. Kellogg: If you don't put them on too thick. You don't want more than two inches of leaves. If you do they will mat down and smother your plants.

Mr. Ludlow: Have you had any experience with using cornstalks that have been fed off, just the stalk without the leaves. Is that sufficient for a winter protection without the straw or leaves? I put on mine just to cover them. They are four inches apart one way and then across it the other way so as to hold it up and not get them smothered.

Mr. Kellogg: That is all right. I have covered with cornstalks.

Mr. Ludlow: Would it be policy to leave that on and let the strawberries come up through, to keep them clean?

Mr. Kellogg: If you get the stalks on one way and haven't them covered too thick the other way, leave them on; the strawberries will come through.

Mr. Gowdy: I would like to ask Mr. Kellogg what he thinks of planting different varieties together.

Mr. Kellogg: It is a good plan. I spoke of Dunlap and Warfield. The Warfield is a pistillate. If you plant all Warfields you get no fruit. If you plant all Dunlap it will bear well but it will do better alongside of a pistillate, or it will do better alongside of some other perfect. It will do better to plant two or four kinds. They used to ask me what kinds of strawberries I wanted, and what was the best one kind. I told them I wanted six

or eight in order to get the best kind. I want an early, and a medium, and a late, two of a kind.

Mr. Gowdy: I planted one year three varieties with great success.

Mr. McClelland: What time do you uncover your strawberries?

Mr. Kellogg: I don't uncover them at all. If you got on four inches of mulch you want to take off enough so the plants can get through, but keep on enough mulch in the spring to keep your plants clean and protect from the drouth.

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Mr. McClelland: Will they come through the mulch all right?

M. Kellogg: They will come through all right if it isn't more than two inches. If they shove up and raise the mulch open it up a little over the plants.

Mr. Willard: I would like to ask the speaker, the way I understood him, why he couldn't raise as good strawberries on new ground as on old ground?

Mr. Kellogg: The soil seems to be too loose. Now, that twenty-one acres I had, it was full of leaf-mold. It was six inches deep and had been accumulating for ages. I couldn't account for it only that it was too loose, and I had to work it down with other crops before I could grow strawberries.

Mr. Willard: So it would be better to plant on old ground or old breaking than new?

Mr. Kellogg: Yes, old ground that has been well manured, or old ground that has never been manured, will grow better strawberries than new soil, as far as I have tried it. New clover soil is a good soil.

Mr. Wedge: It might add to the value of this discussion to state that Mr. Kellogg's soil at Janesville is rather light soil anyhow. I am under the impression that if his soil at Janesville which produced so poorly on new soil had been a heavy clay soil that the result would have been different.

Mr. Kellogg: That twenty-one acres was clay after you got down to it and was in the woods; my other fields were out on the prairie. I don't think the light soil had anything to do with it, with my failure in the woods, I think it was the new soil.

Mr. Sauter: Can the everbearing and the common varieties be planted together?

Mr. Kellogg: Yes, if you are growing plants you want everything.

Mr. Sauter: How far apart must they be planted?

Mr. Kellogg: So their runners won't run together, and they won't mix. If the runners mix maybe you would get some crosses that are valuable.

Mr. Clausen: I was just thinking it might interfere, that some one might not plant strawberries at all on account of new soil. I would say I have a neighbor, and he had entirely new soil. It was black oak and hickory—I have some of that myself. I never saw a better patch of strawberries than he had. I don't think I ever saw a better strawberry patch than he had of the everbearing kind, so I don't think it is just exactly the old soil.

Mr. Willis: I have my strawberries on new ground, and they did very fine, couldn't be better. From a space of five feet square I got twenty-eight boxes, that is, of No. 3.

Mr. Wedge: Forest soil or prairie?

Mr. Willis: It was light clay. I have got about an acre and a half on new soil now, and they look very fine.

Mr. Glenzke: What would be the consequence of the berries being planted after tomatoes had been planted there the year before? What would be the consequence as to the white grub that follows the tomatoes, and other insects?

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Mr. Kellogg: That white grub don't follow tomatoes, if the ground was clear of white grubs before. It is a three year old grub, and it don't come excepting where the ground is a marsh or meadow, and doesn't follow in garden soil, hardly ever. If the ground has been cultivated two years, you don't have any white grub.

Mr. Glenzke: Part of this ground had been in red raspberries, and I found them there. This year I am going to put in tomatoes and prepare it for strawberries. Will that be all right?

Mr. Kellogg: You may get some white grubs after the raspberry bushes if your raspberries have been two or three years growing. Potato ground is the best you can follow strawberries with.

Mr. Rasmussen (Wisconsin): What trouble have you experienced with overhead irrigation with the strawberries in the bright sunshine?

Mr. Kellogg: Everything is against it. You wet the foliage, and it is a damage to the plants. You can't sprinkle in the hot sun without damage.

Mr. Rasmussen: I didn't mean in putting it on in that way, but where you use the regular spray system. We watered that way about seven years in the hottest sunshine without any difficulty, and I wondered if you ever put in a system and sprayed that way, as I think that is the only way to put water on.

Mr. Kellogg: If you wait to spray after sundown it will be all right; the sun mustn't shine on the plants.

Mr. Richardson: Mr. Yankee once said in this society if one man said anything another man would contradict it. So pay your money and take your choice. I sprinkle my strawberries in the hot sun, and I never had any damage done to the plants. His experience is different. Ours is a heavy clay loam.

Mr. Kellogg: Tell the gentlemen about the peat soil, you had some experience with peat soil.

Mr. Richardson: No, I never did. It wasn't peat, it was a heavy black clay and I had the best kind of strawberries, they came right through a tremendous drouth without any water at all.

Mr. Kellogg: What did you use?

Mr. Richardson: I used a common garden hoe.

Mr. Willis: I heard some one talking about the grub worm. I read of somebody using fifty pounds of lime to the acre, slaked lime, and 100 pounds of sulphur to the acre in a strawberry bed, and he killed the insects.

Mr. Kellogg: I think that wouldn't kill the grub; he has a stomach that will stand most anything. The only thing I know is to cut his head off. (Laughter.)

Mr. Willis: Would it improve the plants, fertilize the plants, this lime?

Mr. Kellogg: Lime and sulphur is all right, and the more lime you put on the better—if you don't get too much. (Laughter.)

Mr. Sauter: I am growing the Minnesota No. 3, and also the No. 1017 as an everbearer. Is there any kind better than those two?

Mr. Kellogg: I don't believe there is anything yet that has been offered or brought out that I have examined thoroughly that is any better than June variety No. 3, as grown by Haralson, and the No. 1017 of the everbearers. He had a number of everbearers that bore too much. There was No. 107 and No. 108, I think, that I tried at Lake Mills, which bore themselves to death in spite of everything I could do.

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Mr. Simmons: The question has come up two or three times in regard to peat soil for growing strawberries. Peat soil will grow strawberry plants first class, but the fruit is generally lacking. That is my experience. I grew some on peat soil for two or three seasons, and the plants grew prolific, but I didn't get any fruit.

Mr. Ebler: I would like to ask Mr. Kellogg what treatment he would advise for a strawberry bed that through neglect has matted completely over, in which the rows have disappeared.

Mr. Kellogg: Plow out paths and rake out the plants and throw them away and work the bed over to rows about two feet wide.

President Cashman: I see you all appreciate expert advice. We have Mr. Kellogg well nigh tired.

Mr. Kellogg: Oh, no; I can stand it all day.

Mr. Cashman: I am sure you all agree that it is a great privilege to listen to Mr. Kellogg on this subject. If you will follow his advice very closely it will save you a great many dollars, even to those who don't grow more than an ordinary family strawberry bed. He has had forty or fifty years of experience, and he has paid large sums of money for that experience and now turns it over to you free of charge, and I hope you will all profit by it.

Mr. Kellogg: I have grown probably 300 different varieties of strawberries, and the more kinds I grow the less money I make. (Laughter.)

Mr. Wedge: I would like to ask Mr. Kellogg and I think we would all be interested in knowing when he began growing strawberries?

Mr. Kellogg: Well, I don't hardly know. I didn't go into the business until 1852, but I commenced picking strawberries in 1835, and that was where the Indians had planted them. My father commenced growing strawberries when I was a boy, but when I got to be a man I went at it myself in 1852. (Applause.)

IN MEMORIAM—Mrs. Melissa J. Harris

Passed January 29, 1916.

Mrs. Melissa J. Harris, widow of the late John S. Harris, one of the charter members of our society and rightly called the godfather of the society, passed to her reward on January 29 last, at the age of eighty-five years. Since the death of her husband, which occurred in March, 1901, Mrs. Harris has made her home with some one of her four surviving children, all of whom live in the southeastern part of the state, not far from La Crescent, where Mr. and Mrs. Harris resided from 1856 up to the time of Mr. Harris' death, some forty-five years.

[Illustration: Mrs. Melissa J. Harris.]

Many of the older members of this society have enjoyed the hospitality of this kindly home, among them the writer, who passed a very pleasant day there, looking over the experimental orchards of Mr. Harris, some twenty years ago. No member of our society surpassed Mr. Harris in his zeal for its welfare, and he was ready to sacrifice anything apparently to advance its interests. If the card index of the reports

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of this society was examined it would be found that no member has begun to do the service for the society in the way of contributions to its program, reports on seedling fruits, experimental work, *etc*., that was done by him. His passing left a real void in the life of the association which has never really been filled. A splendid life size photo of Mr. Harris adorns the walls of this office; a reproduction from this in reduced size is opposite page 161, Vol. 1901 of our annual reports.

The funeral services of Mrs. Harris were conducted in the Presbyterian church at La Crescent, the same building in which services were held for her husband, at which there were present from our society as representatives Mr. J.M. Underwood, the late Wyman Elliot, and the writer. Her body was laid to rest beside that of her husband in Prospect Hill Cemetery at La Crescent.

Mrs. Harris is survived by four children, ten grandchildren, and nine great-grandchildren. Frank I. Harris, one of the two sons, is well known to our membership who attend the annual meetings or the state fair; another son, Eugene E., who is also a life member (Mr. Harris saw to it that both of his sons were made life members during his life time) has occasionally been with us. Mr. D.C. Webster, of La Crescent, at present in charge of one of the society trial stations, is a grandson of Mrs. Harris. Exhibitors at our meetings and at the state fair are all well acquainted with this valuable member of our organization.—Secy.

EAT MINNESOTA APPLES.

Contributed monthly by R. S. MACKINTOSH, Horticulturist,
Extension Division, University Farm, St. Paul.

FRUIT NOTES.

Early spring is the best time to prune apple trees. More and more attention is being given to the pruning of young and old trees in order that they may be able to support large loads of fruit. Yet too many trees have been neglected and now look like brush heaps instead of fruit trees.

Neglected trees should have all dead and interlocking branches removed this year. Next year a few more needless branches should be taken out and some of the others shortened. After this a little attention each year will keep the tree in good form.

Each year the Agricultural Extension Division of the University of Minnesota arranges for pruning and spraying demonstrations in different orchards of the state. Communities wishing this kind of help, should at once send in petitions signed by fifteen or more

persons interested in fruit growing. Send applications to Director, Agricultural Extension Division, University Farm, St. Paul.

Pruning is a good subject for farmers' clubs to take up in March and April.

Look out for rabbit injury this spring. Apple trees cost too much

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

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Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

Cypripedia, by Miss Clara Leavitt.

The showy lady's slipper (C. hirsutum) is found in swamps and rich meadows. Old settlers tell of gathering the pink and white "moccasin flower" by the bushel, to decorate for some special occasion. Today we are trying to shield a few in their last hiding places. The draining of swamps and cutting of meadows has had much to do with their disappearance. The picking of the leafy stem by the ruthless "flower lover" cripples the plant for a season or more and frequently kills it outright. Attempts to transfer it to the home garden have succeeded for a year or so but rarely longer, perhaps because its native habitat is very difficult to duplicate.

The small yellow lady's slipper (C. parviflorum), found in bogs, and the large yellow (C. parviflorum var. pubescens), growing on hillsides and in rich woods, as well as in swamps, are the most widely distributed and best known of this genus. They have often been transferred from the wild to the home garden. Where they have been given their native soil and environment the stock has increased and seedlings have developed. They have even been brought into conservatory or window garden and forced to flower in February.

The crimson stemless lady's slipper (C. acaule) is found in drier woods and on the stump knolls of swamps in certain locations. It has with difficulty been established in a few gardens.

The small white lady's slipper (C. candidum) occurs locally in boggy meadows. It is a very dainty plant. It grows in at least one wild garden.

The ram's head lady slipper (C. arietinum) is very rare and local. It is a very delicate and pretty thing, purple and white in color.

All of these species are to be seen in season in the Wild Garden of the Minneapolis Park System.

* * * * *

Committee on the protection of Cypripedia: Mrs. Phelps Wyman, chairman; Miss Clara Leavitt, Miss M. G. Fanning, Mrs. C. E. C. Hall, Mrs. E. C. Chatfield, Mr. Guy Hawkins.

* * * * *

Our plant exchange should be of great benefit to our members, such a fine beginning having been made last spring. Send a list of the plants you have for exchange and

those you would like to receive to our secretary. These will be posted upon the bulletin board at our meetings, where exchanges can be arranged between the members.

* * * * *

March 23. Public Library, Minneapolis, 2:30 p.m. Meeting of Garden Flower Society. Program:

Our Garden Enemies.
Cultural Directions for Trial Seeds.
Distribution of Trial Seeds.
Minnesota Cypripedia. Have they responded to Cultivation?

BEE-KEEPER'S COLUMN

Conducted by FRANCES JAGER, Professor of Apiculture, University Farm, St. Paul.

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IMPORTANCE OF GOOD QUEENS.

The government census of 1910 gives the average of honey production per colony for the State of Minnesota at five pounds per colony. Allowing for mistakes which were made in making up this census, there is no doubt that the average amount of honey produced by a colony is not nearly as high as efficient beekeeping would make it. When some well known beekeepers will average year after year fifty, seventy and even a hundred pounds per colony, there must be something wrong with those who fall far below this amount.

There are many causes responsible for this failure of honey crops. Bad management, no management at all, antiquated or impossible equipment, locality, *etc*., are all factors contributing towards a shortage in the honey crop, but poor queens are the most universal cause of disappointment. The queen being the mother of the whole colony of bees, the hive will be what she is. If she is of a pure, industrious, gentle, hardy and prolific strain, the colony over which she presides will be uniform, hard working, easy to handle, easy to brave the inclemency of the weather and the severity of our winters, and populous in bees. The bees partake of the characteristics of the queen.

The fact of the matter is, that more than 90% of our Minnesota queens are either black Germans or hybrids, neither of which lend themselves to pleasant and profitable beekeeping. Having been inbred for years will make them still less valuable, and most of them have been inbred for generations.

Among many things in which the beekeepers of Minnesota should begin to improve their beekeeping possibilities, the necessity of good queens comes first. With a new strain of pure, gentle, industrious, leather colored Italian bees, their love for beekeeping should receive a new impetus, leading them to better equipment and better management.

It was with this point in view that the University of Minnesota has secured the best breeding queens obtainable from which to raise several thousands of queens for the use of beekeepers of the state.

These queens will be sold each year during the months of June, July and August at a nominal price of fifty cents each, and not more than three to each beekeeper. The University is ready to book orders now. There is such a demand for these queens that last year only one-quarter of the orders could be filled. Given three pure Italian queens to start with, a beekeeper may easily re-queen his whole bee-yard in the course of a year. Detailed printed instructions how to proceed will be sent out to all buyers of queens free of charge.

Time has come to start bee-keeping on a more profitable basis, and the first step towards better success should be a new strain of queens.

ENTOMOLOGICAL NOTES

By F.L. WASHBURN, Professor of Entomology, University of Minnesota.

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RABBITS; RABBIT-PROOF FENCES; FIELD MICE.

Probably the thoughtful orchardist has before this date visited his orchard and trampled the deep snow down around his young fruit trees for a distance of two feet on all sides of each trunk, thus preventing rabbits from reaching the trunk above the protected part, or from eating the branches in the case of low-headed trees. Even at this date, this should be done where the snow lies deep. Frequent tramplings about the young trees also protects the trees from possible injury by field mice working beneath the snow.

This leads us to speak of our experiences with so-called “rabbit-proof” fencing. In the summer time, when an abundance of food is everywhere offered, these small mesh fences are generally effective barriers, but, in the case of the low fences, drifting snow in winter permits an easy crossing, and in the case of the higher fences which have the narrow mesh at the bottom, gradually widening toward the top, it is possible for a rabbit to get his head and body through a surprisingly small space between the wires. The writer was astonished, late last autumn, previous to any snowfall, to see one of these pests, which had jumped from its “nest” in his (the writer’s) covered strawberry-bed, run to the inclosing fence, which was provided with the long, narrow mesh above alluded to, raise himself on his hind feet and push his way through a space not more than three inches wide. It would seem, therefore, that one should accept with some reservation the assertion that these fences are actually “rabbit-proof.”

PREPAREDNESS FOR (INSECT) WAR.

However one may regard the agitation for or against preparing this country for (or against) war, we are doubtless of all one mind as to the desirability of being prepared to successfully cope with the various insect-pests which are sure to arrive during the coming spring and summer to attack shrubs, fruit trees, berry bushes, melons, cucumbers and practically all of our vegetables. The Entomologist has every reason to be thankful that, early last spring, he laid in a supply of arsenate of lead, Black Leaf No. 40, commercial lime-sulphur, tree tanglefoot, tobacco dust, also providing himself with an abundance of air-slaked lime and a spraying outfit suitable for use in a small experiment garden and orchard at Lake Minnetonka. All gardeners, particularly those who cannot quickly purchase such things on account of distance from a supply, should take time by the forelock and obtain materials now, that they may be ready at hand when very much needed.

AN IMPORTANT DISCOVERY IN ENTOMOLOGY.

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An item of importance, and quite far-reaching in its significance is the fact (as reported at the recent meeting of entomologists at Columbus) that the odor in stable manure which attracts house flies, has been “artificially” produced, if that expression may be used, by a combination of ammonia and a little butyric acid. A pan of this, covered by cotton, attracted hundreds of flies which deposited their eggs thereon. The possibilities of making use of this new-found fact are most promising, and the discovery is especially significant in that it opens an immense and practically an untried field in entomological work; that is, the making use of different odors to attract different species of insects. A series of experiments in this direction with the Mediteranean fruit fly, also recently reported, have been most surprising but too extensive to permit of discussion here.

* * * * *

Nurserymen intending to import currants or gooseberries from Europe will be interested in learning that there is a possibility of a federal quarantine on shrubs of this genus grown abroad.

State Entomologist Circular No. 36, issued in January, 1916, and entitled the “Red Rose Beetle,” by S. Marcovitch (illustrated), is available for distribution. Application should be accompanied by one cent stamp.

SECRETARY’S CORNER

PLANT COMMERCIAL ORCHARDS.—It is well established that in certain localities at least in the state commercial orcharding is on a safe basis, offering reasonable financial profits if managed by those who take pains to inform themselves on the subject, and are then thorough going enough to practice what they know. This spring will be a good time to plant such an orchard. Orchard trees of suitable size were never more plentiful in the nurseries, and undoubtedly the sorts which you wish to plant can be readily purchased. Ask some of your nearest nurseries for prices as to 500 trees, either two or three years old, whichever you prefer.

GIVE YOUR NEIGHBOR A CHANCE TOO.—This means that you should not be satisfied simply in having secured something of value to yourself, but pass on to others the valuable opportunity which you yourself are enjoying. It is a well established principle of life that the greatest happiness consists in giving happiness to others. As any member can do his neighbor a favor, without any expense to himself, and indeed with profit, by putting his neighbor in touch with the valuable facilities offered by the Horticultural Society, there is evidently a double reason why he should do so. For the small membership fee charged you can put into his hands all the material referred to on the next page. Read it over and lend your neighbor a helping hand.

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TIMELY NOTES IN OUR MONTHLY.—There will be in our monthly magazine during most of the rest of the months of the year five pages devoted to timely topics. The experience of the past year or two in this direction encourages us to believe that this will prove to be the most valuable portion of our monthly. One page, as heretofore, will be operated in the interest of garden flowers, edited by Mrs. E. W. Gould; another page, prepared by Prof. R.S. Mackintosh, under the head of “fruit notes,” which subject indicates clearly its purpose. Prof. Francis Jager, the Apiarist at University Farm, will prepare another page, pertaining to the keeping of bees. Prof. F.L. Washburn, the State Entomologist, will have a page devoted to insect life as interesting the horticulturist. The fifth page will be handled by Profs. A.G. Ruggles and E.C. Stakman jointly devoted entirely to the subject of “spraying.” Each issue of the magazine will contain these notes as applying to the month just following. They will be found well worth studying.

ARE YOU A LIFE MEMBER?—Of course if you are interested in the work of the Horticultural Society and likely to live ten years you ought to be a life member. Experience with this roll for twenty-five years now as secretary of the society indicates that a life membership in the society is almost an assurance that you will prolong your days. A list of deaths in the life membership roll published year by year would indicate that our life members are going to be with us far beyond the average span of human life. Since publishing a list of new life members in the February Horticulturist, there have been added to this life list five names: Tosten E. Dybdal, Elbow Lake, Minn.; Gust Carlson, Excelsior; A.N. Gray, Deerwood; A.M. Christianson, Bismarck, N.D.; Chas. H. Lien, St. Cloud.

If you have already paid your annual fee for this year, send us $4.00 more and your name will be placed on the life roll with the balance of $5.00 to be paid one year from how—or send $9.00, and that makes a full payment.

[Illustration: HORTICULTURAL BUILDING (SHOWING NEW GREENHOUSES ATTACHED) AT UNIVERSITY FARM, ST. ANTHONY PARK, MINN.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 APRIL, 1916 No. 4

Dwarf Apple Trees.

DR. O.M. HUESTIS, MINNEAPOLIS.

I have here a sample of McIntosh Red grown on a standard tree—a beautiful apple and well colored. Here I have the same variety grown on one of my dwarf trees, not quite as well colored.

Now, the dwarf tree that bore these apples has been planted two years; this is the second year of its growth in my own ground at Mound, on Lake Minnetonka.

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I have sixty dwarf trees, five of which have been in eight years, and they have borne six crops of apples. The last ones I got two years ago, and they were two years old when I got them. I planted five of these dwarf trees at the same time that I planted forty standards. The dwarfs have borne more fruit than the standards up to date. Of course, they have only been in eight years. The standards are Wealthy, Duchess, Northwestern Greening and one or two Hibernal and some crabs; the dwarf stock is the Doucin. It is not the Paradise stock, which is grown in England largely and some in France and Germany. My trees are a little higher than my head, and I keep them pruned in a certain way. One of my older trees the second year had ninety-six apples on it. It was a Yellow Transparent, and they came to maturity very well. Several of my trees are about four feet high. I had from twenty-five to fifty apples on them, and they all ripened nicely. The Red Astrachan and the Gravenstein and one Alexander had a few apples on them, and I notice that they are well loaded with fruit buds for another year, which will be the third year planted.

The care of these trees is probably a little more difficult than that of the standard tree, or, at least, I give them special care. I have attempted to bud into some of these, but in my experience they do not take the bud very well. I can take a bud from one of the dwarfs and put it on a standard, and it will grow all right, but I can't take a bud from a standard and put it on a dwarf as successfully. I judge it is because it isn't as rapid growing as the Hibernal, for instance, would be. I notice the Hibernal is the best to take a bud because it is a rapid growing tree and an excellent one on which to graft.

If I wanted to plant an orchard of forty or fifty acres I would plant standard trees and would put the dwarf between the rows, probably twelve feet apart. Mine are about ten feet apart, some of them a little more, but I have two rows eight feet apart each way, nine in each row, which forms a double hedge. I expect them to grow four feet high. I will prune them just as I wish to make a beautiful double hedge between two cottages.

[Illustration: Residence of Dr. Huestis, at Mound, Lake Minnetonka.]

In pruning those that have been in eight years I have tried to use the renewal system as we use it on grapes sometimes. I take out some of the older branches and fruit spurs that have borne two or three years. They must be thinned out. I counted twenty apples on a branch a foot long. I let them grow until they are large enough to stew and then take some off and use them, when apple sauce is appreciated. I thin them every year and get a nice lot of good fruit each year.

I have noticed for two years that I have about ninety-eight per cent. of perfect apples, not a blotch nor a worm. I spray them all, first the dormant spray and then just as the blossoms are falling, and then one other spraying in two weeks and another spray three weeks later.

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Mr. Ludlow: Do you mulch the ground?

Dr. Huestis: Well, I dig up the ground a little in the spring. The roots are very near the surface, not very penetrating, and I cultivate around the roots, but I am careful not to cut them. Every fall I put a good mulch of leaves and hay around them. I have been a little fearful they would winter-kill. I wouldn't lose one of them for ten dollars, and I think it well to mulch them, leaving a little space at the base.

Mr. Andrews: Are the roots exposed in some cases?

Dr. Huestis: Yes, I noticed on two of the older trees, those that have been in eight years and have borne six crops, you can see the roots on one side, the top is exposed a little, and I think it would be well to put a little dirt on those another year. The stock of these dwarf trees is slow growing with a rapid growing top, and that is what dwarfs them. I have transplanted one tree three times, which would make four plantings in eight years, and that tree bore almost as much fruit last year as any of them. In another case once transplanted I think the tree is better than the others that were left.

[Illustration: Dwarf Yellow Transparent, bearing 96 apples, third year from planting at Dr. Huestis'.]

As I said before, if I was planting an orchard I would put dwarf trees between, and by the time they had borne three or four crops, and you were expecting a crop of fruit from the standard trees—about seven years from the time you put them in—I would put the dwarf trees as fillers, costing about forty cents apiece, and by the time they are bearing nicely your friends would have seen those, and I believe would want them at the time you want to take them out. I believe I could sell any of mine for three or four dollars apiece. I think that would be one way of disposing of them after you wanted to take them out of the standard orchard on account of room. That is just a thought of mine.

When I got my first ones eight years ago I gave one to a man who lives in North Minneapolis, at 1824 Bryant Avenue North. Any one can see it who lives up in that section. The first year he had twenty-nine apples, and it has borne each year since. The one which I have transplanted and which bore last year is a Bismarck. It is a little better apple, in my mind, than the Duchess. It is a good deal like the Duchess but is a better keeper and has a better flavor than the Duchess.

[Illustration: Dwarf Bismarck, fourth year, at Dr. Huestis']

I would like to read a quotation to show that the dwarf tree is not a late thing. Recommending dwarf trees for gardens, "Corbett's English Garden," published in 1829, says: "I do hope if any gentleman makes a garden he will never suffer it to be disfigured by the folly of a standard tree, which the more vigorous its growth the more mischievous its growth to the garden."

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Marshall says, “The fewer standard trees in the garden the better.” Also that the dwarfs are less trouble to keep in order and are generally more productive, and that “placed eight or nine feet distant, pruned and kept in easy manner, they make a fine appearance and produce good fruit.” W.C. Drury, highly regarded as a modern English authority, writing in 1900 says: “For the private garden or for market purposes the dwarf, or bush, apple tree is one of the best and most profitable forms that can be planted.” He also says: “The bush is one of the best forms of all, as it is of a pleasing shape and as a rule bears good and regular crops.”

Mr. Clausen: Don’t you have trouble with the mice?

Dr. Huestis: No, sir, have never seen any.

Mr. Clausen: I had an experience a few years ago. My neighbor made a mistake; he was hauling straw around his apple trees, and he happened to take one row of mine. We had no fence between us—and he laid the straw around the trees. I found when I came to examine these trees in the spring they were all girdled around the bottom. I am afraid to mulch.

Dr. Huestis: I never have taken any chances. Ever troubled with the mice at your place, Mr. Weld?

Mr. Weld: A little.

Dr. Huestis: I have never had any trouble with the mice. I always put on a lot of old screen that I take from the cottages that is worn out and put a wire around it so the mice can’t get through it. We must protect from mice and rabbits.

Mr. Kellogg: How soon do your dwarf trees pay for themselves?

Dr. Huestis: I don’t know. I reckon these four have paid about twelve per cent. on fifteen or twenty dollars this year, and they have right along. They have paid me better so far during the eight years than the standards. That might not apply in eight more years, but for a city lot, a man who has fifty square feet, how many apple trees could he put in that seventeen feet apart? Nine standard trees. In that same plot of fifty feet square he could put in sixty-four dwarfs, and it would be a nice little orchard. I think it is more adapted to the city man. The ordinary farmer would neglect them, and I should hate to see a farmer get them, but I would like to do anything for the man living in the city with only a small plat of land—my vocation being in the city, my avocation being in the country.

Mr. Kellogg: Are those honest representations of the different apples from the dwarf and the standard?

Dr. Heustis: I don't know. Those are a fair sample of those I found in a box on exhibit and are Red McIntosh. They are better colored than mine, most of them are like this (indicating). I find the Yellow Transparent that I have budded on the standard better on the dwarf than on the standard.

Mr. Kellogg: Does it blight any?

Dr. Huestis: No blight; there hasn't ever been a blight. I think that is one reason why I feel I could recommend them quite conscientiously. Other trees have blighted when the conditions were favorable.

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TWENTY-FIVE BY SEVENTY FOOT PLOT WILL PRODUCE ENOUGH VEGETABLES FOR A SMALL FAMILY.—Even the smallest back yard may be made to yield a supply of fresh vegetables for the family table at but slight expense if two or three crops are successively grown to keep the area occupied all the time, according to the garden specialists of the department. People who would discharge a clerk if he did not work the year round will often cultivate a garden at no little trouble and expense and then allow the soil to lie idle from the time the first crop matures until the end of the season. Where a two or three crop system is used in connection with vegetables adapted to small areas, a space no larger than twenty-five by seventy feet will produce enough fresh vegetables for a small family. Corn, melons, cucumbers, and potatoes and other crops which require a large area should not be grown in a garden of this size. Half an acre properly cultivated with a careful crop rotation may easily produce $100 worth of various garden crops in a year.

Plums That We Already Have and Plums That Are on the Way.

The Brown Rot (Monilia) a Controlling Factor.

DEWAIN COOK, FRUIT GROWER, JEFFERS.

By the term “plums we already have” for the purpose of this paper we shall include only those varieties that have given general satisfaction over a large territory and for long term of years, and in the writer’s opinion every one of such varieties are of full blooded, pure Americana origin.

The DeSoto takes the lead of them all. It undoubtedly has more good points to its credit than any other plum we have ever grown. The Wyant and the freestone Wolf are considered as being the next two most popular varieties. These were all wild varieties, found growing in the woods of Wisconsin and Iowa many years ago.

There are a few other Americana varieties that are nearly as good as are some of those enumerated, but at present we shall not attempt to name them. There are many otherwise fine varieties that are not included in this list of plums we already have, but because of a certain weakness of the blossom they require to be intermingled with other varieties, or the blossoms do not fertilize properly. They only bear well when conditions are very favorable. We class such varieties as being not productive enough.

Many attempts, with more or less—generally less—success have been made to improve our native plums through the growing of seedlings. Mr. H.A. Terry, of Crescent, Iowa, has done more of such work in his day than any other one man. His method was to plant the Americana kinds, like the DeSoto, alongside of varieties of the Hortulana type, like the Miner, then growing seedlings from the best plums thus grown. From such

cross bred seedlings Mr. Terry originated and introduced a great many very fine varieties. But where are they today? The Hawkeye and the Terry are about the only ones the general public knows very much about. I will venture this statement, that as far as I know there is no variety of native plum in which there is an intermingling of Hortulana or Chickasaw type that has proven productive enough to be generally profitable.

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The Surprise plum belongs to this type, as also does the Terry plum. The Terry plum we want to keep a while longer, not because it is a mortgage lifter for the growers but because of the extraordinarily large size of its fruit, as well as for its fine quality.

There are many injurious insects and fungous diseases that tend to make life a burden to the man who tries to grow plums in a commercial way. Among the insects are the plum curculio and the plum tree borer, better known as the peach tree borer. The curculio sometimes destroys all of the fruit on the tree, and the borer very often will destroy the whole tree of any variety.

Among the fungous diseases are the shot hole fungus and the plum pocket fungus, but the worst of all is that terribly destructive disease of the plum known as the brown rot. This brown rot fungus sometimes destroys the whole crop of certain varieties, besides injuring the trees sometimes as well. This one disease has done more to make plum growing unpopular than all other causes combined. Give us a cheap and efficient remedy, one that will destroy the rot fungus and not do injury to the foliage, buds or tree, and a long stride will have been made towards making plum growing popular as well as profitable.

Japanese hybrid plums.—Just now the Japanese hybrid varieties are attracting considerable attention. One prominent Minnetonka fruit grower said this to me about them:

“Mr. Cook, what is the use of making all of this fuss about these new plums? Plums are only used for the purposes of making jelly anyway, and we can usually get a dollar a bushel for our plums, and they would not pay any more than that, no matter how large and fine they are.”

This brought me up with a jerk, and I have concluded that no matter how advanced a place in horticulture these new hybrid plums may eventually take, that there will always be a place for our native varieties, even if only for the purpose of making jelly.

It seems to the writer that in view of the fact that after many years’ attempt to improve our native plum through the process of seed selection—and we have made no material advancement in that line—that the varieties of plums that are on the way must almost of necessity be the product of the Americana and some of the foreign varieties of plums.

Mr. Theo. Williams, of Nebraska, a few years ago originated a great many varieties of these hybrid plums. He claimed to have upward of 5,000 of them growing at one time. Only a few of them, however, were ever sent out. Of these the writer has been growing for quite a number of years the Eureka, Emerald, Stella, Omaha, B.A.Q. and some others. As a class they are all reasonably hardy for my section. They grow rapidly, bear early, usually the season after they are planted or the top grafts set. They set fruit more freely and with greater regularity, as the seasons come, than do the best of our native

varieties. The fruit is of larger size and of firmer flesh, while the quality of some of them, like the B.A.Q., ranks rather low. The quality of others of them, like the Emerald, is almost beyond comparison.

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One year ago in answer to a question by the writer as to why the people of Iowa did not take more interest in the planting of these hybrid plums of Mr. Williams, Mr. C.G. Patten stated that it was because the plums rotted so badly on the trees. Now, Mr. Patten stated the situation exactly—most of these fine varieties are notoriously bad rotters. The brown rot seems to be a disease of moist climate. Nature's remedy is an abundance of sunshine and a dry atmosphere, but we cannot regulate the climate. Prof. Hansen has sent out a few varieties of these Japanese Americana hybrid plums, and our Supt. Haralson is doing a great work along this line. We can only hope—but cannot expect—that Mr. Hansen's hybrids or Mr. Haralson's hybrids as a class will prove more resistant to the brown rot than do those of Mr. Williams of the same class.

We have hopes that from some of Mr. C.G. Patten's hybrids of the Americana and Domestica plum will come some varieties worthy of general planting, and also of Prof. Hansen's crosses of the Americana plum and the Chinese apricots.

There is another class of hybrid plums that are something wonderful in their way, beginning to bear nearly as soon as they are planted, the very earliest of all plums to ripen its fruit, immensely productive and of finest quality. I refer to Prof. Hansen's sand cherry hybrid plums. My opinion is that Prof. Hansen has done all that man can do in the way of producing elegant varieties of this class of fruit. But there is the uncertainty, however, or perhaps I had better say the certainty, that the brown rot will take a good portion of the crop nearly every season—sometimes only a part of the crop, and other seasons it may take the entire crop of these fine sand cherry hybrid plums.

Bordeaux mixture has been the one remedy advertised for years for the control of this disease, and however well it may work in the hands of experts of the various university farms, it has not proved uniformly successful in the hands of the ordinary fruit grower.

Now, if some medicine should be invented, or some magic made, whereby the brown rot would be banished from our orchards then a great many of the fine varieties of hybrid plums would be transferred from the "plums that are on the way" to the list of "plums that we already have." The brown rot is a controlling factor.

Mr. Kellogg: What do you know about the Surprise?

Mr. Cook: Oh, I know a little more than I want to know about it. I have had the Surprise a good many years.

Mr. Kellogg: You have been surprised with it?

Mr. Cook: Yes, sir, I have been surprised quite a bit, but in the last two years since the plum crop failed there have been a few plums on the Surprise trees, but for a great many years when other plums bore heavily we got nothing.

Mr. Hansen: Do you know of any plum that has never had brown rot?

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Mr. Cook: In my paper—as they only allowed me fifteen minutes I had to cut it short, and I didn't say very much about the brown rot. All the Americana plums, and all varieties of plums I have ever grown, have in some way been susceptible to the brown rot, but some have been more resistant than others. Now, that is one reason, I believe, why the DeSoto takes the lead. It is less subject to the brown rot. We have here a moist climate, and sunshine and dry atmosphere is the remedy, but some of these varieties have such a peculiar skin it is resistant to brown rot, and it seems certain, I don't know, if it is not on account of the thick skin. The Wolf has a thick skin and is subject to brown rot, but the DeSoto is not subject to that so much but more subject to the curculio. The Japanese hybrid plums, Mr. Williams said at one time—I saw in one of the reports—that he had Japanese plums enough to grow fifty bushels of plums, but he generally only got a grape basket full. He didn't think very much of them. In these sand cherry hybrids, I think Mr. Hansen has done all that man could do.

Mr. Ludlow: What is the difference between the brown rot and the plum pocket fungus?

Mr. Cook: Professor Stakman will tell you that in a later paper, but it is an entirely different disease. The brown rot will work the season through. It will commence on some varieties and work on the small plums and work on the plums half-grown and on the full-grown. The plum pocket fungus, it works on the plums in the spring of the year and sometimes takes the whole crop. The Terry plum, I think, a year ago, it took the whole crop.

Mr. Kellogg: What is the best spray you know of, how often do you apply it and when?

Mr. Cook: Which is that for, for the brown rot?

Mr. Kellogg: Yes, for the plum generally.

Mr. Cook: Oh, I don't know of any. Let me tell you something, the plum as a class is very susceptible to injury from sprays. I know when Professor Luger was entomologist there was some talk of spraying plums for curculio, and some tried it, and while it generally got the curculio it killed the trees, and Professor Luger said that the foliage of the plum was the more susceptible to injury from arsenical poisoning than that of any other fruit in Minnesota. The Japanese hybrid plums, I think, will take injury a little bit quicker than the native, and when you come to the sand cherry plums it is extremely dangerous to spray with anything stronger than rain water.

Prof. Hansen: I want to talk about the lime-sulphur. We will probably have that in the next paper, only I want to say that seems to have taken the place of the Bordeaux mixture. Brown rot, that is something that affects the peach men too. In the state of Ohio in one year the peach men lost a quarter of a million dollars from the brown rot, the same rot that takes our plums. We are not the only ones that suffer from the brown rot. Well, they kept on raising peaches because they learned to control it, and if you are not

going to spray I think you better give up. As to trying to get something that won't take the rot, it is something like getting a dog that won't take the fleas. (Laughter.)

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Mr. Older: I had considerable experience in putting out seedling plums. When large enough to get to bearing there wasn't a good one in the whole lot. I got some plums, the finest I could pick out, and three years ago they first came into bearing, and one of my neighbors went over there when they were ripe and said they were the best plums he had seen, but since then I have had none. I got some Emerald plums from Mr. Cook. They were nice plums, and when he came to see them he said, "I came to see plums, I didn't come to see apples," but the brown rot gets a good many of them. I had some last year, and just before they ripened the brown rot struck them, and it not only took all the fruit but got the small branches as well. I don't know what to do about the brown rot.

Mr. Drum: I would say that my experience was something like Mr. Older's with the sand cherry crosses. They grew until they were large and I sprayed them with lime-sulphur. I couldn't see any injury from that until they were grown, nearly ripe, and then in spite of me in a single day they would turn and would mummy on the trees. I had a Hanska and Opata and the other crosses, and they bore well. They were right close to them, and the brown rot didn't affect them particularly.

Mr. Ludlow: I would like to ask these experts what is the life of a plum tree. Now, an apple tree, we have them that have been bearing for forty years, but my plum trees that were put out less than twenty years ago, they got to be a thicket and they don't bear any large plums at all. I introduced years ago, if you remember, the Ocheeda plum, that come from seedlings that we found in the wild plum at Ocheeda Lake. It is a very fine plum. I had about twelve bushels this year, and I have never seen a bit of brown rot in that variety of plums, although the other varieties, if they bore at all, they were brown rotted all over. The Ocheeda plum has a very thin skin, and when the rain comes at the right time and the sun comes out they all split open. That is its fault. But my orchard is getting old; it is twenty years old. I had a young man work for me, and he left me and bought a new place. I told him he could take up all the sprouts he wanted of those Ocheeda plums. He did so and put out an orchard of them. I think that was about ten years ago. This year while my plums didn't average me, my Ocheedas didn't average, over an inch or an inch and an eighth in diameter from that old orchard—he had sold out and gone to California—but from that orchard a man that never thinks of cultivating sold three wagon loads of the finest plums I ever saw.

Mr. Kellogg: How large were the wagons? (Laughter.)

Mr. Ludlow: Well, the ordinary wagon box. He hauled them and sold them in town. That was from an orchard that had been left without any cultivation.

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Mr. Philips: I have heard George Kellogg say you could prove anything in the world in a horticultural meeting. I was glad to have Mr. Cook say a word in favor of the DeSoto. The first plum I ever bought was a DeSoto thirty-five years ago. I planted it and never saw any brown rot on it and had five bushels on it this year. George Kellogg saw it; I can prove anything by him. (Laughter.) Talking about Prof. Hansen's sand cherry crosses, I have a number of his trees. I have two in particular that are nice trees. My wife the last three years has selected her plums from these trees for preserving and canning. I never saw any brown rot on them. They are nice trees, and I propose to stick by Hansen as long as he furnishes as good stuff as that. The locality makes a great difference in this brown rot. Some of the smaller varieties of Prof. Hansen the brown rot takes. As some one has said, it will take the plums and the twigs after the plums are gone. It may be that the locality has something to do with it.

Mr. Cook: A year ago I was talking with some gentlemen in the lobby of this hotel here and among them was a gentleman from the Iowa society, and I was trying to urge and tell them about the great value of some of those hybrid plums. Mr. Reeves said to me: "Mr. Cook, if you were going out into the woods to live and could only take one variety of plum with you, what variety would you take?" If he said five or six different varieties I would have made a different answer but he said only one variety, and I said it would be the DeSoto, and his answer was, "So would any other man that has right senses about him."

Mr. Anderson: It was my pleasure some time ago, I think it was in 1896, to set out a few plum trees, DeSotos, and those trees grew and grew until they bore plums, and I was very much pleased with them. It was also my fortune about that time to sell plums that another man had grown, such varieties as the Ocheeda, the Wolf and the Wyant. They were such beautiful plums, and I obtained such beautiful prices for them, I was very much enthused over growing plums. I purchased a number of trees of that variety, but up to the present time I have never marketed a bushel of plums from any tree of that kind. The DeSotos bore plums until they died a natural death, which was last year.

Mr. Goudy: I have one DeSoto in my orchard which is seven years old, never had a plum on it, never had a blossom on it. What shall I do? (Laughter.)

Mr. Ludlow: Cut it out.

Spraying Plums for Brown Rot.

PROF. E. C. STAKMAN, MINN. EXP. STATION, UNIVERSITY FARM, ST. PAUL.

The brown rot of plum is without doubt one of the important limiting factors in plum-growing in Minnesota. In seasons favorable to its development, losses of from twenty to fifty per cent. of the crop in individual orchards are not uncommon.

Experiments on the control of the disease have been carried on by the sections of "Plant Pathology and Tree Insects and Spraying," of the Minnesota Experiment Station, since 1911. No accurate results could be obtained in 1912 and 1915 on account of crop failure in the orchards selected for experiment. Results are available for the years 1911, 1913 and 1914.

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Brown rot is caused by a fungus (*Sclerotinia cinerea (Bon.) Wor.*). Every plum grower knows the signs of the disease on the fruit. Blossoms, leaves and twigs may also be affected. The diseased blossoms become brown and dry, and fall from the tree; the diseased leaves become brown and may die. Young twigs may also be killed.

Infection may occur at blossoming-time. The amount of blossom blight depends very largely on weather conditions; in fairly warm, moist weather there is usually more than in drier weather. The same is true of the rot on the fruit; during periods of muggy weather it may spread with amazing rapidity. The rot does not usually attack the fruit until it is nearly or quite ripe, although green plums may rot, especially if they have been injured. It is important to know that a large percentage of rotted plums have been injured by curculio. Counts have shown that in many cases as much as eighty-five per cent. of the rot followed such injury.

Rotted plums should be destroyed for two reasons: (1) The spores produced on them may live during the winter and cause infection in the spring; (2) if the mummies fall to the ground, late in April or early in May of the second spring the cup fungus stage may develop on them. This cup fungus produces a crop of spores capable of causing infection.

Spraying experiments, the summarized results of which are given here, show that the disease can be fairly well controlled even in badly affected orchards.

Some of the experiments were carried on in the orchards at University Farm and some in commercial orchards. There were from twelve to forty-five trees in each plot, and the trees on which counts were to be made were selected before the rot appeared. The percentages given below refer to fruit rot and do not include blossom or twig blight. The object was to determine the times for spraying and the most effective spray mixtures. Details are for the most part omitted, and the results of various experiments are averaged.

For convenience the times of spraying are designated as follows:

1. When buds are still dormant. 2. When blossom buds begin to show pink. 3. When fruit is size of a pea. 4. Two weeks after third spraying. 5. When fruit begins to color.

It did not pay to apply Spray 1. In the plots on which applications 1, 2, 3 and 4 were made there was an average of 6.3 per cent. of rot, while in those from which Spray 1 was omitted there was an average of 6.7 per cent. rot, a difference so slight as to be negligible. Neither did Spray 4 seem to pay, there being an average of 10.9 per cent. brown rot when it was applied and 11.4 per cent. when it was omitted.

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The schedule finally adopted was therefore the application of Sprays 2, 3, and 5. Spray 2 is necessary to prevent blossom blight, although it has not always reduced the amount of rot on the fruit. Spray 5 is the most important in reducing the amount of rot. In all of the experiments during three years the average amount of rot in the sprayed plots which did not receive Spray 5, was 10.7 per cent. On the plots which received Spray 5, with or without the other sprays, the average amount of rot was 4.6 per cent., and the average on unsprayed plots was 34.8 per cent. Excellent results were sometimes obtained by applying only Spray 5, although this did not, of course, have any effect on blossom blight. In 1913 the amount of brown rot in one plot which received only Spray 5 was 3.3 per cent., while in the unsprayed plots it was 33.9 per cent. In 1914 the amount of rot was reduced from 38.8 per cent. in unsprayed plots to 6.5 per cent. in the plots to which Spray 5 was applied. Possibly Spray 3 could be omitted without seriously interfering with results; success in controlling the rot with Spray 5 alone seems to indicate this. It was hoped to settle the matter during the past summer, but spring frosts spoiled the experiment.

For the present it seems advisable to recommend the application of Sprays 2, 3, and 5. In the first two, two and a half pounds of arsenate of lead paste, or one and one-fourth pounds of the powder should be added to each fifty gallons of spray mixture in order to kill the curculio. In the plots sprayed in this way in 1911 ninety-six per cent. of the fruit was perfect, while in the unsprayed plots only 81.6 per cent. was perfect, and in 1913 and 1914 the amount of brown rot was reduced from 34.8 per cent. to 4.6 per cent. Several growers have reported excellent results from these three applications, and there is no reason why other growers should not duplicate them.

[Illustration: Brown rot of plums showing the small, grayish brown tufts of spores. Can be controlled by destroying mummies and thorough spraying.]

The efficiency of various fungicides was tried. Self-boiled lime-sulphur, 8-8-50; commercial lime-sulphur, 1 to 40; 2-4-50 and 3-4-50 Bordeaux; iron sulphide made up with 1 to 40 commercial lime-sulphur, and iron sulphide made up with 10-10-50 self-boiled lime-sulphur were tried and all gave good results. Commercial lime-sulphur, 1 to 40, has been used in commercial orchards with excellent results, and it will probably be used more than the other spray mixtures because it is so easy to use. Possibly weaker solutions of lime-sulphur would do just as well as 1 to 40. This will be determined, if possible, during the summer of 1916.

Good results were obtained only when a high pressure was maintained in spraying. There was a clearly observable difference between plots sprayed with low pressure and those sprayed with a pressure of more than 175 pounds. For large orchards a power sprayer is desirable; for small orchards a barrel sprayer with an air-pressure tank attached is large enough. Such an outfit can be bought for $35 or $40 and can do good work.

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The cost of spraying three times should not exceed fifteen cents a tree. The results from spraying orchards which contain a great deal of brown rot and have never before been sprayed will probably not be so good the first year as in better kept orchards, but by spraying regularly each season the disease can be well controlled.

Mr. Cashman: Please state what you mean by 3-4-50 there.

Mr. Stakman: 3-4-50 Bordeaux mixture means three pounds of bluestone or copper sulphate, four pounds of lime, and fifty gallons of water. The copper sulphate should be dissolved in twenty-five gallons of water, the best way being to put it into a sack and hang the sack in the water. The lime should be slaked and then enough water added to make twenty-five gallons of milk of lime. Here is where the important part of making up the spray comes in. Two people should work together and pour the milk of lime and the bluestone solution together so that the streams mix in pouring. It is very important that the mixing be thorough and the mixture should be used fresh.

The President: Do you add any Paris green at any time or arsenate of lead?

Mr. Stakman: Always add arsenate of lead two times, when the buds are swelling and when the plums are the size of green peas.

The President: How much?

Mr. Stakman: I would rather leave that to Professor Ruggles. We used from 2-1/2 to 3 pounds and Mr. Ruggles, I think, found 2-1/2 pounds was enough.

The President: That is, 2-1/2 pounds to 50 gallons of water with the other ingredients?

Mr. Stakman: Yes.

Mr. Dyer: I would like to ask if you have ever used arsenate of lead for spraying plums?

Mr. Stakman: In the experiments which we conducted in co-operation with Mr. Ruggles, of the Division of Entomology, we always used arsenate of lead in the first two sprayings to kill the curculio.

Mr. Dyer: I had quite an experience, so I want to know what your experience was.

Mr. Stakman: We never had any trouble with it.

Mr. Dyer: I have had an experience of thirty years, and I have never seen or had on my place any brown rot, and I never was troubled with any curculio, and I practically always used arsenate of lead.

Mr. Cashman: Isn't it a fact if you begin spraying your plum trees when they are young and spray them early, at the right time, you have very little trouble with the brown rot? And spray them every year?

Mr. Stakman: Yes, that is it. You might be disappointed the first year if the orchard had never been sprayed, but by spraying year after year you finally cut it down.

Mr. Cashman: You said a pressure of 200 pounds ought to be used?

Mr. Stakman: Yes, but it isn't necessary to get an expensive power sprayer to keep up that pressure. There are sprayers on the market that cost from $30 to $40 which have a pressure tank by which the pressure can be maintained at from 175 to 250 pounds without any great amount of trouble, that is, for a small orchard. If you have a big enough orchard for a power sprayer, of course get it.

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Mr. M'Clelland: This summer my plum trees, the leaves all turned brown and came off. What is the reason?

Mr. Stakman: When did it happen?

Mr. M'Clelland: Along in August, I think; July or August.

Mr. Stakman: What kind of soil were they on?

Mr. M'Clelland: Clay.

Mr. Stakman: Did you spray?

Mr. M'Clelland: Yes, sir, I sprayed.

Mr. Stakman: What did you use?

Mr. M'Clelland: Lime-sulphur, I think.

Mr. Stakman: Did the whole leaf turn brown?

Mr. M'Clelland: Yes, sir, the whole leaf turned brown and came off.

Mr. Stakman: How strong did you use the lime-sulphur?

Mr. M'Clelland: Not very strong.

Mr. Stakman: If you use very strong lime-sulphur you sometimes get such an effect on both plums and apples. Sometimes the leaves fall, and almost immediately you get a new crop of leaves.

Mr. M'Clelland: This was in August.

Mr. Stakman: There was a perfect crop of new leaves?

Mr. M'Clelland: Yes, sir.

Mr. Stakman: My only suggestion would be that you used the lime-sulphur too strong. That might account for it.

Mr. Sauter: I never sprayed until this year. I tried it this year and with good results. I sprayed my apple trees at the same time, and I sprayed the plums with the same thing I sprayed the apple trees with. I had nice plums and nice apples; last year I had hardly any.

Mr. Stakman: What did you use?

Mr. Sauter: Lime-sulphur and some black leaf mixture. I used it on the plum trees and the apple trees, and afterwards I used arsenate of lead.

Mr. Stakman: You didn't get any injury to the plum trees?

Mr. Sauter: No, sir, we had nice plums.

A Member: I have seventeen plum trees, and I have only sprayed with kerosene emulsion and the second time put in some Paris green, and I have never seen any of the brown rot, but there have been a good many of the black aphids on the plum trees, on the end of the branches. I cut them off and burned them. I didn't know whether that would be the end of it or not.

Mr. Ruggles: Why don't you use "black leaf 40," 1/2 pint in 50 gallons of the spray liquid. It can be used in combination with arsenate of lead and lime-sulphur or arsenate of lead and Bordeaux mixture.

If you wash them with black leaf 40 it will kill all the aphids. I did that myself this summer.

A Member: Please give us a little better explanation of what black leaf 40 is.

Mr. Ruggles: It is an extract of tobacco that is for sale by wholesale drug companies and stores, or you can get it from Kentucky, from the Tobacco Products Company, at Louisville, Ky., or Grasseli Chemical Co., St. Paul. I am not advertising, Mr. President, but they will send you a small package for seventy-five cents, about half a pint. Of course, that looks kind of expensive, but it will go a long way. I think possibly it is the best thing we have to combat lice.

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Mr. Stakman: Plum pocket is caused by a fungus which is supposed to infect mostly when the flower buds are just beginning to swell, especially in cold, wet weather. Plum pocket causes the fruit to overgrow and destroys the pit, and big bladder or sack-like fruits are produced instead of the normal fruit. The fungus that causes it gets into the twig and is supposed to live there year after year. Therefore pathologists usually recommend cutting out and burning affected branches and even trees that bear pocketed plums several seasons in succession. Our experiments with plum pocket have not extended far enough to enable me to say anything definite about it.

Mr. Hall: With us in western Minnesota this year this plum pocket got all the plums that the frost didn't get. If we were to cut off the twigs we would have to chop off the trees.

Mr. Stakman: When a tree becomes so badly infected that practically all of the branches produce pocketed plums year after year you can't expect very much normal fruit. Sometimes you might get some, but usually not very many.

Mr. Graves (Wisconsin): Do you use your black leaf 40 in conjunction with your Bordeaux or lime-sulphur?

Mr. Ruggles: Yes, you can.

Mr. Graves: Doesn't it counteract the result?

Mr. Ruggles: No, it does not.

Mr. Stakman: I used this year lime-sulphur and black leaf 40 together.

Mr. Graves: You say you got the same results from black leaf 40 in that mixture?

Mr. Stakman: It killed the plant lice; that is all I wanted.

Mr. Graves: We had some experiences that indicated that black leaf counteracted the other results.

Mr. Stakman: Yes, sir, I think that has been the impression, but I think there have been some experiments more recently to show that the black leaf 40 can be used in conjunction with other sprays without counteracting their results.

Mr. Richardson: Did you ever know the plum pocket to come unless we had cold weather about the time of blossoming and lots of east wind?

Mr. Stakman: Yes, a little; I have seen it mostly when there was cold weather, however, and as I said before it usually isn't so serious unless there is cold, wet weather.

Mr. Richardson: I settled out in Martin County, Minnesota, in 1866, and in all my experience I never saw plum pocket unless we had the right kind of cold weather at the time of the blossoming. I had my plums all killed and destroyed one year and never did anything for it, and when we had the right kind of weather I never had any trouble.

Mr. Stakman: When you have cold, wet weather, as I mentioned before, infection takes place much more rapidly than it does at other times. There is some evidence to show that the fungus lives in the twigs and that affected ones should be cut out.

Mr. Richardson: Yes, but these didn't bear any for four or five years, and when we got the right kind of weather I got good plums.

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Mr. Norwood: My experience is something like this man's. I have had my plums killed off as many as five years with the plum pocket and then had a good crop of plums. I sprayed with lime-sulphur.

Mr. Stakman: When did you spray?

Mr. Norwood: I spray just before the buds open.

Mr. Stakman: The flower or leaf?

Mr. Norwood: Flower, and then I spray when the plums are well started, just before they begin to ripen.

Mr. Stakman: Were you spraying for the pocket or brown rot?

Mr. Norwood: I used lime-sulphur and arsenate of lime.

Mr. Stakman: Of course, spraying after buds open wouldn't do any good for the plum pockets at all.

Mr. Norwood: I spray mainly for the brown rot, and I have pretty good luck.

Mr. Cashman: Have you had any experience in using orchard heaters to save plums in cold nights?

Mr. Stakman: I will ask Mr. Cady to answer that.

Mr. Cady: No, I haven't tried to use them.

Mr. Cashman: We tried it this year, and we saved our plum crop. We have tried it the last four years and saved our plum crop each year. We also sprayed each year and had a very good crop of plums when neighbors who had not sprayed had very few, and I am satisfied if we use the proper ingredients and spray properly at the right time, and occasionally use an orchard heater when there is any danger of freezing, that we will raise a good crop of most any plum that is hardy enough for this climate.

A Member: What kind of heaters do you use?

Mr. Cashman: We use oil heaters. We use crude oil, the same oil we use in our tractor engine.

A Member: Where do you buy your heaters?

Mr. Cashman: We have them made at the hardware store, of sheet iron, with a cover. We put about two gallons of oil in this heater. There is a small piece of waste that is

used as a wick, which we light from a torch. It will heat quite a large space sufficiently for two or three hours and prevent frost.

Mrs. Glenzke: Do you put a canvas over the tree or leave it uncovered?

Mr. Cashman: We do not put anything over the tree.

Mr. Stakman: What does your oil cost?

Mr. Cashman: About eight or nine cents a gallon.

Prof. Hansen: Just a thought occurred to me that out west on the Pacific coast where men have to get down to business in order to raise fruit they have these horticultural commissioners that have absolute police power to make orchard men clean up. They will come into your old orchard and pull it up and burn it and add it to your taxes, charge it up to you, if you don't clean up. The same sort of police power should prevail here. If a man has an old plum orchard that is diseased through and through, it won't do for him to tell his tale of woe year after year and not do anything. A county agent will come along and clean it up for him. After it is cleaned up it will be an easier proposition. If you are not going to keep up with the times and spray, then the county agent ought to have police power to burn the orchard. Either spray or go out of the plum business.

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TO MAKE CONCENTRATED APPLE CIDER ON A COMMERCIAL SCALE.—The specialists of the fruit and vegetable utilization laboratory of the department have completed arrangements for a commercial test of the recently discovered method of concentrating apple cider by freezing and centrifugal methods. As a result, a cider mill in the Hood River Valley, Ore., will this fall undertake to manufacture and put on the retail market 1,000 gallons of concentrated cider, which will represent 5,000 gallons of ordinary apple cider with only the water removed.

The new method, it is believed, makes possible the concentrating of cider in such a way that it will keep better than raw cider, and also be so reduced in bulk that it can be shipped profitably long distances from the apple growing regions. The old attempts to concentrate cider by boiling have been failures because heat destroys the delicate flavor of cider. Under the new method nothing is taken from the cider but the water, and the resultant product is a thick liquid which contains all the apple-juice products and which can be restored to excellent sweet cider by the simple addition of four parts of water. The shippers and consumers, therefore, avoid paying freight on the water in ordinary cider. In addition, the product, when properly barreled, because of its higher amount of sugar, keeps better than raw cider, which quickly turns to vinegar.

The process, as described by the department's specialists, consists of freezing ordinary cider solid. The cider ice is then crushed and put into centrifugal machines such as are used in making cane sugar. When the cider ice is whirled rapidly the concentrated juice is thrown off and collected. The water remains in the machine as ice.

At ordinary household refrigerator temperatures this syrup-like cider will keep perfectly for a month or six weeks, and if kept at low temperatures in cold storage will keep for prolonged periods. At ordinary house temperatures it, of course, will keep a shorter time.

To make the concentrated syrup, the cider mill must add to its equipment an ice-making machine and centrifugal machinery, so that the process is not practicable on a small scale. The specialists are hopeful, however, that the commercial test soon to be inaugurated in Oregon will show that it will be possible for apple growers to concentrate their excess cider and ship it profitably to the far South or to other non-producing regions. The specialists also believe that it will enable apple producers to prolong the market for cider.—U.S. Dept. of Agri., Oct., 1914.

How Mr. Mansfield Grows Tomatoes.

MRS. JENNIE STAGER, SAUK RAPIDS.

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Somewhere around 1870 Mr. Wm. Mansfield, of Johnsons Creek, Wis., commenced to apply what Gov. Hoard, of Wisconsin, told him was “persevering intelligence,” to the propagating and improving of the tomato, and he soon found out that the tomato was capable of almost unlimited improvement. He has made a specialty of the tree tomato, of which he says he has demonstrated to the world that in the Mansfield tree tomato he has produced one of the greatest wonders of the age. All who have seen them, tasted or grown them, with even a small degree of good sense, are loud in their praise for their good qualities: wonderful growth of tree, beauty of fruit, smoothness, solidity, flavor, earliness, *etc*.

In giving directions how to grow them he says you should remember that if your brightest child is raised among Indians he is not likely to become president. Neither will the tree tomato if thrown on a brush pile, or just stuck in a poor, dry place and left to care for itself, be ready to jump on your table, on the Fourth of July, or any other month, a ripe, delicious, two-pound tomato.

He says first get your seed of some reliable person, who can warrant it pure and all right. Then at the proper time, which in this climate would be some time in March, get some rich old earth for boxes in your house, hotbeds or greenhouse. Sow the seed, cover lightly, wet down every day and keep warm, with all the sun possible. When up ten days transplant to other boxes, six inches apart, and not less than four inches deep. Keep wet and give all the light and sun you can, and by the time it is safe to set them outside they should stand from twelve to twenty-four inches in height, with bodies half an inch thick.

To prepare the ground.—First select a place as near water as possible, and also, if you can, let your rows run east and west. Throw out dirt two spades deep, then put in three or four inches of night soil if you can get it, if not use hen manure and wood ashes, equal parts, or some other strong manure, in the bottom of trench. Then fill up the trench with the best dirt you can get, mixed with well rotted stable manure, as no fresh manure must come near the roots or bark to rot them.

Now set out your plants without disturbing the dirt about the roots. Set eighteen inches apart in the row and have the dirt in the trenches a little lower than at the sides. Place a strong stake at each plant or a trellis and tie them to it as fast as set. Then if it does not rain use hard, soft, cold or warm water and give plenty each day. As your plants commence to grow, just above each leaf will start a shoot. Let only the top of the plant, and only one or two of the best branches grow, so as to have not over one or two of the best stems to run up. Now the buds for blossoms show themselves on the tops of the vines, and a few inches below. Just above each leaf, a shoot starts; nip off every one of these just as soon as they appear. As the lower leaves get brown and old pick them off. Train the fruit as it grows to the sun. Tie often and well. Let no useless wood grow. Give all the sun possible and water, water and then water. Then you can take the cake on tomatoes.

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[Illustration: Wm. Mansfield and his big tomatoes, Casselton, N.D.]

Mr. Mansfield's record twenty-six years ago, at Johnsons Creek, Wis., was: Height of tomato tree, eleven feet. Weight of single tomato, two pounds six ounces. He says, since he has moved to North Dakota, his tomato has in no wise deteriorated.

Annual Report, 1915, Central Trial Station.

PROFS. LE ROY CADY AND R. WELLINGTON, UNIVERSITY FARM.

Since the coming of Prof. Wellington to the Station to take up the pomological and vegetable divisions the work of this Station, has been divided, Prof. Wellington taking the fruit and vegetable experimental work, while Prof. Cady continues the work in ornamentals, and on that basis the reports will be made this year.

Ornamentals.—The campus of University Farm has been very much enlarged this year by the building of the Gymnasium, and consequent parking about it, and the grading of an athletic field. This will call for considerable planting work next spring.

The season has been exceptionally good for the growth of all ornamental stock. All came through last winter in good shape. A late frost killed many of the early flowering plants, and this prevented the forming of fruit on such plants as barberry and wahoo. About 400 seedling paeonies flowered again this year. Some of these are promising. An excellent block of aquilegia was flowered. A trial ground of some hundred or more annuals was maintained and proved very interesting. It is hoped that many more annual novelties may be tried out this year. The perennial garden established last year was added to and furnished something of interest the whole season. It will be the aim of the Division to have in this garden all the annuals and perennials of value in this section. Some new shrubs were added by purchase and through the Bureau of Plant Industry. The hedges have proved an interesting exhibit again this year, and it is planned to add a number of new ones to the group next season. About seventy-five varieties of chrysanthemums were flowered this autumn and were much enjoyed by our visitors.

Fruit.—This year has been a very poor fruit year owing to the freeze on May 18, when the thermometer dropped to 26 degrees Fahrenheit. At that time a very promising crop of apples was frozen on the trees. Currants and gooseberries were also frozen on the bushes, and the young shoots were frozen on the grape vines. Later the grape vines sent out secondary shoots which bore a small crop of late maturing fruit. Regardless of the heavy freeze an apple was found here and there throughout the orchard, although no one variety seemed to be particularly favored. On one-year-old Compass and Dyehouse cherry trees a few fruits were borne, and a similar amount of fruit was produced on one-year-old Sapa and Skuya plums. The old plum seedling orchard, which is located to the south of the college buildings

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and is partially protected by a wooded hill to the north, gave about five per cent of a crop. The one-year-old raspberries and blackberries bore a small crop, and the new strawberry bed, containing over 150 varieties, yielded a good crop. Records were made on the blossoming dates of practically all the varieties grown at the Station, and complete descriptions were made of all the strawberry flowers, fruits and plants.

[Illustration: Class in propagation at work at Minnesota State Agricultural College.]

Plants were taken from the strawberry bed and used for setting out a new bed, which is located on level and uniform ground. By another year sufficient data should be at hand to report on the performance of the varieties tested.

The aphids were very numerous and unfortunately caused the defoliation of all the currants with the exception of the blacks. A new sidewalk through the currant patch necessitated the transplanting of about one-half of the varieties, and so the prospect for a good currant crop next season is poor. The mildew attacked the Poorman gooseberry very severely but did practically no damage to the native varieties, as the Carrie and Houghton. Blight was a negligible factor, and what little appeared was removed as soon as noted. This year's rest, especially as it has been coupled with a good growing season, should be very favorable for an abundant crop in 1916.

In summing up the varieties at the Trial Station, it is of interest to note that the following number are under observation: 235 apple, 1 apricot, 15 cherry, 3 peach, 6 pear, 70 plum, 23 blackberry, 3 dewberry, 14 red currant, 3 black currant, 2 white currant, 13 gooseberry, 26 grape, 4 black raspberry, 22 red raspberry, 1 purple raspberry and 157 strawberry.

Vegetables.—The vegetable work has been concentrated on the bean, cucumber, lettuce, pea, onion, potato and tomato. The chief work with the bean and pea has been to isolate desirable canning types from the present varieties. Selection has also been carried on with the lettuce, with the object of securing a head type which matures uniformly. Onion bulbs of various types have self-fertilized, and desirable fixed strains will be separated if possible. Incidentally, the inheritance of various types and colors of the onion is under observation. In the tomato the influence of crossing on yield and earliness has been studied. Increases nearly as high as five tons have been obtained, and the prospects are very bright for securing valuable combinations for gardeners who use greenhouses and high-priced land. Results of this work will probably soon be published in a station bulletin.

[Illustration: Chrysanthemums in flower in University Farm greenhouses.]

A better type of greenhouse cucumber is being sought by combining the European and White Spine varieties. From past experience the author knows that a uniform type that is well adapted to market purposes can be obtained, and the only question will be its productiveness. Unfortunately hybridizing was not performed early enough in the season, and disease prevented the making of crosses. This coming season the work will be repeated.

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The main work of the year has been on the potato, and the chief problem has been on the determination of the cause of degeneracy. Incidentally, many varieties have been tested, and the exchange of seed with the Grand Rapids, Crookston and Duluth stations has been started. If possible, the effect of varying climatic and soil conditions on the potato will be noted.

A few vegetable varieties have been tested and among them the Reading Giant, a rust-proof asparagus, has proved promising. Malcolm, the earliest Canadian sweet corn, ripened very early and will be tested further. Washington, a late sweet corn ripening between Crosby and Evergreen, made an exceptionally good showing and may prove of much value for market purposes. The Alacrity tomato was found to be similar to the Earliana and superior in no way. Bonny Best and John Baer tomatoes produced smooth, desirable fruit and are deserving of a wide test.

The much advertised “seed tape” was given a trial, and it proved satisfactory in most cases. For kitchen gardeners who are ignorant of planting distances, methods of planting and varieties, and who can afford to pay a higher price for their seed, the tape may prove of value, that is, if a high grade of seed is maintained.

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A CORRECTION.—In O. W. Moore’s interesting article on “Sexuality in Plants,” which appeared in the November (1915) number of The Horticulturist, two errors were present. The first is merely typographical, as Kaelreuter’s name, page 411, should be spelled Kolreuter. The second, however, is misleading, as it states that the process of fertilization is called “Mendel’s Law.” It is true that Mendel’s Law is based upon fertilization, but it concerns simply the splitting up of certain characters into definite mathematical proportions. For example, Mendel found that when he crossed a yellow and green pea the first generation produced only yellow peas. These peas when self-fertilized split up into practically three yellows to one green. By self-fertilizing the progeny of the second generation it was found that one-third of the yellows bred true for yellow, and two-thirds of the yellows broke up into yellow and green, showing that they were in a heterozygous condition, and that all the greens bred true for green. At the present time this method of segregation has been proved to hold for many easily differentiated characters in both the animal and plant kingdom, but much more experimental work will have to be done before it can be said to hold for all inheritable characters.—Prof. Richard Wellington, University Farm.

Rose Culture.

MARTIN FRYDHOLM, ALBERT LEA, MINN.

(Annual Meeting, 1916, So. Minn. Hort. Society.)

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Rose culture is one of the most fascinating occupations in the line of horticulture. But when you come to talking or writing about it you scarcely know where to begin or what to say, there passes before your eye an exhibition of such an amazing fragrance and beauty of varying colors. Even now as I am writing these lines I can see with my mind's eye every rose in my garden, some in their full glory, filling the air with the sweet fragrance; others just opening; others in bud; and so on in an ever pleasing variety. I have taken special interest in roses for some ten or twelve years and have grown a good many different varieties of them with success, good, bad and indifferent. I have succeeded well with some of the hybrid perpetual roses. At the present time I have in my garden Paul Neyron, General Jacquiminot, Ulric Brunner, Black Prince, Etoile De France, Frau Karl Droschky and Marshall P. Wilder, also others of which I have lost the names. Of climbing roses I have Crimson Rambler, Thousand Beauties, Prairie Queen and Dorothy Perkins. All the above named are everbloomers, except the climbers, and all need careful winter protection.

How to grow them.—Get two year old No. 1 plants and prepare your soil just like you would for your vegetable garden. If your soil is not particularly rich, spade in a liberal quantity of well rotted manure and mix well with soil. Set your plants and keep up clean cultivation all summer and give them plenty of water, and you will have an abundance of roses the first year. In the fall get some clean straw, bend your rose bushes over, put a fence post across on top of them to hold them down and then cover with straw to a depth of one foot. Or if you have a number of them planted in one row, make a long box about two feet wide and about twenty inches deep, fill about half full of straw, then place along side of the row of plants, bend your plants down lengthwise the row, then tip the box over them, put some straw around sides of box and on the outside put some posts or boards on to hold it down, when you will have the best protection possible. Right here I want to put in a word of warning, and that is, if you do not like to do extra work don't attempt to grow roses; in other words, if you are lazy they don't like you well enough to stay with you, for it means work and lots of it.

We have, however, one class of roses which can be grown by every one who wants them, the hybrid Rosa Rugosa roses. Of them we have such as Blanche D. Caubet, pure white of large size, a perpetual bloomer; Sir Thomas Lipton, also white, a little smaller in blossom but perfectly double; Conrad Meyer, clear silvery pink, of large size, very double and of choicest fragrance, a continuous bloomer (needs some winter protection); New Century, rosy pink, shading to almost red in the center, good size and double. One of the hardiest is Hansa, deep violet red, very large, double and an exceedingly profuse and continuous bloomer, absolutely hardy. These five varieties can be considered as everybody's roses, because of the easiness and sureness with which they can be grown, taking into consideration the elimination of winter protection. Planting, preparation of ground and cultivation are the same as for all other roses. Do not imagine for a minute that they will do well in sod or grass.

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[Illustration: Martin Frydholm in his rose garden, at Albert Lea.]

Another class of roses is the Baby Ramblers. For borders and bedding roses these I think surpass all others on account of the easiness by which they may be grown. And they are a perfect mass of blossoms from June till freezing. They need winter protection, but that is not difficult on account of the low growth and small size of plant.

Above all do not forget that all roses need rich soil and lots of water. When your rose bushes are three years old you must begin to give some attention to trimming. Cut out some of the oldest wood before you lay them down in the fall, and if some of the shoots have grown very tall cut back about half, although these rank canes may give you the best roses the following season if you can protect them well enough so that they do not winter-kill. In this photograph which is shown here is one Ulric Brunner with one shoot extending two feet above my head and covered all along with the most magnificent roses I have ever had in my garden. The same thing I have done with the General Jacquiminot.

Asparagus by the Acre.

E. W. RECORD, MARKET GARDENER, BROOKLYN CENTER.

First I am careful about selecting seed of a good variety. My choice is Palmetto, because it is hardy and the best seller on our market. In starting a bed I sow my seed as early as possible in the spring in rows about eighteen inches apart, and when the plants are well up I thin out to about an inch, so the roots will not be so hard to separate when ready to transplant. My experience has been that plants two years old are more easily handled than those one or three, because the one year plants are not matured enough, while the roots of the three year old have become too matured, and when separated too many of the roots are broken off.

In preparing the ground for asparagus I plow and then harrow it and mark it off so the rows will be five feet apart. I plow a furrow from fourteen to sixteen inches deep, throwing the dirt both ways. Then with my cultivator I loosen up the bottom of the furrow. I place the plants in the furrow about eighteen inches apart, being careful to spread the roots evenly over the bottom of the furrow, putting a little dirt over them to hold them in place. With my cultivator I keep filling in the furrow, at the same time plowing out the middle to keep down the weeds.

In fertilizing a bed of asparagus my experience has been that the best way is to plow a furrow between the rows, filling it with barnyard manure, then covering this with earth. Spreading the manure broadcast makes too many of the stalks grow crooked.

I never cut my asparagus for market until the third year, and then only for a short time. By the fifth year the bed is strong enough to cut the whole season. When the season is

over I cultivate often enough to keep down the weeds. I never cut the old stalks off until spring, because after the first freeze the stalks are hollow, and this would allow the frost to run down into the roots.

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Annual Report, 1915, Vice-President, Second Congressional District.

JOHN BISBEE, MADELIA.

A summer remarkable in many respects has passed. Many of our people have labored hard, and the rewards of that labor have been meager and unsatisfactory. Horticulture with all the other labors on the land has been rewarded like the other cultivators of the soil in our section of the state. I sent out twenty-five of the circulars and twenty were filled out and returned.

Apple raisers report, four a good crop, the balance poor or none.

Plums: One fair, others poor or none.

Cherries: One good, all others poor.

Grapes: One good, balance poor to none.

Blackberries: One good, balance poor to none.

Other fruits all poor.

Nursery stock: One place reports one car load planted, the balance a few, all making good growth.

Strawberries: Five report good crop, balance few to poor.

Blight: Some reported but little efforts made to eradicate.

Fruit trees did not suffer much last winter (1914-5). All report plenty of moisture in ground.

Varieties of apples doing best: Wealthy, Duchess, Longfield, Salome, Spitzenberg, Northwestern Greening, Anisim, Malinda, Hibernal, Jonathan.

Spraying neglected very largely.

I am doing all of the top-working I can get done every spring.

Am setting largely the Salome. I find the tree hardy here; a moderate bearer; apples fine and handsome; a good keeper; tree does not blight and grows very thriftily. It grows on a great share of the stocks in which I have placed it.

My next best apple is the Spitzenberg. I am not placing many Wealthy scions, as I have about all I want of them.

I tried thinning the fruit on some of my heavy bearers last summer and like it much. I think the best way to do it is to cut out the fruit spurs, as that can be done in the winter.

Annual Report, 1915, Vice-President, Fifth Congressional District.

CHAS. H. RAMSDELL, MINNEAPOLIS.

The horticultural interests of the Fifth Congressional District (of which Minneapolis is the largest part) comprise three lines of activity, the raising of fruit, vegetables and flowers for home supply and profit, ornamental horticulture for pleasure and the city marketing of the produce of this and every other region, furnishing whatever is demanded by a large metropolitan market. Therefore, I will report along these lines.

[Illustration: Chas. H. Ramsdell.]

Judging from the reports of my correspondents throughout the country, the “freeze” in May was responsible for a rather complete absence of local fruit the past season. Sheltered orchards and those on the south side of any lake bore a small crop. Of apples, the Wealthy and Malinda are mentioned as bearing fairly well. Plums were entirely a failure, cherries are not raised to any extent, grapes and small fruits were not enough to supply the market as a whole. Raspberry and strawberry growing seems to be on the decline, owing to the prevalence of insect pests which do *not* receive attention to keep them in check. The importance of this is all the more apparent, because with the shorter distances of this district being the rule, the danger from rapid spread is more pronounced.

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The growing conditions of the season have been of the best, and all stock goes into the winter in excellent shape with a good amount of soil moisture and a promise for better conditions next season.

Several market reports have been received which give valuable information. Prices of fruit, vegetables and floral stock have been low in almost all cases. The public demand has been rather below normal, although it has been steady and fair in volume. There seems to be a good deal of complaint about the care of the railroads, *etc*., with fruit and perishable products, but, on the other hand, a good deal of local produce is not put up in good shape. The uniformly good packing of western fruit reveals the cause of its popularity on the local markets. Certain kinds of fruit almost glutted the market this season, notably Florida grape fruit, western box apples and peaches. I quote one market statement as very pertinent:

If Minnesota apple growers would gather their apples before they are too ripe, carefully grade and pack uniformly through the barrel, thus making it possible for the wholesaler to ship out on orders, they would undoubtedly realize more for their product than to market them themselves in the usual manner in which apples are marketed.

Ornamental horticulture in my district is making rapid progress. Large lots of nursery stock are yearly put in with excellent results. The influence and interest of the “Garden Flower Society” and of these horticultural meetings is nowhere more felt than in Hennepin County. The gardens of the Minneapolis park board, in Loring Park, at Lyndale Farmstead, and near the Parade and Armory, give the horticultural public much valuable information. Even the wild flower garden in Glenwood Park is yearly receiving an increasing number of visitors. The increasing use of perennials is creating a new gardening enthusiasm. The perennial exhibit at the summer meeting of the Horticultural Society was worthy of much study. Careful use of hardy evergreens is increasing also, adding value especially to our winter landscapes. This season has been very favorable to gardening work and steady has been the progress made.

Greater care with insect pests, and better methods of preparing fruit for market seem to be the two greatest needs of the horticulturists of the Fifth District.

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APPLE PRODUCTION AND PRICES.—According to the best authority available, the apple crop in the United States for 1915 promises to be about 22,500,000 barrels, says The Niagara County, New York, Farm Bureau News. This will be the lightest crop in several years, the 1910 crop being the next lightest, when about 24,000,000 barrels were produced. In comparison, the 1914 crop was about 45,000,000 barrels and the 1913 crop about 30,000,000 barrels.

The above refers to the commercial crop that is marketed in closed packages, and should not be confounded with the recent estimate of the United States Department of Agriculture, which is understood to refer to the total production of apples, including those used for cider and shipped to the market in bulk.

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Annual Report, 1915, Vice-President, Sixth Congressional District.

E. W. MAYMAN, SAUK RAPIDS.

[Illustration: Residence of E. W. Mayman, at Sauk Rapids, Minn.]

This district comprises quite a large area, and a large amount of fruit of various kinds is raised. Besides the reports received, I visited a good many places where fruit is being raised and intended visiting more except for unfavorable weather. From all sources the reports were that all fruit trees, vines and other plants came through the previous winter in good condition, and that all fruit trees budded and blossomed earlier than usual. April being such a warm month caused this condition—and indications were for a record-breaking crop. But this was all changed after the severe freeze of May 17th, which destroyed nearly all blossoms of apple and plum and what promise there was of cherry and grape. The frost again on June the 8th did great damage to raspberries and strawberries, currants and gooseberries. From all reports received and from my own observation at my place I can sum up briefly as follows:

Apples not more than five per cent. of crop; crab apples, no crop; plums, from ten to fifteen per cent. of a crop; cherries, very few planted except the Compass and crop very light; grapes, not very extensively raised, Collegeville having the largest collection so far as I know, and at that place while the new growth had been frozen off still a second growth of new wood was formed and gave a light crop of fruit.

Blackberries: No crop reported.

Raspberries: There is in this immediate vicinity upwards of twenty acres or more planted of several varieties, but the crop was very light, and from other places the reports received were the same.

Strawberries: There is also quite a large acreage planted in this vicinity, but the crop the past season was very poor, except for the everbearing variety planted for experimental purposes. This variety did well and continued to fruit to November 1st.

Currants and gooseberries: Reports gave no crop to speak of, and at my place and in this vicinity while there is quite a large planting there was no fruit. This, of course, was owing to the frost as before stated.

Very little nursery stock has been planted except in small quantities here and there, yet there is great interest taken in fruit raising.

In regard to blight, none to speak of according to reports, and everything indicates a good healthy growth.

As to spraying there seems to be little done along that line, although some orchards have been sprayed.

All trees and shrubs and perennial plants planted the past season, as well as those previously planted, made an exceptionally good growth, owing, I think, to the cool, moist spring and continued cool summer. And, all wood maturing early, everything, I think, has gone into winter quarters in very good condition, and other things being favorable we may expect a good crop of everything next season.

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* * * * *

The following poisoned wash has proved highly satisfactory in the West and promises to be one of the most popular methods of protecting trees from rabbits:

Poisoned Tree Wash.—Dissolve one ounce of strychnine sulphate in three quarts of boiling water and add one-half pint of laundry starch, previously dissolved in one pint of cold water. Boil this mixture until it becomes a clear paste. Add one ounce of glycerin and stir thoroughly. When sufficiently cool, apply to the trunks of trees with a paint brush. Rabbits that gnaw the bark will be killed before the tree is injured.

Annual Report, 1915, Vice-President, Ninth Congressional District.

MRS. H. E. WELD, MOORHEAD.

The fruit crop in general throughout this district was not very good. The spring was late and cold with a heavy frost in June. Where the fruit trees were protected by a natural windbreak, we find the best conditions. Wilkin, Becker, Ottertail counties' reports indicate that the apple crop was small, but the fruit was of good quality.

[Illustration: Residence of Louie Wentzel, Crookston, life member and vice-president in 1914]

The varieties that are grown in this district in order of their importance and hardiness are the following: Hibernal, Duchess, Okabena, Patten's Greening and Wealthy. The hardier varieties of crabs are growing here. The Transcendent is the most popular crab. The Hyslop, Florence and Whitney are also grown.

But very little blight is reported in this district.

In localities where the trees have the protection of a windbreak there was a small crop of plums. The DeSoto, Forest Garden and Hansen hybrids are giving very good results. Even the wild plums were few, as the blossoms were hurt by frost.

Where there was windbreak protection the Compass cherry tree looks healthy and has given a fair crop.

Grapes have not been very generally planted. The Beta is the hardiest variety. The Concord does well where properly planted and cared for.

Raspberry bushes made a good growth and look healthy; although damaged by frost there was a fair crop.

Strawberries yielded fairly well where they were given attention. The Senator Dunlap, Warfield and everbearing plants should be more generally grown.

Gooseberries and currants were just fair in some localities, in others the late frost destroyed all prospects of small fruits. The Houghton and Downing gooseberries, Red Dutch and White Grape currants are some of the varieties planted.

In Ottertail, Wilkin and Beltrami counties a good deal of nursery stock has been planted and with very good success.

Very little has been done in the way of spraying orchards, as trees are young.

All fruits are going into winter in good condition, with fair amount of moisture in the ground and trees full of fruit buds.

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The hardy ornamental shrubs, honeysuckle, lilac, mock-orange and spirea Van Houttii can be grown here. Hardy perennial flowers that do well are peony, phlox, golden glow and bleeding heart. This northern section of the state is the land for the hardy perennials. Nowhere else do we get such beautiful colorings and bloom.

Annual Report, 1915, Madison Trial Station.

M. SOHOLT, SUPT.

This season has been very good. We have had plenty of rain, so that all nursery stock set out this last spring has made a good growth.

The first part of May a hard frost did quite a good deal of damage to small stock just planted or lined out in the nursery. This frost also damaged the blossoms on the fruit trees. The plum trees happened to be in full bloom when this frost came, so that froze them entirely, and so we did not get any plums to speak of. We also had a light crop of apples, especially of the early varieties. The Northwestern and Patten's Greening bore a good crop.

The grapes also froze. I expected to get some fruit off those grape seedlings I received from the State Fruit-Breeding Farm three years ago, but they went with the rest of it.

The plum trees I received this and two years ago are all doing well. They did not freeze back any when we had that hard frost; so far they seem to be hardy for this location.

Had a medium crop of raspberries, also a light crop of currants and gooseberries. We had a good crop of strawberries. Seedling strawberry No. 3 is doing very well. Everbearing strawberries are doing nicely. We had a nice fall and plenty of rain, so that trees and shrubbery went into winter quarters in good condition.

Growing Beans and Sweet Corn.

P. B. MARIEN, ST. PAUL.

Since it is one thing to grow beans and sweet corn and another to make money on them, I think from a market gardener's point of view my heading should have been "growing beans and sweet corn at a profit."

I will talk of beans first, because while the two are planted at about the same time, beans make their appearance on the market long before sweet corn.

Beans have a nitrogen gathering power and are therefore a soil-improving crop. They are to the gardener what clover is to the farmer. For early beans we have found that sandy soil well fertilized is by far the best. If possible it should be sloping toward the south, although we have had good success on level land well drained. One should

have the best seed possible, and if you get hold of a good strain of seed that produces nice, velvety beans earlier than your neighbor, save as much of that seed as you can. Of course now that the price of seed is $10.00 to $14.00 a bushel one cannot be too particular.

[Illustration: P. B. Marien, St. Paul.]

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Too much stress cannot be laid on the fact that to make money on beans one must have them on the market within a week after the first ones make their appearance. To do this one must plant them at the right time. The practical gardener knows that as he sits near the stove with the ground still frozen and a cold March wind blowing he cannot say “I will plant my beans on April 15 or on April 20.” It is impossible to set a date for planting. After the ground has been plowed and well tilled he must wait until it is well warmed. Sometimes it pays to take a chance, but we always wait until the buds appear on the white oak trees. However there is nothing infallible about this rule, but it is the one we generally follow.

As to kinds we have two wax beans which we have planted for many years: the Davis, which does well in wet weather, and the Wardwell Kidney, which does well in dry weather. Every variety of green beans we have ever grown has done well.

Rows three feet apart, with the hills about six inches apart, three or four seed in a hill, might take up too much room on a small scale, but where one uses horses to cultivate, I think it is about right.

Beans should be cultivated at least two or three times a week, and they should be hoed three times during the season. Never cultivate your beans while the dew is on, as it has a tendency to rust them.

While St. Paul has not offered a very good market for medium and late string beans in the last few years, it is a good plan to have a patch come in about every ten days. Because you happen to get from $2.50 to $3.50 a bushel for your first beans this year, do not resolve to put the whole farm into beans next year, for they might come three or four days later than your neighbor’s, and your profits might be like ours were one day last summer. I came to market with forty-eight bushels of beans. They cost twenty cents for picking. I sold thirty-two bushels at thirty cents and offered the remaining sixteen bushels at twenty cents, but found no sale for them. I brought them back home and to my surprise found two extra bushels, making eighteen instead of sixteen bushels. I concluded that someone had despaired of selling them and perhaps had poor success in trying to give them away and so forced them on me. However we consider we did well on our beans, as the first two pickings brought from $2.00 to $3.50 per bushel.

Now a few words about sweet corn. Along about the 6th to the 12th of July the truck gardener should load his first sweet corn. Sweet corn is of American origin, having been developed from field corn, or maize. No large vegetable is so generally grown throughout the country, the markets of the cities taking large quantities, and immense areas being grown for canning purposes.

Seed that fails entirely is not often found, but when one has a good strain that produces early corn it is best to save some.

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We generally have sweet corn to sell every day from about the middle of July until the first frost. To do this we plant every ten days from about the 20th of April to the 20th of June. Our early variety is the Peep-O'Day, which is planted about the same time as the early beans. We also plant the Golden Bantam at this time. This is followed by Red Cob Cory, Pocahontas and some more Bantam. Then about May 15th to 20th we plant early and late Evergreen, Bantam and Country Gentleman.

[Illustration: A load of vegetables at Marien's ready for market.]

Soil well adapted to common field corn will produce good sweet corn, thriving best on well fertilized land. Sandy soil is best for the early varieties.

Sweet corn is often grown in drills, but we prefer the hills three feet apart, as it is easier to get an even stand, and cultivating both ways will push the crop. It should be cultivated shallow and never deep enough to hurt the roots. It is well to hoe it once.

Sweet corn is one of the few vegetables which is quite free from serious injury from either insects or diseases.

Sweet corn may be divided into three classes: early, medium and late. It is very important that the various kinds come in as early as possible, as a few days make a lot of difference in price.

So you see that to make a profit on beans and sweet corn, four things are needed: good seed, planting at the right time, in the right kind of soil, and plenty of elbow grease —or hard work.

A member: How far apart do you plant your beans in the row?

Mr. Marien: The rows three feet apart and the hills six inches, putting three or four seeds in a hill.

A Member: Don't you recommend testing your seeds before you plant them?

Mr. Marien: Hardly the bean seeds. I don't remember of ever having found any poor bean seeds.

A Member: I mean seeds generally, corn, *etc*.?

Mr. Marien: Yes, sir, we do; we always test our seed.

Mr. Goudy: What is your method of harvesting your beans?

Mr. Marien: Well, we generally employ pickers, boys and girls, and we pay them about twenty-five cents a bushel when they are above a dollar and a quarter, and then we

keep going down; as the price goes down we go down too; but we have paid as much as thirty cents when the price of beans was high and it is important to get many on the market the next day.

[Illustration: Harvesting the hay crop at Marien's.]

Mr. Anderson: What are your gross receipts per acre for beans?

Mr. Marien: That is a hard question to answer, as sometimes it is very poor for the medium and late beans, and sometimes there aren't any receipts at all. (Laughter.) But the early beans sometimes go as high as $250.00 an acre.

Mr. Anderson: How late can you plant them and be sure of a crop?

Mr. Marien: We have planted them as late as the 15th of June.

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A Member: You mentioned Davis as your first variety. What is the second one?

Mr. Marien: The Wardwell Kidney. We always plant the two varieties at the same time because if we strike a wet season then the Davis does well, and the Wardwell won't do as well in wet weather but will do better in dry weather.

Mrs. Glenzke: Will you tell me the color of your beans? Are they golden wax?

Mr. Marien: Yes, some golden wax and some green string beans. We haven't as good a market for the green ones.

Mrs. Glenzke: Have they a string on the back?

Mr. Marien: Some have and some have not. There is the Bountiful, or the Thousand to One; that is a small green string bean that hasn't any string. But they are very hard to pick; so we don't raise many of them.

Mrs. Glenzke: Have you ever tried Golden Pod?

Mr. Marien: I think that is a wax bean?

Mrs. Glenzke: Yes.

Mr. Marien: Oh, we don't like them, at least not on the St. Paul market, because they are hard to pick. I don't know how it is in the Minneapolis market.

A Member: What is the best of the green kind?

Mr. Marien: We find that the Bountiful is a very good bean; and then there is also the Red Valentine.

A Member: Did you ever grow any Crusset Wax?

Mr. Marien: No, sir, I have not. Of course, there are some kinds that are just the same, but they go under different names in different places. Different catalogs will catalog the same seeds in a different way.

* * * * *

BEWARE BLIGHT CURES.—Almost every year orchardists are persuaded to try some new, so-called "blight cure" or preventative, only to find later that they have wasted time and money in the experiment. Government regulations regarding fake remedies of this character are more strict than formerly, but there are still some agents trying to dupe the public into buying their wares.

Blight, which is often referred to as apple blight, fire blight, or pear blight, is caused by bacteria which live in the sap of the tree, and the principle followed by the blight-doctor is to introduce something into the sap which will prevent the working of the bacteria. The remedies are applied in various ways. Sometimes the trunk is painted with a mixture of some kind, or holes are bored into the trunk and these filled with a powder. The orchardist is sometimes furnished with a box of nails as the first “course” and instructed to drive these into the roots of the trees.

It is evident that anything introduced into the sap that is strong enough to kill the bacteria living there will likewise damage the cell tissue of the tree, and result in more harm than benefit. One powder that has been brought to the attention of the Experiment Station, sells for $3.00 per pound, and is administered in teaspoonful “doses.” Such a preparation as this is probably harmless, but is a waste of time and money. It would have no effect on the tree or the blight.

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Some of the agents not only claim that their remedies will cure blight, but, due to ignorance or other causes, they also claim that trees treated will be immune from attacks of certain insects.

Orchardists may rest assured that up to the present time, no real preventative or cure has been found for blight, and that the only way it can be controlled is by cutting it out. —Colorado Agricultural College.

IN MEMORIAM—MRS. E. CROSS.

Mrs. Erasmus Cross, of Sauk Rapids, and a member of the Minnesota State Horticultural Society since 1888 (27 years), passed away at that place on Tuesday, December 28th. On December 16th Mrs. Cross sustained a painful injury by falling on the floor and breaking her hip. Owing to her advanced age, eighty-two years, the limb could not be set without the use of chloroform, which could not be given on account of weakness of the heart. Death finally released her from her suffering.

[Illustration: The late Mrs. E. Cross, daughter and grandaughters.]

Mrs. Jane Cross was always very enthusiastic about the Horticultural Society and the good it was doing, not only for this but other states. The ills of her age had prevented her from attending the meetings these late years, though she often did so in earlier years, but she always sent her fee through the writer, and eagerly awaited her return from the meeting to hear of its stimulating success. Mr. Cross died about six years ago. Two sons, James, of St. Paul, and Robert, of Sauk Rapids, and two daughters, Mrs. Annie Nicholson, of Hamline, and Mrs. Emma Sovereign, of Sauk Rapids, mourn her loss. Our society has lost a most loyal friend.—Mrs. Jennie Stager, Sauk Rapids.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

Notes from Prof. Alway's interesting and instructive talk on
"Maintaining the fertility of our gardens."

Requisites for proper plant growth are warmth, ventilation, root room, the absence of harmful alkalies or animals that destroy the beneficial bacteria in the soil, water and plant food.

By far the most important requisite for growth is water. More plants and crops fail because of the lack of a proper amount of it than from any other cause.

Plenty of fresh air is needed by the plants, as they derive a portion of their food from it.

They adapt themselves largely to conditions as to root-room, a plant thriving in a pot, but spreading to much greater root space when grown in the open with plenty of room. The more restricted the root space, the more food and water it will require.

The fourth requisite for growth does not concern us as there are no alkali lands in the counties near the Twin Cities, and the harmful minute animals that destroy the beneficial bacteria in the soil are as a rule found only in greenhouses.

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The best fertilizer for the garden is the thorough use of the hose.

Each year stable manures become harder to obtain, but the fertility of the garden can be maintained by the use of commercial fertilizers, which are more concentrated foods and are much easier to work with.

The perfect plant food consists of nitrogen, phosphorus and potash. We can obtain these in separate form and use as we need them.

Nitrogen comes in the form of a salt, called nitrate of soda, and in dried blood. The nitrate of soda is very soluble in water and is taken up at once by the plant. It can be scattered upon the ground near but not touching the plant, as in the latter case it would burn it. It can also be dissolved in water—a tablespoonful to a pail—and the ground, but not the plant, watered. Dried blood is slower in action and requires warmth, so should not be used early in the season. Nitrogen promotes quick and luxuriant growth of leaves and stems and is good to use when a green growth of any kind is wished.

In bone meal we find the phosphorus necessary to aid in the development of fine and many flowers, to expand root growth and to hasten maturity. It works slowly, so can be applied to the ground about a plant early in the season, and will be available in the ground the following year if enough is used. Equal parts of nitrate and bone meal can be used at the rate of one to two pounds to every one hundred square feet.

Potash is almost off the market, as a result of the war, the main supply being imported from Germany. It can be obtained from hardwood ashes, and every bit of these should be saved for the garden and stored in a dry place where they will not become leached out by the action of water.

April Spraying.—Snowball bushes and others that have been troubled with aphides, or plant lice, the previous year should receive a thorough spraying of Black Leaf No. 40 (an extract of forty per cent. nicotine) before the leaf buds expand. For this early spraying, two tablespoonsful of the extract can be used to every gallon of water. It will stick to the branches better if some soap is dissolved in it. This spray will kill most of the eggs of these pests, which will be found near the leaf buds. When the leaves open another spraying should be given to kill all those that escaped the first treatment. For spraying after the leaves open use one tablespoonful to each gallon of water.

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Meeting of the Minnesota Garden Flower Society, April 27th, St. Paul, Wilder Auditorium, Fifth and Washington Streets, 2:30 p.m.

Native Plants in the Garden
Shall We Collect or Grow Our Native Plants?
Roadside Planting.

BEE-KEEPER'S COLUMN.

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

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Bees are kept both for profit and for pleasure. The old fashioned beekeeper with his hybrid bees, kept in immovable hives, logs or boxes, did not derive much profit from his bees. He kept them mostly for pastime. During the last fifteen years men with new methods of management and modern equipment have been rapidly superseding the picturesque old beekeepers. Modern beekeeping courses are now taught in connection with our institutions of learning, and young men full of energy and ambition are beginning to realize that beekeeping is offering one of the few opportunities to make a comfortable living with a comparatively small expense. Older beekeepers, both on the farm and professional men, also are beginning to study beekeeping. They attend short courses, subscribe to scientific bee papers and study bee literature. With increased study and knowledge the whole status of the beekeeping industry is just now undergoing a rapid change. Professional beekeepers, men who devote their whole time to beekeeping, are increasing, and more amateurs are turning to professional beekeeping every year. Organizations of beekeepers now exist in nearly every state. Their object is to spread knowledge among their members and to secure better prices for their product by co-operative marketing. Contrary to fears of more conservative beekeepers the demand for a first class article of honey is increasing more rapidly than the supply. A national organization of beekeepers and bee societies is taking up just now national problems in connection with their industry and has succeeded in making the government interested in this “infant industry.” An appropriation of $200,000 has just been allowed by the agricultural committee of the Congress to develop beekeeping in localities where help is needed. The state of Minnesota allows an annual appropriation for beekeeping interests of $10,000, divided among the following branches: Bee inspection department, which takes charge of bee diseases, $2,000; state fair exhibits for premiums and maintenance of a bee and honey building in connection with our State Fair, $1,500. The Division of Bee Culture at the University Farm, which has charge of teaching, demonstration, extension work, research, queen rearing, correspondence, statistics and model apiaries, $6,500. Minnesota beekeepers should be grateful to those men who have helped them to raise their industry from a mere nothing, until we have become the acknowledged leaders in beekeeping among all the states of the Union. They, however, are rapidly following, nearly all states now have efficient bee inspection laws, and twelve universities have followed our lead and have included beekeeping in their curriculum.

But we must not be satisfied with what we have accomplished. Out of $14,000,000 worth of honey which this state produces (by figuring) only $1,000,000 worth are gathered every year, and beekeeping in the state must grow to fourteen times its present proportions before it will be anywhere near its possibilities.

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ORCHARD NOTES.

Conducted monthly by R. S. MACKINTOSH, Horticulturist, Extension Division, University Farm, St. Paul.

Minnesota orchardists are preparing for a full crop of apples this year. From the experiences of last year with apple scab and codling moth, more thorough spraying is to be done. Senator Dunlap stated an experience he had in spraying that should be carefully considered by all apple men. Nine rows of trees were sprayed on Monday or Tuesday. Owing to bad weather the other rows could not be sprayed until Friday or Saturday. What was the result? He had 175 barrels of No. 1 fruit from first part and only seventeen barrels of No. 2 in rows sprayed later. Some are planning their orchard work for the season along the following lines:

First: Pruning. To be done during the mild weather in March and April. Thin out all dead wood, interlocking branches, water-sprouts and shorten others. Pruning is to get the tree into better form to sustain a large load of fruit, to open the center to permit sunlight to get in to color fruit, and to permit of better spraying. There are too many trees in Minnesota that have never been touched by knife or saw. Such trees need attention, but the pruning should not be too severe at any one time. Begin this year to do a little pruning; next year do more; the year after a little more; and after that very little attention will be needed to keep the tree in good condition.

While pruning look out for rabbit and mouse injury. If good trees have been injured do some bridge grafting as soon as you can. This means connecting the healthy bark above the wound with the healthy bark below. Small twigs cut from the same tree, that are long enough to span the wound, are cut wedge shaped on both ends, and these ends put under the healthy bark. If possible cover the wounded area with earth. If too high up tie the scions in place and cover all cut surfaces with grafting wax and cloth. Several scions should be put in if the tree is large.

Second: Spraying. Three sprayings are needed on every bearing apple tree in Minnesota.

First spray: When the center of buds show pink. Don’t wait too long.

Second spray: When the petals have fallen.

Third spray: Ten to fifteen days after the second.

Use lime-sulphur and arsenate of lead each time. It is important to do this at the right time, in the right way, and with the right materials. Right is the word and not left-undone. Further particulars will be found on the page devoted to spraying topics.

Third: Cultivation. Follow the plan that is best suited to location. This may mean sod, part sod and cultivation, cultivation and mulch, mulch only, or cultivation and cover crop. Doubtless the last is the best in most instances.

Fourth: Thinning. The thinning of apples in Minnesota has not been received with as much consideration as its importance demands. More attention will be given to this topic in subsequent issues.

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HOME GARDEN.

What about the farm and home garden for 1916? Is the garden to receive the undivided attention of one or more members of each family, so that all members and guests may share its fruits? Let's make the home garden the best spot on every Minnesota farm in 1916. A conservative estimate of the actual value of the products from a half-acre garden is fifty dollars. In Minnesota there are over 150,000 farms. This would mean a total value of over $7,000,000. This does not include the value of the products of the village and city gardens. Careful estimates made in this state show that it costs about fifteen dollars for man and horse labor to take care of a garden of about three-fourths of an acre. Now for a BIG GARDEN MOVEMENT this year—for all the year. Not a big beginning kept up until the little weeds become big weeds. Is anyone going to allow weeds to outdo him?

NOTES ON PLANT PESTS.

Prepared by Section of Insect Pests, A. G. RUGGLES, and by Section of Plant Diseases, E. C. STAKMAN, University Farm.

Buy spray materials as soon as possible. The orchardist will probably notice very little difference in the price of his spraying materials, like arsenate of lead and lime-sulphur, as compared with last year; but those who still think that Paris green is the only good stomach insecticide, will be astounded by this year's price. At the present time, in one pound lots, the retailer cannot sell Paris green for less than 50c per pound—over twice what it was last year. In large quantities, it is doubtful if it can be purchased for less than 45c per pound. Fortunately arsenate of lead, a better stomach insecticide than Paris green, has not advanced materially in price, the powdered form being obtained for about 25c per pound. One and one-half pounds of this powder is used in fifty gallons of spray mixture. In our experiments, we have found arsenate of lead superior to Paris green as a remedy for potato bugs and all orchard insects. It is not necessary, therefore, to allow any injurious biting insect to live simply because Paris green is high in price. Arsenate of lead, if properly applied at the right time, will keep any of these insects in check.

A dormant wash does little good in controlling scab. Hence, on account of the high price of spraying compounds, do not spray when unnecessary.

Many diseases of nursery stock are controlled by spraying. Begin spraying as soon as leaf buds unfold, with lime-sulphur 1-40 or Bordeaux mixture 4-4-50.

Copper-sulphate has also advanced 15c or 16c per pound. Lime-sulphur has not advanced materially; therefore, plan to use lime-sulphur or some of the made-up (paste)

Bordeaux instead of Bordeaux mixture, whenever possible. *Potatoes can not be sprayed with lime-sulphur.*

The aphis problem is usually a very serious one, because they are such persistent little breeders. The trees or shrubs most affected are roses, snowball, currant, apple, plum and elm. The eggs of the plant lice pass the winter on the bark or buds of these plants and hatch as the buds begin to swell. Spray with the lime-sulphur (1-9) at this time. As soon as the leaves appear, spray with nicotine-sulphate as per directions on the container.

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If plum pocket was bad last year, the trees should be thoroughly pruned. Then spray with copper-sulphate, one pound to nine gallons of water, or lime-sulphur, one gallon with nine gallons of water, before the buds open. Follow with one to forty lime-sulphur or other spray as for brown rot. Control methods for plum pocket are not well worked out, so these methods cannot be depended upon entirely.

Be sure and look over the apple trees carefully; cut out and burn all cankers. Black rot has been increasing in the state, and since a great deal of early infection may come from cankered limbs, it is important that cutting out and burning be resorted to.

Last year the spring canker worm was just as active in the state as the fall canker worm; therefore, just as soon as possible, trees affected last year should be banded with the tree tanglefoot. The moths come out of the soil the first two weeks in April and at that time attempt to crawl up the trunks of the trees to lay their eggs on the limbs.

When raspberries are uncovered, be sure to cut out and burn all dead canes missed last fall. The gray bark disease and anthracnose, also snowy tree cricket and red-necked cane borer, are controlled in this way.

Plan to keep the young canes covered with a protective spray of resin-Bordeaux mixture. Try it on at least part of the patch. The benefit will not be apparent for a year.

Spray currants and gooseberries as soon as leaf buds begin to unfold, with either Bordeaux mixture 4-4-50 or lime-sulphur 1-40, to prevent powdery mildew and leaf spots.

For further information write to the section concerned. Inquiries will receive prompt attention.

SECRETARY'S CORNER

ANNUAL MEETING OF AMERICAN ASSOCIATION OF NURSERYMEN.—Information has reached this office to the effect that this national association will hold its annual meeting in Milwaukee June 28th to 30th. This is so near by that it ought to bring a goodly number of Minnesota nurserymen in attendance. For particulars in regard to the matter address John Hill, 204 Granite Bldg., Rochester, N.Y.

PASSING OF HANS KNUDSON.—Mr. Knudson, late of Springfield, Minn., was the originator of the Compass cherry, which has been generally planted throughout the Northwest these recent years. He grew this variety from a seed as a result of a handmade cross between the Miner plum and the sand cherry. Mr. Knudson had other seedlings of similar origin which we thought might be of value, but nothing has been since heard from them. News of his passing early in January has just come to this office.

THE MCINTOSH RED.—I think the McIntosh is quite hardy as a top-worked tree; there are two in my old orchard set in 1894, and they have shown no signs of injury. They were grafted on crab whips, but they were planted on a knoll, that while clay was within twelve to fifteen inches of a deep bed of sand. They have been shy bearers, but I think on a clay subsoil, such as I now have, they might prove good bearers. I would not be afraid to risk them as to hardiness.—F. W. Kimball, Waltham, Minn.

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REPORTS FOR MINNEAPOLIS MEMBERS.—Every member of the society is entitled to a copy of the annual report if desired. As there are not as many copies printed, however, as there are members, if every one asked for a copy we should be in trouble at once. Copies are mailed as promptly as possible after receiving membership fee to all members except those living in Minneapolis and those who come in as members of some auxiliary society. Minneapolis members are requested to call at the society office and secure the copy to which they are entitled, which will then get into their hands in a good deal better shape than though it passed through the postoffice. Members of auxiliary societies are entitled to a copy of the report, but only upon the prepayment of postage, which would be seven cents to points within 150 miles of Minneapolis and ten cents outside that limit.

SCIONS FOR TOP-WORKING.—Stark Bros. Nurseries, of Louisiana, Mo., have sent to us for use in testing on top-worked trees a quantity of scions of the following varieties: King David, Jonathan, Delicious, Stayman Winesap, York Imperial and Liveland Raspberry. These scions are to be used primarily to fill orders for top-working from members who have selected them as one of the plant premiums, No. 8. There will, however, be a considerable surplus, we believe, and as far as they hold out we shall be glad to send them out to members of the society who have trees for top-working, and know how to graft properly, upon receipt of postage stamps to the amount of postage and packing, which would be approximately ten cents. We are not sure that we can supply all who may ask for them, but to a limited extent we can do so. I would suggest promptness in making application for these scions. Address Secy. Latham.

WHO IS GROWING MCINTOSH RED APPLE?—Information from an interested member of the society is called for as to what success, if any, has been had in growing the McIntosh Red top-worked on hardy trees here in Minnesota. Scions of this variety have been sent out several years by the society and probably some have already come into fruitage, or perhaps they have been secured from other sources. Replies will be published. Address Secy. Latham.

NO PLANT PREMIUMS AFTER APRIL 1ST.—All members ordering plant premiums have undoubtedly noted this important condition that “all applications for plant premiums must be made prior to April 1st.” This condition will be strictly adhered to, and those sending in selections for plant premiums after that date need not feel disappointed if they do not receive them. It is absolutely necessary to make a definite date beyond which no applications will be received in order to work out successfully the problem of distribution which faces us at that time.

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TO MEMBERS OF AUXILIARY SOCIETIES.—Occasionally a member of an auxiliary society writes to this office asking for a copy of the annual volume of the society. Members of auxiliary societies are entitled to this volume, but the State Society does not pay postage on it, the amount received from auxiliary societies for memberships not permitting this expense. Any member of any auxiliary society who wishes to have a copy of the annual volume mailed from this office should send with the application postage at the rate of seven cents if within one hundred fifty miles of Minneapolis, and ten cents to points in the state more than one hundred fifty miles from Minneapolis.

BUY NURSERY STOCK AT HOME.—There are always more or less agents of foreign nurseries, that is nurseries located outside the state, canvassing for orders of nursery stock in our state, and many citizens are also tempted to reply to advertisements of outside nurseries who are trying to secure business in Minnesota. It is not my purpose to condemn these outside nurseries nor their methods of doing business, which in most cases undoubtedly are honorable and straight forward. But there is a real advantage in buying nursery stock at home, that is, from nurserymen located in our own state, and especially from nurserymen who are in the immediate vicinity. There is no class of goods that one can buy in connection with which there is such opportunity for mistake and fraud as in nursery stock. It is impossible for any but an expert to tell by the appearance of a tree or plant of any kind what the variety is, and either through mistake or purposely it is no uncommon thing for those purchasing trees to be disappointed as to the names of varieties when they come into fruitage or flower. If the nurseries are in our own state, or in our vicinity, it is a very easy matter to get at them, and they will almost uniformly be found willing to make good such blunders, or if they don't and the matter is worth while they can be made to do so. Don't place your orders outside of the state if the things you want can be purchased at home. You will find it a real advantage to act on this counsel. Especially in the case of strawberry plants the element of distance is a very important one as on account of their leafy character they heat and spoil readily. A few plants near home are often worth more to the recipient than a large shipment from abroad.

NURSERYMEN OF MINNESOTA.—The secretary endeavors to keep a correct list of all those engaged in the nursery business in this state. As far as his personal acquaintance goes of course the list is known to be a correct one, but there are doubtless a number engaged in the nursery business in a small way of whom he does not know personally, and he would be glad to hear from any engaged in the nursery business who are not personally acquainted with him so that their names may be added to this list. The address of the secretary is always to be found on the front cover page of this magazine.

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THE SOCIAL ELEMENT AT OUR ANNUAL MEETING.—Those of our members who attended the last annual meeting could not have failed to note the large proportion of ladies in attendance at these meetings, not only at the one managed by the Woman's Auxiliary, but also at every other meeting during the four days session. You may be surprised to learn that approximately one-third of those who registered as purposing to attend the meeting belonged to the gentler sex, and the proportion in attendance was somewhere in that neighborhood. This is one of the delightful features of our annual gathering which is steadily increasing. More and more are the ladies attending our meetings, and in larger number are they becoming members of the association aside from any relation they may sustain as wives or daughters to those who are already members. This movement should be in every way encouraged, and we hope another year to be able to offer still more attractive accommodations in this direction. In planning for a new building for the society, this feature of our work should not by any means be lost sight of. I believe that very few organizations of this kind can boast so large an interest on the part of the ladies in the various branches of its work.

DID YOU SELECT EVERBEARING STRAWBERRIES AS YOUR PREMIUM?—An altogether unexpected demand has been made upon us for the Everbearing Strawberries the society is offering as plant premiums to its members this spring. Probably twice as many plants have been called for as can be furnished in the amount asked for. Under the "right of substitution" which the society reserves in the matter of its plant premiums, probably plant premium No. 16 will be substituted for Nos. 17 and 18 if matters turn out as now appears, though the number of plants sent will be more than is offered under No. 16. As this everbearing strawberry, originated at the fruit-breeding farm, No. 1017, is a very prolific plant maker, a dozen plants, if the runners are allowed to grow, will make plants enough to set out a bed of them next year, large enough in all probability for family use.

In the matter of June-bearing strawberry No. 3, offered as premium, there is undoubtedly stock enough to fill all orders including those asked for for which money has been sent, and we are in hopes that orders for raspberry No. 4 can be filled in their entirety, though it may be necessary to return money which has been sent for additional plants.

In this distribution all members will be treated exactly alike and altogether in accordance with the conditions noted in connection with the list of premiums as found on page six of the society folder and on the inside front cover page of the magazine.

[Illustration: VIEW IN FRUIT-BREEDING GREENHOUSE, STATE COLLEGE, BROOKINGS, S.D.

This is Prof. N. E. Hansen's laboratory, where he works out his problems in cross-breeding. (See opposite page.)]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

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Vol. 44 MAY, 1916 No. 5

What is Hardiness?

PROF. N. E. HANSEN, HORTICULTURIST, BROOKINGS, S.D.

By the term hardiness is understood the capacity to resist against any special condition of environment. So in speaking of hardiness of the plant it may mean hardiness as to either cold, heat, drouth, fungus or insect trouble. In the present discussion hardiness against cold will be considered mainly, since that is the most difficult problem we have to meet in this horticultural field. It would be of great advantage could we determine by examination of the plant its power to resist cold. If we could determine by the looks of a new apple tree its power of resistance to our test winters, it would save us many thousands of dollars and much vexation of spirit. Some years ago the Iowa State Horticultural Society made a determined and praiseworthy effort to determine hardiness by some characteristic of the plant, especially in apple trees. A chemical test of the sap of hardy and tender varieties was made. The palisade cells of the leaf, and the cellular structure of the wood, were examined under high powers of the microscope to determine some means by which a tender variety could be distinguished from a hardy one, but no general rule or conclusion could be formulated. In a general way nurserymen and orchardists say that a variety that ripens its wood well in the fall shows it by the twigs being sturdy and not easily bent, while twigs that are not well ripened indicate lack of hardiness.

The winter of 1884-85 was preceded by a late, wet autumn that kept trees of all varieties growing very late, so that winter came before the wood was ripened. In all the literature on this subject, I have been unable to find any method by which a hardy variety could be distinguished from a tender one of the same species, or, in other words, there is no correlation between morphology and hardiness.

Although we do not know what determines hardiness, we may still go ahead with our experimental work. We do not really know what electricity is, but inventors in that line have enough of a theory on this subject so that they are able to work very successfully with this gigantic force of nature. We know there is a difference in hardiness between the red cedar of Tennessee and the red cedar of Minnesota, and that it is safest for us to plant the tree as it is found at the north. The same applies to many other trees that are found native over a wide area. At Moscow, Russia, the box elder as first imported was from St. Louis, and it winter-killed. Afterwards they got the box elder from Manitoba, and it proved perfectly hardy. Although botanically both are the same, yet there is a difference in hardiness.

My way of securing hardiness is to work with plants that are already hardy. I like to work with native plums in my plant breeding experiments because there need be no

concern about their hardiness. We know they are hardy, or they would not be here after thousands of years of natural selection in this climate.

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The other way of obtaining hardiness is by crossing a tender variety with a hardy one. When we cross the native plum with the Japanese plum, we obtain seedlings that combine in a fair measure the hardiness of the native plum with the size and quality of the Japanese plum.

In many states of the Union the question of varieties for commercial orchards has been to a large degree settled. There is always room for a new apple, but for commercial purposes the varieties already in cultivation are sufficiently satisfactory as to size, color and quality as well as in keeping and shipping capacity. So the main effort in their horticultural societies is along other lines, such questions as marketing, packing, spraying, insects, fungi and orchard management. But in this region the winter apple question is still a vital one.

Some promising winter apples have appeared recently, and it remains to be seen whether they will stand up under the next test winter. They are certainly satisfactory in size, color, quality and keeping capacity.

The greatest question now presents itself in planting apple seed. What variety shall I choose? Some pedigrees may be like a blind alley, they will lead us nowhere. The commercial apples of the East and of the Pacific Coast are the survivors of millions of apple seedlings raised by immigrants from Western Europe during the past three centuries. They survived because they were the best. From time to time very good varieties are super-ceded by new ones that appear. From the ashes of millions of seedlings will arise, Phoenix-like, the creations that will dominate our future prairie pomology. Here in the Northwest thousands of farmers have already determined to a considerable extent what we may expect from planting the seed of certain standard varieties.

[Illustration: The Waneta plum. A promising variety originated and introduced by Prof. N. E. Hansen.]

Wisconsin, Minnesota and Iowa are full of seedlings of the Duchess. Some of the best are Okabena, Peerless, Patten's Greening, Milwaukee, Dudley, Pewaukee. A very large amount of Wealthy seed has been planted, especially in Minnesota. Many of these give promise, but in none do we appear to have obtained the true winter-keeping capacity. The Wealthy has given us the Lord's L, Evelyn, Lyman Sweet, Perfect and many more, observed at Minnesota state fairs from time to time. The Malinda has given us in the Perkins' seedlings a number of promising new varieties that evidently are true winter keepers. The fact that they appear hardy may come from the fact that the original orchard had hardy varieties, like the Duchess, standing near the Malinda. From the experience with these three varieties I would like to draw the conclusion that in order to get winter apples we should save the seed of winter apples, but it would not be safe to draw this conclusion without further experiments. There is an immense number of Ben Davis seedlings in Missouri and adjoining states, but none appear to have come into

extensive commercial notice except the Black Ben Davis and Gano. But as near as I can learn we cannot obtain real hardiness from this line of descent, unless the Ben Davis in the mother orchard is standing near varieties like the Duchess.

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The seed of standard winter apples top-grafted on hardy stocks like Hibernal should be carefully saved as nature may have smiled with indulgence upon your efforts and created the desired variety. I am watching with great interest a tree of very vigorous, smooth growth, from seed of Talman Sweet top-grafted on Duchess. You would not expect to get anything hardy from seed of the Talman Sweet, but the entire hardiness so far of the young trees propagated from the original seedling, makes me impatient to see the fruit. A blend of Talman Sweet and Duchess ought certainly to bring something good, but they will not all be hardy or all good. The fact that there are so many different lines of pedigree available to us in our apple work, makes it all the more necessary for us to divide the work.

Let us gather inspiration from the story of Johnny Apple-Seed—one of the patron saints of American horticulture—who about one hundred and twenty-five years ago forced his way through the wilderness of Indiana and Ohio and planted many bushels of apple seed as he went along, so that when settlers came they found their orchards ready for them. The story of John Chapman and his unselfish efforts in planting the seed of apples and other fruits in the American wilderness should give us courage and patience to give a little of our time to this work. Make a record of what seeds you plant, and when the seedlings are one year of age plant them out in a row where they can be cultivated. Select the best ones as they fruit and bring to the state fair or horticultural meeting. You may not win the grand prize, but you will have the satisfaction of having made some contribution to the common welfare.

* * * * *

In localities where cottontails are sufficiently abundant to be a continual menace, the safest and most nearly permanent method of securing immunity from their ravages is to fence against them. It has been found that woven wire netting of one and one-half inch mesh and thirty inches high will exclude rabbits, provided, that the lower border of the fence is buried five or six inches below the surface of the ground. In cases where a small number of trees are concerned, a cylinder of similar wire netting around each tree, if so fastened that it cannot be pushed up close against the tree, serves the purpose more economically.

Standardizing Minnesota Potatoes.

A. W. AAMODT, UNIVERSITY FARM, ST. PAUL.

(Gideon Memorial Contest.)

The potato is one of the large farm crops of the country, rating next to the cereals in importance. According to the census report of 1909, United States produced 389,194,965 bushels, and three-fourths of these were consumed in the states in which they were produced. The report also shows that the most extensive production was

along the northern tier of states, from Maine to Minnesota. In 1909 the states ranked in production as follows: New York, Michigan, Wisconsin, Maine, Minnesota, Pennsylvania, Ohio, Iowa, Illinois and Colorado. In the same year Minnesota ranked fourth in surplus production, producing sixteen per cent. of the potatoes which entered into interstate commerce. Wisconsin produced twenty per cent., Michigan twenty-four per cent. and Maine twenty-five per cent.

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[Illustration: Figure I. Rural New Yorker.]

In Minnesota the largest part of these potatoes are grown in certain districts of the state, and according to the 1909 census the counties rank in respective order, namely: Hennepin, Isanti, Chisago, Clay, Anoka, Sherburne, Washington, Ottertail, Dakota, and Mille Lacs. This shows that the largest production is in the vicinity of St. Paul and Minneapolis, and the Red River Valley, especially in Clay County.

The following statement shows the per cent. of increase in acreage from 1900 to 1910 and that the older districts are being rapidly outdone by the counties towards the northern part of the state:

Clay, 455 per cent.; Sherburne, 254 per cent.; Polk, 136 per cent.; Todd, 109 per cent.; Hennepin, 83 per cent.; Anoka, 58 per cent.; Isanti, 26 per cent.; Chisago, 17 per cent.

From these reports it is also evident that the distribution of the surplus is entirely towards the southern states, either as table stock or as seed potatoes, which in turn varies with the different years because of differences in crop yields. But as a general rule Maine, New York and Michigan supply the states in the east, east central and southeastern part of the country, Wisconsin the Chicago market and Minnesota the Mississippi Valley, especially Nebraska and Kansas. In addition Minnesota ships seed potatoes to many of the Southern states.

[Illustration: Figure II. Burbank.]

Because of these markets, potato shippers maintain that competition is extremely keen between the potato growing sections of this country. There can be no doubt that the only way Minnesota can meet her increase in yield and increase in demand is to determine whether or not she will expand her markets to the territory which is now being held by the other states. But before Minnesota can get these markets and obtain the better prices, she must standardize her potatoes. That is, Minnesota can obtain great improvement by adopting certain standards for the grading and sorting of potatoes.

At a conference held in Chicago, last February, of representatives from the growing, shipping and marketing interests, the following recommendations for greater uniformity in potato shipments were made:

Size.—Market stock of round white varieties shall be graded over a screen which measures 1-7/8 inches in the clear. For long white varieties a screen of 1-3/4 inches, in the clear, is recommended.

Weight.—Stock running over twelve ounces is undesirable and not over five per cent. of this maximum weight should be allowed in first class shipments.

[Illustration: Figure III. Burbank Russet.]

Quality.—Stock should be practically free from serious external imperfections, including late blight rot, common scab, sunburn, frost injury, bruises, knobbiness, second growth, *etc*. Stock should be mature and clean.

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Varietal purity.—Commercial potato shipments should be graded to one variety.

All indications show that Minnesota must grade and sort for commercial shipments of potatoes, and that a definite brand or grade designating a definite standard must be adopted in order to secure the highest prices. All inferior stock must be thrown out, and the best potatoes given a chance to make an attractive showing.

The standing which Minnesota potatoes will have in the market will be determined a great deal by the grading, which is usually the work of the dealer, although some farmers do their own grading by hand. Ungraded potatoes injure the Minnesota potato trade and reduce the profits, as the freight is the same on dirt, small and unsound potatoes as it is on the fine stock. As much as a ton of dirt and culls is sometimes found in a car on the Chicago "team tracks" after the wholesale merchant has sacked all he is willing to accept. This freight, sorting charges and cost of disposing of refuse must be paid by some one. Co-operating to improve the sorting done at loading stations is a means of establishing a grade to meet competition and to reach new markets.

[Illustration: Figure IV. Early Ohio.]

Standardization also means grading to eliminate potatoes infected with disease, such as common scab and late blight, sunken discolorations or dry hard blisters, green, spongy and coarse stock. All of these defects tend to lower prices.

In order to increase the value of the Minnesota potato we must also supply the market with the variety which it demands, and, furthermore, this variety must be free from mixture. Minnesota has already taken a step in this direction. The Minnesota Agricultural Experiment Station, Minnesota Crop Improvement Association and the Minnesota Potato Growers' Association have recommended the following varieties and types to be selected and grown.

The Rural New Yorker, as shown in Figure 1, is the leading round, white, late potato for Minnesota. It is a good yielding and keeping variety, fine in quality, an excellent market sort and suitable for almost any soil.

Similar to the Rural New Yorker are the Carman No. 3 and Sir Walter Raleigh.

The Green Mountain is a desirable white late potato, similar to the Rural New Yorker, but more oblong and with squarer ends. It is better suited to rich heavy soils than the Rural New Yorker, as they are not so likely to grow hollow.

[Illustration: Figure V. Triumph.]

Other similar varieties are the Carman No. 1, Green Mountain, Jr., and State of Maine.

The Burbank (Fig. II) is a long, white, late potato of excellent quality and suitable only for rich, loose, loam soils. Thrives well upon new rich soils that are well supplied with humus.

Other inferior varieties confused with the Burbank are the White Chief, White Star and Pingree.

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The Burbank Russet (Fig. III) is a long, russet, late potato differing mainly from the Burbank in its heavily russeted skin. Very fine for baking. Suitable for low, moist, friable and peaty soils.

The Early Ohio (Fig. IV) is the leading early potato in Minnesota. The type is oval with a pinkish or flesh colored skin. It is particularly suited to the black, rich, friable soils.

The Triumph (Fig. V) is a round, red, very early potato, valuable for southern seed trade. It suffers severely from drought, and, therefore, soils subject to this condition should be avoided.

Similar or identical varieties are Red Bliss, Bliss, Triumph and Stray Beauty.

The Irish Cobbler is a promising white, early, roundish potato of good quality, although inferior to the Early Ohio. It has not been sufficiently tested out, but is promising for southern seed trade.

Similar variety is the Extra Early Eureka.

The King is a broad, oblong, reddish potato. Very suitable for worn-out and sandy soils.

Similar or identical variety is the Maggie Murphy.

In conclusion I would have you to remember the main points of this paper which may be summarized as follows:

First. That Minnesota is one of the leading potato producing states of the Union.

Second. That Minnesota must establish a reputation for a continuous supply of well graded stock practically free from diseases and blemishes.

Third. That Minnesota must create a general interest in better seed, true to name and type.

Finally. Minnesota must secure the co-operation of all agencies interested in the production, distribution and utilization of potatoes to get better production, better grading and better marketing.

* * * * *

INSECTS HELP RAISE CROP.—It is well known that most of our crop plants will not form fruit and seed unless the flowers are properly pollinated. The principal carriers of pollen are wind and insects. In some plants, such as the beet, both wind and insects play an important part in the spread of pollen. In all cereals and grasses, and in the potato, the pollen is carried mainly by wind. In most of our common plants of garden,

field, and orchard, insects are the chief and most effective carriers of pollen. The following is a list of insect-pollinated plants: Onions, asparagus, buckwheat, gooseberry, currant, cabbage, radish, turnip, raspberry, blackberry, strawberry, apple, pear, plum, cherry, peach, alfalfa, clover, melons, cucumbers and squashes. We are very dependent upon the bees and other insects for a good crop yield.—W. W. Robbins, Colorado Agri. College.

Annual Report, 1915, Vice-President, Eighth Congressional District.

FRANK H. CUTTING, DULUTH.

This district embraces within its limits a very large area having different characteristics from a horticultural standpoint. Much of the land has a high elevation and is rolling or hilly, and much is low and comparatively level. A considerable portion is close to Lake Superior and other large bodies of water and, therefore, governed by conditions with respect to frost different from those controlling land not so situated. The quality or character of the soil is also varying.

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The foregoing considerations probably furnish the reason for the widely differing reports secured on the blanks distributed, and which were quite generally answered. This prompts the suggestion that before planting commercially or on a large scale one should personally conduct a series of experiments on land designed for use to test its adaptability for the fruits intended.

We suffered a frost and hard freeze on the 18th day of May which greatly damaged the fruit buds; the temperature registered on that day at the United States Weather Office being 27 deg. The month of June was the coolest in forty-five years. The low temperature of the summer months and lack of sunshine resulted in a tardy development of fall fruits and a failure to mature them. Even the Beta grape and the Compass cherry did not ripen their fruit. The Opata plum, however, bore a large crop of ripe plums early in September.

Very little blight has been reported.

The weather report shows a deficiency of precipitation up to December 1 of 3.81 inches. However, the heavy rains in November immediately before the ground froze supplied sufficient moisture to enable trees and shrubs to stand the winter.

The following list is suggested by the reports:

Apples: Duchess, Okabena, Wealthy, Patten's Greening.

Crab Apples: Florence, Early Strawberry, Virginia.

Plums: Cheney, Aitkin, Compass, Opata.

Grape: Beta.

Cherries: Reports generally unfavorable.

Blackberries: No kinds reported favorably.

Raspberry: Minnetonka Ironclad, King, Cuthbert, Older.

Strawberries: Dunlap; Everbearing—Progressive and Superb.

Currants: Red Dutch, Perfection, Wilder, White Grape.

Gooseberries: Carrie, Houghton, Downing.

Hardy Perennial Flowers: Peonies, Phlox, Sweet William, Delphinium, Canterbury Bells, Foxglove, Oriental Poppies, Iceland Poppies.

Hardy Shrubs: Snowball, Hydrangea, Lilac, Honeysuckle, High Bush Cranberry.

Annual Report, 1915, Paynesville Trial Station.

FRANK BROWN, SUPT.

The summer of 1915 will long be remembered as the summer with no warm weather. There was a heavy frost the morning of June 10th. The season's rainfall was very heavy, but trees at the best made only a normal growth, and with many varieties, especially of forest trees, the growth was much less than the usual growth of even a dry season.

Some fruit trees blossomed quite early, and the young fruit formed during a warm spell, and these trees were heavily loaded with fruit. This was especially noticeable with Wealthy, Duchess, Okabena and Whitney No. 20 apples, and with some of the Hansen hybrid plums. Other trees, fully as good bearers, blossomed a few days later and set no fruit at all, the frost killing the blossoms while not severe enough to harm the fruit already set.

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The cool weather of this past season has probably helped fruit growers more than it has hindered them, for had it been as hot as it usually is when we have such a tremendous rainfall, blight would most certainly have caused much trouble, but as it was we have had practically no blight at all.

This season has again demonstrated very plainly the advantages of top-working, such trees making a better growth, and the fruit being more even, and less troubled with spots, scab, *etc*.

The plums sent to this station the spring of 1913 bore no fruit at all this season, but the trees made a fair growth and all appear healthy except a few that froze back the winter of 1913-14.

The plum trees sent from the central station the spring of 1914 made a very poor growth that season, owing undoubtedly to the fact that the roots were dry when reaching here, but this last season all but one made a splendid growth, and one No. 10, to my surprise, produced five plums that for beauty and eating qualities would place this variety in the front rank with the best in the state. We shall watch these trees with great interest and will report on their actions as they develop.

The four trees of No. 1 plum, sent here the spring of 1915 from the central station, made a splendid growth, each tree developing fruit buds in abundance.

Of the seven varieties of raspberries sent here the spring of 1913, three made good this last season. No. 2 bore a tremendous crop of very large fruit, in quality the best; No. 4 bore heavily, an all around good berry and apparently a good shipper; No. 7 produced a good crop, not quite as large as No. 2, but continued in bearing for a long period. Further testing will be necessary for these berries, but so far they look good.

There is little to say about grapes, except the growth has been good, and the amount of fruit buds started immense, but the frost and unsuitable weather told the tale—we won't repeat it.

Of strawberries we will say this: If the central station did nothing in five years except to produce the strawberry known as Minnesota No. 3, they have still done well. It is hardy, a good shipper, it is delicious with cream and sugar, a good canner, in fact a great big Senator Dunlap with no green core, but ripens to the tip. It is also a good plant producer.

The strawberry known as No. 1017, planted last spring, did well. It is a wonderful plant producer, having a very heavy, dark green foliage, it seems to be a good bearer of large, dark red berries.

With the wood on the fruit trees thoroughly ripened, and fruit buds in good condition, we may look ahead to the future with courage, believing that all things come to him that waits in Minnesota, providing he hustles while he waits.

* * * * *

RED ROSE BEETLE IS EASILY KILLED.—Did you ever wait patiently in the spring for your favorite Japanese rose to bloom and find when the buds were ready to burst that it was scaly and spotted around punctures made by the red rose beetle? Then did you vow once more to destroy the beetles when you saw the roses begin to wither from punctures made by the beetle in the stem?

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The destruction of the red rose beetle is simple, according to a circular recently issued by the Minnesota state entomologist, University Farm, St. Paul. The method is to cultivate the ground around the rose bush early this spring and cultivate it again in the late fall. This will destroy many of the beetles, for they live in the soil in the winter. Then a few of the pests can be hand-picked and destroyed.

If they are still too thick, they may be removed next fall for safety to next year's blooms. The beetle lays its eggs in the hip of the rose. These can be seen after the rose is in full bloom as a black spot, covered over with no noticeable depression. The growing pests leave the old blossom by the middle of September and go into the soil until next spring.

The bush should be examined in the latter part of August for any flower hips containing insect larvae and all found should be plucked and burned. A few hours' work will insure a beautifully blooming bush next year.

Annual Report, 1915, Jeffers Trial Station.

DEWAIN COOK, SUPT.

The 1915 apple crop at this station was a complete failure, owing to the freezes of late May and early June. This apple failure, so far as I have been able to ascertain, was prevalent over the entire county of Cottonwood, although we could hear of plenty of apples being grown only a short distance over the county line in all directions excepting to the west of us.

[Illustration: A windbreak at Dewain Cook's, mostly white willow.]

The season has been one of cool weather and much rainfall, so much so that although we had no killing frosts this fall until October 5th, yet no corn or melons ripened in this vicinity. We quit spraying our fruit trees when the freeze came last spring and destroyed the apple crop, and the result has been that there was much scab on the foliage of many varieties of our apple trees. The Antonovka and the Hibernal seem to be about the healthiest in this respect. As to the fire blight there has been absolutely none at this station the season just passed.

As for plums we got a few bushels in the final roundup, De Sotos, Wolfs and Wyants mostly. Of the Japanese hybrids, we got a few specimens of the B.A.Q. The Emerald bore freely, but the fruit mostly either was destroyed by the brown rot or cracked badly just as they were getting ripe. The Tokata, one of Hansen's hybrids, gave us specimens of very fine fruit.

Of the apricot hybrids only the Hanska made any pretense of trying to bear anything, but the curculio got away with about all of them.

When I made the midsummer report most of Hansen's sand cherry hybrids were promising a good crop, but with the exception of the Enopa and Kakeppa, from which we gathered a few quarts of fruits, we got nothing. The brown rot, assisted by the curculio, took them all. It sure looks as if we ever expect to make a general success with these sand cherry hybrids and with the Japanese hybrids, we will have to be better educated along the line of controlling this disease that is so very destructive to the fruit of some varieties of plums, especially of those varieties that have sand cherry or Japanese blood in them.

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[Illustration: A veteran white spruce at Mr. Cook's place.]

[Illustration: Specimen Colorado blue spruce at Dewain Cook's.]

We have to report a grand success with everbearing strawberry No. 1017, sent to this station from our State Fruit-Breeding Farm last spring. The season all through was favorable for that class of fruit. We kept all blossoms picked off till about the first of August, when we let everything grow, and there is a great number of new plants. These new plants, with a few exceptions, did not bear, but the old plants, the ones set last spring, we gathered from them, from about September 15 till the first hard frost, October 5th, a liberal crop of surprisingly fine fruit. The Americus, also an everbearing variety, treated exactly as we did Minnesota 1017, bore a great number of plants and some fruit in the fall. The berries were not so large as the 1017 nor so many of them. While it is a perfect flowering variety, most of the late blossoms blighted, which seems to be a weakness of this variety.

On November 5th our strawberry beds were all given a mulching with loose oat straw for a winter protection.

The several varieties of grape vines originating at the Minnesota State Farm on trial here have all made a vigorous growth. We have them all pruned and laid on the ground, and we intend to give them no other winter protection. They are in a sheltered location. In spite of the various freezes early in the season we got samples of fruit from most of the varieties. Minnesota No. 8 seems to be the earliest to ripen its fruit. The wild grape flavor is noticeable in all these varieties.

The various varieties of plum trees sent here from the State Farm made vigorous growth the past season and are looking healthy with the exception of Minnesota No. 21. Of the five trees of this variety each one has a great many galls on the body of the tree. It is probably what is termed black knot, only the galls have not turned black yet. They are apparently of too recent growth for that. It is probable that we will plant other trees in their places next spring.

* * * * *

PAINTING OF SMALL TREE WOUNDS USELESS.—It has long been the custom for horticulturists to recommend, and fruit growers to use, dressings of various kinds on the wounds of trees when branches are removed in pruning. A few years ago the New York Experiment Station decided to conduct some experiments to determine whether such practice was really of any value or not.

From results of this work, which have recently been published in bulletin form, it is concluded that the use of white lead, white zinc, yellow ochre, coal tar, shellac and avenarious carbolineum as coverings for wounds under five inches in diameter is not

only useless, but usually detrimental to the tree. This is particularly true of peaches, and perhaps of some other stone fruits, which, according to recommendations, should never be treated at all.

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The substances mentioned often injure the cambium layer to such an extent that the healing of wounds is greatly retarded. Of the substances experimented with, white lead proved to be the best and is recommended wherever anything is used. But it is not thought worth while to use even white lead for wounds two or three inches or less in diameter, though it may be advisable to use it on wounds where very large branches have been removed.

On the larger wounds, where much surface is exposed to decay, the white lead will help to keep out moisture and the organisms which cause decay. The smaller wounds, however, heal so quickly that the evil effects of the covering may more than offset the benefits derived from its use.—R.A. McGinty, Colorado Agricultural College, Fort Collins, Colorado.

Annual Report, 1915, Montevideo Trial Station.

LYCURGUS R. MOYER, SUPT.

About twenty-six years ago a plantation of white spruce was made at this station. The trees flourished for several years and bade fair to become a permanent success, but some six or eight years ago they began to fail and many of them have since died. The survivors are all in poor condition. It seems that this tree is not well adapted to prairie conditions, at least not to the prairies of Southwestern Minnesota. Its native range is much further north. Here it evidently suffers from heat and dryness. The Black Hills spruce is commonly regarded as belonging to the same species. It has not been tested nearly so long, but so far it seems to be entirely hardy.

Something like thirty years ago a few trees of black spruce, a few trees of European larch and a few trees of balsam fir were planted here. They have long since disappeared. White pine planted at about the same time disappeared with them. A single tree of Scotch pine planted at about the same time, standing in the open, is gnarled and crooked and shows a great many dead branches. A forest plantation of several thousand Scotch pine, made something like twenty-two years ago, is still in good condition. Many of the trees are from twenty-five to thirty feet high. Some of the smaller trees have been over-topped and smothered out, but generally the trees seem healthy. A few hundred of the black, or Austrian, pine were set at the same time. They are about two-thirds of the height of the Scotch pine, but they are as healthy and vigorous trees as one would care to see. Some trees of rock, or bull, pine (Pinus scopulorum) were set at the same time. They have grown at about the same rate as the black pine and are healthy, vigorous trees.

Norway spruce has done better here than white spruce, some old trees fruiting freely. The Colorado blue spruce (Picea pungens) seems to be our best spruce, and so far as tested the Black Hills spruce is a good second. Douglas fir has been planted in a small way in the parks, but it is young yet.

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It seems probable that the Scotch pines in the forestry plantation owe their comparatively good condition to the shelter they get from the hot winds from being planted close together, and from the fact that they are partly protected by the black pines planted to the west of them. The single tree of Scotch pine above referred to has had garden cultivation for thirty years, but it seems likely that it was injured by the same hot winds that killed the white pine and the larch. The Scotch pine is a native of Northern Europe, Norway, Sweden, Denmark, Scotland, Normandy (near the ocean) and Germany and Russia around the Baltic, and all these countries have a moist, cool climate. The black pine is a native of Southern Europe, growing all the way from Southern Spain to the Taurus Mountains in Asia Minor. In its native habitat it has become accustomed to the hot winds that often sweep across the Mediteranean, the burning sirocco of the Great Sahara. The dwarf mountain pine, Pinus Montana, grows in the Pyrenees, in the Alps, in the Carpathians and in the Balkan Mountains, so that it, too, often encounters the hot winds that come across from the African deserts. It is probable that the ability of the black pine, the dwarf mountain pine, the Black Hills spruce, and the rock pine to flourish on the prairies of Southwestern Minnesota is due to the fact that all these trees have become accustomed to resisting the hot, dry winds that often reach them in their native habitats.

The Norway spruce (Picea excelsa) in its many varieties is native to almost the whole of Europe, extending from north of the Arctic Circle to the Pyrenees and Balkan Mountains in Southern Europe. We could then expect that trees from the Pyrenees or from the Balkans might be so well accustomed to the hot winds from Africa as to make them resist, at least for some time, the hot winds of the prairies. And they do seem to stand better than the white spruce or the balsam fir or the white pine.

Some report should be made on the material sent out for trial from the State Fruit-Breeding Farm. The strawberry, No. 1017, made a fine growth, and promised a large crop of fruit in September, but a few days of quite dry weather, following a very wet spell, ruined the crop at ripening time.

The raspberry, No. 4, is a great producer of sprouts and multiplies enormously, but it seems to be a rather shy fruiter, and the fruit is not of the highest quality. It is intermediate in season. No. 5 is a much larger and better berry, although not quite so hardy. Both came through the winter, without covering, in good condition. No. 8 seems to resemble the old Columbian. It does not sucker much. It is a large, late berry of good quality. It was covered, so its hardiness is untested. Prof. Hansen's Oheta is a berry of much promise. It is of fine quality and fruits abundantly.

The hybrid plums were sprayed with a commercial dust spray but not effectively enough, for the fruit all rotted. We shall try more thorough spraying next season.

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Patten's Greening, Oldenburg, Okabena and Simbrish No. 1 produced a good crop of apples. With us Okabena is undersized, of poor flavor and an extremely poor keeper.

The Growing of Vegetables for Canning.

M. H. HEGERLE, PRES. CANNING FACTORY, ST. BONIFACIUS.

The state authorities, through the Agricultural Farm and other sources, are doing good work promoting and encouraging the growing of vegetables, but it seems more could be done towards the marketing and conservation of these vegetables after they are grown.

The growing season for vegetables in this state is comparatively short, and although during that short period everybody eats vegetables, every grocer's show windows, and even the sidewalks, are used to display them, and a tremendous business is done, yet there are tons and tons of nice fresh vegetables go to waste, not only for the market or truck farmer but in every family garden—be the same ever so small, there is a steady waste going on, all of which could easily be conserved *by canning*.

Canning is simply putting the fresh vegetables in tin cans or glass jars (the latter are much more expensive, but no better), steaming and sealing them and setting aside until wanted. By doing this every truck farmer, and any one having ever so small a garden, could conserve enough which otherwise would go to waste to keep them in real fresh vegetables all winter.

Of course the thousands living in the cities having no garden can not do this and are therefore dependent on the canning factory for their fresh vegetables, and here is where my topic comes in, *the growing of vegetables for canning*.

It is no trick to grow vegetables for home canning, any variety will do. You need not select a big lot of one kind, and you need not sort for size or color. Just take the surplus as you find it in your garden from day to day. All it needs is, it must be fresh and it must be thoroughly clean—but growing for the canning factory is different. To line up fifty to 200 growers to sow the same seed, to plant, harvest and bring to the factory just when in right condition, requires time and hard work. This really is the hardest problem the canning factory has to solve, and that is the reason why all successful canners grow at least part of their product.

You must remember vegetables put in cans will come out just as you put them in. If you put in stale, tough, stringy beans you will be sure to find them there when you open the can, but if you put in fresh, tender beans, peas, corn or whatever else, you will find these exactly as you put them in, and it's immaterial whether you open this can the first, second or tenth year. We must not forget that vegetables properly sterilized and sealed will keep indefinitely, and they require no preservative of any kind. No canning factory uses any preservative, and no home cannery should use them.

[Illustration: Upland Farm, St. Bonifacius, Minn.]

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There was a time when canning was considered an art or a secret. I remember receiving circulars offering for sale the secrets of canning, and while in the grocery business some twelve years ago I sold thousands of packages of canning compound. These canning compounds, after a thorough examination by our State Food Department, were found not only worthless but harmful if put in canned foods.

Remember, to can vegetables successfully, it requires no canning compound or preservative of any kind, simply fresh and thoroughly clean vegetables.

Fresh vegetables are a good, healthy food, we all know this; and besides they are cheaper than meat; therefore should be on our tables two or three times a day. But mind you, they must be fresh, and while for some of us during the growing season it is comparatively easy to get them fresh, yet during the rest of the year, say eight to ten months, real fresh vegetables in bulk are hard to find and high in price. A lot of so-called fresh vegetables shipped in from a distance at best require several days to make the rounds through the grower, the shipper, the jobber, the retailer—to our tables and are really not fresh. They have become stale, and by coming in contact with different kinds of material have lost their delicate flavor. Therefore to insure real fresh vegetables for our tables, at least during the winter months, we must take the canned article.

All of us remember how most everything in the grocery line was handled in bulk, dried fruits, cereals of all kinds, coffee, tea, *etc*., was displayed on the counters, along the aisles and even outside along the sidewalk, handled and examined by any one and exposed to dust and flies. Just about the same way are vegetables in bulk handled today. Where is the grocer who would go back to those days, and where is the public that would patronize him?

Mrs. Glenzke: What vegetables do you can?

Mr. Hegerle: We can corn; beans, string and wax; apples, tomatoes, *etc*.

Mrs. Glenzke: How do you manage to get the farmers to bring them in? In Wisconsin it was a failure. As you say, they came when they got their work done, and the whole bunch came there at one time.

Mr. Hegerle: That is the hardest work, to get the growers to bring the vegetables when they are in the right condition and when they should be canned.

Mrs. Glenzke: There are five canning factories in that neighborhood now, and there isn't a one of them that allows the farmers to bring their stuff. They rent the farmers' land for themselves. For miles and miles you can't find a farmer that hasn't rented his farm.

Mr. Hegerle: You have to have the vegetables at the right time.

Mrs. Glenzke: They use the farmer's team and give him all the assistance they can. It does away with having them all at one time. I have seen twenty-five farmers come at one time. I don't see how you manage it.

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Mr. Hegerle: We have had a lot of trouble, and we are growing some of our vegetables.

Mrs. Glenzke: You can raise four successive crops of peas on the same ground, and you can make that work all right. They used to can squash, corn, tomatoes, and they have got down to peas entirely.

A Member: Doesn't most of that trouble arise from the low prices?

Mr. Hegerle: No, not entirely. The price when contracted is satisfactory, and we find in our experience in growing our own vegetables we can grow them cheaper than what we pay to the growers. But we wouldn't grow any if we could get the growers to bring them in when they are in the right shape. When corn is at a certain stage to make a good canned article it has got to be brought in that day, and if the farmer don't bring it, if he has a state fair on or a wedding or a funeral or something and delays it a day or two, then it is all off; that corn is lost.

Mr. Sauter: I would like to know which is the best beans for canning, the yellow or the green?

Mr. Hegerle: Well, we prefer the Refugee, both in wax and green. We prefer them because they are the best in flavor we have.

Mr. Sauter: Which is the best, the flat or the round of the wax?

Mr. Hegerle: Round is preferred by the trade, by the grocers or jobbers. I have kept the flat wax beans for my own use of those that we can.

Mr. Sauter: Don't the flat ones bring a little more than the round ones?

Mr. Hegerle: Well, probably the first or second picking, but you can't pick them as often as the other variety. The Refugee you can pick four or five or six times, and the flat beans can only be picked two times.

Mr. Anderson: I would like to ask what you pay for beans for canning purposes?

Mr. Hegerle: We pay from 3/4 of a cent up to 4 cents a pound. Sometimes a man brings in some that are almost too good to throw away, they are big and stringy, and rather than send them home we think we have got to take them and pay him something for them. We would rather not have them, and we usually dump them. Starting from that we pay up to three and four cents. Four cents for well sorted and mostly small beans. They have got to be graded, 1, 2, 3, 4 and 5. Number 1 is the smallest, and they bring the best price. We pay in proportion to the number 1's and 2's in the load.

Mr. Sauter: What tomato do you find the best for canning?

Mr. Hegerle: Well, the Earliana.

Mr. Sauter: Do you have any trouble with those bursting the cans?

Mr. Hegerle: No, sir.

Mr. Sauter: We had that trouble in canning for our own use. They burst the can, they expanded.

Mr. Hegerle: That is the fault of the man, not of the tomato.

Mr. Sauter: They were picked and canned the same day.

Mr. Hegerle: Probably not sterilized enough. Sterilizing fruit is the main thing. A tomato is really one of the easiest things to can.

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Mr. Sauter: In other tomatoes we don't have that trouble. It seems to hurt the sale of them to the women folks.

Mr. Hegerle: Sterilize them a little more.

Mr. Sauter: About how long would you cook them?

Mr. Hegerle: I am not the man at the wheel on that part. I don't know.
We have a superintendent that handles that part of it.

Top-Grafting.

AN EXERCISE LED BY A. J. PHILIPS, WEST SALEM, WIS., AT 1915 ANNUAL MEETING OF THE SOCIETY.

Mr. Philips: When I first talked top-working in Minnesota, Professor Green and some of the knowing ones felt a little leary about it, but I kept right on just the same. The most I have got out of top-working is the pleasure I have had, doing the work and seeing the fruit grow. I inherited a love for top-working from my father. He used to top-work some, and after I began planting trees my old friend Wilcox used to come and visit me, and he was strong on top-working on hardy roots. I used to make a little sport of the old man, but no more I guess than people have made of me for doing the same thing. He made me a proposition about forty years ago. He says, "You plant ten trees of a good variety to top-work on—I will pick them out for you—and then you top-work them with Wealthy, and then plant ten Wealthy trees right beside them on the same land and in the same rows, right together, and see which will do the best." At the end of ten years the Wealthy on their own roots had borne good crops but they began to fail, while the top-worked ones (on Virginia crab) were just at their best bearing at that time. Professor Green came and looked them over at the end of fifteen years. The first ten on their own roots were dead, and the others grafted on Virginia bore apples until they were twenty-five years old. That convinced me that top-working in certain cases would pay if done on a hardy stock.

I have seen a Northwestern Greening tree that was crotched, split apart and lay down when it was loaded with apples, in Waupacca County, but when grafted onto a stock whose limbs grew out horizontal it will carry a load of fruit until it ripens without injury.

I won a first prize at the Omaha exposition. My apples were not much better, but they were top-worked and were a little larger. I have some specimens here that show the practical difference. These grew on my own land. I found in showing apples in Milwaukee at their fairs that I could always get the best specimens from the top-worked trees. That convinced me that you could grow better fruit that way.

Mr. Brackett: What age do you commence the grafting?

Mr. Philips: I like to commence at two years old. I like to set a Virginia crab and let it grow one year and then commence top-working, and top-work about half the first year and the balance the second.

Mr. Brackett: Is that in the nursery row?

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Mr. Philips: No, where I am going to have it grow. I have found the Virginia—and the Hibernal, too, either of them, very vigorous trees. The Virginia is very vigorous. You dig up a Virginia tree, and you find a great mass of roots; it has strength, and it grows fast. I have top-worked about forty varieties on the Virginia and some on Hibernal. Mr. Cady was there and looked it over, Prof. Green was there and Mr. Kellogg has been there a number of times—and I always ask them this question: If they found any trees where the top had outgrown the stock? I have never seen an instance where the top of the tree put onto a Virginia crab outgrew the Virginia. I have some in my garden now where the union is so perfect it takes a man with good eyesight to see where it is.

[Illustration: A.J. Philips, West Salem, Wis. Photo taken in his eighty-second year.]

Mr. Brackett: If you had Virginia trees twelve years old would you top-work them?

Mr. Philips: Yes, sir, out towards the end of the limbs.

Mr. Brackett: Suppose the limbs were too big on the stock you are going to top-work, how would you do then?

Mr. Philips: I practice cutting off those larger limbs and letting young shoots grow. Mr. Dartt did a good deal of top-working, and he top-worked large limbs. I told him he was making an old fool of himself, but he wouldn't believe it. He would cut off limbs as large as three inches and put in four scions and at the end of two years they had only grown eight inches each. I have put in one scion in a Virginia limb that was about 3/4-inch in diameter, and had it that season grow eight feet and one inch. That is the best growth I ever had.

The reason that my attention was called to the Virginia as being vigorous was, when I attended the meeting of this society about thirty years ago—I think it was at Rochester—Mr. A. W. Sias, who was an active nurseryman and one of the pioneers of this society, offered a premium of $5.00 for the best growth of a crab apple tree, and then, in order to win the money himself (which he did), he brought in some limbs of a Virginia that were six feet long that grew in one season; and I figured then that a tree that could make that growth in one season was a vigorous tree, which it is. Nothing can outgrow it, and that was one reason why I commenced using it.

Mr. Brackett: I have one trouble in grafting the Wealthy to the Hibernal on account of its making that heavy growth. I lost some of them by blight on that account.

Mr. Philips: Which was blighted, the Hibernal?

Mr. Brackett: No, the Wealthy made such a big growth that it blighted. I cut the top back and put grafts in, and they made a good growth, but they blighted. Did you have any trouble like that?

Mr. Philips: No, sir, I think my soil is different from yours. My soil is of a poor order, a heavy clay, and it don't make the growth.

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Mr. Brackett: How many of those large limbs could you cut off in one year and graft?

Mr. Philips: Cut about half of the growth of the tree if not too large, don't cut enough to weaken the tree too much. Next year cut the balance off.

Mr. Crosby: In grafting, suppose you get scions from an Eastern state, what time would you get those scions, say, from Maine; Maine is on a parallel with Minnesota?

Mr. Philips: I prefer cutting scions in the fall before they freeze.

Mr. Crosby: How would you keep those scions?

Mr. Philips: I have tried a great many ways, in dirt and burying them in the ground, but the best way to keep them is to put them in boxes and put some leaves among them. Leaves will preserve them all winter if you keep them moist enough, wet them a little once in ten days just to keep them damp. Leaves are a more natural protection than anything else. Don't you think so, Mr. Brackett?

Mr. Brackett: Yes, sir.

Mr. Crosby: What kind of a graft do you usually make?

Mr. Philips: I have put in some few whip-grafts but use the cleft-graft with the larger limbs.

Mr. Wallace: Is the Patten Greening a good tree to graft onto?

Mr. Philips: It is better for that than most anything else where I live. It is hardy and makes a good growth. If I had Patten Greenings, many of them, I would top-work them. The apple is not a good seller where I live.

Mr. Kellogg: What was the condition of that tree where Dartt put in four scions?

Mr. Philips: They grew eight inches each in two years, then died. Those scions were too weak to take possession of the big limb. It is like putting an ox yoke onto a calf. They can't adapt themselves. They hadn't strength to take hold of that limb and grow. That was a good illustration. Put a graft on a small limb, and it will assimilate and grow better than if you take a large one.

Mr. Brackett: Where you put in more than one scion in a limb, is it feasible to leave more than one to grow?

Mr. Philips: No, not if they grow crotchy. I let them grow one year to get firmly established and then I take off the lower one. I have trees in my garden I have done that with, and you couldn't see the crotch. It grows right over.

Mr. Brackett: I have seen a great many of them where both of them were growing.

Mr. Philips: It makes a bad tree, as bad as a crotchy tree.

Mr. Kellogg: Isn't it better to dehorn it and get some new shoots to graft?

Mr. Philips: Yes, sir, and if they are *very old* the best way is to set out new trees.

Mr. Crosby: In getting scions are there any distinguishing marks between a vigorous scion and one not vigorous?

Mr. Philips: Nothing, only the general appearance. If I see a scion that looks deficient I pass it by.

Mr. Erkel: Would it be practical to use water shoots for scions?

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Mr. Philips: I should rather not. I have always had scions enough to avoid using water shoots. They are an unnatural growth; I wouldn't use them. Take a good healthy scion.

Mr. Kellogg: Would scions from bearing trees with the blossom buds on do you any good?

Mr. Philips: Well, not with a blossom bud on; I wouldn't use such a scion. Some people say if you cut your scions from a bearing tree they will bear quicker, but I never saw any difference.

Inasmuch as this question has been asked a great many times by people, what age to plant a tree, whether it is best to plant young trees or trees four or five years old, I will say I am in favor of young trees, and I am in favor of grafting a tree when it is young.

Mr. Brackett: Isn't that a general opinion in the West where they make a business of planting large orchards?

Mr. Philips: I think so. I think that is the case.

Mrs. Cadoo: Can you graft onto a Martha crab and have success with that?

Mr. Philips: I never had very good success with the Martha crab; it isn't vigorous enough.

Mrs. Cadoo: We had a tree twelve years and got seven apples.

Mr. Philips: Well, I think I got eight. (Laughter.) I believe with the Martha crab if you will plant it where there are other crab trees around it you get a pretty good crop, but not if you isolate it. I have an idea it is not self-fertilizing. I think that is the trouble with the Martha. It is a nice crab.

Mr. Brackett: You showed the difference in size there, those top-worked and those not —don't you think that is because of cutting the top back? You throw a heavy growth in there, which makes the fruit that much larger?

Mr. Philips: Well, it might be.

Mr. Street: Have you had any experience in budding in August or first of September on those trees?

Mr. Philips: Yes, sir, I do a little budding every year. Budding is a hard thing to do, that is, it is a particular thing to get the bud matured enough and still have sufficient sap to slip.

Mr. Street: Would you put it on the top or bottom side of the limb?

Mr. Philips: I would put it on the upper side of the limb every time, but I would put it a little further from the trunk of the tree than I would to graft for the reason, if the bud fails you have two chances, and you have that same limb to cut off and graft next year.

[Illustration: Winesap apples top-worked on Peerless, grown at Northfield, Minn.]

Mr. Johnson: I want to ask if it has a tendency to make the apple any earlier? Virginia crab is an early bloomer, and would grafting it with Wealthy make it bloom earlier?

Mr. Philips: I hardly think so. I think it is a great deal as it was with the man that had the boots. Some told him his boots would wear longer if he greased them, and some one else told him they would wear longer if he did not. So he greased one and not the other, and the one that he greased wore fifteen minutes longer than the other. (Laughter.) I don't think it makes much difference. I tell you what it does do. You graft a McMahon onto a Virginia and instead of having the McMahon its usual color, you will get a very nice blush on it.

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Mr. Erkel: Is the Duchess a good stock to graft onto?

Mr. Philips: I haven't found it very good. It is hardly vigorous enough for a stock.

Mr. Erkel: You mentioned Patten's Greening a few minutes ago. Isn't that considered a rather short-lived tree?

Mr. Philips: Not with me it hasn't been. I set some thirty years ago. I never had a Patten's Greening injured with the cold. It is very hardy.

Mr. Street: How about the Brier's Sweet crab? I grafted some last year and had a larger percentage of the scions live on those than on the Hibernal.

Mr. Philips: You wouldn't get as good a growth afterwards. The scions on the Virginia would grow better and have a better top. I don't think the Brier's Sweet is as vigorous as Virginia.

Mr. M'Clelland: I grafted on 120 Hibernals this spring and got hardly one failure.

Mr. Philips: You did good work.

Mr. M'Clelland: Made a growth of three to four feet, some of them.

Mr. Philips: That is good.

Mr. M'Clelland: Have you anything as good?

Mr. Philips: If I had Hibernals I would graft them, but if I had to set something on purpose for grafting I would set Virginias. I have had better success with that variety for stocks.

Mr. Kellogg: Too big a growth on the graft is liable to be injured in the winter, is it not?

Mr. Philips: Too vigorous a growth on the tree is liable to get injured in the winter anyway. I like to see a good growth. I like to see it grow and then pinch it back in the fall. You can pinch it back a good deal easier when it has made a good growth than to make it grow big enough.

Mr. Street: I would like to know whether we should force all of the growth into the scion the first year where we graft on trees that have been set two years.

Mr. Philips: One of the pleasures of doing top-working is to watch the growth of the grafts. I did a good deal of that on Sunday. You might do worse than communing with nature. You watch them same as you watch the growth of anything else, and if you think the graft is growing too fast let some of the shoots on the stock grow to take part of

the sap, but if you think it is growing too slow and these shoots are robbing it, cut them off. I like a good growth on grafts; it looks more like doing business.

Mr. Street: But the second year would you keep all of the growth in the graft?

Mr. Philips: Yes, sir, the second year I would, and if it makes too large a growth pinch off the end. I put in some for a neighbor this season, and I go down and see to them every two weeks. If I thought they made too much growth in August I pinched them back so as to make them ripen up quicker. I don't like to have them grow too late; as Mr. Kellogg said, frost will get them. (Applause.)

Spraying the Orchard.

HON. H. M. DUNLAP, SAVOY, ILLS.

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(Continued from March No.)

Then just as soon as your bloom falls, just as soon as the blossom petals fall, then you want to spray again. You should use arsenate of lead along with your lime-sulphur in both sprayings, because your arsenate of lead will take care of a great many insects that injure the fruit. The first spraying, immediately before the bloom, with arsenate of lead is for the curculio, what is called the Palmer worm, for canker worm—if you have any of them—the tent caterpillar, the leaf roller and various other insects that injure the fruit and the foliage. The spray just immediately after the bloom in addition to fungous is a codling moth spray. To get rid of the codling moth worm you use the arsenate of lead. The codling moth egg hatches shortly after the bloom falls, and the little worm instinctively goes into the blossom end of the apple, because that is the only place it can enter the apple at that particular time. Just why it does not enter on the side of the apple I can not say, but there is a little fuzz on the outer side of the apple at that stage of growth that perhaps prevents their getting in, and that fuzz as the apple grows larger disappears, so a little later they can enter on the side or at any other part of the apple that they choose.

[Illustration: Hon. H. M. Dunlap, Savoy, Ills.]

When the blossoms fall the apples stand upright on the tree, and the little pointed leaves that are on the blossom end of the apples, that we call the calyx, are all open, and at that time you can spray so as to get the arsenate of lead on the inside. Within a week or ten days after the bloom falls these sepals, or little leaf points, gradually close together until they are all closed up tight, and after that you can't get your spray in there. After the worm hatches he gets between the little leaves of the calyx and goes on the inside of the apple and into its center. You want to have your poison ready for Mr. Worm when he enters the blossom end of the apple, and the more thoroughly and more effectively you spray the better are the results.

It has been said that if you spray thoroughly at that time, that that is the only spray you really need for the codling moth worm. I don't agree with that, as there is always a second brood of worms. I use the arsenate of lead along with the lime-sulphur for all these sprays, before the bloom and after the bloom, and if you don't spray more than three times you will be doing yourself a good service, and it will well pay you. In some parts of the country they spray as high as seven or eight times in the commercial orchards, but I would say in a farmer's orchard three times would be enough, once before the bloom and twice later, and you will notice the good results.

There are other sprays besides these, but none perhaps of any importance to you up here except the winter spray for the San Jose scale, if you have that, and I noticed one or two specimens out there that seemed to have the scale upon them. That spray should be done either in the fall or early winter or late winter while the trees are dormant. That has to be put on of winter spray strength, using lime-sulphur or some of

the other San Jose scale sprays without the arsenate of lead, as you don't need to use the lead with this spray.

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Now, as I stated to start with, these remarks ought to be appropriate to your needs and to make them so it would be a good deal better for me to give you the opportunity of asking questions or of discussing this question of spraying yourselves rather than for me to go into this subject any further and not know just exactly what you would like to listen to. If you have any questions to ask I would be glad to answer them if I can.

Mr. Horton: What proportion of the lime-sulphur and arsenate of lead do you use?

Mr. Dunlap: If we get the commercial brand of lime-sulphur we use it in the proportion of three gallons of that commercial mixture to 100 gallons of water and for the arsenate of lead in the same spray tank at same time we use four pounds of arsenate of lead to the 100 gallons.

Mr. Horton: Have you ever carried over lime-sulphur from one year to another?

Mr. Dunlap: Yes, sir, we often do that, carry it over until the next year. It wants to be kept where it will not freeze.

Mr. Horton: Is there much danger of evaporation so it would be too strong to use next year?

Mr. Dunlap: Your barrel should be kept bunged tight.

Mr. Richardson: Mr. Dunlap fails to say anything about dormant sprays.
Don't you use dormant sprays?

Mr. Dunlap: I was just speaking about the dormant or winter spray. When you spray in the winter time use lime-sulphur or scalicide.

Mr. Richardson: Another thing: I take a little exception to what Mr. Dunlap says in advocating buying a spraying machine collectively in the neighborhood, for the simple reason that it is necessary to spray at one particular time, at the vital time just before the blossoms fall and at the time they have fallen. We have found it almost impossible to do any spraying for anybody except ourselves at that time. We talked that matter over before we bought spraying machines.

You said you wondered whether there were any apples grown here commercially. Out of our town we shipped this year eight car-loads of apples. We have three power sprays in our orchard, and we talked that matter over before we bought them, about buying collectively, and we decided it was absolutely impossible to do it. I don't think it is feasible for a small grower to depend on that kind of thing because he may be disappointed. My theory is for each one to have his own sprayer, large or small. Another thing, we find a pressure of 200 pounds is better than spraying without that pressure; we get better results.

Mr. Dunlap: The gentleman misunderstood me. I said where you have just small orchards you could do it collectively. Of course, I do not advocate where a man has enough to have use for a spray machine for his own orchard that he get one collectively. That would be a great mistake, but where a man has only fifty trees in a neighborhood where there are no big orchards, it would be better for a dozen or more to combine. If you can get around with it in a week you will be all right but not longer than that.

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Mr. Richardson: I beg to differ with you just the same. I think if you want to spray you must spray at the time; it might rain the next day, and you might miss the whole season.

Mr. Dunlap: There are a good many people who don't like to go to the expense of a spray machine just for fifty trees or 100 trees. If they would combine with a few neighbors they would do some spraying work, otherwise they wouldn't do any at all. If a man will buy a machine and do his own spraying, why, that is certainly the best thing to do, but if he won't do that it is better to combine with his neighbors and do it than for none of them to do it. Community spraying is the best thing to do if you have only small orchards.

Mr. Dyer: What pressure would you recommend in spraying for codling moth where arsenate of lead is used?

Mr. Dunlap: You can do effective spraying all the way from sixty pounds to 200 pressure. My preference is about 150 pounds. I have known instances where considerable injury was done by using too high pressure. We have sprayed at 225 pounds, but we have given that up. It is not as good as from 150 to 175 pounds.

Mr. Dyer: I would like to know about what quantity of arsenate of lead and lime-sulphur combined would you recommend? How much of each?

Mr. Dunlap: In 100 gallons of water we put three gallons of the concentrated solution of lime-sulphur, as we buy it commercially, three gallons to 100 gallons of water, that is, for the summer spray, and for the arsenate of lead we use four pounds of arsenate of lead to the 100 gallons.

Mr. Dyer: In connection with that I would like to ask if you have used or would recommend pulverized lime-sulphur?

Mr. Dunlap: I haven't used any.

Mr. Dyer: Do you know anything about it?

Mr. Dunlap: I think it is a more expensive proposition.

Mr. Dyer: I never used any myself. I thought perhaps that might work better in connection with the arsenate of lead than the liquid.

Mr. Dunlap: I couldn't say, I have always followed the policy of never departing from well-established lines of work until I am satisfied that the new one is absolutely all right. I have seen in our state men destroy the fruit from a forty or eighty acre orchard by taking up some new thing that was highly advertised and looked very attractive. It is not the same proposition, of course, but they tell us the devil comes in very attractive form. He comes with a swallow-tail coat and a red necktie and a buttonhole bouquet, and he

looks very attractive. So it is with a lot of these things advertised; they look attractive but for our own good we ought to stick to the things we know and let the state experiment station try them and report upon them.

Mr. Huestis: Does Mr. Dunlap attribute the general dropping of apples to the scab fungus?

Mr. Dunlap: Not entirely.

Mr. Huestis: Do you think that it weakens the stem of the apples?

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Mr. Dunlap: Yes, sir, the droppings of the apple is largely due to the scab fungus. Of course, some of the dropping occurs as the result of too much rain or too much dry weather, something of that kind, that is not attributable to scab fungus.

Mr. Kellogg: Does spraying injure the bees?

Mr. Dunlap: I have never had anybody prove to me that the bees were especially injured by spraying in the bloom. We do not practise spraying in the bloom, that is, we spray when we have about one-third of the bloom left on the trees. I have never had any injury, and we have orchardists who have bees in their orchards, and they go on spraying the same way. I do not believe bees are poisoned by the spray. Maybe I am mistaken about it, but I have never seen any conclusive proof of the bees being poisoned by the spray. It is possible they might collect it and carry it into the hives and might poison the brood in the hive. I don't know. I thank you. (Applause.)

The Value of Horticulture to the Farm.

MRS. CLARENCE WEDGE, ALBERT LEA.

It is pleasant to have a good roomy subject. E. S. Martin said in Harper's Weekly as Christmas time approached, "There are just two places in the world, and one of these is home." I will paraphrase it by saying, "There are only two places in the world, and one of these is the farm." So the value of horticulture to the farm is a large subject.

I passed a farm last summer that I shall never forget. It was quite unattractive, I believe, so far as variety of contour was concerned—quite level and commonplace. Right across the road from the house was a half-grown windbreak of golden willow. Against that as a background blazed out row upon row of the most brilliant flowers, graduated down to the edge of the road, and extending as far as half a city block or more. Think what a beautiful surprise for every one that turned that corner. I think the occupants of the house must have enjoyed sitting on their porch watching the people in the cars start with pleasure and turn to look as they flew past. That farmer (or his wife) knew something of the value of horticulture to the farm. Perhaps it was a device of the farmer's wife to divert the gaze of the passer-by from the porch, for you know we do stare shamelessly when we are on a joy ride. At any rate, that farm would not be forgotten by any one that passed it. The advertising that beauty spot gave his place would exceed in value a column a week in the county paper, and not cost a tenth as much.

Lowell remarks, "Nature with cheap means still works her wonders rare." And there she stands with arms extended, offering the farmer all the wealth and beauty he will put forth his hand to take.

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Last fall I passed another farm down in Iowa, whose owner had tried to make his place conspicuous by putting a concrete wall and gateway in front of his house, and making lavish use of white paint in decorating his buildings and grounds. He succeeded, but I cannot help thinking that if he had put the money that useless concrete work cost into shrubbery and vines, it would have made his place twice as attractive. I dislike pretentious adornments to the farm, especially where the rest of the place doesn't measure up to them. Like Senator Blaine, who, at the time the Queen Anne style of architecture became popular, on being asked why he did not have his old fashioned house Queen Anned, replied that he did not like to see a Queen Anne front and a Mary Anne back.

A farm home can be something better than a city park. One of the beautiful things that I shall always remember about Berlin was a way they had of bordering their parks and the enclosures of public buildings. They take tree-roses trimmed up to the height of a fence with a hemispherical head. Then they plant them around the edge of their grounds a rod or two apart, festoon chains from the top of one rose stalk to the top of the next, and where the chain touches the ground midway between them, they plant a little ivy which climbs up and conceals the chain and gives the appearance of festoons of vines between the rose trees. I thought them so lovely that when I married a nurseryman I thought I would persuade him to do something of that kind on our grounds, but he has convinced me that while that is all right for a city park, it would not be in good taste in a country place. It would look too artificial. The charm of a country place is its natural beauty. For the same reason we do not have any trimmed evergreens or hedges on our place. Moreover, the man who makes his living from the soil finds the upkeep of those decorations too pottering, and if he had money to hire it done he would rather put it into his automobile or into other improvements.

The natural beauty that can be set about the farm home will become it better. Wild grape vines or woodbine draping the wire fences tempt the eye of the passer-by to linger, and they cost nothing. Once planted, they are there for a life-time. A walnut tree in a fence corner will grow to a fair size in ten years, in twenty it becomes a land-mark. A catalpa of a hardy strain will do the same thing in about half the time in our part of the state. Take an elder from your woods and plant it in an angle of your house, and it makes a luxurious growth that rivals the castor bean of the city park and does not need to be replaced the next spring.

It certainly pays to go in for some kind of horticultural adornments for the farm. They are so easy and inexpensive to obtain and make such a happy difference to the farmer's family and to all who pass his way. When you have a specially prosperous year on the farm, save a little of the surplus for new trees or shrubs.

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But I remember passing another farm, all of twenty-five years ago, where horticulture may once have been of value to the farmer but had become a burden to him. There was a dense grove of willow down at one side, through which the drive leading to the barn was kept wet and muddy by the shade. On the other side rose a high grove of trees casting a gloomy shade on the house and poultry buildings, and a few odd shrubs straggled along the roadside and gave the place an unkempt look. Of all things, have sunshine! City people often have to sacrifice it, but no farmer is too poor to have it in plenty. Don't let your trees tyrannize over you.

It is, perhaps, unnecessary to mention the value of a windbreak to a farm. If it has not been provided by nature it is an absolute necessity to plant one as a matter of economy. It saves fuel inside and gives comfort outside. The cows give more milk, and all the animals put on more fat, if they have a sheltered place to take their airing. It is also a good thing to set some bushes or small spruces along the foundation wall of the house on the windy side. They are ornamental in summer, and in winter they catch the snow and tuck the house in against the wind.

When it comes to the garden, the "Value of Horticulture to the Farm" depends largely upon the farmer's wife, for a garden needs mothering as well as fathering. Few farmers have time to do more for a garden than the actual labor of plowing, planting, and cultivating, and digging the root vegetables in the fall. Somebody must watch the garden, go through it nearly every day, poison the cabbage worms and potato bugs, keep the asparagus and cucumbers picked, watch for the maturing of peas and beans, and dispose of any surplus either by canning or sending to market. To visit the garden only when you wish to gather some particular vegetable is like milking the cow only when you happen to want some milk.

A garden well tended puts the farm far ahead of the city home for luxuries of the table and cuts the cost of living in two. Fresh vegetables and cream are expensive articles in the city, inaccessible to any but the well-to-do, but it does not take a very thrifty farmer to have them, providing he has a thrifty wife. But to be a real helpmeet she must have an overall skirt and a pair of rubber boots. Then the dewy mornings will be as much of a pleasure to her as to her husband, and she can do her garden work in the cool of the day.

A garden is especially valuable to a farm, because the farm is usually somewhat isolated and must depend more or less upon its own resources for freshness and variety of food. A good garden on the farm will almost abolish the tin can, and strike off a large part of the grocer's bill, to say nothing of making the farmer live like a king.

The Strawberry Weevil.

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As strawberries are about to blossom, it would be well to keep a look-out for a shortage in the number of blossoms, for this is the first indication of the work of the strawberry weevil. Because of the diminutive size of the insect, few are acquainted with it, so that the shortage of blossoms or failure of the crop is often attributed to frost, hail, climatic conditions or some other agency. Upon close examination, the buds will be found to be severed from the stem, some lying beneath on the ground, others being still attached by a few shreds in a drooping manner. Further examination around the buds may reveal a small snout beetle, which is the cause of the injury, it being about one-tenth inch long and marked with two dark spots on each wing cover. The females oviposit in the buds, and then cut them off when oviposition is completed, in order to protect the larva within, which later develops to the adult beetle.

[Illustration: Showing beetle of strawberry weevil and the damage it inflicts.]

The strawberry weevil has been especially injurious around the vicinity of Hopkins the past summer. It was not uncommon to find fields with from forty to ninety per cent. of the buds cut, and as the earliest and most mature buds, which would be the first to ripen, are among those cut, the losses inflicted may be quite serious. The weevil not only injures the cultivated strawberry, but is found to attack the buds of the red raspberry, dewberry and wild strawberry. It is a singular fact that only the staminate varieties are injured, especially those which furnish considerable pollen, since this constitutes the chief food supply of both larvae and adults.

Life History.—The weevil appears as soon as the buds begin to form and soon after deposits an egg within the bud. She then immediately crawls down the stem and proceeds to sever the bud. The eggs hatch within five or six days, and in about three or four weeks the footless grubs become full-grown, coming out as adults about five days later. This new brood, upon emerging, will attack the leaves, making numerous small holes on the under surface, soon after picking time. As early as August 25 the beetles were found to go into hibernation last summer, within the strawberry fields, being found especially among the dead leaves. The older beds were found to be more seriously infested because of the fact that they wintered over in the small fields.

Control.—Since the weevils do not disperse readily, and since they hibernate within the fields, the one crop system and the plowing up of the beds immediately after picking would probably do away with the injury entirely. This one crop system could be followed for about two years, when it might be advisable to return to the two crop system if the weevils have disappeared.

On April 18, 1916, the weevils were located by the writer underneath the straw, and beginning to move about. From observations last year, it would be advisable to remove the straw from one or two rows in order to hasten the maturity of the buds, and keep the straw on the remainder of the patch in order to force the weevils to the uncovered row. They could then be destroyed either by plowing under or burning.

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Some recent experiments by Prof. Headlee, State Entomologist of New Jersey, appear to have been successful against the strawberry weevil. A dust spray of a mixture of arsenate of lead one pound, and sulphur one pound, was used as a repellent, giving almost perfect protection. The material was applied twice, April 30th and May 6th.

The writer will be glad to co-operate with the growers, if they find the presence of the weevil in their strawberry beds.—S. Marcovitch, Section of Economic Entomology, Division of Economic Zoology, University Farm.

Secretary's Annual Report, 1915.

A. W. LATHAM, SECRETARY.

Twenty-five years is a long time to look forward to, but it does not seem so long when you look back, and yet when I review the changes that have taken place in the Horticultural Society since I assumed the position of secretary twenty-five years ago the way seems long indeed. In the year 1890 very nearly all of the old members of the society, those who had contributed their time and money to bring it into existence and keep it alive for its first twenty-four years were still on the membership roll and doing loyal work for the association. As year by year passed these veterans of the association one by one dropped away until at the present time the number of those in that class who are still with us here are so few in number that it becomes almost a vanishing point. In the year 1897 a photograph was taken of "ten veterans of horticulture," a copy of which is hanging in the secretary's office, and of these ten the only one now with us is that loyal friend and supporter of the society, Seth H. Kenney, of Waterville, now eighty years of age and too feeble to attend this meeting. Going back to a date still earlier, covering the first few years of the association, the only working members of the society as far as the secretary recalls are J. M. Underwood, C. M. Loring and himself. This is the order of nature, and we should remember only with gratitude and affection those who have served before us and with us and passed on.

At the close of this, the forty-ninth year of the society, we find the membership roll somewhat larger in number than at any previous period in its history, there being on the annual roll 3,079 members, and on the life roll 311 members, of whom 30 are honorary. There have been added to this roll the past year one honorary life member, Mr. Lycurgus R. Moyer, of Montevideo, and 20 paid life members. The number of deaths appearing on this life roll during the past year is fortunately only two, Mr. E. A. Webb, editor and manager of "The Farmer," who had been a member since 1906, and V. A. Neil, of Minneapolis, whose death occurred prior to the 1914 annual meeting but had not been spoken of heretofore.

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As usual a considerable number of sources have contributed towards this large membership roll. The auxiliary societies, of which there are 10 have brought upon this roll in all 878 members. One new auxiliary society has been added to the number this year, organized in St. Paul under the name of "Horticultural, Poultry and Improvement Association of West St. Paul." An auxiliary society maintained at Crookston for a number of years seems to be no longer in existence and should probably be taken from the list of auxiliaries. The farmers' institutes have not contributed as largely to the membership roll as some previous years, on account in part of the fact that the work heretofore done by farmers' institutes is being done in farmers' clubs and schoolhouse meetings of farmers, which does not offer as good an opportunity for securing memberships, though the service to the cause of horticulture is probably even better. Through this source the society has received this year 146 memberships. Many of the nurserymen have contributed liberally to the membership this year, memberships that were given by them to their customers in accordance with an arrangement made with this office. In all from this source have come upon our roll 172 memberships.

The State Fruit-Breeding Farm continues to be the object of permanent central interest in our association. Unfortunately the frosts of last spring interfered with the fruiting of the thousands of trees which under other circumstances would have borne fruit, many of them for the first time, so that practically few advances have been made the past year in breeding new tree fruits except in preparation for the future. In small fruits it was different, and the list of these worthy of trial which are standing the climate well is a growing one. Our membership are exceedingly interested in these new fruits as manifested by the large number called for through the distribution of plant premiums. In all there were sent out this year 2,594 lots of these plant premiums.

There is a growing interest in top-grafting late-keeping varieties of apples as indicated by the large number of calls made on this office for scions for this purpose the past season.

The seedling contests continue and the interest in growing seedlings continues as well, there having been a call during the past year from this office for a considerable number of packages of apple seeds by our membership.

So far no apple seedling has appeared to which we could award the $1,000 prize offered by the society for a winter apple. Referring to the seedling contest inaugurated some years ago, the first $100 premium in connection with which should have been awarded three years ago, it appears that the time limit for the fruitage of these seedlings was made too short. The fourth premium comes due at this meeting, but no claimants have as yet come forward for any of these premiums. Probably it will be thought a wise thing to do to continue these awards during later years when these seedling trees will come into bearing.

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The “acre orchard” contest entered into a year ago last spring in which there 35 entries finally materialized into a smaller number than anticipated, reports having come into the office last year from 23 contestants. The reports for the current year are now being received but not all at hand.

The executive board provided conditions under which these orchards should be conducted and the prizes awarded, which conditions will be found published in the 1914 report of the society on page 45.

Trial stations are continuing their work and are being used principally now as far as new material is concerned in testing of fruits from the State Fruit-Breeding Farm. To this list has been added the government station at Mandan under the management of A. W. Peterson, reports from which point will also be made to our association from time to time, as well as from the trial stations connected with University Farm, all of which stations have been added also to our society list.

Arrangements are being perfected for the purpose of extending to our membership opportunity to use the books from the society library, which is now increased to about 3,300 volumes. This list has been published in the 1915 report of the society, and we shall be prepared early in the year to send out books to all who desire them according to the regulations, which will be published in an early number of our monthly.

The society is maintaining its card indexes and adding year by year to the amount of material which they represent. One of these cards indexes contains the names and titles of all the articles published in the society’s annual reports and is indexed also with the names of the writers, the index being prepared in this double manner. Another card index contains the list of books in our library, and the third one, indexed by subjects, the bulletins on horticulture coming from the various state experiment stations and the U.S. Department of Agriculture. These indexes are invaluable for their various purposes and may be used by the membership at their volition.

The society maintained an office at the late state fair, at which a considerable number of memberships were received and a large number of members met by the secretary and other officers of the society. We believe this was an excellent move and should be continued in the future.

As to the horticultural exhibit at the state fair, while the secretary has no official connection with it, it should be spoken of as a very satisfactory exhibition indeed and well handled. The building as a whole, covering all branches of horticultural work, was a real credit to the various interests represented and well deserves all the time and expense lavished upon it.

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Probably the most important event of the year with which the secretary was officially connected was the effort made to secure an appropriation from the state legislature in session last winter for the construction of a building for the uses of the Horticultural Society. The building committee, with which the secretary served, held a number of meetings with members of the Board of Regents and various committees at the state legislature, at which a considerable number of our membership besides those regularly on the committee were in attendance and took part in appeals in the interest of the building. The secretary's service in this connection was largely the effort made to enlist the co-operation of the membership in the way of getting them to write letters or talk personally with the members of the legislature upon the subject, and an appeal was sent out through the mails to all of our membership with this object in view. The response was a most liberal one, far beyond our expectations. Some of the members of the legislature received over thirty letters from their constituents asking their support to this measure. There was not a single member of the legislature who did not receive some communications about this matter. In all there were sent in this manner to members of the legislature 1,594 letters. While our efforts to secure this building failed, it was, as we believe, largely on account of the prevailing and unusual sentiment for economy which permeated the legislature to an extraordinary degree, and we have reasonable assurance that a similar effort with the next legislature will bring us success. In regard to this matter the chairman of the building committee speaks more fully.

The financial report follows and to this your attention is respectfully requested.

Secretary's Financial Report, 1915.

A. W. LATHAM, SECRETARY.

RECEIPTS.

Balance $91.62
G. W. Strand, Treasurer 685.96
Life membership fees 190.00
Books sold 14.10
Cuts sold 7.50
Banquet tickets sold at 75c each 138.00
Garden Flower Society, account premiums 65.00
Annual fees, 1914 8.00
Annual fees, 1915 3,004.00
Annual fees, 1916 263.00

$4,467.18

DISBURSEMENTS.

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Postage $717.33
Office rent 420.00
Telephone 55.45
Premium books 113.61
Office supplies 28.36
Plant premiums 105.14
Assistance in office 719.21
Printing 247.16
Expenses annual meeting, 1914 90.73
Expenses annual meeting, 1915 76.84
Expenses summer meeting, 1915 14.64
Banquet 152.75
Reporting annual meeting 174.99
Expenses vice-presidents 29.17
Expenses superintendents, trial stations 50.59
Assistance annual meeting 1914 100.50
Expenses delegates, *etc*., meeting, 1914 224.07
Expenses delegates to other societies 30.29
Discounts, membership fees, auxiliary societies, *etc*. 825.54
Examining officers' books 10.00
Treasurers salary, 1914 25.00
Collecting checks 10.00
Plans of horticultural building 40.00
Officers' bonds, 1915 15.00
Forestry Association 50.00
Insurance on library sundries 8.00
Sundries 20.68
Balance 112.13

$4,467.18

GENERAL STATEMENT, DECEMBER 1, 1915.

Balance in Hennepin County Bank December 1, 1914 $177.38
Interest in 1915 $11.24

Total $188.62
Loring Fund, including interest 140.60
Balance with secretary 112.13
Balance with treasurer 4,906.00

Total $5,347.35

SUMMER MEETING, 1916.

Premium List, Summer Meeting, 1916.

No Duplicating of Varieties Permitted.

OUT-DOOR ROSES.

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1st 2d 3d 4th
prem. prem. prem. prem.

Collection—three blooms of each named
variety, to be shown in separate vases $6.00 $4.00 $2.00 $1.00

Collection of named varieties—three blooms of each, in separate vases, amateurs only 6.00 4.00 2.00 1.00

Three named varieties, white—each variety in a separate vase, three blooms of each, each bloom on a separate stem 2.00 1.00 .50

Three named varieties, pink—each variety in a separate vase, three blooms of each, each bloom on a separate stem 2.00 1.00 .50

Three named varieties, red—each variety in a separate vase, three blooms of each, each bloom on a separate stem 2.00 1.00 .50

Collection of Rugosa and Rugosa Hybrids—each variety (consisting of one cluster of blooms on a single stem) in a separate vase 2.00 1.00 .50

Most beautiful rose in vase 1.00

Largest rose in vase 1.00

Seedling rose to be shown by the originator.
(Not previously exhibited in
competition.) Bronze medal donated by
the American Rose Society.

Basket of out-door roses and foliage, arranged for effect without ribbon, not to exceed twelve inches in diameter 3.00 2.00 1.00

The following named varieties of roses to be entered separately and shown in separate vases, three to five blooms in each vase.

Prince Camile deRohan, General Jacqueminot, Margaret Dickson, M. P. Wilder, Jules Margottin, Magna Charta, Paul Neyron, Madam Gabriel Luizet, Baroness Rothschild, Anna de Diesbach, Ulrich Brunner, John Hopper, Rosa Rugosa (pink and white), Baron deBonstetten, Karl Druski, Madam Plantier, Grus an Teplitz.

Each, 1st prem., 75 cents; 2nd prem., 50 cents; 3rd prem., 25 cents.

PEONIES.

1st 2d 3d 4th
prem. prem. prem. prem.

Vase of Festiva Maxima, 6 blooms $2.00 $1.00 $0.50
" " flesh or light pink " " " " "
" " medium or dark pink " " " " "
" " white " " " " "
" " red " " " " "

Collection—three blooms of each named variety in separate vases $6.00 $4.00 $2.00 $1.00

Collection—three blooms of each named
variety in separate vases, amateurs only 6.00 4.00 2.00 1.00

Seedling peony, three blooms 3.00 2.00 1.00 .50

Collection—one bloom of each variety, shown each in a separate vase; for amateurs owning no more than ten varieties 2.00 1.00 .50

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ANNUALS AND PERENNIALS.

	1st prem.	2d prem.	3d prem.	4th prem.
Vase of Arabis	$1.50	$1.00	$0.50	
" " Canterbury Bells	"	"	"	
" " Dielytra	"	"	"	
" " Delphinium	"	"	"	
" " Evening primrose (Oenothera)	"	"	"	
" " Forget-me-not	"	"	"	
" " Foxglove	"	"	"	
" " Gailardias	"	"	"	
" " Grass pinks	"	"	"	
" " Iceland poppies	"	"	"	
" " Iris	"	"	"	
" " Lilies	"	"	"	
" " Lupine	"	"	"	
" " Nasturtiums	"	"	"	
" " Oriental poppies	"	"	"	
" " Pansies	"	"	"	
" " Perennial coreopsis	"	"	"	
" " Pyrethrum	"	"	"	
" " Shasta daisies	"	"	"	
" " Sweet peas	"	"	"	
" " Sweet William	"	"	"	

Collection—named perennials, in separate vases $6.00 $4.00 $2.00 $1.00

Collection of annuals and perennials in separate vases (not to exceed 12) by amateurs who have never taken premiums on flowers 4.00 3.00 2.00 1.00

Vase of flowers grown and exhibited by
child 2.00 1.00 .50

Vase of any kind of flowers not named in this list. (An exhibitor may make any number of entries desired under this head) 2.00 1.00 .50

Vase of flowers arranged for artistic
effect 1.50 1.00 .50

Basket of outdoor-grown flowers, arranged
by exhibitor 3.00 2.00 1.00

STRAWBERRIES.

One quart of each variety, to be shown on plate, not in box.

1st prem. 2d prem. 3d prem. 4th prem.
Collection (not less than six varieties) $5.00 $4.00 $3.00 $2.00

Collection of three named varieties 3.00 2.00 1.00 .50

The following varieties of strawberries to be entered separately:

1st prem. 2d prem. 3d prem. 4th prem.
Bederwood, Dunlap, Crescent, Splendid,
Clyde, Warfield, Lovett, Enhance, Glen
Mary, Haverland, Progressive, Superb,
Americus, each $1.00 $0.75 $0.50 $0.25

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Best named variety not included in the
above list 2.00 1.00 .50

Seedling, originated by exhibitor 3.00 2.00 1.00

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

Notices of our May, June, July and August meetings will be mailed to members. Being exhibition meetings, the dates will depend upon weather conditions.

It is suggested that in cases where plants have not already been exchanged, the informal exhibition of spring flowers, our May meeting, be also “Exchange Day,” and that plants for exchange be brought to that meeting.

A SHAKESPEARE GARDEN.

So wide an interest in the commemoration of the tercentennial celebration of Shakespeare’s death has been awakened by the “Drama League of America” that there will be many old English gardens planted in 1916,—gardens containing as many as possible of those flowers mentioned in his plays.

Not all of these many flowers and shrubs could be grown in our climate, some mentioned, such as nettles, burdocks, plantains and other weeds, would be entirely out of place in a garden, soon overrunning it. It must be remembered, too, that in Shakespeare’s time herbs and wild flowers were cultivated in most gardens, that many considered beautiful then are now almost forgotten, and that some have been so far surpassed by their improved hybrids, the originals would not now be cultivated.

We have not attempted, therefore, to include all of the flowers so lovingly mentioned by the poet, but have used only those that will prove beautiful and hardy in Minnesota, making a planting that will prove, with proper care, permanent. Were each plant labeled with its proper quotation the garden would prove much more interesting, *e.g*., “There’s rosemary, that’s for remembrance—” Hamlet, marking the plant of that name.

Annuals.—Gillyflowers (Ten weeks’ stocks); Love in Idleness (Pansy, Viola tricolor); Mallow (Lavatera splendens); Marigold (Calendula officinalis); Poppy (Somniferum, Opium poppy).

Trees.—Hemlock, Hawthorne.

Vines.—Honeysuckle, Scarlet Trumpet.

Bulbs.—Scilla Nutans (Hyacinthus nonscriptus); Daffodils; Saffron (Crocus santious); Crown Imperial (Frittilaria Imperialis); Lily, Candidum, Turk's Cap (Scarlet Martagon), Orange Lily (Croseum), Spectabile, Tigrinum.

Herbs.—Balm (Lemon Balm); Camomile (Anthemis); Caraway; Dian's Bud (Wormwood, Artemisia Absinthium); Fennel (Foeniculum officinalis); Hyssop (Hyssopus officinalis); Lavender (Lavendula vera); Marjoram (Origanum vulgare); Mint; Milfoil (Yarrow); Parsley; Rosemary (Rosmarinus officinalis); Rue (Ruta graveoleons); Savory; Thyme (1, Thymus vulgaris, 2, Thymus Serpyllum).

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Perennials.—Aconite (Napellus); Balm (Bee-balm); Brake; Carnation (Bizarre Dianthus caryophyllus); Clover (Crimson Trifolium incarnatus); Columbine (Aquilegia vulgaris); Cowslip (Primula veris); Crowflower (Ragged Robin, Lychnis floscuculi); Cuckoo Buds (Butter cups, Ranunculus acris); Daisies (Bellis perennis); Eryngium M. (Sea Holly); Flax; Flower de luce (Iris Germanica, blue); Fumitory (Dicentra spectabilis; Bleeding Heart); Harebell (Campanula rotundifolia); Larksheel (Delphinium elatum, Bee Larkspur); Peony; Pinks (Dianthus Plumarius); Violet (Viola Odorata).

Roses.—Brier (Eglantine Rose), Provencal (Cabbage Rose), Musk, Damask, White Provence, York and Lancaster.

For appropriate quotations to mark each flower the little book, “Shakespeare’s Garden,” by J.H. Bloom, will be found very helpful. Our other authorities have been Biesley and L. Grindon, all of which are in the Public Library.

MRS. N. S. SAWYER.
MRS. E. W. GOULD.

ENTOMOLOGICAL NOTES

By F. L. WASHBURN, Professor of Entomology, University of Minnesota.

SUGGESTIONS TO PARTIES PLANNING TO PURCHASE NURSERY STOCK.

It may be quite out of place to offer any suggestions along this line to readers of this magazine, and yet some buyers may find help in the following:

For evident reasons it pays to buy Minnesota stock where possible, stock which has been tried out and found to be hardy, rather than purchase new varieties, glowingly described in catalogues. Always buy from an inspected nursery.

For evident reasons it pays to buy from nurseries near at hand, so that the time elapsing from the shipping of the trees or shrubs and the planting is small.

Further, it is always desirable, if possible, to buy from the nurseryman himself, a responsible party, rather than from an agent. It is further very desirable to personally pick out your own stock in a visit to the nursery.

When the goods are received, see that they bear an inspection certificate for the current year. The plants should be in good condition and show that the roots are protected from air and wrapped in moist packing material. The condition of the received goods indicates the carefulness of the nurseryman or the contrary. Do not allow trees or

shrubs to lie neglected after being received, where the roots will dry out. If you are not ready to plant they should be at once heeled in, first divesting them of their wrappings.

If any injurious insects, like scales or fungus-looking growths, are found on the trees, the same should be reported to the Experiment Station. After planting the trees and shrubs, they should receive the best of care in regard to cultivation.

Finally, refuse to accept any raspberry or blackberry plants showing crown gall on roots or crowns.

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CROWN GALL ON RASPBERRIES BLACKBERRIES.

All the nurserymen are able to recognize crown gall, and whatever we may think regarding its effect or lack of effect upon apple, we know by personal observation that it may and does cause the death of raspberries. This disease of course is, unfortunately, very common—almost universally present in our nurseries. The public, generally, are so well aware of its injurious effect upon canes that they are indignant when any such stock is received from nurseries. It behooves all nurserymen, therefore, for the sake of their own business interests if nothing else, to be extremely careful that no diseased stock of any kind is sent to patrons.

* * * * *

THE DESTRUCTION OF A CARLOAD OF DISEASED POTATOES.

The State Entomologist, by virtue of being a collaborator with and agent for the United States Horticultural Board, supervised the destruction by burning of 403 sacks of potatoes, seven per cent. of which, according to the testimony of our Plant Pathology Division, were infested with powdery scab. The Great Northern Railroad, which had brought the potatoes from Canada, were given the choice by Federal authorities, either to return the potatoes to Canada or destroy them by burning, under our supervision. They chose the latter procedure and the use of the Minneapolis crematory was secured for this purpose. Ninety sacks of this same shipment which were illegally unloaded at Casselton, N. Dak., were buried by North Dakota authorities. It is to be hoped that this disease does not find its way into the potato belt in the Red River Valley.

NOTES ON PLANT PESTS.

Prepared by Section of Insect Pests, A. G. RUGGLES, and by Section of Plant Diseases, E. C. STAKMAN, University Farm.

The first real spraying of the apple orchard should be given just as the center bud of the flower cluster begins to show pink. The material to use in the spraying compound is lime-sulphur (1 to 40) plus arsenate of lead, 1-1/2 pounds of the powder, or three pounds of the arsenate of paste to fifty gallons of the made-up lime-sulphur. If done properly this will get the scab of the apple, blossom blight or the brown rot in the plum, and is the most important spray for plum pocket. The arsenate of lead in the mixture will control the young of leaf eating insects and precocious plum curculios.

The second most important spraying of the year is given within a week after the blossoms fall, the same spraying compound being used. This spraying kills many of the germinating spores of such things as apple scab and also is the important spray for codling worm as well as for the plum curculio and for leaf eating insects.

Watch carefully for the hatching of plant lice eggs. The ideal time to spray for these is just after hatching, and before the young lice become hidden in the bud scales or in the curl of the leaves. The spraying material to use at this time is a sulphate of nicotine.

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Plow the plum orchard as soon as possible in order to turn under mummied plums, which are responsible for much of the primary infection of brown rot.

Plowing the apple orchard early to turn under the old leaves is also essential in preventing scab spreading to the flower stalks.

Cultivate the vineyard in order to turn under the mummies. Practice clean cultivation from the very beginning in order to help control black rot and downy mildew. If the rot or mildew was very bad in the previous years, early spraying with the Bordeaux mixture 4-4-50 is very important.

Keep the radishes, cauliflowers, and cabbages covered with a poison spray from April 30 to May 20 to prevent the ravages of the cabbage maggot. This should be applied once a week in fair weather, and twice a week in rainy weather. The spray is made as follows:

Lead arsenate, three-fourths ounce; New Orleans molasses, one-half pint; water, one gallon.

Look over the seedling cabbages carefully and destroy all which show any sign of wilting or rotting.

Cut out apple twigs badly injured by the buffalo tree hopper and burn them immediately.

Watch for plant lice on lettuce in cold frames. To combat the insects the plants should be sprayed with nicofume liquid, one teaspoonful to a gallon of water.

BEE-KEEPER'S COLUMN

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

COMB HONEY, EXTRACTED HONEY, AND INCREASE.

The practical beekeeper must decide at the beginning of the honey season whether he wishes to produce extracted honey, comb honey or merely to increase the number of his colonies. The manner of management of his apiary will depend upon such decision. At any rate a modern outfit, pure bred colonies in modern ten or eight frame hives, is required for successful beekeeping no matter in what line of bee industry he may feel inclined to engage.

For production of extracted honey the ten frame hive is to be preferred. Bees are less inclined to swarm in a ten frame hive, and two ten frame supers as a rule will be required where three eight frame supers would otherwise be necessary.

In successful extracted honey production swarming may be reduced to a minimum if during the dandelion and fruit trees honey flow, and in the beginning of white clover flow, once a week an empty drawn comb be inserted into the middle of the brood nest. As soon as the brood chamber has eight frames of brood the queen excluder is added and an extracting super added filled with white extracting combs. If the beekeeper does not care to raise his extracted honey in snow white combs only, the excluder may be omitted, but the result will be that the queen will lay eggs throughout the whole hive, thus rendering extracting difficult on account of brood present. When raising

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extracted honey on a large scale two extracting supers may suffice for each colony. When the one next to the brood chamber is filled it is extracted at once, the top one taking its place next to the brood. The extracted super when empty is then given back to the bees and placed on top. When the second super is filled the process is repeated. This process of extracting honey requires a period of four or five weeks. All supers are removed at the end of the honey flow. The last full super, however, should not be extracted but saved for the feeding of light colonies in the fall and spring.

The easier way to produce extracted honey is to have enough supers, say three or four for each colony. The first is added during the dandelion or fruit blossom flow as soon as the colony is strong enough to readily enter into it. When this super is nearly full and the combs can be seen through the top bars to whiten, another super is added next to the brood chamber, and the partly filled super is raised. When this second super begins to get well filled, a third and a fourth super is added on top. In the latitude of Minneapolis it is not advisable to insert a super next to brood chambers after July 4th, or two weeks before the end of the honey flow, because such procedure would result in a large amount of uncapped honey.

Comb honey should not be produced where the honey flow is slow and intermittent. Weak colonies will not produce comb honey profitably. In making up supers only A 1 sections should be used, with full sheets of extra thin foundation and three-eighths inch bottom starters of thin foundation. Care should be taken to fasten the foundation very solidly, else heat and weight of bees will cause it to drop. One or more bait sections should be used in the first comb honey super to induce the bees to enter into it more readily. Bait sections are the half finished, unmarketable sections of the previous season. One to four are used near the center of each super.

(To be continued in June No.)

[Illustration: THE HOME OF THE LADY SLIPPER—MOCCASIN FLOWER.

THE MINNESOTA STATE FLOWER.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 JUNE, 1916 No. 6

The State Flower and State Flag of Minnesota.

E. A. SMITH, VICE PRES. JEWELL NURS. CO., LAKE CITY.

The material in this paper has been gathered from several sources, part of which has never before been published. It is presented not so much in the spirit of criticism as it is in the spirit of making the best of a mistake which the writer believes occurred when the moccasin flower was designated as the state flower of Minnesota.

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Last spring an acquaintance of mine was rambling through the woods and came across the Cypripedium, or the Moccasin flower, or the Lady slipper, the state flower of Minnesota. He sent me a few specimens. Although I had lived in the state of Minnesota for a number of years, this was the first time that I had ever seen the state flower or known anything about it. The incident set me to thinking, and I went to work to find out what I could about this flower. I herewith present that information as briefly as possible.

There are forty-one states in the Union that have a state flower. Other states have the matter under consideration. This fact alone would indicate that a state flower is of some importance as an emblem, or it would not be so generally considered by the various states. In most instances the flower was selected by a vote of the public school scholars of the respective states. The vote was then submitted to the state legislature and a resolution adopted making the state flower legal. I submit to you the question: Are school children qualified to choose a flower as an emblem of the state? Do they understand the conditions required in the state and the purpose of the selection sufficiently well to enable them to select intelligently? Do the children in your school know what flower is common in the northern part of the state as well as in the southern part of the state?

In Minnesota, however, the state flower was not chosen by the school children of the state, but upon petition of the Woman's Auxiliary Board of World's Fair Managers a resolution was introduced into the senate February 4th, 1893, by the late Senator W.B. Dean, providing that the wild Lady Slipper, or the Moccasin flower, Cypripedium calceolus, be accepted and the same designated and adopted as the state flower, or the floral emblem of the state of Minnesota. This resolution was also adopted in the house the same day. A few years later upon petition of the Nature Club of Minneapolis the variety was changed to the Reginae or Spectabile, variety.

[Illustration: The Lady Slipper—Minnesota State Flower. Somewhat under size.]

The mystery of the selection in this state is, why was a flower chosen which is not common to any part of the state? We therefore have a state flower, beautiful in itself, but without special appeal to the people because it is comparatively unknown.

There are about forty species of the Cypripedium belonging to the north temperate zone. Several of these species occur in the northern United States and Canada, east of the Rocky Mountains, which are found in the state of Minnesota. It is called the Moccasin flower because it resembles the Indian shoe. This plant grows preferably in cool and moist woods or in bogs. It flowers principally during the months of May and June. The varieties differ in color, being deep red, pink, yellow, white and variegated. All of the species, however, are very beautiful.

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The varieties more commonly found in Minnesota are, Acaule, rose purple; Candidum, small white; Arietinum, red and white; Parviflorum, small yellow; Pubescens, large yellow; and Spectabile, description of which is as follows: Plants stout, leaves oval, acute; sepals, roundish, white; petals, oblong, white; labellum, white or pale pink purple. Very showy.

It is unfortunate that the Minnesota State Flower does not take kindly to civilization and cultivation, as it is very difficult to transplant. About ten years ago at Lake City, Minnesota, we tried to propagate the moccasin flower. We dug the roots and transplanted them in ground especially prepared in a nearby grove where we could watch their development, but the plants were a failure.

A state flower should be one of the common flowers of the state, so familiar to all, that its name would suggest a picture of the flower itself. Probably not 10 per cent of the people of the state have ever seen it. On this account it is to be regretted that this variety was chosen as the flower emblem of the state. A state flower, like the state flag, should be accessible and familiar to everyone, and yet, probably, the state flag of Minnesota is a stranger to many residents of the state, for Minnesota did not have a state flag until 1893.

An emblem should mean something to the individual. The family coat of arms and the iron cross are distinctive emblems. The shamrock in sentiment is as dear to an Irishman as his native land. If an emblem means something to the individual, how much more it ought to mean to the state and nation.

The flag is an emblem of loyalty and patriotism. Men fight for it. They lay down their lives for it because it stands for home and country. I fancy if men did not know what the flag looked like, the fight would not be a very fierce one. Do you know what the state flag of Minnesota looks like? A description of it can be found in the Legislative Manual for 1915. This flag bears a wreath of white moccasin flowers (Spectabile) upon a blue background, in the center of which is the state seal. The design was chosen by a committee of six ladies. It is appropriate and beautiful, and was designed by Mrs. Edward H. Center, of Minneapolis.

The state should furnish an attractive picture of the state flower and the state flag to every high school in the state, free of charge. The influence would be good, creating a deeper loyalty to the state.

Wisconsin State Horticultural Society.

REMARKS AT ANNUAL MEETING BY SECY. F. CRANEFIELD, MADISON, WIS.

President Cashman: We have with us today, Prof. Cranefield, secretary of the Wisconsin Society. I am sure everybody will be pleased to hear from him.

Mr. Cranefield: Mr. President, Ladies and Gentlemen: I thank you, Mr. President, for your very kind introduction. I know you meant well when you introduced me as professor, but I really must plead “not guilty” to the charge. There was a time, long ago, when I was connected with our Agricultural College, in a minor relation, that I was not in a position to resent it, but I have reformed since, and as secretary of the Wisconsin Horticultural Society I am trying to live down the past.

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It goes without saying that I am glad to be here. I want to come as long as you will let me come. We of the Wisconsin society are watching you closely to see if we can by any means learn the secret of your success, and to that end we are here in considerable force. Our president is here, and the managers of two of our largest co-operative fruit shippers associations also.

Frankly, we want to beat you if we can. You have the biggest and the best society in the country, and we have the second biggest and next best, and we are striving for first place.

Having now disposed of the usual compliments befitting the occasion I will aim to tell you of a few things we are trying to do in the Wisconsin society.

The efforts of our society during the past ten years have been directed quite largely to the development of commercial fruit-growing in the state. While we have not overlooked nor forgotten the home owner we have been working to take commercial orcharding out of the hands of the farmer and put it in the hands of specialists, and we are succeeding. We have today about thirty thousand acres of purely commercial orchards in Wisconsin and more coming. We discourage by every means at command the planting of fruit trees by the man who is engaged in general farming except sufficient for his own use.

Further, in this campaign we aim to concentrate our efforts on certain districts so as to build up fruit centers. For instance we have in Door County, that narrow little neck of land between Green Bay and Lake Michigan, over seven thousand five hundred acres of orchards, apple and cherry.

Along the Bayfield shore line we have another splendid fruit district almost, if not quite, as well known as Hood River and worth vastly more.

In the southwestern corner of the state along the valley of the Kickapoo River, on the high bluffs on either side of the river, have been planted a thousand acres of apples and cherries in the past five years.

While not all of this development is directly due to the Horticultural Society, ours has been the moving spirit. The Kickapoo development is due wholly to the work of the society.

In this way we are establishing an industry that will be a tremendous asset to the state. There was a time when dairying was but a feeble industry in Wisconsin, and now we lead.

Our society also aids in the development of marketing associations. In doing these things we also aid the farmer and home owner, for whatever is best in the commercial

orchard is best in the home orchard. Spraying, pruning and cultivation as practiced by the expert serve as models for the farmer who has but two dozen trees.

The other activities of our society are similar to yours. We publish a magazine, as you do; we hold two conventions, as you do; in fact our work, and no less our interests, are the same as yours, and I most sincerely hope that the very pleasant relations that have existed between the societies may continue for all time.

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Marketing Fruit Direct.

H. G. STREET, HEBRON, ILL.

In studying this subject, the direct marketing of fruit, let us first see how much it includes. Does it include simply marketing alone? Or does the success of it depend principally upon the varieties of fruit set out together with the after cultivation, pruning and spraying? First of all you must interest people in your work by producing something that they really want, and half of your problem will then be solved.

There are any number of places in the northwest where the demand far exceeds the supply. I do not mean for the common run of fruit full of worms and covered with scab, but, instead, strictly No. 1 fruit of the very best varieties.

About 1901, through the advice of my uncle, Dr. A. H. Street, of Albert Lea, I joined your society, and through the experience of your members I learned many valuable lessons. Perhaps the one that impressed me the most was that of grafting our choicest varieties upon hardy crab stocks so as to make them hardy enough to withstand our hardest winters, and by so doing it nearly insures us against total failures in the fruit crop and especially against losing the trees outright.

[Illustration: Mr. H. G. Street, of Hebron, Ills.]

This top-working of course will not do all; we still have to assist Nature by proper spraying, pruning, cultivating, *etc*. Doing all in your power to secure a crop each year to supply the trade you have already worked up is a big item in holding it.

While studying your conditions, together with those of Wisconsin and Illinois, I became very much interested in the native plums as well as in the apple industry. Therefore I also set out some three acres of the following varieties: Surprise, Terry, Wyant, Hammer and Hawkeye, also some of the Emerald and Lombard.

As this was then new business to me, I had fallen into no deep ruts, and of course I took it for granted that all horticulturists practiced what they preached. Therefore I pruned, sprayed, *etc*., according to directions, and in due time the fruits of my labor commenced to show up, and they certainly were attractive to the eye as well as to the taste.

[Illustration: Wolf River apple tree twelve years old, bearing eighteen bushels, in H. G. Street's orchard.]

As our supply increased our demand increased also, so that for the past five years our average plum crop has been around 2,000 baskets (the 8-lb. grape basket) and all sold readily at 25 to 35 cents retail.

We are located at Hebron, Illinois, eight miles south of Lake Geneva, Wis., on the Chicago & Lake Geneva Railway, which makes an ideal location for a fancy trade. During plum harvest it is nothing uncommon to have fifty to 100 visitors a day. These customers include all classes, from the Chicago millionaires to the common laborers, and all receive the same cordial reception.

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We make it a point never to allow them to think that we are close with our fruit—not even the neighborhood boys, as they are our best friends. What they buy we charge them a good fair price for and never fail to give all new customers a few choice samples of best varieties.

By the latter part of the plum season our big red Wolf River apples commence to show up and cook well; also Wealthy and McIntosh commence to get ripe enough to eat, and the demand each year has far exceeded the supply.

So far we have had very few poor apples, but we always sort them into three grades, the third grade being made up into cider to sell while sweet. The second grade we sell as such for immediate use. The firsts of the McIntosh we have sold at $2.00 to $2.50 per bushel, Wealthy, Jonathan and Grimes at $1.50 to $2.00, while Wolf, N. W. Greening, Salome, Winesap, Milwaukee, *etc*., have averaged us $1.25 per bushel. We are always very careful not to have any bruised, diseased or ill shaped specimens in our first grade.

The President: Can you tell us something more about your experience in marketing direct? Do you sell all the fruit you raise on the place?

Mr. Street: We sell about all the fruit that we raise direct to the consumer. When we first started we started with strawberries, and about half of our crop went to the merchants, and he would retail it for 20 per cent, but to any one that came there for it we would charge the full retail price, same as he had to charge, and we never had any trouble with any of the stores that we dealt with. If we have any seconds or anything we don't like to put out to the stores we sell them to our customers and charge them whatever we think would be right for them.

As to plums, about two-thirds of those would sell right direct to customers coming there, the rest we supplied to the stores at 20 per cent discount so that they could retail them at the same price that we retail them for. Since the apples have begun to bear it seems that two-thirds of the people want the McIntosh, and almost everyone is satisfied with its flavor. They average a little larger with us than the Wealthy, and some of them you can hardly tell from the Wealthy unless you know just about what the fruit is. Last year we kept them until about February or possibly later, but an apple with as good a flavor as that you cannot keep from being eaten up.

The President: I suppose that is automobile trade?

Mr. Street: A great deal of it is.

The President: How did you get it? By advertising?

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Mr. Street: No, by doing something so much different from what anybody else is doing you get people to talking. I think the Wolf River apple together with the Terry and Surprise plums have been the cause of getting started. Of course, the McIntosh now is helping out, too. You give a person a few Wolf River, not for eating but for cooking, and then give him a Wealthy or something like that to eat—they will be looking at the big Wolf River and eating the other and seem to be well satisfied and always come back. Whenever we sell to the stores we always gauge our prices so that the majority of their customers will take our fruit before taking the shipped in fruit from Chicago. We find with grapes we can charge about five cents a basket more than they retail the Michigan grapes for.

[Illustration: View in eleven year old orchard of H. G. Street.]

For native plums we get more than they do for the Michigan fruit. We have had quite a good many of the Burbank plums, but we cannot sell over one-third as many as we do of the natives.

A Member: You don't ship them, so don't consider the packing?

Mr. Street: The only ones we ship are those ordered by people coming there or by letter. If they want a bushel we pack them in a bushel box. If they want three or six bushels then we pack them in barrels.

Mr. Anderson: Where are you located?

Mr. Street: Just south of the Wisconsin state line.

Mr. Anderson: I am located 100 miles west of here, and I shipped out 400 bushels of apples to the Dakotas last year direct.

Mr. Richardson: How many growers are there in your neighborhood growing fruit commercially?

Mr. Street: I do not know of any who spray, cultivate and prune according to the best methods within about 100 miles. We always make it a point to give our customers good fruit, so that we are not afraid to recommend it. Then there is another advantage. If they come right there, and we have any seconds we can tell them just what they are, and if they want them we can sell them for what they are worth, but if we are putting them into a store, I prefer not to put in seconds.

Mr. Kochendorfer: I think that is the advantage of disposing on a public market. You have a chance to sell the inferior goods without any coming back.

Mr. Street: The main thing is to use improved methods and try to outdo the other fellow. Cultivate a little more thoroughly, put in your cover crop, not over-fertilize but all

you possibly can; give the dormant spray; spray before bloom very thoroughly and again after bloom; two weeks after that again, about July 15th.

Mr. Richardson: How many apple trees have you?

Mr. Street: We now have ten acres in apples, but most of them are young, about three acres in bearing.

Mr. Richardson: I would like to ask the gentleman if in a small place that way he hasn't a better local market than we have here in the larger cities. Around Lake Minnetonka they raise grapes, but we get most of our grapes from Ohio and Indiana. I have wondered why it is that these grapes go to another market when they can just as well go to the Minneapolis market. You know as well as I do anyone buying fruit in the Twin Cities always buy fruit grown in Ohio or Indiana.

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Mr. Street: I do not know why it is, but so far we haven't realized that we have any competition. We charge for our best eating apples fully as much as the stores have to charge for the Western fancy packed fruit. There is not a worm hole or speck of disease on the No. 1, and really I can't see how they can compete after raising the fruit in the West and packing and shipping it to Chicago and then out there. The price they would have to charge there would make us a good fair price; in fact, a good big price.

A Satisfactory Marketing System.

G. A. ANDERSON, RENVILLE.

I have marketed this fall some over 400 barrels of apples, mostly Wealthy, Duchess and Northwestern Greening. Three hundred barrels of these were shipped direct to local merchants in Dakota and western Minnesota towns in small shipments of a few barrels at a time or as fast as they could sell them. I started this way of marketing during the big crop of 1913 and this year again, getting nearly all of my old customers back and many new ones. I secured satisfactory prices, and for my location I believe I have solved the marketing problem. One does not pay much attention to the marketing as long as enough only for local demand is produced, but when one has a surplus to dispose of the marketing problem looms rather large. I have tried several times shipping to commission firms, but have never received satisfactory returns.

A Successful Cold Storage for Apples.

H. F. HANSEN, ORCHARDIST, ALBERT LEA.

Mr. Clarence Wedge: I want to preface this short paper with the statement that Mr. Hansen is a man who has worked himself up from the very bottom of the horticultural ladder. He came to Albert Lea a very poor man, and I think supported himself for some time by trapping and fishing and such work as he was able to do. He is a man with a great tendency to investigate and to work out problems for himself. By his thrift and persevering investigations he has brought himself into a fine property and great success. He is the market gardener in our part of the country and a credit to his kind. (Mr. Wedge reads the paper.)

When my orchard, near the city of Albert Lea, began to bear heavy crops of fruit, I found it very desirable to hold the Wealthy and other kinds that ripen at the same time until after the farmers had marketed their fruit. We have a very good cold storage in Albert Lea that is open to the public, but the price they charge is sixty cents per barrel for two months' storage, which is more than the fruit will bear, and so I began to think of putting up a cold storage of my own.

My first one was built underground with pipes for ice and salt to cool it, something like the system that I am now using. But I found out in the first season that it takes a great

deal of ice to offset the heat that is coming in from the ground at the sides and bottom of the cellar. And so I built the storage which I am now using entirely above ground, using the basement under it for storing cabbage and vegetables. I built this in 1913, the size 28x56 feet, using cement blocks for the basement, where the cabbages are stored. The cold storage above this is built as follows:

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First, an ordinary frame building with 2x4 inch studdings sheathed on the outside with drop siding with No. 3 flooring. Inside of this sheathing 2x4 inch studs placed flatwise, sheathed on the inside with No. 3 flooring, and the six-inch space back of the studs filled with sawdust. On the outside of this firing strips one-half foot are nailed, which are covered with linofelt. One-half foot firing strips are nailed inside of this, and these also covered with linofelt. To this again one-half foot firing strips are added, to which are nailed metal lath, and the whole is plastered with cement. The floor both above and below is made of 2x12 joists, with No. 3 flooring nailed below the joints, the space between which is then filled with ten inches of saw dust, leaving an air space of two inches at the upper edge of the joists. The joists are then covered with linofelt and then the linofelt covered with No. 3 flooring.

On the north and west sides I found it necessary to add one more waterproof coat of linofelt in order to make sure of keeping out the frost.

I have so far only finished up for cold storage one-half of the room, using the other half for a packing room, so that my present facilities are only 28x28 feet. This room is cooled by eight inch pipes of galvanized iron, extending from the attic above to troughs near the floor, that are sloping so as to carry off the melted ice. These pipes are on both sides about two feet apart. The ice is pulled up into the attic by horsepower and broken up small enough into pieces to feed the pipes. The amount of salt used with the ice depends upon how fast we want the ice to melt. A large quantity of salt cools the storage down quicker. In practice I find that it takes one hour for a man to elevate a ton of ice, chop it up and fill the pipes. They hold something over a ton and must be filled every other day in ordinary September weather. It will not do to let the pipes remain less than one-half full. When the ice gets down that far, we have to fill again.

The total cost of my storage when it is entirely furnished up and the present capacity doubled will be about $3,000.00. At present it holds 2,000 standard size apple boxes.

I find that it only pays to put in good fruit that in ordinary seasons will keep until the first of March and hold its flavor well and give good satisfaction on the market. Icing stops about the middle of November. The cost per box for storage is as follows: Ice and salt, ten cents. Interest on investment, six cents. I have figured out carefully the entire cost of growing and storing apples, and find out that leaving out the interest on the value of the land, it will approximate forty-eight cents per bushel. This includes cultivation, spraying, packing, and picking. The question which now interests me is whether we can grow fruit good enough and stand the expense and compete with apples grown in the other good fruit sections of the country.

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Mr. Older: I had the pleasure of visiting this plant with Mr. Wedge, and this man had quite a good many boxes of as fine apples as you would wish to see. This was along the latter part of February, and they were in fine condition. He had a lot of Jonathans and Yankees and some other varieties I don't remember, grown on top-worked trees there.

The Plum Curculio.

EDWARD A. NELSON, UNIVERSITY FARM, ST. PAUL.

(Prize Winner at Gideon Memorial Contest.)

The small crescent-shaped punctures, so common on apples, plums, peaches and other fruits, are made by a small snout-beetle known as the plum curculio. The beetles issue from their winter quarters at about the time the trees are in full bloom and feed on the tender foliage, buds and blossoms. Later they attack the newly set fruit, cutting small circular holes through the skin in feeding, while the females, in the operation of egg-laying, make the crescentic cuts so characteristic of this species. The egg, deposited under the skin of the fruit, soon hatches into a very small whitish larva or grub, which makes its way into the flesh of the fruit. Here it feeds greedily and grows rapidly, becoming, in the course of two weeks, the fat, dirty white "worm" so well known among fruit growers.

The curculio is a native of North America and for more than 150 years has been known as an enemy of fruits. Our early horticultural literature abounds with reference to its depredations. In more recent times the great increase in planting of fruits, brought about to supply the increased demand, has permitted it to become much more abundant than formerly, and the plum curculio constitutes at the present time one of the most serious insect enemies of orchard fruits. Statistics gathered of its depredations show that it is distributed over much of the area of the United States. Its western limit is, roughly, a line drawn through the centers of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. East of this line the entire United States is infested except the southern third of Florida and the northern half of Maine.

Is the plum curculio causing much damage to the fruit growing industry of this country? That it is is shown by the National Conservation Committee in its report in Volume III, page 309, where it states that the average annual loss in late years to only three fruits is as follows:

Apples $3,257,806

Peaches 4,088,814

Plums	1,244,149

Grand Total	$8,590,769

Just think of it! A total loss each year to only three fruits of over $8,500,000. This amount is a heavy drain upon the fruit growing industry of this country. During the past twenty-five or thirty years the total damage caused by this insect, to the various fruits which it attacks, would, on a conservative estimate, probably be not less than $100,000,000.

These figures show the absolute need of the adoption of effective remedial measures against this insect so as to lessen this loss. But before we can hope to combat this insect systematically and successfully it is necessary to know its life history and habits.

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[Illustration: The curculio in its stages of growth, and its fruit injury.]

There are four distinct stages in its life cycle: (1) The egg, (2) the larva, or “worm,” (3) the pupa, and (4) the adult, or beetle.

The curculio passes the winter in the adult stage under accumulations of partly decayed leaves, among the closely-packed dried grass of sod-covered orchards, and probably wherever suitable protection from the winter may be found. Its depredations are usually worse near woods, so it probably finds here very suitable places for wintering.

In the spring, when the fruit buds are unfolding, the beetles begin to emerge from their winter quarters and feed to some extent on the blossoms and tender leaves of the fruit trees. Mating soon begins, and by the time the fruit is well set the beetles make this fruit the chief object of their attention. The circular punctures in the skin are feeding punctures, while the crescent-shaped ones are egg-laying punctures. A single egg is deposited in a puncture, although several may be placed in a single fruit. From one to eight eggs may be deposited daily by an individual female, which may be continued for several months. The great majority of the eggs, however, are deposited by the end of eight weeks. These eggs hatch in from three to seven days, being influenced greatly by the weather.

The egg hatches into a larva, or “worm,” which bores into the fruit. It becomes full-grown in from twelve to twenty days and bores out of the fruit. It enters the soil, burrows to a depth of one-half to two inches, and forms an earthern cell in which to pupate. In three or four weeks it emerges as a full grown beetle and attacks the ungathered fruit and the foliage. On the approach of cold weather the beetle seeks a protected place in which to pass the winter.

The character of the injury is very nearly alike in all fruits. In the plum the fruit often falls to the ground before mature. In seasons of short crops very little fruit may remain to ripen. The punctures cause the fruit to become mis-shaped and to exude masses of gum. The ripe fruit becomes “wormy.” The late varieties may be seriously injured by the new generation of adults. In the apple the injury to the fruit is about the same as in the plum, except that the infested fruit is not so likely to fall to the ground and that the egg rarely hatches into the grub there. The fruit becomes knotted and pitted. The late varieties may also be injured by the new generation of adults. In the peach, cherry and other stone fruits, the injury closely resembles that of the plum.

Although the plum curculio has some natural enemies that tend to reduce its numbers somewhat, yet they are not important enough to be considered as effective means of control. Some of these natural enemies are parasites of various kinds, birds, chickens and the like.

There are several remedial measures practiced, varying in their degree of effectiveness. Away back in the early days of horticulture in this country, when the curculio became very abundant rewards were offered for an effective method of combating it. Several were proposed, but only a few were at all effective. The best of these methods is what is called “jarring.”

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The curculio has the habit of falling to the ground and “playing ’possum” when disturbed. This led to the practice of holding or spreading sheets beneath the tree and then striking the tree a sudden, forcible blow with a padded pole or mallet in order to dislodge the beetles. The trees were jarred daily from the time the calyx or “shuck” began to slip from the newly set fruit until the beetles had disappeared, or for at least four or five weeks. This was practiced to quite an extent, but it takes too much time and is too expensive.

A still better remedy is clean cultivation. Experiments have shown that as high as 76.75 per cent. of the pupae may be destroyed by means of thorough cultivation. The mere breaking of the pupal cell, leaving the earth in contact with the body of the pupa, is fatal to many. Others are killed by the crushing action of the earth as it is stirred. Others are exposed to the elements and subject to the attacks of their enemies, such as ants and birds. Sunlight is quickly fatal to them, and exposure to the air on a warm day in the shade is also fatal to them. Observations show that the insect is in the pupal condition in the ground in from fifty to sixty-five days after the falling of the blossoms of such fruit as apples and plums. Data have been presented to show that the minimum time spent in the ground is about twenty days. Shallow cultivation should begin, therefore, in about eight or nine weeks after blossoming. It is best to cultivate every week or oftener for six or seven weeks. It is very necessary that this cultivation should reach immediately beneath the spread of the limbs, as most of the curculios are found here, having dropped from the fruit above and burrowed into the soil where they fell.

The third method of combating the curculio, the method most commonly used and most generally recommended, is spraying with arsenical poisons. The spray most generally used is arsenate of lead. The most economical and effective way is to add arsenate of lead to Bordeaux mixture. The Bordeaux is mixed in the following proportions: three pounds of copper sulphate (blue vitriol), four pounds of lime, and fifty gallons of water. To this amount of Bordeaux mixture three pounds of arsenate of lead are added. In place of Bordeaux mixture lime-sulphur may be used. If the insecticide is used alone, three pounds of arsenate of lead in fifty gallons of water make an effective spray. It is best to spray three times, the first spraying coming just before the blossoms open, the second coming ten days later, and the third another ten days later. The cost is from ten to fifteen cents per tree for the three sprayings. This cost is lessened when combined with other sprays.

While spraying greatly reduces the injuries inflicted, yet it is apparent that account must be taken of other factors, such as the relative abundance of insects as compared with the amount of fruit present on the trees. With a small fruit crop and an abundance of curculios, the most thorough spraying in the world will not serve to bring through a satisfactory amount of sound fruit.

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While spraying is undoubtedly the most important aid and, if persisted in from year to year, may answer for its control, as its effects are cumulative, yet it is clear that other control measures should also be employed. In all cases which have come under observation the insects have always been found most abundant in orchards which are in sod or are poorly cared for and allowed to grow up more or less in weeds and trash. Also, orchards near woods always suffer severely, especially along the border. As opposed to this condition is the notably less injury in orchards kept free from weeds and trash. In such cases spraying usually given for other insects, as the codling moth, serves to keep the curculio well under control. In fact, it may be said as a general statement that the curculio will never become seriously troublesome in orchards given the usual routine attention in cultivation, spraying and pruning now considered essential in successful fruit growing. Serious losses from the curculio are almost conclusive evidence of neglect, which is best and most quickly corrected by the adoption of proper orchard practice.

* * * * *

AN ANTIDOTE FOR WASP STINGS.—It not infrequently happens that persons biting unguardedly into fruit in which a wasp is concealed receive stings in the mouth or throat. Such stings may be exceedingly dangerous and even fatal since the affected tissues swell rapidly and this is liable to cause difficulty in swallowing and breathing. An effective antidote is employed in Switzerland. The sting is rubbed vigorously with garlic, or, if it is too deep in the throat for this treatment, a few drops of the juice from bruised garlic are swallowed. If garlic is not to be obtained onion may take its place, but is a less active agent. The efficacy of this simple remedy was verified by a Swiss specialist, who found it important enough to be presented at a session of the Vaudois Society of Medicine.

Increasing the Fertility of the Land.

PROF. F. J. ALWAY, DIVISION OF SOILS, UNIVERSITY FARM, ST. PAUL.

I have been asked to speak on “Increasing the Fertility of the Land.” To speak on such a subject is sometimes a rather delicate matter because some people consider they have a soil so good that you can’t increase its fertility. With some of the prairie soils, when they were first plowed up that wouldn’t have been so very far amiss. Take those black prairie soils with the grayish yellow clay subsoil, with an abundance of lime in it, which you find in a large part of the state, including a large part of Hennepin County, and you have as good a soil as you may expect to find anywhere on the earth’s surface. But you can’t keep a soil up to its full limit of fertility, no matter how good it is, unless you frequently treat it with something.

[Illustration: Prof. F. J. Alway.]

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When a soil is well supplied with lime there are three things that are liable to be deficient. If it is not well supplied with lime there may be four, but the bulk of your soils are good enough so far as lime is concerned. Those three are potash, which is abundant and will be abundant 100 years from now, phosphoric acid, or phosphorus, with which our soils are fairly well supplied, and nitrogen, which comes from the vegetable matter. In nitrogen our prairie soils are remarkably rich when first plowed up. The phosphoric acid and the potash you can not lose unless they are taken away in the form of crops, but the nitrogen may be lost without even taking off crops. All you have to do is to cultivate your soil, when part of the nitrogen becomes soluble in water and is carried down by the rain into the water-table unless you have plants growing with roots to take it up; a large part escapes into the air. So when your black prairie soil has been under cultivation for twenty years, as an orchard, usually from one-half to one-third of the original nitrogen has escaped, most of it into the air, only the smaller part being carried off in the crops. That is the one thing that orchardists and horticulturists have to concern themselves about first of all, so far as soil fertility is concerned.

I see that the first of the questions for me to answer deals with that. “What crop do you consider the best green manure?” There are two kinds of green manures. One is represented by rye. Rye takes up the nitrogen that is in the soil, and when it dies leaves behind what it took out of the soil; the next crop can get this. By plowing under the rye crop you do not increase the amount of nitrogen, the most important element of fertility in the soil.

We have a better green manure than that, better than rye or oats or barley or any of those plants that properly belong to the grass family; namely, the members of the clover, bean or pea family—all of these plants which are called legumes, which have pods and which have flowers shaped like butterflies.

As these grow they take up nitrogen from the air; the bacteria which make their home on the roots of those plants take the nitrogen from the air and give it to their host plants. The plants receive this nitrogen, store it in themselves, and when the crop is plowed under you have a great amount of nitrogen added to the soil. Now, a clover crop of an acre growing from spring until the freeze-up in the fall may take out of the air as much as 120 pounds of nitrogen. One hundred and twenty pounds of nitrogen, bought in the form of commercial fertilizer from Swift & Company, or Northrup, King & Company, would cost you $24.00. The clover has taken that much out of the air. If the crop were pastured off, the greater part of this nitrogen would be returned to the soil; when you plow the clover under still more nitrogen is taken from the air by bacteria that live upon the decaying plant material, and you may have $48.00 worth of nitrogen per acre added to the soil by simply growing clover for one year.

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Any kind of green manure crop that bears pods is good. Vetches are good, and soy beans are among the best for orchards. Clover, if you give it time to make a good growth, is as good as anything.

The next question is—"Should apple raisers use commercial fertilizers?" Now, the apple tree, when it is growing on good soil, makes such a vigorous root development that it is hard to get any commercial fertilizer to help it. On poor soils it, like any other kind of plant, will respond to fertilizers. Some of the eastern experimental stations have been carrying on investigations with commercial fertilizers for a great many years to see whether in apple orchards these will cause an increase in the yield or an improvement in the quality of the fruit. On good soils, even after ten or twelve years' fertilization they have been found to have no effect except in the case of nitrogen, and this can be better supplied in the form of a green manure plowed under than in any other way. That is to say, keep your orchard clean until the last of July or first of August, sow your green manure crop, let it grow until freeze-up and stay there during the winter time. It holds the snow and so affords some winter protection. In the spring plow it under, and you plow under all the nitrogen that the plants had collected the previous year. Then keep your orchard clean during the summer time, until in July or August you again sow the green manure crop.

[Illustration: Applying ground limestone to an acid soil to determine whether liming will be profitable. Half of the field is left unlimed.]

The fertilizers that I get more inquiries about than any others are the phosphates—bone meal, acid phosphate and rock phosphate. Horticulturists have read that striking results are being obtained with these on certain crops in the eastern and central states, and they want to know whether the same fertilizers will pay here. Some inquire about potash fertilizers. With the latter there is no doubt but that the results we would obtain would, even under ordinary circumstances, not pay. At the present time potash costs about ten times what it does in times of peace. Sulphate of potash, which ordinarily brings $45.00 per ton, is now quoted at $450. This puts its use out of the question.

The phosphoric acid fertilizers are no higher now than usual. They cost, according to the kind, from $9.50 to $25.00 per ton. Some of them are produced near here—in South St. Paul. With tree crops, apple, plum and pear, we need expect no increased yield from the use of phosphates, unless it be on our very poorest soils. On certain crops, like the bush fruits—the currants and the raspberries, we might get a distinct benefit. I cannot give a definite answer to that. I can tell you what results they have obtained in New York state, what they have obtained in Pennsylvania or Illinois or Maine, but what results we would get in Minnesota we do not know. We can't apply their results to our conditions. The only thing we can do is to carry on such experiments here, and they have not yet been started. That brings me to a third question I have here.

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“What experiments are being conducted by the University of Minnesota with orchard and other horticultural crops?” We realized the importance of this matter and plans were prepared. Then, as you know the last legislature was economical. It decided that one of the best places to make a cut would be in the funds for experimental work; when these funds were reduced we not only could start no new experiments but even had to cut off some of the old ones. For that reason these fertilizer experiments have to wait until the next legislature or the one after. I hope the next legislature will make such an appropriation that they may be begun.

Now, for the next question. A man states that he can secure at a very low rate limestone from one of the Minneapolis companies producing crushed limestone for road-making purposes and wants to know whether it will pay him to haul it to his farm. Well, if you do not have any other work for your teams it may pay you. However, if your time is valuable, you had better take some samples of the soil and send them in to the experiment station. Just address them to the Soils Department or Soils Division. Then we can decide whether it is worth while trying some of the limestone. We cannot tell you whether it will pay; we can tell you whether it is likely to pay, or whether it is likely to be a waste of energy, or whether it is so doubtful that you ought to give it a fair trial. On perhaps two-thirds of the fields in Hennepin County it would be a waste of money and energy; on about half of the others, we may say, it is almost certain to be a good investment at a dollar a ton. On the remaining portion we simply can’t say. On these, chances are even whether it would pay. No crops are injured by limestone, so you are safe in putting it on. Practically all crops are benefited by it on sour soils and especially the vegetable crops.

The next question is—“Are the black peat or muck soils first class? Do they need anything besides drainage?” Some of them, a very few, produce really good crops when they are drained, plowed and brought under ordinary cultivation without fertilization, but only a few. Nearly all of them need commercial fertilizer, and until a bog covered with peat soil has been carefully examined to ascertain the depth of the peat, the difficulty of drainage, and the character of the peat (because peats differ greatly within a few miles of each other) it is unwise to attempt to reclaim it. Within three miles of the experiment station we have three bogs very different in character. One, about half a mile from the buildings, is heavily charged with lime. Another has an exceedingly small quantity of lime so that profitable crop production of any kind would be out of the question without a heavy application of ground limestone or quicklime. Still another one stands between these two. One of them can be reclaimed without any great expense, but with the one it would be a very expensive matter to fertilize and treat with lime after it had been drained.

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Those are the questions that have been given me. Are there any other questions?

Mr. McCall: What is peat lacking in?

Mr. Alway: Practically all peats are lacking in potash. If the peat layer be very shallow, six inches, twelve inches, sometimes even twenty-four inches, the plants are able to get their roots down through the peat and get their potash from the underlying clay or loam. In that case no fertilizer is needed. Some of the peats lack lime, some of them lack lime, potash and phosphoric acid, and some these three and nitrogen also, so that you either have to apply some commercial form of nitrogen or grow legumes as green manures.

Mr. Kellogg: What was the trouble where I couldn't raise strawberries on new wood soil?

Mr. Alway: I couldn't answer that.

Mr. Kellogg: The leaf mold was six or eight inches deep.

Mr. Alway: Was it any deeper than that?

Mr. Kellogg: I don't know, it may have been down a foot, and the leaf mold had been accumulating there for ages.

Mr. Alway: In some cases the peat is so thoroughly decayed that it looks like leaf mold and it may be a foot or two feet deep.

Mr. Kellogg: This was no peat, it was just wood soil. I could not raise anything—

Mr. Alway: Did the plants grow?

Mr. Kellogg: Yes, the plants grew and wintered well but didn't bear worth a cent.

Mr. Alway: Did they make lots of runners?

Mr. Kellogg: Oh, fairly good, but right over the fence in the next field that had been worked for twenty-five years I got 260 bushels of strawberries to the acre; never had any manure on it.

Mr. Alway: The more leaf mold the more nitrogen; if you have too much nitrogen it may develop the vine and fail to form fruit or seed.

Mr. Ludlow: On heavy black prairie soil, three feet deep, where I am growing eighty bushels of corn to the acre, I want to put in strawberries, and I have a lot of wood ashes,

dry wood ashes, not leached ashes, but dry wood ashes. Would it be worth while to put that on or would that overdo the thing? Would it be policy to put that on?

Mr. Alway: It is not likely to do any harm, and it is likely to do some good. Wood ashes contain chiefly lime and potash. The potash will be a distinct benefit. The lime isn't of any particular benefit to this crop on most soils. For strawberries it is slightly harmful on our ordinary soils that are originally well supplied with lime.

Mr. Ludlow: On another piece a ways from that I put out a young orchard, and in order to start the trees well I had covered the ground half an inch deep with wood ashes around those trees. I noticed that the weeds grew there twice as quick as they did when I got away from the wood ashes.

Mr. Alway: There you have the benefit of the potash and the lime. If you put lime in the orchards it will make the clover and most of the other green manure crops grow better, and thus you gain in nitrogen from the lime; you gain in potash as it comes from the wood ashes.

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Mr. Brackett: Have you ever found any ground with too much leaf mold on it to grow good strawberries?

Mr. Alway: I have not.

Mr. Brackett: I remember when I broke out my place where I am living now I had a place where the leaves had collected and rotted until I would say there was eight or ten inches of leaf mold. When you went across it you would sink in almost to your shoe tops. On that piece of ground I grew 11,000 quarts of strawberries to the acre in a year, the largest yield I had ever grown on that leaf mold. You can never get too much leaf mold. There must have been something else besides the leaf mold.

Mr. Alway: In case a crop does not give a satisfactory yield it may be due to other things than the soil, and until we eliminate the other possible causes we can't safely blame it to the soil.

Mr. Moyer: What do those black soils in the western part of the state need? They have a whitish deposit on top.

Mr. Alway: Drainage. That is alkali.

Mr. Kochendorfer: I have a ten-year apple orchard that I disked last year and kept it tolerably clean this spring. There were a lot of dandelions sprung up that I mowed down the middle of July, and since then they have grown up again. Will they take nitrogen the same as clover?

Mr. Alway: They won't take any from the air. They will act like so much rye, but when they die and decay nitrogen will be gathered from the air and added to the soil by bacteria that live upon the decaying vegetable matter.

Mr. Kellogg: Did you ever hear of them dying?

Mr. Alway: Dandelions? If they are plowed under.

A Member: Is it practicable to grow soy beans in this soil? Can they be gotten at a reasonable price, and can we mature them here?

Mr. Alway: They mature here without any serious difficulty. There are a great many different varieties. If you order them from a distant seed house you may get a variety that will mature in Louisiana but not in Minnesota.

A Member: How about cowpeas?

Mr. Alway: Cowpeas are disappointing thus far north. In Minnesota they are not nearly as satisfactory as the soy bean. In an unusually warm summer they are satisfactory.

A Member: With the soy bean do you have to plow in the whole of it?

Mr. Alway: Yes. The whole plant ought to be plowed under.

A Member: Would it be practicable to feed soy beans in an orchard?

Mr. Alway: Yes. You don't get quite the same benefit from the green manure when you pasture as when you plow under.

A Member: How about the hairy vetch? Does it grow here?

Mr. Alway: Yes. It grows here. It is not a bad crop at all.

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POISONING TREE SCALE.—We take the following from *Scientific American* as worth consideration by the owners of orchards and lawns:

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A correspondent in *Science* relates the following rather startling experiment in killing tree scale by poisoning the sap of the tree. He says:

"I have in my ground a plant of Spanish broom about a dozen years old and with a trunk about four inches in diameter which has for several years been seriously infested by cottony cushion scale (*Icerya purchasi*). I have tried various sprays, have put scale-eating beetles on the tree, and at one time cut all the branches off and sprayed the trunk several times in the attempt to get permanently rid of this scale, but up to last winter it seemed that all attempts were in vain. In February of this year, when the broom was very thickly covered with the scale, I bored a three-eighths inch hole in the trunk to a depth of about three inches, filled the hole nearly full of crystals of potassic cyanide, and plugged it up. In two days the scale began to fall from the tree and in a few days all appeared dead. Others hatched and attacked the tree, but lasted only a short time, and the tree has since been free from scale and very vigorous."

NOTICE OF SUMMER MEETING, 1916

A JOINT SESSION OF THE MINNESOTA STATE HORTICULTURAL SOCIETY AND ITS AUXILIARIES, THE MINNESOTA STATE GARDEN FLOWER SOCIETY, THE MINNESOTA STATE BEE KEEPERS SOCIETY AND THE MINNESOTA STATE FLORISTS SOCIETY.

Will be held FRIDAY, JUNE 23rd, 1916, in the Gymnasium, at University Farm, St. Paul.

THE GYMNASIUM BUILDING in which this meeting is to be held has recently been constructed and only finished suitable for the uses of this gathering within the past year. The grounds about it are still in part in an unfinished condition. Directly south of this building are the football grounds, originally a marshy tract, now filled in and leveled off, with hillsides sloping upwards some thirty to forty feet on either side, well shaded. These slopes would be excellent places for the picnic dinner and the afternoon session except for the fact that they have recently been seeded and are not yet in condition for use. The main room in the gymnasium building, which is a very large room—at least three times as large as the one occupied by our exhibit last year—will be used for the fruit and flower display, and exhibitors can have access to this hall early in the forenoon, though visitors will be barred from the exhibition hall until 12:00 m. to give ample opportunity for placing and judging the display.

The exhibition will remain in place undisturbed until 9:00 o'clock p.m. The flowers will be distributed to the various hospitals in the Twin Cities.

THE PREMIUM LIST accompanying this notice is practically the same as last year, there being only a few minor changes, to which it will not be necessary to refer here. The season, up to the time of writing this notice at least, having been a favorable one

we are anticipating a large display of flowers, probably the finest ever shown at any of our summer gatherings, and as the weather is always pleasant on the occasion of our summer meeting a large gathering of members and visitors is also assured.

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DEMONSTRATIONS.—There will be a number of demonstrations at the farm, one by Prof. Francis Jager, the apiculturist, at 11:30 o'clock, at the Apiary Building. No special subject has been announced for this, but it is certain to be a profitable occasion for those interested in bee culture. Professors connected with the entomological and pathological departments will conduct experiments in spraying at some point near the Main Building. Undoubtedly there will be other demonstrations, which may be announced before the meeting or in regard to which announcements will be found posted at the gymnasium.

GUIDES TO THE GROUNDS.—Guides will be in attendance to escort visitors about the grounds to various points of interest. These guides will be prepared to answer questions pertaining to the various branches of educational work at the farm. Those who wish to take advantage of this service will meet the guides at the gymnasium at 10:30 a.m. and 3:30 p.m. The guides will wear suitable badges.

PICNIC DINNER.—In regard to the picnic dinner, which will occupy the time between noon and 2:00 o'clock, we are not quite sure as to where it will be held, but probably near the dining hall. Should the weather be unfavorable of course there is plenty of room inside the gymnasium building. Lemonade, ice cold, will be provided in quantity at the gymnasium building to meet the needs of the picnickers.

AFTERNOON MEETING.—At 2:00 p.m. the afternoon session of the meeting will be held at some point in or around the gymnasium building, depending on the weather at that time and somewhat also on the weather between now and then as to the condition the grounds may be in.

REACHING THE GROUNDS.—Take the Como-Harriet or Como-Hopkins car in either St. Paul or Minneapolis, get off at Doswell Avenue, and a walk of approximately one-half mile will bring you to University Farm grounds. To reach the gymnasium go north on Cleveland Avenue, which is the avenue running along the west side of University Farm, past the University Farm buildings until you come to the last building, which you will recognize as the gymnasium by its size. The grounds between Cleveland Avenue and the gymnasium are in an unfinished condition, but visitors will readily find their way across. If you prefer to ride all the way to the grounds get off at Eustis Avenue, which the conductor will point out to you. From that place cars run every fifteen minutes into the Farm grounds, an extra fare of five cents being charged. Ask the conductor to let you off at the gymnasium building, which you will reach from the street car after a short walk over ground still ungraded and where no special path has been provided. Getting off at that point, however, saves a long walk from the terminal station. If in doubt as to the way, follow the sign of the arrow.

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VISIT TO STATE FRUIT-BREEDING FARM.—This farm is located at Zumbra Heights, twenty-two miles west of Minneapolis on the Minneapolis and St. Louis railroad. The train leaves depot at 8:35 a.m. Return can be made by way of Zumbra Heights landing on Lake Minnetonka and the lake steamers via trolley line to Minneapolis, or by waiting until mid-afternoon a train can be secured returning to the city on the railroad. One or more of the professors will go out Saturday morning, June 24th, to accompany any who may desire to take advantage of this opportunity to visit the Fruit Breeding Farm in a body. There are many things of interest there, the special timely feature at this season being the fruiting of a large field of No. 3 strawberries, which variety gives promise of being the coming commercial berry of the Northwest.

ENTRIES.—All entries must be received by the secretary not later than Monday, June 19th. No entries whatever will be received at the meeting. The exhibitors are urged to send in their entries at as early a date as possible, under no circumstances later than the date noted above. Entry blanks will be furnished by the secretary on application.

EXHIBITS.—All exhibits must be in place and properly labeled by 11:30 a.m. to compete for premiums. The exhibitors must be members of the society and growers of the articles exhibited. Any one may become a member upon payment of the annual fee of $1.00.

Fruits and flowers shown become the property of the association.

Premium List, Summer Meeting, 1916.

No Duplicating of Varieties Permitted.

OUT-DOOR ROSES.

1st prem. 2d prem. 3d prem. 4th prem.

Collection—three blooms of each named variety, to be shown in separate vases $6.00 $4.00 $2.00 $1.00

Collection of named varieties—three blooms of each, in separate vases, amateurs only 6.00 4.00 2.00 1.00

Three named varieties, white—each variety in a separate vase, three blooms of each, each bloom on a separate stem 2.00 1.00 .50

Three named varieties, pink—each variety in a separate vase, three blooms of each, each bloom on a separate stem 2.00 1.00 .50

Three named varieties, red—each variety in a separate vase, three blooms of each, each bloom on a separate stem 2.00 1.00 .50

Collection of Rugosa and Rugosa Hybrids—each variety (consisting of one cluster of blooms on a single stem) in a separate vase 2.00 1.00 .50

Most beautiful rose in vase 1.00

Largest rose in vase 1.00 Seedling rose to be shown by the originator. (Not previously exhibited in competition.) Bronze medal donated by the American Rose Society. Basket of out-door roses and foliage, arranged for effect without ribbon, not to exceed twelve inches in diameter 3.00 2.00 1.00

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The following named varieties of roses to be entered separately and shown in separate vases, three to five blooms in each vase.

Prince Camile deRohan, General Jacqueminot, Margaret Dickson, M.P. Wilder, Jules Margottin, Magna Charta, Paul Neyron, Madam Gabriel Luizet, Baroness Rothschild, Anna de Diesbach, Ulrich Brunner, John Hopper, Rosa Rugosa (pink and white), Baron deBonstetten, Karl Druski, Madam Plantier, Grus an Teplitz.

Each, 1st prem., 75 cents; 2nd prem., 50 cents; 3rd prem., 25 cents.

PEONIES.

	1st prem.	2d prem.	3d prem.	4th prem.
Vase of Festiva Maxima. 6 blooms	$2.00	$1.00	$0.50	
" " flesh or light pink " "	"	"	"	
" " medium or dark pink " "	"	"	"	
" " white " "	"	"	"	
" " red " "	"	"	"	

Collection—three blooms of each named variety in separate vases $6.00 $4.00 $2.00 $1.00

Collection—three blooms of each named variety in separate vases, amateurs only 6.00 4.00 2.00 1.00

Seedling peony, three blooms 3.00 2.00 1.00 .50

Collection—one bloom of each variety, shown each in a separate vase; for amateurs owning no more than ten varieties 2.00 1.00 .50

ANNUALS AND PERENNIALS.

Vase of Arabis $1.50 $1.00 $0.50
" " Canterbury Bells " " "
" " Dielytra " " "
" " Delphinium " " "
" " Evening primrose (Oenothera) " " "
" " Forget-me-not " " "
" " Foxglove " " "
" " Gailardias " " "
" " Grass pinks " " "

" " Iceland poppies " " "
" " Iris " " "
" " Lillies " " "
" " Lupine " " "
" " Nasturtiums " " "
" " Oriental poppies " " "
" " Pansies " " "
" " Perennial coreopsis " " "
" " Pyrethrum " " "
" " Shasta daisies " " "
" " Sweet peas " " "
" " Sweet william " " "

Collection—named perennials, in separate vases $6.00 $4.00 $2.00 $1.00

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Collection of annuals and perennials in separate vases (not to exceed 12) by amateurs who have never taken premiums on flowers 4.00 3.00 2.00 1.00

Vase of flowers grown and exhibited
by child 2.00 1.00 .50

Vase of any kind of flowers not named in this list. (An exhibitor may make any number of entries desired under this head) 2.00 1.00 .50

Vase of flowers arranged for artistic effect 1.50 1.00 .50

Basket of outdoor-grown flowers,
arranged by exhibitor 3.00 2.00 1.00

STRAWBERRIES.

One quart of each variety to be shown on plate, not in box.

1st prem. 2d prem. 3d prem. 4th prem.

Collection (not less than six
varieties) $5.00 $4.00 $3.00 $2.00

Collection of three named varieties 3.00 2.00 1.00 .50

The following varieties of strawberries to be entered separately:

1st prem. 2d prem. 3d prem. 4th prem.

Bederwood, Dunlap, Cresent,
Splendid, Clyde, Warfield, Lovett,
Enhance, Glen Mary, Haverland,
Progressive, Superb, Americus, each 1.00 $0.75 $0.50 $0.25

Best named variety not included in
the above list 2.00 1.00 .50

Seedling's, originated by exhibitor 3.00 2.00 1.00

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

Photographic contest—Open to all members of the Garden Flower Society.

Class I. Photograph showing best garden arrangement or planting effect.
List of flowers and shrubs to accompany picture.

First prize—Twenty-five perennial plants.

Second prize—Twelve iris.

Class II. Photograph showing individual plant in bloom. A growing plant in bloom will be preferred to one in a vase.

First prize—Twenty-five perennial plants.

Second prize—Twelve iris.

Class III. Photograph showing wild flower in bloom. Directions governing
Class II to be followed.

First prize—Twenty-five perennial plants.

Second prize—Twelve dahlia tubers.

Any number of pictures may be entered in each class, but only one prize in each class will be given an exhibitor.

When possible have photographs 5x7 inches or 4x5 inches, although size will not bar an otherwise meritorious picture. Photographs in Classes I and II should be confined to the garden of the exhibitor.

All pictures are to be in the hands of our secretary by November first, and are to become the property of the society. The prizes will be delivered the following spring. The pictures will be on exhibition at our annual meeting in December.

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These directions in The Garden Magazine are so good they are quoted verbatim:

NEXT TO SEED PLANTING the most important part of the gardener's work is skill in the technique of transplanting. How often do you hear concerning some gardener, that if he "only touches a thing, it is bound to live?" There is no "king's touch" in the garden game. People who "love" plants are more successful with them, merely because such persons take greater care in handling them. The first essential in transplanting is to have good plants. They should be well hardened off (see March Reminder, covering cold-frames); this applies to plants in flats and in pots even more than to those growing in frames. In buying plants, select stocky, compact, dark colored ones in preference to very large ones.

PREPARE THE SOIL as carefully as though you intended to sow seeds. Mark out the rows, and if fertilizer is to be used, mix it thoroughly with the soil before beginning transplanting. Then prepare the plants carefully. Unless they are very small, cut back the largest leaves about one-half with an old pair of scissors. With a small trowel or an old knife, cut them out of the frame or flat in which they are growing, keeping as much soil as possible with each. (If not in flats, cut them out as you use them in the garden.) If they are in pots, knock them out carefully and pack into flat for convenience in handling. Paper pots, which produce the best plants, are not removed before planting. Water thoroughly the day before planting, so that the soil will be in the best condition for handling; but for several days before planting, it is well to keep the plants "on the dry side," as they will then re-establish themselves more quickly when set out.

(To be continued)

ENTOMOLOGICAL NOTES

By F. L. WASHBURN, Professor of Entomology.

University of Minnesota.

A SILVER PRUNE IN BLOOM AT MINNETONKA.

May 19, 1916.—The writer has a small silver prune grafted on hardy root, which he obtained from Mr. Arrowood, Nevis, Minn., now in bloom at his experimental garden at Minnetonka—not many flowers, it is true, but in bloom just the same. This tree is not more than two feet high, and was somewhat protected by a rabbit protector and high snow. Other plums in the Entomologist's orchard, (one acre) are now nearly full of bloom: Hanska, Skuya, Opata and other Hansen hybrids, as well as trial plums from the University fruit breeding farm.

We have top worked this spring Hibernals, and Patten's Greenings with Stark's Delicious, Grimes Golden, King David and Johnathan.

One-half of this land slopes sharply to the north and the other half more gently to the south, clay, loam with clay subsoil, offering favorable conditions for orchard work as well as work with grapes, small fruits and vegetables.

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Of grapes we have started Concord, Worden, Moore's Early, Agawam, Brighton, Iona, Lindley, Salem, Barry, Herbert, Isabella, Green Mountain, and others.

We have even had the temerity to try Loganberries from the Pacific coast, and have some in fruit at present. A heavy covering of soil next winter will possibly protect these plants during the cold weather.

THE WHITE PINE BLISTER RUST IN MINNESOTA.

This disease has just been found on a few White Pines in two Minnesota nurseries. The trees in one of these nurseries came from Wisconsin, shipped into that state from the east. Absolute identification has been furnished by the Plant Pathology Division of the Agricultural College. The state entomologist has already in the field a force of men who will inspect every nursery in the state where white pines are grown.

THE ENGLISH SPARROW PEST.

We have experienced some success in the use of a sparrow trap, catching from 11 to 25 in half a day. It must be noted, however, that this does not occur every day, and further, that the young birds are most easily caught. Both old and young evidently learn to avoid the trap. Another party who has used this trap also reports success even greater than ours. Other parties report an average catch of ten birds a day for nearly four months. One can also, if on a farm, resort to shooting them singly, or, better, when gathered together feeding. In fact, they may be baited with grain for a few days (preferably in the fall or winter) and previous to the use of the shotgun. This accustoms them to gathering in a close flock. Eggs and nests may be repeatedly destroyed, if placed within reach. A well-directed stream of water from a hose is helpful in making them desert their roosts, at least for a while.

Dearborn (Farmers' Bulletin No. 493, U.S. Dept. of Agr.) describes a nest-box trap. Sparrows may also be poisoned, but this calls for extreme care. In this case it is interesting to learn that one experimenter fed a large number of sparrows killed by poisoning to a pet cat with no ill effects to the latter.

We have picked them from cornices upon our house at dusk with the aid of a small collecting gun or pistol, firing a very light charge of shot, but found that the shot marred the house, and were therefore obliged to discontinue the practice.

In addition to trapping sparrows with approved sparrow traps the following recipe has recently come to our notice:

"Feed good cracked corn a few days; then substitute poisoned cracked corn made as follows: Soak one quart of cracked corn in water; take it out and let it get about half

dry. Dissolve one ounce of strychnia in hot water. Soak corn in this until it swells and then dry completely."

BEE-KEEPER'S COLUMN.

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Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

COMB HONEY, EXTRACTED HONEY, AND INCREASE.

(Continued from May No.)

Colonies run for comb honey are very much inclined to swarm. Swarming with the resulting division of forces is incompatible with profitable comb honey production. The colony must be kept together for best results. The following methods are used by well known beekeepers.

1. At the beginning of the honey flow let the colony cast a natural swarm. After hiving the bees on starters or full sheets of foundation and giving them a little brood to prevent them from swarming out again, the swarm is put in the place of the parent colony, which is removed to one side two or three feet. The seventh day the old colony is moved over to the opposite side of the swarm two or three feet. Two weeks after, all the bees are shaken in front of the swarm, and the hive with wax and honey removed. Thus the desire of bees for swarming has been satisfied, and the colony is still working together.

2. Make a shaken swarm. During the dandelion honey flow add an extracting super to your comb raising colony to give bees room to store. At the beginning of the honey flow set the whole hive a little aside and put a new bottom board on the place thus vacated. On this bottom board place the extracting super from your colony. Find the frame with the queen and put it in the middle of this new brood chamber, bees and all. Then shake all the bees from the old brood chamber into the new. The brood in the old hive thus left orphans may be piled up on top of some weaker colony in your yard who will take care of it. Five such supers with brood may be piled on top of one such colony, and they will be the strongest in the yard for storing extracted honey during the basswood or other late honey flow. This honey will be very handy for feeding your bees in the fall and spring. Now add a comb honey super to your shaken swarm. Add more supers when necessary, below before July 4th, on top after that date. Remove all comb honey supers at once at the end of the honey flow to have them white and clean.

3. When your colony is very strong at the beginning of the honey flow—about June 10th—remove the queen, either by killing her or by starting a new colony with her with two frames of brood. The seventh day cut out all queen cells but one—be sure not to leave two. This will re-queen your apiary, will prevent swarming for that season, will put a large number of bees into the field—there being no larvae to feed, will prevent thousands of bees from being hatched after they are of no use as gatherers of honey, and the honey needed for raising those bees will go into the supers.

(Continued in July No.)

SECRETARY'S CORNER

NOTICE OF SUMMER MEETING will be found on pages 257-259 of this magazine. Don't overlook it—and be sure to come. Great show of flowers and a fine day is assured—that is our record to date.

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THE SECRETARY'S OFFICE during the summer month, will be open as usual except Saturday afternoon, but the secretary will be in regularly only on Mondays, Wednesdays and Fridays.

THE STATE ENTOMOLOGISTS REPORT ON NURSERY INSPECTION in 1915 has been issued as circular No. 37. It contains a list of all inspected nurseries in the state; and also six full page photographs illustrating the nursery industry in Minnesota. Copies can be obtained by writing F.L. Washburn, St. Anthony Park, Minn.

A GOOD YIELD OF EVERBEARING STRAWBERRY PLANTS.—Mr. J. J. Kunkel, of Kimball, Minn., writes under date of May 13th: "The three everbearing strawberry plants I received of you in 1915 made about 250 young plants, of which I replanted this spring about 200. We had a few berries, but did not expect berries as we let all runners grow."

Who has done better than that in growing No. 1017 everbearing strawberry plants?

A FARMER ON THE BOARD OF REGENTS.—We are much pleased to note the appointment of a real farmer in the person of C. W. Glotfelter, of Waterville, as a member of the Board of Regents of the Minnesota State University. Mr. Glotfelter is well known throughout the state as late president of the Minnesota State Agricultural Society, and is at present occupying the same position with the Minnesota Crop Breeders' Association. He is a farmer in every sense, as he lives upon a farm which he has himself worked personally a great many years. We feel that the horticultural and agricultural interests of the state are especially well cared for by this board in having Mr. Glotfelter in its membership.

WYMAN ELLIOT'S CONTRIBUTION TO THE LIBRARY.—A short time since Mrs. Elliot, widow of the late Wyman Elliot, sent to this office as a contribution to our library all of the horticultural and agricultural books which belonged to Mr. Elliot. There were in all 397 volumes, nearly all of them bound in cloth. The larger portion of these were reports of other horticultural and agricultural societies, most of which the Horticultural Society already had in the library. There were, however, some forty or fifty very valuable reference books, or books on specific subjects of a horticultural character, and a considerable number of reports of other societies which we did not have, in all amounting to seventy-seven volumes. These have been placed mostly in two cases by themselves which will be marked with Mr. Elliot's name, and, of course, each one of these volumes has an inscription of similar character on the fly leaf. The remainder of these books, 320 in number, are being sent to University Farm library for use there as far as they need them, and they will be likely to know where to place to advantage any that they have no personal use for. There are plenty of libraries in the state that would be glad indeed to receive some of these volumes, and we hope that in this way Mr. Elliot's name will appear in the catalog of many of our public libraries.

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NEW LIFE MEMBERS.—There have been quite a number of names added to the life membership roll of the society during the year 1916 and since the last public record was made of this sort. The names of the following persons have now been added to the permanent roll of the society: Ludvig Lima, Montevideo; Mrs. Florence Burlingame, Grand Rapids; A.L. Negstad, Arlington, S.D.; C. P. Bratnober, 1419 Harmon Place, Minneapolis; Miss Anna M. Johnson, Lafayette; H. J. Appleby, Minneiska; Hans M. Johnson, Pipestone; Christ Effertz, Norwood; O.J. Oyen, Watson; F.E. Older, California State Normal School, Los Angeles, Cal.; Erick Sparre, Elk River; E. H. Mazey, 3029 Ewing So., Minneapolis.

There is still room in this list for others, and why not instead of paying annual membership year after year make one payment and have done with it?

RESOLUTION ABOUT STATE FLOWER.—The following resolution was unanimously adopted at a meeting of the Minnesota Garden Flower Society, held during the annual session of the State Horticultural Society, in December last.

> Resolved, That whereas, The State of Minnesota has adopted a state flower, which, on account of its being a native of the woods and bogs, is not generally known or recognized, and

Whereas, The State of Minnesota in 1893 adopted by legislative vote a state flag, which emblem is not generally known to the residents of the state, and believing that familiarity with the state flower and the state flag will do good and create loyalty to the state and union;Be It Resolved, That we, the Minnesota State Horticultural Society, do hereby petition and pray the state legislature of Minnesota, to have printed an attractive picture of the state flower and the state flag, properly framed, and present it to the high schools of the state, with the request that it be placed upon the wall of their assembly room.

> Also, that it be furnished free of cost, to such other public buildings as may be deemed advisable.

PROGRAM, “FARMERS’ WEEK.”—During “Farmers’ Week” at University Farm, January 1-7, 1917, there will be scheduled several conferences which fruit and vegetable growers should find of value to them in their work. These conferences deal with all of the problems of the grower, but special afternoons are given to the small fruits, the tree fruits, and vegetables. Next January will be the third conference of the fruit growers, the second for the vegetable growers, and the first for the small fruit growers as a separate branch of the fruit work.

Mr. W. G. Brierly, Chairman of the Division of Horticulture, University Farm, is working on programs for these conferences for next January. He will be very glad to have any one interested write to him for information or to suggest topics for discussion. The program for the vegetable growers’ conference will be drawn up by a joint committee

from the St. Paul and Minneapolis vegetable growers, working with Mr. Brierly. The committee is planning to meet at the time of the summer meeting of the Horticultural Society and will, of course, welcome any suggestions as to topics and speakers.

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These conferences are for all growers interested and are free to all. There has been some difficulty heretofore in that very few suggestions as to program have been offered by the growers themselves. If you have any problems or matters which you would like to have discussed at these conferences, now is the time to make your suggestions.

[Illustration: SOUTH END OF EXHIBITION HALL AT LATE SUMMER MEETING. The flower exhibit is mostly in north end of hall, and not showing in this picture.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 JULY, 1916 No. 5

My Neighbor's Roses

The roses red upon my neighbor's vine
Are owned by him, but they are also mine,
His was the cost, and his the labor, too,
But mine, as well as his, the joy their loveliness to view.

They bloom for me, and are to me as fair
As for the man who gives them all his care.
Thus I am rich, because a good man grew
A rose-clad vine for all his neighbors' view.

I know from this that others plant for me,
And what they own, my joy may also be.
So why be selfish, when so much that's fine
Is grown for you, upon your neighbor s vine!

—*Anon*

SUMMER MEETING, 1916.

Minnesota State Horticultural Society

A Joint Session with its Auxiliaries, the Minnesota State
Garden Flower Society, the Minnesota State Bee-Keepers Society
and the Minnesota State Florists Society.

A. W. LATHAM, SECY.

There seems to be something almost uncanny in the unbroken sequence of pleasant days that have greeted the annual summer meeting of the Horticultural Society in the last quarter of a century. For days before this meeting it seemed assured that we should this year at least have an unpleasant day for our gathering, and even the day before and night before were most unfavorable. Friday morning, June 23rd, however, opened up bright and beautiful, warm and pleasant, as nature can smile, and continued so throughout the day. The meeting was in accord with these favorable circumstances, and I believe brought out more and better flowers and more, though no better, people, both as exhibitors and in attendance, than any previous similar gathering the association has held.

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The exhibition was installed in the new gymnasium at University Farm, a room sufficiently large so that it not only accommodated the exhibition with wide aisle space, but also found plenty of room for the placing of chairs for the afternoon meeting. Tables were arranged around three sides of the hall, which were used for the displays of perennials and roses. The peonies were shown on several tables in the north center of the hall and besides these there were exhibits of some of the choicest of the peonies made upon the floor, so arranged that visitors could walk amongst them and look down upon them and see them at their best. One table was occupied with the strawberry exhibit, which, however, was a small one on account of the lateness of the season, though the Fruit-Breeding Farm showed some forty or fifty plates of No. 3, the new June-bearing berry of such large popularity, and a few everbearers. The number of entries was, I believe, in excess of any previous meeting, amounting altogether to 521. Most of the old exhibitors at our summer meeting were present and some few of the newer ones. The effort which was made this year to secure a completed exhibit at 11:30 proved to be a success, and by the lunch hour the judges had gotten well along with their work and the hall was opened to the public to inspect the display.

At 12:00 o'clock or thereabouts the members and their friends gathered upon the lawn near the station dining hall, where there were plenty of trees and green grass, and partook of the noon repast, for which purpose the station provided coffee and also lemonade, the latter a new feature in our bill of fare.

The regular afternoon meeting was held at 2:00 o'clock in the same hall in which the exhibit was placed. This was largely attended, some two or three hundred taking advantage of the opportunity to listen to those who found place on this extempore program. Our society reporter took some notes of what transpired at the meeting, but they were only partial notes, and what here follows in regard to what took place is only in the nature of extracts.

President Cashman was in the chair as usual and in a few words extended greeting to the society saying, amongst other things:

"This occasion is always looked forward to with a great deal of pleasure. We meet those engaged in similar lines of work, we discuss the problems with which we have to contend, our joys and our sorrows. We come here to meet our friends—and my experience has been that there are no truer or more loyal friends than those found amongst the horticulturists. The true horticulturist is a lover of nature, a lover of the beautiful and all that goes with it. He looks for nothing except the best that can be found in human kind. Such are the men and women that belong to the Horticultural Society."

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As representing the University Farm, whose hospitality in a large sense the society was enjoying, Dean Woods gave us a hearty welcome in his happy way, and what follows is typical of the kindly things he said: "We always have pleasant days and pleasant memories because those who study flowers and fruits and the beauties of nature are the ones from whom one can get inspiration to understand and to know what nature means. Any one who can listen to the sounds of nature, any one who can see in flowers the spirit of life struggling upwards has the true spirit of the horticulturist and is always welcome here."

Mr. A. Brackett, of Excelsior, being called upon, had something to say about strawberry culture, and in the course of his remarks showed several plates of different varieties of strawberries. What follows is the substance of his talk on this subject. "We have here what we call the No. 3 strawberry produced at the Experimental Farm. I believe from my experience that it is going to take the place of all of our common June-bearing strawberries. It is a deep rooter, fine large plant and a nice, solid berry, and I have never seen any blight or rust on the plants. I think that it will pay for all the expense that has ever been paid out for the farm, that one berry will pay for it, it will be of that much value to the people of Minnesota. The everbearing strawberry has come to stay, and for private use you do not need to plant any other variety. The everbearing strawberry will ripen its fruit at least a week ahead of almost any other berry we have, and then it will continue bearing until the frost kills it. I had at least twenty bushels of fruit from my plants last year, and I secured from one-quarter acre fifty-three cases and sold them at $4.80 a case. They talk about what they can raise in California, but we can do better here, and I believe if you will stick to these three varieties, the Americus, Superb and Progressive, you will not need to plant any other variety. The Americus has the best flavor but it isn't as large. Of the Superb nearly all of the berries are large, very few small ones, but they haven't got the flavor.

"There is one thing about this new strawberry, it can not bear the year around, that is, during the summer, unless the ground is very rich. I think I put on one-half acre of the everbearing strawberries twenty-five loads of fertilizer. You have got to make the ground rich to carry these plants through and produce the berries. I use a narrow row on the hill system. I cut my rows down in the spring, dig up the plants and leave the row four inches wide and plants six inches apart. This brings more berries and better plants."

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Prof. C. B. Waldron, of Fargo, N.D., horticulturist at the Fargo Agricultural College for a quarter century, who has rarely missed being with us at any summer gathering, being called upon, among other things said: "There are a good many things that affiliate people together in groups of one kind or another. It used to be that if people had the same belief about eternal punishment, *etc*., that they would group themselves together, but nowadays we find people grouping themselves according to more natural methods. I think people grouping themselves together for a common love of trees, fruits and flowers makes a more natural bond of affiliation, and when I find a man that knows the names of many of our beautiful flowers I feel drawn to him at once. I can't seem to tire of that person's company, no matter what political party he belongs to. These things that I speak of seem to be a more natural and harmonious relationship to build our friendship upon than almost anything else. I know that I always look forward days and weeks ahead to meetings like this, where I can meet with people who love and admire and cherish the things that I find my greatest delight in."

The superintendent of the Fruit-Breeding Farm, Mr. Chas. Haralson, spoke briefly of the work at the Fruit-Breeding Farm, which he is conducting with such distinguished success. His statement was altogether too brief when one knows the vast amount of detail work that is being done there in development of new fruits: "The work at the Fruit-Breeding Farm is carried on just the same as usual. We are working on strawberries, plums, apples, grapes somewhat and several other fruits like gooseberries and currants. The best success we have had so far in the new varieties is with strawberries, raspberries and plums. It takes only a few years to run through a generation of these, and we can get them selected quicker than apples. The plum crop is very light this year, especially on the hybrid plums, on account of winter-killing, that is, the buds killed during the winter. They never did that before, but this year they have done it to a great extent. The strawberry crop is very good and so are the raspberries now coming on. Probably as many as 2,000 apple seedling trees are bearing this year, so we will have a little chance for selection in the line of apples. In grapes we are working with most of the seedlings from the Beta and some hybrids, and we have a few of the Beta seedlings that are very good. One red variety compares favorably with any of the cultivated varieties. It is perfectly hardy so far. And we have two or three varieties of black nearly as large as Moore's Early or Concord.

"We also have a number of seedlings of pears, but we are not very far advanced with them yet. Pears stand the winter fairly well, although they winter-kill to a certain extent. When they are weakened through the winter and growth starts in the spring they blight. Blight is the worst part of our work with pears."

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Prof. R. S. Mackintosh, of University Farm, was caught on the floor, and as usual took opportunity to tell people they ought to eat more apples and something about how to get them. This seems to be a subject that is ever in his mind and which he is persistently working to good advantage.

“You folks that are hungry and want apples or apple pie want to get busy about the middle of August and eat up your surplus apples in Minnesota. It is a shame that farmers, fruit growers, *etc*., have spent years trying to grow apples in Minnesota and then we cannot get enough people to eat the apples. We are going to carry on the clearing house as we did last year, and if you want apples let us know. We can grow apples the same as we can grow peonies and strawberries, but it is a little hard to get them distributed properly.”

Mr. A. M. Brand, of Faribault, who had an extraordinary exhibit of seedling peonies at the meeting, pronounced by our peony expert, Mr. C.S. Harrison, “second to none in the world,” was introduced and talked briefly along the line of seedling peony production, as follows: “There is a great deal of encouragement in what we have been able to accomplish down there at Faribault along the line of producing something fine in peonies. Sixteen years ago we started out with the idea of improving upon the stock that we already have. We had a little red peony, a very nice peony, originated by Mr. Terry down in Iowa, called Rachel, and starting out with that as a mother plant we have produced some of the finest roots that there are in cultivation. By using lots of the seed of Rachel we have been able to produce this Mary Brand, considered by many of the peony growers as one of the finest red peonies in the world. A great many people that raise nice peonies think they have to go to the trouble of hand fertilization. That isn’t necessary. We started out with such varieties as Rachel, and by letting the bees and the elements do the fertilizing for us we were able to produce varieties like this. Here is the new seedling that we brought out this year and named Ruth—a pink peony. As a rule we plant about a peck of seed every year, and out of that peck of seed it probably brings us 10,000 seedlings, and out of this 10,000 we get one good seedling, and this is the only good seedling that we have produced this year. This is a seedling that comes from Rosa Fragrans. When we picked this seedling from the bed of seedlings we considered this the finest seedling that we had, and it has never come good from that time to this, and it is ten years since we have been trying this seedling, which will show you when you are growing seedlings that the first time a seedling blossoms and comes splendid you mustn’t be too enthusiastic about it. The next year it may be worth nothing. You have got to try a seedling in every way to find out whether it is worth sending out. As a rule it takes us ten years from the time that a seedling first blossoms until we send it out. Ninety per cent of all the peony seedlings that you grow will be singles, one out of 10,000 seedlings will be fair and one out of 100,000 seedlings will be extra good—so you see that those which we have produced give us some encouragement. I wouldn’t advise many of you to go into the seedling business, although you might produce one good seedling out of a handful of seed.

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“If you plant a peony on the lawn you have to fertilize it heavily. You can’t have your lawn right up to the stalks of the peony. If you want a peony on the lawn you must give it two feet of ground. Most of the peonies that are brought here are taken out of fields that are cultivated with a horse cultivator. If you want your flowers on the lawn and don’t want to cultivate them you have to use lots of fertilizer. You must not use too much. Fertilize heavy about once in three years. Don’t fertilize every fall. Fertilize in the fall, and the next spring spade the manure in and then don’t use any manure for three or four years. Plant peonies any time from the first of September until the time it freezes up and plant any time in the spring until the growth starts on the plants. If you plant in the spring you are just six months ahead of planting in the following September, though September is really the best time to plant. If a peony clump becomes old, as large around as a tub, and you still want it to stand in the same place I would cut out half of the stalks as they come up, and then to get still larger blossoms after the stalks have come up I would pinch the side buds also.”

[Illustration: A fringe of peonies at the summer exhibit.]

Mrs. Crawford, of Indiana, a peony grower of much experience there, who came to Minneapolis for the purpose of attending our flower meeting, we understand, told us something about how peonies are grown in her section, an interesting and practical talk, part of which follows: “In Indiana we have a sour, black clay soil. We fertilize with crushed limestone and leaves. I fertilize with the leaves that fall in the autumn after the leaves have begun to rot. I cover them without cutting the tops. Then in the spring when they begin to bud we go over them on our knees and work the leaves all in with a trowel. I have 3,000 plants, but with the assistance of the men we have we get it done, and grow fine peonies. In regard to manure, I never feel that I can put any fertilizer within two feet. The rows are from three to four feet apart. We never use any fertilizer that will come in contact with the stems, as when the flowers are cut off it leaves the stem hollow, and if the manure gets in the stem it works down the stem into the roots and leaves a hollow root in time. We never use in our part of the state any fertilizer that will come in contact with the stems except leaves. When the streets are cleaned in the fall I pile the leaves on the back lot. I have fourteen or fifteen loads hauled in. This is scattered over the peonies. I want to compliment you on having very fine peonies, some of them finer than I have ever seen, and I hope you will all be as enthusiastic about raising peonies as I am. Is it necessary to burn the tops when they are cut off? I consider that the ashes from the tops aid in fertilizing. I pile them up in little piles and burn them and sprinkle the ashes over the peonies. Frequently when I dig around a peony and I feel that the soil has become exhausted I throw in a handful of garden peas, and when they get about a foot high I spade them under for fertilizer.”

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Mr. D. W. C. Ruff, of St. Paul, had a wonderful showing of peonies of named varieties, most of them very expensive from a money standpoint, they having cost him prices varying from $5.00 to $40.00 a root, and judging by the character of the flowers which he held up for the audience while he talked about them they were well worth the money. I regret that we are unable to give a verbatim report of his talk, with the names of the varieties, but this information must be secured from him at some later time. In part he said:

"I have spent the last fifteen years in making a good collection of peonies. I have gone all over the world for peonies and have brought together some of the finest peonies from all the noted growers and horticulturists. In my collection I have over 400 hundred varieties, that is, what I am growing at my home. I have brought here today of course a great many peonies of the later varieties. I have brought these here from an educational standpoint so that the people might see some of the rare ones that they might have heard about or read about and see them and know of these varieties. Last year I made an exhibit and showed hundreds of them. This year I have brought just a few choice things."

Rev. C. S. Harrison spoke in his usual inspiring way, but with such force and speed that our stenographer was unable to pick him up, which we sincerely regret. We all know Mr. Harrison as an enthusiast in flowers. He has met with us year after year at both annual gatherings. While he is eighty-three years old yet what he has to say and the way he says it still have the ring and inspiration of youth. He proposed the organization of a peony society for the Northwest, and a show of hands indicating there was material present to perfect such an organization the plans were laid therefor. Our reporter got this far:

"I have attended the national peony shows of Boston and New York, and they cannot hold a candle to your peonies, mark that! There is something in your soil and in your climate which brings them to the front."

Prof. F. L. Washburn was to tell us something about the white pine blister rust, but he failed to inflict upon us a long technical talk, and from what he said all the reporter got was this, from which however one could well judge what was in his thought. "We have found in Minnesota a disease on the white pine called the 'white pine blister rust.' One stage of this disease is on the gooseberry or currant, that is, we find it now on the white pine and going to the gooseberry or currant. We went to the governor, state treasurer and state auditor and obtained $1,000 for use in fighting this besides our regular appropriation."

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Mr. J. M. Underwood, of Lake City, without whom the program would be incomplete, spoke a few closing words as follows: “We have had such a splendid program, and I know you are anxious to look at these beautiful flowers, and all I have time to say, and a disposition to say, is that I think we owe a great obligation to the Garden Flower Society, a splendid organization auxiliary to the State Horticultural Society. I think you ought to all be members of that Garden Flower Society. It is a wonderful working organization, and I think the ladies that are in charge of it deserve a great deal of credit and should be complimented as being foremost on the program. There is a great deal that I could say, but I know there isn’t time for it, and I thank you.”

In the meantime many more visitors had come into the hall to view the display, which continued on exhibition until 9:00 o’clock in the evening. Prof. Cady, who had general charge of the arrangements at the meeting, reports that at least one thousand people saw the display, and we think that it was well worth while to have kept it open until that hour. Representatives from a number of the hospitals were present after the meeting and took the flowers away to be used to cheer the sick in both Minneapolis and St. Paul.

The total amount of awards at this meeting were $178.75. A list of these awards with the names of the judges follows in a separate article. No one person took any large amount of premiums, they were well distributed amongst a dozen and a number of others who received smaller amounts. Mrs. H.B. Tillotson, who has a wonderful flower garden near Eureka, Lake Minnetonka, received premiums of $17.00, which is the largest amount paid to any one person, although there were a number of others who received slightly smaller amounts.

Award of Premiums, Summer Meeting, 1916.

ROSES.

Collection, B. T. Hoyt, St. Paul, fourth premium, $1.00.
Collection named varieties, amateurs, Thos. Redpath, Wayzata, second premium, $4.00.
Collection named varieties, amateurs, Mrs. H. B. Tillotson, Excelsior, First premium, $6.00.
Collection named varieties, amateurs, Mrs. D. W. C. Ruff, St. Paul, third premium, $2.00.
Three named varieties, white, Thos. Redpath, Wayzata, first premium, $2.00.
Three named varieties, pink, Thos. Redpath, Wayzata, first premium, $2.00.
Collection Rugosa and R. Hy., B. T. Hoyt, St. Paul, first premium, $2.00.
Most beautiful rose, Mrs. H. B. Tillotson, Excelsior, first premium, $1.00.

Largest rose, Mrs. D. W. C. Ruff, St. Paul, first premium, $1.00.
Seedling, B. T. Hoyt, St. Paul, first premium, Bronze medal donated by American Rose Society.
Basket outdoor roses arranged for effect, Mrs. H. B. Tillotson, Excelsior, first premium, $3.00.
Basket outdoor roses arranged for effect, Mrs. D.

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W. C. Ruff, St. Paul,
second premium, $2.00.
Basket outdoor roses arranged for effect, Mrs. John Gantzer, St. Paul,
third premium, $1.00.
Mdm. Plantier, Thos. Redpath, Wayzata, first premium, $0.75.
Gen. Jack, B. T. Hoyt, St. Paul, first premium, $0.75.
Gen. Jack, Mrs. G. T. Brown, St. Paul, second premium, $0.50.
Magna Charta, Mrs. G. T. Brown, St. Paul, first premium, $0.75.
Ulrich Brunner, Mrs. G. T. Brown, St. Paul, first premium, $0.75.
Baroness Rothschild, Mrs. G. T. Brown, St. Paul, first premium. $0.75.
Mdm. Plantier, Mrs. G. T. Brown, St. Paul, second premium, $0.50.

AUG. S. SWANSON, Judge.

PEONIES.

Flesh or light pink, Mrs. Frank Moris, Lake Elmo, third premium, $0.50.
Medium or dark pink, Mrs. Frank Moris, Lake Elmo, third premium, $0.50.
White, Mrs. Frank Moris, Lake Elmo, second premium, $1.00.
Festiva Maxima, B. T. Hoyt, St. Paul, second premium, $1.00.
Medium or dark pink, B. T. Hoyt, St. Paul, second premium, $1.00.
Festiva Maxima, John E. Stryker, St. Paul, first premium, $2.00.
Light pink, John E. Stryker, St. Paul, second premium, $1.00.
Dark pink, John E. Stryker, St. Paul, first premium, $2.00.
Red, John E. Stryker, St. Paul, second premium, $1.00.
Flesh or light pink, D. W. C. Ruff, St. Paul, first premium, $2.00.
White, D. W. C. Ruff, St. Paul, first premium, $2.00.
Red, D. W. C. Ruff, St. Paul, first premium, $2.00.
Collection, 3 blooms, professional, B. T. Hoyt, St. Paul, first premium,
$6.00.

A. M. BRAND,
C. J. TRAXLER,
Judges.

Collection, three blooms, amateur, Mrs. Frank Moris, Lake Elmo, fourth
premium, $1.00.
Collection, three blooms, amateur, Mrs. H. B. Tillotson, Excelsior, third
premium, $2.00.
Collection, three blooms, amateur, John E. Stryker, St. Paul, first
premium, $6.00.

Collection, three blooms, amateur, Mrs. E. W. D. Holway, Excelsior, second premium, $4.00.

OLAF J. OLSON, Judge.

Seedling, B. T. Hoyt, St. Paul, fourth premium, $0.50.
Seedling, Crimson No. 1, 1916, A. M. Brand, Faribault, third premium, $1.00.
Seedling, Ruth, A. M. Brand, Faribault, first premium, $3.00.
Seedling, No. 245, A. M. Brand, Faribault, second premium, $2.00.

D. W. C. RUFF, Judge.

ANNUALS AND PERENNIALS.

Dielytra, F. H. Ellison, Minneapolis, third premium, $0.50.
Forget-me-nots, F. H. Ellison, Minneapolis, first premium, $1.50.
Gailardias, F. H. Ellison, Minneapolis, third premium, $0.50.
Grass Pinks, F. H. Ellison, Minneapolis, second premium, $1.00.
Iceland Poppies, F. H. Ellison, Minneapolis, second premium, $1.00.
Dielytra, Mrs. Frank Moris, Lake Elmo, first premium, $1.50.
Delphinium, Mrs. Frank Moris, Lake Elmo, third premium, $0.50.
Foxgloves, Mrs. Frank Moris, Lake Elmo, second premium,

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$1.00.
Grass Pinks, Mrs. Frank Moris, Lake Elmo, first premium, $1.50.
Delphinium, Mrs. H. B. Tillotson, Excelsior, second premium, $1.00.
Foxgloves, Mrs. H. B. Tillotson, Excelsior, third premium, $0.50.
Iris, Mrs. H. B. Tillotson, Excelsior, third premium, $0.50.
Gailardias, Guy C. Hawkins, Minneapolis, second premium, $1.00.
Dielytra, Anna E. Rittle, St. Paul, second premium, $1.00.
Iceland Poppies, Mrs. E. W. Gould, Minneapolis, third premium, $0.50.
Gailardia, E. A. Farmer, Minneapolis, first premium, $1.50.
Foxgloves, Mrs. J. F. Fairfax, Minneapolis, first premium, $1.50.
Iceland Poppies, Mrs. J. F. Fairfax, Minneapolis, first premium, $1.50.
Iris, Mrs. E. W. D. Holway, Excelsior, first premium, $1.50.
Delphinium, Mrs. H. A. Boardman, St. Paul, first premium, $1.50.
Forget-me-nots, Mrs. H. A. Boardman, St. Paul, third premium, $0.50.
Iris, John S. Crooks, St. Paul, second premium, $1.00.
Canterbury Bells, Mrs. Chas. Krause, Merriam Park, second premium, $1.00.
Grass Pinks, Mrs. Chas. Krause, Merriam Park, third premium, $0.50.
Canterbury Bells, J. A. Weber, Excelsior, first premium, $1.50.
Forget-me-nots, Vera P. L. Stebbins, second premium, $1.00.
Oriental Poppies, F. H. Ellison, Minneapolis, first premium, $1.50.
Pansies, F. H. Ellison, Minneapolis, first premium, $1.50.
Pyrethrum, F. H. Ellison, Minneapolis, second premium, $1.00.
Sweet Peas, F. H. Ellison, Minneapolis, first premium, $1.50.
Sweet William, F. H. Ellison, Minneapolis, second premium, $1.00.
Shasta Daisies, Elizabeth Starr, Excelsior, third premium, $0.50.
Lilies, Mrs. Frank Moris, Lake Elmo, third premium, $0.50.
Oriental Poppies, Mrs. Frank Moris, Lake Elmo, second premium, $1.00.
Pansies, Mrs. Frank Moris, Lake Elmo, second premium, $1.00.
Lilies, Guy C. Hawkins, Minneapolis, first premium, $1.50.
Perennial Coreopsis, Guy C. Hawkins, Minneapolis, first premium, $1.50.
Pyrethrum, Guy C. Hawkins, Minneapolis, first premium, $1.50.
Lupine, Mrs. E. W. Gould, Minneapolis, first premium, $1.50.
Shasta Daisies, Mrs. G. T. Brown, St. Paul, second premium, $1.00.
Sweet William, Mrs. J. F. Fairfax, Minneapolis, third premium, $0.50.
Lupine, Mrs. H. A. Boardman, St. Paul, third premium, $0.50.
Oriental Poppies, Mrs. H. A. Boardman, St. Paul, third premium, $0.50.
Pyrethrum, Mrs. H. A. Boardman, St. Paul, third premium, $0.50.
Shasta Daisies, Miss Flora Moeser, St. Louis Park, first premium, $1.50.
Lilies, Mrs. Chas. Krause, Merriam Park, second premium, $1.00.
Pansies, Mrs. Chas. Krause, Merriam Park, third premium, $0.50.
Lupine, Miss Marion Prest, St. Paul, second premium, $1.00.

Sweet William, J. A. Weber, Excelsior, first premium, $1.50.

JOHN HAWKINS,
JOHN A. JANSEN,
Judges.

Collection named perennials, J. A. Weber, Excelsior, first premium, $6.00.
Collection named perennials, F. H. Ellison, Minneapolis, second premium, $4.00.
Collection named perennials, Mrs. Frank Moris, Lake Elmo, third premium, $2.00.

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MRS. H. A. BOARDMAN,
MRS. WM. CRAWFORD,
Judges.

Vase of flowers by child, Mrs. F. E. Kidd, Minneapolis,
first premium, $2.00.
Vase of flowers by child, Matilda Gantzer, St. Paul, second premium, $1.00.

MARTHA A. WYMAN, Judge.

Vase of any kind flowers, Mrs. Frank Moris, Lake Elmo, second premium,
$1.00.
Vase any kind flowers, Miss Marjorie Knowles, St. Paul, first premium,
$2.00.
Vase any kind flowers, Miss Flora Moeser, St. Louis Park, third premium,
$0.50.

J. A. Boies, Judge.

Vase of flowers arranged for artistic effect, Mrs. F. E. Kidd, Minneapolis,
second premium, $1.00.
Vase of flowers arranged for artistic effect, Mrs. S. A. Gile, Minneapolis,
first premium, $1.50.
Vase of flowers arranged for artistic effect, F. H. Ellison, Minneapolis,
third premium, $0.50.
Basket outdoor grown, Elizabeth Starr, Excelsior, third premium, $1.00.
Basket outdoor grown, Mrs. S. A. Gile, Minneapolis, second premium, $2.00.
Basket outdoor grown, Mrs. H. A. Boardman, St. Paul, first premium, $3.00.

M. EMMA ROBERTS,
CARRIE L. WILKERSON,
Judges.

STRAWBERRIES.

Collection, six varieties, H. G. Groat, Anoka, first premium, $5.00.
Collection, three named varieties, H. G. Groat, Anoka,
first premium, $3.00.
Collection, three named varieties, E. A. Farmer, Minneapolis,
second premium, $2.00.
Progressive, Mrs. H. B. Tillotson, Excelsior, first premium, $1.00.
Bederwood, H. G. Groat, Anoka, first premium, $1.00.
Dunlap, H. G. Groat, Anoka, second premium, $0.75.
Crescent, H. G. Groat, Anoka, first premium, $1.00.

Warfield, H. G. Groat, Anoka, first premium, $1.00.
Warfield, Mrs. M. A. Rohan, Minneapolis, second premium, $0.75.
Senator Dunlap, J. F. Bartlett, Excelsior, first premium, $1.00.
Minnesota No. 3, J. F. Bartlett, Excelsior, first premium, $1.00.
Minnesota No. 3, A. Brackett, Excelsior, second premium, $0.75.
Americus, A. Brackett, Excelsior, first premium, $1.00.
Progressive, A. Brackett, Excelsior, second premium, $0.75.
Superb, A. Brackett, Excelsior, first premium, $1.00.
Best named variety, Mrs. H. B. Tillotson, Excelsior, first premium, $2.00.
Best named variety, H. G. Groat, Anoka, second premium, $1.00.
Best named variety, Mrs. John Gantzer, St. Paul, third premium, $0.50.
Seedling, A. Brackett, Excelsior, first premium, $3.00.

THOMAS REDPATH, Judge.

Experiment Work of Chas. G. Patten, Charles City, Ia.

GEO. J. KELLOGG, LAKE MILLS, WIS.

June 6.—I have just spent four days with our friend Patten. He has 7,000 surprises on seventeen acres of experiment orchard dating back to 1868—every tree of the 7,000 has a history.

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For twenty-eight years he has been working on the Chinese sand pear and has brought out a race that is blight-proof, perfectly hardy and of good size and quality. He is not yet satisfied, but has 5,000 cross-bred seedlings of many crosses that are about three feet high, ready for transplanting in orchard rows next spring—and he has not room to set them. The state of Iowa does not appreciate his labor or value the work he has done and is doing; they are not giving him the money or men to carry on this work.

Beside the pear experiments he has hundreds of crosses of apples that are very promising and just coming into bearing. These are scattered all through that orchard of 7,000 trees, with the pears, and nearly as many plum crosses. Some plums are heavily loaded this year that are of wonderful value, and one of the great points is that they have escaped the bad weather in blooming time, while all our standard varieties failed —and I believe the hardiness of bloom will insure fruit on his best kinds when others fail in bad weather.

He is breeding form of tree in all these fruits—see his paper in the last volume of Iowa Hort. Report. His crop of apples is light, but many crosses show some fruit. Some pears and plums are loaded. Eugene Secor says, “Patten is greater than Burbank.”

* * * * *

WINDBREAKS ON FARM PAY DIVIDENDS.—Windbreaks are usually more or less ornamental on a farm, and add to the contentment of the owner. But it is not generally known that windbreaks actually pay dividends. At least studies made a few years ago in Nebraska and Kansas indicate that windbreaks are profitable. The state forester will soon study their influence in this state. It must be admitted that windbreaks occupy space that could be profitably devoted to agricultural crops, and that the roots of the trees and their shade render a strip of ground on either side of the windbreak relatively unproductive. Yet in spite of these drawbacks, efficient windbreaks undoubtedly do more good than evil.

The windbreak reduces the velocity of the wind, and, consequently, the loss of soil water from evaporation from the soil surface and from the field crops. This is equivalent to additional rainfall, just as “a dollar saved is a dollar made.” It seems from investigations made by the United States Forest Service that the greater yield of field crops and apples behind the protection of a good windbreak is enough to warrant every farmer in the prairie states in planting windbreaks.—W.J. Morrill, Colo. Agri. College.

MIDSUMMER REPORTS, 1916.

Collegeville Trial Station.

REV. JOHN B. KATZNER, SUPT.

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The weather conditions of last winter were not any too favorable for plants and fruit trees. In fact the cold was at times severe and long continued, reaching its maximum with 38 degrees below for one day. The total subzero weather for the winter amounts to 489 degrees, of which January figures with 285 and February with 168 degrees below. This is some cold, no doubt, and yet our hardy fruit trees did not suffer. But other trees not quite hardy suffered more than usual. This is particularly noticeable on my German pear seedlings. The wood of the branches as well as of the stem had turned black down to the ground. All the imported European varieties of pears are dead and ready for the brush pile. Prof. N.E. Hanson's hybrid pears have suffered just a little. This, however, may be due to the unripe condition of the wood rather than to cold. They had been grafted on strong German pear stock, made a vigorous growth and were still growing when the frost touched them. Another season they may be all right. All our cherry trees, too, are almost dead and will be removed and their place used for a trial orchard.

It was of great advantage to plants and trees that we had much snow, giving them good protection in root and stem two feet up. But this deep snow helped the rabbits also in reaching the lower branches of the apple trees. They were very active during the winter months and did much damage by biting off the buds and smaller twigs from those branches, but did no injury to the bark of trees otherwise.

Spring was rather cold and late. Up to the middle of May there was not much growth of any kind. But we started work at the station as soon as the ground could be worked. Apple and plum grafts made last winter were set out. The orchard was gone over and trees pruned where needed. The grape vines were uncovered and tied up on the trellis. A liberal dressing of manure was worked in around vines growing on poor soil. More than a hundred Alpha grape vines were planted along a students' walk for their future benefit. The everbearing strawberries were looked after and a new bed was started. Some apple trees were planted in the orchard to replace others. Quite a number of German pear seedlings were grafted with hardy varieties an inch below ground. We expect this will give us healthy and hardy trees and fruit in due time.

[Illustration: Patten's No. 108 in blossom at Collegeville Station.]

A friend of mine sent me from Los Angeles, Cal., four fine large cherry trees: the Tartarian, Napoleon Bigarreau and Early Richmond. These are one year old budded trees; they have made in the congenial climate of California a growth of about eight feet and are an inch through the stem. They arrived the first week in March. It was cold yet and the ground covered with a foot of snow. As we could not plant them, we applied water to the roots and kept the trees unpacked in the cool root cellar till planting time.

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They are growing now, but next spring we expect to see their finish. Another variety of sweet cherries was sent to the trial station from the mountains of Pennsylvania and planted in the nursery, but we expect that will meet the same fate. From the U.S. Dept. of Agriculture we have obtained scions of a pear, No. 26485, which were used in budding some German pear seedlings, as also ten plants of Prunus Tomentosa No. 38856. This is a Chinese bush cherry, and though the fruit is of little value, yet the plant is said to be quite ornamental.

In forestry work 200 arbor vitae were set out, more for ornamental effect, and in open places of the woods several thousand Scotch pine were planted. This planting was also extended partly around the opposite lake shore to improve the landscape during the winter months, when everything looks bleak and dreary.

This station has received quite a liberal supply of new stock for trial from the Minn. State Fruit-Breeding Farm, *viz*.: June bearing strawberry No. 3, everbearing kind No. 1017, raspberry No. 4 and everbearing sorts Nos. 30 and 31; of plums, Nos. 35, 9, 21, 1, and sand cherry crossed with Climax; of apples, six Malindas, Nos. 38, 32, 29, 25, 12 and 12. They are fine large trees and were planted in the trial orchard. Ten smaller apple trees which we received were set out in the nursery and after a year or two will find their place in the orchard. These trees are labeled: Gilbert, Winesap, Russet Seedling, then Nos. 90, 271, 269, 16, 7045 and A1. All of this stock has been carefully planted and is now doing well.

The only variety of fruit trees which bloomed before the 20th of May was the Akin plum. Most all other trees were getting ready to bloom, but it was really too cold for them to open their flowers. From that time on the blooming became more general among the plums and later among the apples. The trees which did not bear last year were full of flowers. Some of the new plums, too, had quite a number of blossoms, and we are watching with great interest what the fruit will be, as we intend to propagate the best ones in a small way for home use.

Of small fruits we have now on trial five varieties of raspberries and also three sorts of strawberries, Nos. 3, 4 and Progressive. This will give us a good chance to judge of their relative value as to hardiness, quality and quantity of fruit.

The truck garden is taken care of as usual, but is far behind other years in growth and development of vegetables on account of the cold spring. If it were not for our greenhouse and hotbeds, I think we would yet be without radishes and lettuce.

The same may be said in regard to the planting of our lawns. The plants were all ready in the greenhouse, but the planting had to be deferred as long as there was danger of

frost. The flower beds on the lawns were finally planted, the designs are very good, but it will take some time yet till their beauty can be seen and enjoyed.

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Judging from present conditions, we may get a pretty good crop of fruits. The time for the late spring frosts passed by without doing any harm. The weather during blooming was favorable for setting a good crop of apples and plums. The grapes, too, show up well and promise a good crop, and the strawberries and currants are doing splendidly.

Jeffers Trial Station.

DEWAIN COOK, SUPT.

June 13.—*Plums*—Much rainy weather during the blooming period was undoubtedly the main reason why the plum crop of 1916 will not amount to very much. Only a few of the Americana have set any fruit whatever. However, the Terry and the Wyants carry considerable fruit.

Of the Japanese hybrids the B.A.Q. and Emerald have set some fruit—also the Stella. Of the hybrid plums originating at the Minnesota State Fruit-Breeding Farm there are only a few scattering specimens on any of them. Most of them have set no fruit whatever. Minn. No. 6, one tree, is in a dying condition from winter-killing.

Hansen's hybrids have mostly set some fruit, but not freely. The Hanska, Toka, Opata and Wohanka are among those varieties making the best showing of fruit.

While in a general way we consider the rains during the blooming period responsible for the almost failure of the 1916 plum crop, but, to be a little more specific, the blight of the plum bloom, or rather the brown rot fungus, was more generally prevalent and more generally destructive than at any previous season. As for the fungous disease known as plum pocket, we have not seen one this season. It has been entirely absent.

As for spraying to control the brown rot fungus, we have and are doing the best we know. With the exception of about twenty-five large plum trees that we have made into a hog pasture and could not get at very well with our gasoline spraying outfit, we sprayed about all our plum trees (and other fruit trees as well) twice before blooming, once just as the fruit buds began to swell and again just before they bloomed, with lime-sulphur solution. We are now spraying the third time, adding arsenate of lead to the lime-sulphur.

Of grapes sent me from our State Fruit-Breeding Farm all varieties are looking fine. The Beta we gave no winter protection, but all of the others we covered with strawy manure. We did this as all the other varieties winter-killed the first winter after planting, and we did not like to take any chances with them.

Minn. No. 3 strawberry is doing itself proud. We consider it the best all round variety we have ever grown and are planting almost exclusively on our own farm.

The everbearing Minn. 1017 continues to hold place as first best. We set out some 400 plants of this variety this spring, and they are making runners freely. Judging from last season, we expect a large crop of fine fruit from them next September, as well as a great quantity of new plants.

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Apples are in a very satisfactory condition. I need to say but little about varieties. All kinds of bearing size bloomed full, and most kinds have set full of fruit. Of such kinds as Okabena, Duchess and Wealthy, it looks as though practically every blossom turned into an apple.

We received several seedling apple trees from Mr. Chas. Haralson, of the State Fruit-Breeding Farm. They were all set out, and all are growing.

La Crescent Trial Station.

D. C. WEBSTER, SUPT.

June 17, 1916.—We received this spring, from the Fruit-Breeding Farm, plants for trial as follows: Malinda Nos. 12, 25, 29, 32, 38, 269, Russett Seedling, Gilbert Winesap, Nos. 7045, No. 90, No. ——, No. A 1, everbearing raspberry Nos. 30, 31, and strawberry No. 3. We also received from other sources Waneta and Lokota plum. Everything received for trial this year lived and is growing well.

Of the plums received in 1914, No. 6 died last winter. Those remaining about all bloomed, but only a very little fruit set on the following: Nos. 3, 5, 8, 10, 14, 20. Native plums have set no fruit this year.

Apple trees top-worked last year did poorly. The trees worked two years ago did finely and already have quite the appearance of real apple trees. Some are setting fruit this year, and we anticipate a few fine specimens of Jonathan and Delicious this fall from them.

In the orchard which blighted so badly two years ago, several trees died from that cause. A great many are in a ragged condition from the pruning necessary, and we note with considerable anxiety the occasional appearance of that dreaded enemy a few days ago.

Last year we had what might be called a full crop of apples, and consequently did not expect them to do much this year. However, they had a fairly good bloom, and about one-half of the trees have set a fair crop. We sprayed twice with so far satisfactory results.

Strawberries in this vicinity were badly injured by ice in winter where not covered. Ours were covered and now promise a good yield. Began picking the 14th inst.

We set quite a patch of everbearers No. 1017 this spring. They bore last fall but chickens picked most of the berries. Superb were unsatisfactory and winter-killed where not covered.

Carrie gooseberry has set full of berries and plants look fine.

All other trees and shrubbery in general at this station are in good condition.

Mandan, N.D., Trial Station.

(Northern Great Plains Field Station.)

W.A. PETERSON, SUPT.

All plants at this station went into the winter with favorable soil moisture conditions. Many plants, however, made a late growth and were still in growing condition late in September.

The winter was a long and severe one, although there was more snow than usual. The early spring was severe, being both windy, cold and dry. Up to date (June 9th) there have been very few calm days. Three or four very severe dust storms did considerable damage by blowing out seeds and blighting the tender new growth of many plants.

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The winter of 1915-16 in this section can be called a test winter, as much winter-killing both in root and top has resulted.

A large proportion of the apple and plum orchard (60% to 75%) killed out. There was no mulch or protection in these orchards. Practically all grapes killed out, even though protected. A few Beta are alive at the crown. Asparagus (unprotected) suffered severely. All raspberries had been covered with dirt. They came through perfectly and promise a good crop.

Strawberries wintered successfully. The South Dakota variety came through perfectly, even when not mulched. All are in full bloom now. Practically all of Prof. Hansen's plum hybrids killed out entirely, or are dead to trunk or crown.

A large number of seedlings of Chinese apricot, Chinese peach, native grapes, Juneberries and bullberries passed through the winter with little or no injury. About 1,000 Beta seedlings, lined out as one year seedlings in the spring of 1915, winter-killed, with the exception of about seven or eight plants.

Paradise apple stocks wintered safely.

Soft maples that winter-killed to the ground in the preceding year are good to the tips this spring, even though they had made four to six feet of new growth last summer.

Many new plantings have been made this spring, especially along plant-breeding lines. Extensive experiments have also been started with fruit trees, shelter-belt trees, ornamental shrubs and perennial flowering plants to determine the factors that influence the hardiness of plants.

Strawberry No. 1017, from the Minnesota Fruit-Breeding Farm, made an excellent showing in 1915, and all plants bore some fruit. Only a few runners were made, however. All plants were potted in fall, so no data has been secured on their hardiness. Several hundred more plants of this variety were set out this spring and they made an excellent stand.

Montevideo Trial Station.

LYCURGUS R. MOYER, SUPT.

Syringa Japonica.—The Japanese tree lilac has often been recommended by this station, but last winter was unusually severe, and an old tree obtained from Prof. Budd, nearly thirty years ago, now shows several damaged branches. Younger trees on our grounds and in the city parks show no injury. Perhaps this tree cannot be expected to live to be much more than thirty years of age nor attain a much greater height than thirty feet. The old tree is throwing up new stems from its roots and may rejuvenate itself.

Caragana.—The small shrubby caragana (Caragana pygmaea) was unusually fine this spring when in full bloom. We received it from Prof. Budd many years ago. It does finely in the clay banks of Lincoln Parkway in this city, but it is seldom offered by nurserymen. Caragana frutex, formerly called Caragana frutescens, is a somewhat taller shrub and not quite so floriferous. It makes a fine screen. Both of these shrubs are addicted to root sprouting, and might not please those who care for a stiff, formal garden. Both may be readily propagated from root cuttings.

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Roses.—Hansen's Tetonkeha rose at this writing is in full bloom and is a very striking object. It grows to the height of about four feet and needs no protection. The flowers are large and of a deep pink color. It seems to be as hardy as the old yellow rose of our gardens, that rose being now, too, at its best. Among other garden roses Paul Neyron is in a rather weak condition, Ulrich Brunner is doing a little better, while *Mme*. Georges Bruant is doing still better. Rosa pratincola grows on our grounds naturally, and we have brought in from the edges of the timber Rosa Engelmanni and Rosa Maximilliani. A friend in Duluth has sent us Rosa Sayi, and we obtained Rosa Macounii from the Bad Lands of North Dakota. These roses, as well as the more common Rosa blanda, make an interesting addition to the hardy border.

Delphinium Formosum.—We obtained a plant or two of the old tall larkspur almost thirty years ago. The old plants persisted several years, and seedlings have grown up from self-sown seed, and the plantation is now as attractive as ever.

Chrysanthemum Uliginosum.—The giant daisy has been here for a long time and needs but little attention. The clumps should be taken up and divided occasionally. It is one of our best late fall flowers.

Philadelphus.—Philadelphus pubescens came through the winter without injury. Philadelphus zeyheri suffered a little. Philadelphus coronarius came through in fair condition in a rather protected border, but Philadelphus Lemoinei was frozen back nearly to the ground.

[Illustration: Giant daisy, or chrysanthemum uliginosum.]

Physocarpus.—Physocarpus opulifolius came through the winter with no more than its ordinary injury.

Lonicera.—The old climbing honeysuckle (Lonicera sempervirens) came through the winter very much damaged, but our native honeysuckle is in fine condition. The bush honeysuckles are all hardy. The one known as Lonicera bella alba does not differ very much from the common white form of the Tartarian honeysuckle.

Prunus Triloba.—The double flowering plum has always been hardy with us, and usually has been a splendid bloomer in the latter part of April, but last winter was so severe that it did not bloom at all this spring.

Catalpa.—Another strange feature of the winter was that Catalpa speciosa came through entirely uninjured.

Viburnum.—Viburnum pekinensis came through in fine condition as well as its close relative, the high bush cranberry. The common snowball did not suffer so much from

aphis this year as usual. Viburnum lentago, which grows in the river valleys here naturally, is doing finely.

Syringa.—Among the bushy lilacs Syringa ligustrina, Syringa Chinensis, Syringa josikea and Syringa villosa all bloomed fully. The varieties of the common lilac, known as Ludwig Spaeth, Charles X, Senator Vollard and the one that Prof. Budd brought from Russia and called by him Russian lilac, were all very satisfactory. This last variety has pink flowers and is a very choice variety of Syringa vulgaria.

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Amelanchier.—The large Juneberry, probably Amelanchier Canadensis, was a very attractive object in April, when its purple-colored young leaves contrasted with its white bloom. The dwarf Juneberry, with their villous young leaves and white flowers, are very attractive in April and should receive more attention from our planters.

Dictamnus.—The gas plant (Dictamnus fraxinilla) becomes more attractive from year to year. It is one of the hardy plants which needs scarcely any attention to keep the weeds away. The pink form is very showy when in flower, and the plant is very attractive after the flower is gone.

Iris.—A rather large collection of Siberian iris is very attractive just now. The city has found it a very desirable, hardy plant to set in the park.

Apples.—A very good tree for park planting seems to be the crabapple, known as Malus seboldii. It is very attractive when in bloom, and the fruit as it ripens takes on a rich warm color that is very interesting. Okabena is promising a light crop, which may be advantageous, as when this variety bears freely the apples are apt to be undersized. A Thompson seedling is promising a full crop as well as most of the other common varieties. The Wealthy on Malus baccata is bearing a full crop.

Hybrid Plums.—The common varieties of plums are promising a very good crop, except Surprise, which is not bearing at all this year. Minnesota No. 10 is the only one of the new seedlings bearing a full crop. No. 18 has a light crop. No. 8 is thrifty and promising and so is No. 10. No. 20 suffered from the winter. Plums No. 1 and 2 are both promising. Plum No. 11 was injured by the rabbits. Hansen's No. 3769, Sansota, is bearing a light crop.

Raspberries.—Raspberry No. 8 is promising a full crop. It is a very late variety. Hansen's Oheta is one of our best berries.

Gooseberries.—Western Minnesota is not well adapted to the cultivation of gooseberries, nor do currants do very well. The Carrie gooseberry is promising a full crop, and some of the older varieties are doing better than usual, perhaps on account of the unusually cool season.

Nevis Trial Station.

JAS. ARROWOOD, SUPT.

June 16, 1916.—Apples came through the past winter in fairly good shape, especially the stock we have grown at this place. There has been some loss with stock that has been brought from outside nurseries from top killing, and there have been some sun scalds where trees have been exposed to the southwest sun, mostly among the limbs

and crotches. There will be a fair crop of apples, as they seem to be setting fairly good. There has been considerable top-working done this spring with fair success.

[Illustration: Mr. James Arrowood alongside a seedling of the Transcendent in early bloom.]

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Our native plums have all come through the winter in good shape, with only a small setting of plums, on account of so much rain. In regard to the plums we received from the Breeding Station in 1913: the number of plums was eighteen; all grew except two, and those killed back each year. They were No. 2. All the rest have grown, but no fruit up to date except on No. 7. That fruited last year and also is loaded with fruit at this date. The trees received in 1914 all grew except two. They all made a fair growth but haven't yet set any fruit. The dozen trees that were sent me in 1915 have all made a good growth this last year.

Two dozen grapes that were sent to me three years ago have not set fruit but have made a slow growth. Now in regard to small fruit, such as strawberries, we wish to say that No. 3 heads everything in the strawberry line for growth and berries. Its equal is not found in this section of the country. In regard to the everbearing we cannot say that they have done as well as we expected them to. The raspberries that we received three years ago have all done very well. No. 1 and No. 5 have done the best. Those berries have all stood out without covering through the winter. We have one acre of them now. They have not killed back at all and promise a big crop.

We received this spring about one dozen apple trees which we will report on later. Currants and gooseberries promise a good crop.

In regard to the shade trees and the evergreens they have all done remarkably well. We have more faith in the seedling fruits, such as apples and plums, for this section of the country. We believe our only hope will be through the seedlings. This was the late Prof. Green's prediction to me just before his death. Every year brings to mind his saying, that we must plant our own apple and plum seed if we ever expect any good results in Northern Minnesota.

In regard to the Hansen plums—all seem to be doing well and are set full of fruit. We would also mention the Hansen sweet alfalfa, which is a wonder. It grows and spreads equal to quack-grass. Four years ago we received fifty plants, which were planted according to directions of the professor to set two feet apart and cultivate the first year. During these four years it does not appear that there has been a single plant killed out. It has spread from the seed and roots over two rods wide and six rods long and as thick as it can stand.

Owatonna Trial Station.

THOS. E. CASHMAN, SUPT.

There is but little to report from the Owatonna Station at this time. Trees and plants came through the winter in good condition. The apple trees, Haralson's plum seedlings, No. 1017 everbearing strawberry, No. 4 raspberry and Beta grape seedlings came

through the winter without injury. Trees that are old enough have blossomed well and are carrying a fair crop of fruit.

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A new lot of seedlings originated by Mr. Haralson at the Fruit-Breeding Station have been planted this year, and the station this year put in the following: Malinda Nos. 12, 17, 13, 58, 32, 29, 7, 18, 25, 3, 35, 38, W. 82; Malinda seedling, W. 132; Hilbut, Winesap, W. 79, No. 16, No. 269, W. 81, W. 100, W. 184, No. 90, W. 20 G., No. 243; No. 31 everbearing raspberries, Russet Selly, W. 36, W. 135, No. 272. They are starting off in good shape and will all make a good showing for the first year.

We have done the usual spraying, first with lime-sulphur and a small portion of arsenate of lead while the trees were dormant, and just lately a good dose of arsenate of lead. The foliage of the trees is perfect, and bugs of all kinds are conspicuous by their absence. People who have not sprayed find their trees badly stripped of foliage. I am afraid of severe losses unless they get busy very soon. Spraying costs but little and must be done if we are to raise fruit.

Paynesville Trial Station.

FRANK BROWN, SUPT.

The plums sent to this station the spring of 1914 wintered very nicely, blossomed very full and have set considerable fruit. The new growth on these trees is very satisfactory, and they seem to be healthy in all ways.

No. 1 plum trees sent here last spring froze back quite badly, but as many other supposedly hardy trees did the same we are still in hopes that this was only an incident in a hard winter.

[Illustration: A corner of the home orchard at the Paynesville Station.]

No. 4 raspberry is still a favorite here; it winters perfectly, is a strong grower, and a good all around berry, both as a home berry, and as a shipper.

Raspberries Nos. 2 and 7 are both good, but No. 2 lacks a little in hardiness, and we wish to test No. 7 more fully before reporting. The other raspberries, Nos. 1, 3, 5 and 6, are no good here.

If I knew how to say more in favor of that grand strawberry Minn. No. 3 I should say it; with us it is the best of all the June-bearing berries, hardy, productive, a good canner and a good shipper.

The spring of 1915 we received from the Central Station fifty plants labeled Minn. No. 1017. We considered it our duty to test these in all ways, so kept all berries picked off until July 1st, then allowed fruit and plants to form as they would, and the result was an immense crop of dark red fruit, of the finest quality, and over 600 strong, sturdy plants. These were transplanted this spring without the loss of a single plant, and at this date are certainly a fine looking bunch.

The apple trees received this spring from the Central Station are all doing well. The trees and plants from that Station certainly speak volumes for the work being done by Supt. Haralson.

Some trees and shrubs killed back quite badly the past winter, especially spirea Van Houtti was badly hurt.

Fruit prospects are good, the cold backward spring held the fruit buds back until all danger of frost was over.

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Strawberries are especially fine this season, and bid fair to be a record crop. In fact, the horticulturists in this part of our state have much to be thankful for.

Sauk Rapids Trial Station.

MRS. JENNIE STAGER, SUPT.

June 13—Starting with a late spring, which saved all sorts of blossoms from the frost, now in June we have promise of an unlimited amount of fruit. But with heavy rains almost every night, we cannot effect much with spraying. One spraying eliminated all worms so far from not only the currants and gooseberries, but the roses also, and once going through the orchards has done away with the few tent caterpillars that had started in their work.

So on the whole we have hopes of a full harvest of not only tree but small fruits. Most vegetables are backward, as also flowers from seeds, but with so much to be thankful for how can any of us complain.

* * * * *

ALLEGED PEAR BLIGHT CURES ARE WORTHLESS—ORGANISM OF DISEASE LIVES UNDERNEATH BARK OUT OF REACH OF “CURE.”—Fruit growers should not allow themselves to be induced to purchase and use worthless pear blight cures. Every year we hear of cures for pear blight being sold to fruit growers, but to the present time the experiment stations of the country have hunted in vain for any practical remedy that may be sprayed upon trees or used in any way for the cure of this typo for disease. The organism lives underneath the bark entirely out of reach of remedies that may be applied to the surface of the tree.

I would strongly recommend to fruit growers that they do not spend any money for pear blight until they are able to learn through experiment stations, or the Department of Agriculture at Washington, D.C., that there is a remedy that can be used for the control of this disease.—C. P. Gillette, Colorado Agricultural Experiment Station.

West Concord Trial Station.

FRED COWLES, SUPT.

June 14.—The past winter was long and severe. Besides the severe cold, a heavy coat of ice remained a long time on trees of all kinds, causing much anxiety, but when the time came trees of all kinds were full of bloom and beauty. Most varieties of apples have set a full crop of fruit. Some trees which bore a heavy crop last year have little or none this year, but the general crop of apples will be heavy if it matures. Our trees top-worked to Jonathan and Northern Spy are bearing good this year; they show no signs of winter-killing.

[Illustration: Side view of Mr. Cowles' home grounds.]

Plums were full of bloom as usual, but have set little fruit. Some varieties—Sansota and Wyant—have a few scattering plums. Seedling No. 17 also has a few. The new seedlings from the Station are all growing good. The native plums in a thicket have more fruit than the named varieties.

Strawberries have wintered well and give promise of a full crop. Some garden patches in the vicinity winter-killed badly. Minnesota Seedling No. 3 promises to be a good berry; the strong fruit stems keep the berries from the ground. The Progressive and Superb, of the everbearing type, are no longer an experiment, but are a success, and many farmers are planting them.

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Raspberries winter-killed some. The Herbert seems as hardy as any. Seedling No. 4 is also hardy. Gooseberries and currants are bearing as usual. Grapes have started rather late and will have a short season to mature.

The early flowering shrubs bloomed very full this spring. Lilacs did extra well. The Persian lilac was very full and lasted a long time. Chas. X, Madam Chereau and Alphonse la Valle were fine. Villosa is just coming out; this is a beautiful variety. The tree lilac received from China a few years ago is going to bloom for the first time. The iris is just in full bloom, and the delicate colorings always please. Peonies are late this year, none being out at this time. A few Rugosas are the only roses out at this time, but they look promising for a little later.

Orcharding in Minnesota.

DISCUSSION LED BY PROF. RICHARD WELLINGTON, UNIVERSITY FARM.

Mr. Sauter: I want to set out 500 trees; what kind shall I set out? I live at Zumbra Heights.

Mr. Wellington: I would prefer some of the more experienced growers to speak on that question, but going over the recommendations of over 160 growers the Wealthy is recommended in practically all cases in preference to the other varieties. We know, however, that the Wealthy needs pollen from other varieties for fertilization of the blossom, so it would be foolish to put out 500 Wealthys. It is better to mix in some of the other varieties. If I was planting an orchard, probably seventy-five per cent. of the apples would be Wealthys.

Mr. Sauter: And what next?

Mr. Wellington: Well, that depends altogether on your market. If you can handle the Duchess apple, work the Duchess in; or if you wanted a few late apples, work in some of the other varieties.

Mr. Sauter: Isn’t the Okabena better than the Duchess?

Mr. Wellington: It is a little later.

Mr. Richardson: Four days later.

Mr. Wellington: That would be my recommendation. I would put in the majority of the trees Wealthys and then work in some other varieties according to your market.

Mr. Sauter: Isn’t the Malinda and the Northwest Greening all right?

Mr. Wellington: The Northwest Greening seems to be especially valuable in certain parts of the state. In some parts they winter injure, but it is a good late variety.

Mr. Sauter: How is the Malinda?

Mr. Wellington: Malinda is all right excepting in quality. It is lacking in quality.

Mr. Sauter: Is it a good seller?

Mr. Wellington: I couldn't tell you about that. Some of these other gentlemen could give you information on that point. It tastes more like cork than anything else, but after the other apples are gone we are not so particular about it.

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Mr. Dunlap: The speaker brought out one point that we tested out a great many years ago in Illinois, and I suppose it is really an important one here, and that is the protection against the winds with shelter-belts. Now, at the University of Illinois they planted out some forty acres to test that with all the varieties they could get together, and they planted spruce trees not only on the outside of the orchard but they planted them in through the orchard, dividing the orchards up into ten acre plots. Quite a number of the early planters of apples in Illinois also put windbreaks around their orchards with considerable detriment to their orchards.

We find that we need air drainage there just as much as we need protection against the wind. If I were in Minnesota I might change my mind after studying the conditions, but if I was going to plant in Minnesota and I should plant evergreens I certainly would trim them up from the bottom so as to get air drainage. I have known of instances where orchards were protected and where there was air drainage they were all right, but where they were closely protected by the trees they were injured by the frosts by their starting too early in the spring. If you get a warm atmosphere around the trees you start your buds pretty early, several days earlier than they would if they had the right kind of air drainage, and it does seem to me that the experience we have had would be against close planting around an orchard for protection from frost, though you do want to protect them against winds, but air drainage, it seems, is not a detriment to orchards. (Applause.)

Mr. Richardson: I wish to say that in my observation and my experience if I was putting in a windbreak I would put it on the south and west sides; I wouldn't have any on the north and east.

Mr. Brackett: Our prevailing winds are from the south and west during the summer, and the Wealthy is an apple that is bad for falling off when it gets to a certain stage, and I think it is very necessary for us to have a windbreak on the south and west if we are going to protect our orchards here.

Mr. Ludlow: The wind comes from the northwest generally in the winter, when we have storms, and if snow falls and it comes from the northwest, and the orchard is protected on that side by a windbreak, the windbreak will catch the snow and it will pile on top of the orchard, and I have known at least a dozen trees to be broken down by the storms of winter getting in that way.

A Member: I think crab apple trees make a good windbreak, if they are set twice as close together as trees in the orchard.

A Member: I think location has more to do with it than anything else. I have two or three orchards in mind where five years ago, when we had that hard frost, they had an abundance of apples, and it was protected from the northwest. I have another orchard in mind that was protected from the north and northwest, and this year they had over

1,400 bushels of Wealthy apples. Mine wasn't protected particularly from the north, and I had no apples, but back of the buildings, there is where I had my apples. I tell you location has more to do with it than a windbreak in such a case.

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Mr. Drum: You all remember some ten or more years ago when the apple trees were in blossom, and we had a terrible snow storm and blizzard and freeze. My orchard was protected both from the southwest and the northwest and the north, and following that freeze my trees had the only apples that were left in that country. I think that protection from the north and northwest is just as essential, especially in a position where the winds have a wide sweep. My house and my orchard slope off to the northwest, and I have a full sweep of the northwest wind there for miles. The house was set as it were on a pinnacle. I think the protection from the northwest is fully as essential in such a position as any other.

Mr. Whiting: This windbreak proposition is a question of locality. In the western part of the state, as well as in South Dakota—especially in South Dakota—we say that the south windbreak is decidedly the most important of any we can put in. We have more hot winds than you do here in the eastern part of Minnesota. You don't have that trouble, but in western Minnesota you are very much like we are in South Dakota. Mr. Ludlow knows the conditions, and I say you must take that into consideration. If you are in that locality the south windbreak is decidedly the most important of any. Then I would say the windbreak on the south, west and north are all of considerable importance. Of course, you can overdo it, you can smother your orchard. You must guard against that, but we have too much air drainage.

In regard to the variety proposition, isn't it true that you are growing too many perishable apples in Minnesota? I know it is so in South Dakota. We are growing too many of these early varieties; we ought to grow more winter varieties. If you want to build up a large commercial apple business you have got to raise more keepers. You are planting too many early varieties.

Mr. Dowds: I have been setting out apple trees more or less in different states for sixty years. If I was going to set out another orchard I would put windbreaks all around it, north, south, east and west, and the windbreak that I would use would be the yellow willow. It grows quick, it gives you a circulation of air, and it protects your trees. My experience in the last fifteen years has been that the yellow willow was the best windbreak that you can have around the house.

Mr. Brackett: Mr. Whiting says, grow winter apples. I want to know what winter apples will bring the money that Wealthy bring.

Mr. Whiting: That is a hard question, but isn't it a fact that you grow too many Wealthys? Don't you glut the market unless you have cold storage? You ought to work to that end just as much as possible; you ought to have more good keepers, better winter varieties.

The Society Library.

Books may be taken from the Library of the Minnesota State Horticultural Society by any member of the society on the following terms:

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1. Only one book can be taken at a time.

2. Books with a star (*) before the title, as found in the published library list, are reference books and not to be taken from the library.

3. In ordering books give besides the name also the case and book numbers, to be found in the same line as the title.

4. Books will be sent by parcel post when requested.

5. When taking out, or sending for a book, a charge of ten cents is made to cover expense of recording, transmission, *etc*.

6. Books are mailed to members only in Minnesota and states immediately adjoining. When sent to points outside the state a charge of fifteen cents is made.

7. A book can be kept two weeks: If kept longer a charge of two cents per day will be made.

8. The library list, to December 1, 1915, is published in the 1915 annual volume of the society. Additions to this list will be published year by year in the succeeding annual volumes.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

Mr. H. H. Whetzel, of the plant disease survey, U.S. Department of Agriculture, stationed at Cornell University, where the American Peony Society has its test grounds, has made a study of the stem-rot disease of the peony and has set forth the results in an address before the Massachusetts Horticultural Society, from which the following has been culled:

“The botrytis blight is by far the most common and destructive disease of the peony so far as known at present. This disease is frequently epidemic, especially during wet springs. It occurs wherever peonies are grown, apparently the world over.

“This disease usually makes its appearance early in the spring when the stalks are coming up. Shoots will suddenly wilt and fall. Examination will show they have rotted at the base or just below the surface of the ground. The rotted portion will soon become covered with a brown coat of spores—much like felt. Generally it is the young stalks

that are affected, though sometimes stalks with buds just opening will suddenly wilt and fall. It is thought the spores are carried through the winter on the old stubble, after the tops have been cut off. They are in the best position to give rise to a new crop of spores in the spring, and the new shoots become infected as they appear.

“To eradicate this disease the old stubble should be carefully removed in the fall or early spring by removing first the soil from the crown so as not to injure the buds, and cutting off the old stalks. These should be burned and the soil replaced with clean soil or preferably sand. Whenever a shoot shows sign of the disease it should be cut off and burned. The buds must also be watched and any that begin to turn brown or black and die must also be cut off and burned, as spores will be found upon them, and these will be spread by the wind and insects. Spotted leaves should also be picked off. In wet seasons the peonies should be closely watched. For the small garden, with comparatively few clumps of peonies, this treatment will be entirely practical and effective.”

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Bulbs should be ordered this month if you wish the pick of the new crop. There are two fall blooming bulbs that would add to our September and October gardens. One is the Sternbergia, or autumn daffodil, and the other is the autumn crocus.

The bulbs should be planted in August and will blossom the same season. The daffodil is a clear yellow and is good for cutting. These bulbs must be ordered as early as possible.

Lady bugs are our garden friends, destroying multitudes of aphides. They should never be killed.

Have you the following all ready for use?

For insects, bugs or worms that chew—or eat portions of plants—arsenate of lead, paris green or hellebore.

For sucking insects, nicotine or kerosene emulsion.

For diseases, bordeaux mixture or ammoniacal copper carbonate solution.

A good sprayer.

* * * * *

Remember our photographic contest.

BEE-KEEPER'S COLUMN

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

INCREASING COLONIES (CONTINUED FROM JUNE NO.)

[Illustration: Prof. Francis Jager's apiary at St. Bonifacius.]

To increase you must first make your colonies strong. One or more of your best colonies must be selected to raise queens for your increase unless you wish to buy your queen. Stimulate your queen raising colonies by feeding and not giving them any supers. The crowded condition will bring on an early swarming impulse, under which they will raise from twelve to twenty large, well developed queen cells each. The queens of your queen raising colonies should be clipped. When in due time a queen raising colony swarms, catch the queen and remove her and let the swarm return.

Immediately after this swarm you may proceed to divide your other colonies from which you wish to increase. Put down on a permanent location as many empty hives as you have available queen cells in your colony that swarmed. Into one of these you put your removed breeding queen with two frames of brood and bees. Into each of the rest of the empty hives put two frames of brood with all adhering bees from your colonies you wish to increase. Be sure to leave the queens in the old hive after brood for increase with adhering bees has been removed. Thus you have now a number of new colonies with bees and two frames of brood but no queen. The rest of the hive may be filled with drawn comb or sheets of foundation. To prevent the bees from returning to the old home, stuff the entrance of the hive solidly with grass. In two days the grass will wilt and dry and the bees will come out automatically and stay in the new location—at least most of them. In the meantime being queenless they will be busy with raising queen cells on the two frames of brood.

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This occupation will make them contented, then on the seventh day cut out every one of their queen cells and give them a cell from your breeder colony. Your queen breeding colony on the seventh day after swarming will have ripe queen cells ready to hatch, with one queen probably out. If by listening in the evening you hear her “sing” and “peep” go next morning and remove all queen cells and give one to each of your newly formed colonies. They will be readily accepted, will hatch immediately, sometimes whilst you are removing them, but certainly the same or next day and begin laying in due time. From such colonies you may not expect any surplus honey, but they will build up rapidly and will be strong colonies to put away next fall.

[Illustration: ADMINISTRATION BUILDING (MAIN BUILDING), UNIVERSITY FARM, ST. ANTHONY PARK, MINN.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 AUGUST, 1916 No. 8

How May University Farm and the Minnesota State Horticultural Society be Mutually Helpful in Developing the Farms and Homes of the Northwest?

A. F. WOODS, DEAN AND DIRECTOR, DEPT. OF AGRI., UNIVERSITY OF MINN., ST. PAUL.

The farm without its windbreaks, shade trees, fruits, flowers and garden, if it can be called a home at all is certainly one that needs developing and improving. There are many abiding places in the Northwest, as in every other part of the United States, that lack some essential part of them. The first and most important step with a view to correcting these conditions is to bring together those interested in home improvement to talk over problems and difficulties and to plan how to correct them and to interest others in the movement. This is what this great society with its auxiliary societies has been and is now doing most successfully. It is true that your work has been more particularly from the horticultural view point, but, as I said in the beginning, fruits and flowers are civilizing and home making influences.

There should be more horticulturally interested people from the farms affiliated with this society. Each farmers’ club should have a horticultural committee. There are now

about nine hundred farmers' clubs in the state, and the number is increasing constantly. These clubs represent the communities in which the members live. They include men, women and children, farmers, preachers, teachers, every member of the community willing to cooperate. They start things in the community interest and follow them up. The Agricultural Extension Service of the University is in close touch with these clubs. The horticulturists

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of the service especially might help to arouse the interest of the clubs in this movement. This society might offer some prizes especially designed to interest the boys and girls of the farmers' clubs. Each club horticultural committee should have representation in this society. Some of the prizes might be memberships or trips to the annual meeting. Many members of this society are members of such clubs. They could take the lead in the movement. In this way the society would keep in touch with the homes and communities of the state, and all would grow together in horticultural grace—and the other graces that go with it.

[Illustration: A Minnesota farm home with handsome grounds and modern conveniences.]

The gospel of better homes is like every other gospel. It must be taken to those who need it and who know it not or are not interested. The extension service of the University is organized to carry the message of better homes, better farms, better social and business relations to the people who need it. Farmers' institutes, short courses, lectures, demonstration, farm supervision, judging at county fairs, boys' and girls' club work, institute trains, county agent service, indicate some of the kinds of work in progress. The press is also a powerful factor in this work. The Minnesota Farmers' Library, which is made up of timely publications on all matters of rural interest, has a mailing list of fifty-five thousand farmers. From six to twelve of these publications are issued each year. "University Farm Press News" reaches regularly six hundred papers in the state. "Rural School Agriculture," containing material especially adapted to the needs of the consolidated and rural schools, reaches practically every rural and consolidated school in the state each month. "The Visitor" is a special publication prepared for the use of the teachers of agriculture in the high schools of the state. The "Farmers' Institute Annual" is a manual of three hundred pages published each year in editions of fifty thousand and contains material of interest to every farmer. Many special articles are prepared for farm papers. Every department of the extension service and college and station is in touch with the farm homes of the state through correspondence, and much valuable work is accomplished in this way. The aim is always to work from the home as the center, and from that to the group of homes constituting the community, the township, the county and the state, in an ever-enlarging circle.

[Illustration: A typical Minnesota consolidated school building.]

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The greatest opportunity for better homes and better farms and a better country life is in enlisting the children of the country in the movement. When I say the children of the country, I do not mean to exclude the children of the villages and towns whose tastes may lead them countryward. We should never stop or attempt to stop the free movement between the country and the city. It is good for both. The children of today will be the farmers and farm home makers and the business men and women of tomorrow. Are the children of the farmers looking forward with interest to farming as a business, and life in the country as attractive? The movement to the city in ever-increasing numbers is the answer, but it is the answer to what has been and now is, rather than to what is to be. A new day is dawning, in which the brightest minds and the choicest spirits will again choose to live in the open country and make there the ideal homes from which shall continue to come the life and vigor of the nation. But if it is to be so, the schools of the country must furnish real intelligent leadership and the country church must come again to spiritual leadership. We must all help to bring this about.

Minnesota has a plan to accomplish this, and it is working out even better than we dared hope. Experience has shown that by consolidation or the cooperation of several districts, good results may be secured at no greater cost than the same type of school costs in town. The small school of today is expensive because it is inefficient. The consolidated school is giving the children of the country the education that they need and is doing it better than it can be done anywhere else. The consolidated school is becoming the rural community center. An important feature which has been adopted by many of the consolidated districts is the building of a home for the teachers in connection with the school. This home may be made typical of what the modern home should be, not expensive but substantial, artistic, convenient and sanitary. The grounds should be suitably planted with trees, shrubs and flowers, and there should be a garden. The school building is also made to fit the needs of the community. The larger rooms may be used for entertainments, farmers' club meetings, lectures, *etc*. There should be facilities for testing milk and other agricultural products, examining soils, *etc*. There should be a shop for wood and iron work, or at least a work bench and an anvil. There should be a library of good reading and a place to cook and bake and sew. There should be a typewriter, a piano or an organ, and such other conveniences for teaching and social center work as the community may wish and be able to secure, and, best of all, teachers living at the school who know how to operate the plant in every detail and to make it useful to the community.

[Illustration: An ideal plan for consolidated school grounds.]

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There were nine of these schools five years ago in Minnesota. According to the last report of the Department of Public Instruction, there are 142 now, and the number is increasing constantly. The state as a state is behind the movement and is giving substantial aid, direction and supervision to these schools. When the forward movement was planned, plans were also made to train teachers and to give the teachers already in the service special work that would fit them to adjust themselves to the new needs.

The normal schools and the high schools teaching agriculture, manual training and home economics have adjusted their courses to meet this new demand. Six years ago the work had hardly begun. Today there are 214 high and graded schools teaching home economics, 177 teaching agriculture, 125 teaching manual training, and of these 121 are preparing teachers especially for the rural schools.

The College of Agriculture and Home Economics of the University of Minnesota is training the teachers in these subjects for the high schools and normal schools, and, in cooperation with the State Superintendent of Public Instruction, the Department of Agriculture has been conducting a summer school for rural teachers, where those already teaching and those planning to teach can get the training required to meet the new conditions and demands. Similar summer schools have been conducted in cooperation with the agricultural schools at Crookston and Morris. All together each year there are between 1,800 and 2,000 teachers taking these special courses. Every effort is made to bring to these teachers the view point of the new country life movement.

This society and the members individually in their home communities should stand squarely behind this movement. They should become thoroughly informed regarding it. It is the cornerstone of the new country life.

Finally I wish to call your attention again to the great educational opportunity which you are missing. If you could come into vital contact each year with more than 4,000 young men and women who are seeking for everything that will help them to be more useful citizens, would you do it? You could exert in that way an exceedingly great influence on the homes and future welfare of this state and nation. You can do it if you will come out and live with us the year round at University Farm. We should have a building there suited to your needs that we could all use as a great horticultural center, open the year round. You have already taken steps in this direction. I hope that conditions will be such that we can join hands to get it very soon.

* * * * *

SAN JOSE SCALE REQUIRES PROMPT ACTION—ORCHARD SHOULD EITHER BE DESTROYED OR SPRAYED BEFORE BUDS OPEN.—There are a few orchards in Colorado that are found to be infested with the San Jose scale.

Owners of these orchards should determine upon one of two courses to pursue. The orchard should either be promptly cut down and destroyed, or the trees should be thoroughly treated with lime-sulphur solution or a good quality of miscible oil for the destruction of the scale before the buds open in the spring.

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If lime-sulphur is determined upon, the home-made article may be used, or the commercial lime-sulphur solutions may be used, in which case they should be diluted with water, in the proportion of one gallon of the commercial lime-sulphur to not more than ten gallons of water. The application should be made thoroughly, so that every bit of the bark of trunk and limbs is covered with the spray.

If miscible oil is used, I would recommend using one gallon of the oil to each nineteen gallons of water. Hard or alkaline waters should be avoided, as sometimes the oil will not make a good emulsion with them. Use soft water, if possible.—C.P. Gillette, Colorado Agricultural Experiment Station.

The Horticulturist as King.

C. S. HARRISON, NURSERYMAN, YORK, NEB.

Some of the promises regarding our future stagger us with their vastness. “To him that overcometh will I grant to sit with me on my throne.” But how is it down here? Thou “crownest him with riches and honor.” Thou hast “put all things under his feet.” Unto fields where feet of angels come not we are chosen as partners of the Heavenly Father to make this a more fruitful and beautiful world.

In our life work much depends on our attitude regarding our calling. We can plod like an ox, or like Markham’s semi-brute man with the hoe, and make that the badge of servitude to toil, or we can make it a wand in a magician’s hand to call forth radiant forms of beauty from the somber earth to smile upon us and load the air with fragrance. We can live down in the basement of horticulture or in the upper story.

Man is coming to his own. The savage trembled at the lightning stroke which shivered the mighty oak. Little knew he that here was a giant at play waiting to be tamed and harnessed so he could be the most obedient servant—ready at the master’s beck to leap a continent, dive under the ocean, draw heavy trains, and run acres of machinery. Man reaches out his wand, and steam, gas, and oil rise up to do his will.

If, with the advance of civilization, he wants beautiful things to adorn person or home, he finds subterranean gardens of precious gems almost priceless in value—gems that are immortals, flowers that never fade, prophets all of the “glory to be revealed.”

You have heard of the marvelous Persian garden of gems—four hundred feet in length and ninety feet wide—made to imitate the most beautiful blooms of earth. It cost millions upon millions. Do you know that it is in your power, with the advance of floriculture, to create gardens far more resplendent in beauty—great gardens of delight fit for the touch of angel’s feet, while the whole is flooded with billows of sweetest perfume? Three years ago that was a patch of barren earth; now you have pulled down a section of paradise upon it and condensed there the tints of the morning, the

splendors of the evening, the beauty of the rainbow, and the effulgence which flames in the mantles of the suns.

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I love to think of Nature as a person—first born daughter of God—her head white with the snows of the centuries, her cheeks radiant with the flush of recurrent springtime, emblems of eternal youth. She takes you by the hand, leads you into the forests, talks to you of the soul of the tree, tells you how intelligent it is. There is one standing in the open. It has performed a feat no civil engineer can emulate. Think of those roots so busily scurrying around in the earth, gathering food to send up the cambium highway to nourish the trees. See the taut cords thrown out to anchor it against the storms. Look at those trees on the outskirts. Among wild animals the strongest are on guard on the outside to protect the herd. So these sentinel trees guard their wards against the storms. Fool man cuts down the guards and the wards fall before the sweep of the storm. Mother Nature—dear, friendly soul—takes you into her holy of holies and reveals her mysteries. She makes a confident of you. She throws open her doors and shows you the wide vistas of a new land you may enter and glorify. Follow her direction, and what a friend you have! Cross her, thinking you know more than she does, and she laughs at you. She takes you into the garden and the nursery and discloses her wonders and helps you to work miracles. You plant seeds and bulbs, and beauty rises to greet you. Did you ever think of the royal position of the florist and horticulturist?

The sacred poet speaks of the “labor of the olive.” What a flood of light that opens upon us. “All things are yours.” Let us go out into the grove you have planted. I once took off my hat to myself. While living in the Republican Valley, near the 100th meridian, I planted some bull pine seed. When the little trees were large enough, I transplanted them in rows six feet apart and started a miniature forest. Twenty-five years after I went to see them. The rows were straight. The trees had fine bodies six inches through. They were miniature columns in a temple, holding up a canopy of green. The ground was covered with a thick carpet of needles. It was one of the most pleasing sights I ever saw. Then I thought, “What if I had planted forty acres?” I would have had a Mecca to which horticultural pilgrims would have flocked from hundreds of miles. I planted the trees, and the faithful servants kept on working day and night, and that beautiful grove was the result. Every tree you plant is your servant, and how faithful it is—no shirking, always at it whether you are looking or not. Look at that cherry tree. How the tiny rootlets scurry through the soil—faithful children gathering food to send up to their mother. Look at that flood of bloom. Then the fruit grows till a mass of red gleams from the leafy coverts. There is a great difference between a patch of brown earth and your faithful Jonathan. What a marvel that little patch of soil, absolutely milked by those busy foragers, and the extracts of it glowing in red beauty on the tree. Talk of chemists! Those quiet rootlets surpass them all.

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[Illustration: Albert Victor iris, from Mr. Harrison's garden—about one-third size.]

If you want to be in the realm of miracles, lay down your hoe awhile and sit among your flowers. Your brain devised the plan, your hand planted the seeds and bulbs. "Behold the lilies, how they grow." Now sit there and think it out. At your feet are artists no human skill may imitate. Two peonies grow side by side. Golden Harvest opens with yellow petals fading to purest white. In the center is a miniature Festiva Maxima—blood drops and all. How can those roots send up the golden tints, the snowy white and the red, and never have the colors mixed? Close by is a Plutarch, deep brilliant red. The roots intermingle. How is it possible to pick out of the dull soil, Nature's eternal drab, that brilliant color for your peony? There are your iris, the new sorts absolutely undescribable. There are a dozen different shades in a single bloom. But those blind artists at work in their subterranean studios never make a mistake. The standards must have just such colors, the falls just such tints, and where did they get that dazzling radiant reflex such as you see on Perfection, Monsignor and Black Knight? But it is always there shimmering in the sunlight. There is a fairy—a pure snowy queen. How was that sweetness and purity ever extracted from the scentless soil? Every bloom uncorks a vial of perfume which has the odor of the peach blossom.

Did you ever sit down in your kingdom and see what a royal throne you occupied? What a reception your flowers give you! The ambrosia and nectar of the feasts of the deities of fable are overshadowed by the fragrance and sweetness of your worshippers. It would seem that every flower, like a royal subject, was bent on rendering the most exalted honor to her king. No company of maidens preparing for nuptials were ever arrayed like these. Each one is striving to do her best. The highest art ever displayed in the palaces of kings is no comparison to the beauty and splendor of your reception. By divine right you are supreme. The fertile soil puts her tributes at your feet; for you all the viewless influences of nature are at work; for you the sun shines and the showers fall. So brothers, don't creep but mount up as on eagle's wings. Invoice yourself and see how great you are! Don't live all the while in the basement—spend some time in the upper story of your calling!

You are not making the earth weep blood. You are not spreading on the fields a carpet of mangled forms. You are not dropping ruin and death from the skies or polluting God's pure waters with submarines. You are not turning all your energies into the work of destruction, despoiling the treasures of art and the pride of the ages and turning the fairest portions of the earth into desolations. You are not changing yourselves into demons to gloat over starvation and ruin. You are soldiers of peace. Behind you was the somber earth. You touched it with the wand of your power, and beauty, health and pleasure sprang up to bless you.

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See what you have done! You have clothed the barrenness of the dreary plain with gardens, orchards and forests. You have been at work with God and glorified a vast empire, and now he has blessed the work of your hands. Instead of the air sodden with tears and tremulous with the wail of widows and orphans, you are welcomed with the joy of children and the delight of mothers. All along the lines of progress you receive the most cordial ovations, and when you pass on to the land where “everlasting spring abides”, may you receive the royal welcome, “Well done, good and faithful servant.”

The Newer Fruits in 1915 and How Secured.

PROF. N. E. HANSEN, STATE COLLEGE, BROOKINGS, SOUTH DAKOTA.

Mr. Hansen: Mr. President and Fellow Members: This subject is not an entirely satisfactory one this year owing to the fact that we lost about three sets of tomato plants from frost, the last frost coming the ninth of June. These conditions, of course, are unusual, but it prevented the fruiting of a lot of new fruit seedlings which appeared promising. However, I decided to propagate two new plums because they had borne several excellent crops. One of these is a very late plum of good quality, with flesh of peculiar crisp texture, which ripens after all the other plums, about a week before frost. It is a combination of the Wolf plum with the Kansas sand plum (*Prunus Watsoni*). The tree is of late dwarf habit but very productive, and its late season may give it a place.

Another plum which I decided to place in propagation is a hybrid of the wild plum of Manitoba with the Japanese plum. The mother tree was raised from wild plum pits received from Manitoba a few years ago. These bear very freely and are the earliest of the native plums. The tree is of low, dwarf habit. The fruit is not as large as my Waneta, which is a hybrid of the largest native plum, the Terry, (*Prunus Americana*), with the Apple, one of the best of Burbank’s Japanese plums. But since the range of the plum Manitoba is so far north, it may give greater hardiness where that is needed. At any rate, it is of interest to know that the Manitoba native plum can be mated with the Japanese plum.

Pears constitute my favorite line at present. “What can I do for hardy pears?” is a question I have been asked many times. The prairie northwest cannot raise pears owing to the cold or the blight. In my travels in Asia, including four tours of exploration in Siberia, I made a business of buying up basketfuls of pears in Manchuria, Mongolia, Western China and Eastern Siberia and saving the seed, giving the flesh away to the coolies, who were glad always to get the fruit. These have raised me many seedlings. In addition I have imported a lot of pears from Russia.

[Illustration: Pyrus Simoni

The hardy, blight-proof sand pear used by Prof. N.E. Hansen in breeding pears for the Northwest. A careful study of our eastern Arctic pears has been made recently by Mr.

Alfred Rehder, botanist at Arnold Arboretum, and this form of sand pear is now called Pyrus Ovoidea instead of Pyrus Sinensis, or Pyrus Simoni.]

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The pears of northern China and eastern Siberia are usually called the Chinese sand pear and have been given various names, *Pyrus Sinensis*, *Pyrus Ussuriensis*, *Pyrus Simoni*. The form I am working with mainly was received in the spring of 1899 at the South Dakota Station under the name of *Pyrus Simoni*, from Dr. C.S. Sargent, Director of the Arnold Arboretum, Boston, Massachusetts. Since the publication of Bulletin 159, of the South Dakota Experiment Station, April, 1915, in which I give a brief outline of this work, the pears of this region have been studied by Dr. Alfred Rehder of the Arnold Arboretum, and it now appears that the true name of *Pyrus Simonii* should be *Pyrus Ovoidea*. These trees have proved perfectly hardy at Brookings and have never suffered from blight. Varieties of other pears have been top-grafted on this tree, and they have blighted, but the blight did not affect the rest of the tree. Mr. Charles G. Patten, Charles City, Iowa, also has a form of the Chinese sand pear which has proven immune to blight. In other places sand pears have been under trial which have suffered from winter-killing. However, I understand that the pear Mr. Patten has tapers toward the stem, while the pear received by me as *Pyrus Simonii* tapers toward the blossom end. The actual source of seed is really of greater importance than the botanical name, as it is possible to get the seed from too far south, whereas we should plant only the northern form of the species.

The fruits of *Pyrus Ovoidea* correspond in size to the ordinary pear much like the Whitney crab-apple does to the apple. It is a real pear, juicy and sweet, but not high flavored. Other varieties of pears have been top-grafted on this tree and have blighted, but the blight did not affect the rest of the tree. During the many seasons I have had this pear the tip of one twig only showed a very slight trace the past season, but I did not determine it was really blight. It is practically immune.

I have also worked the Birch-Leaved pear, *Pyrus betulifolia*, Bunge, a native of northern China, and a choice ornamental tree. Trees of this species were received from a nursery in Germany in the fall of 1896 and have proven perfectly hardy and quite resistant to blight. The fruit is quite small, usually less than one-half inch in diameter, covered with thick russet. *Betulifolia* means birch-leaved, alluding to the shape of the leaf.

Now, the pear is a difficult thing to work with on account of blight. What is blight? It is an American bacterial disease, not found in the home of the pear, Asia or Europe, so that during the 6,000 years of its cultivation of recorded history the pear has never had to meet the bacterial enemy known as blight. That is one of the reasons, I presume, why they have such strict quarantine in Europe against American trees. The question with pears is, will they stand blight or not? They are spending hundreds of thousands of dollars in California to keep out blight. Blight is a native of the northeast United States, and they are keeping it down on the Pacific slope, but they are always on the edge of the precipice. The whole pear culture of America is in an unsatisfactory state, owing to this danger.

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With these two northern pears as a foundation, I have endeavored to secure seedlings with fruit of large size and choice quality by hybridizing them with many of the best cultivated pears from Germany, France, England, Central Russia and Finland, as well as with some of the best varieties from the eastern pear-growing regions of the United States. The work has been done mostly under glass in our fruit-breeding greenhouse. Some of these fruits weighed one and one-fourth pounds. Some of the resulting seedlings are subject to blight, while many have thus far shown immunity. Since it is impossible to determine their relative immunity to blight except by distributing them for trial elsewhere, I sent out scions in the spring of 1915 of thirty-nine of these new seedlings to twenty-four men in several states. These varieties are under restrictions until fruited and deemed worthy of further propagation.

[Illustration: Crossing work in pears—view in Prof. N. E. Hansen's Fruit-Breeding Greenhouse, State College, Brookings, S.D.]

I did not know whether immunity to blight is a possibility or only an iridescent dream, so I made no charge for these scions. The only test of a pear seedling, the same as with the apple, is that of propagation. Furthermore, if you have but the one seedling tree you may lose it by accident; whereas, if you send it out to a number of good men, you cannot lose it.

It should be distinctly understood that none of these new seedlings have borne fruit, but by what may be termed the projective efficiency of the pedigree I am satisfied that some of them will be valuable. In like manner, a horse-breeder depends so much on the pedigree in his colts that he is willing to enter them in a race. I believe something of value will come from this line of work. I do know that my *Pyrus Ovoidea* is a pretty good, juicy little pear, a whole lot better than no pear at all. I hope these seedlings will keep up their immunity to blight. The original seedling trees certainly have had every chance to become affected by blight, as they were surrounded by blighting apple trees, crab-apple trees and pear trees, and no blight was cut out. I thought this was the best way, since that is the test they will have in the farmers' orchards when they go out from the nursery.

Hardy Pear Stocks.—Now we are up against the problem of stocks for these hardy pears. The quince is a standard dwarf stock, but it is not hardy enough for us. Last spring I planted 12,000 seedlings of the various commercial pear stocks, including imported French pear seedlings, American grown French pear seedlings, Kieffer pear seedlings and Japan pear seedlings. From one season's experience I like the Japan pear the best. The French pear seedlings, especially, did not do well. The Japan pear stock is coming into high favor in recent years on our Pacific slope, where it is sometimes called the Chinese blight-proof stock. The French pear

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stock is not in favor on our Pacific slope owing to their liability to blight. We may also expect from the French pear stock a decided lack of hardiness. The Japan pear stock is probably some form of the Chinese sand pear. The seed may come from too far south, whereas we should plant only the northern form of the species. This varying degree of hardiness in the Japan pear seedling of commerce I find discussed in a German horticultural paper. I have tried to establish a regular source of supply by importing the seed, but it is difficult indeed to do this. To avoid root-killing at the north we should mulch these Japan pear seedlings heavily until we get enough orchards of this truly hardy form, *Pyrus Ovoidea*, planted so we can raise our own stocks. I firmly believe we will extend pear culture on the North American continent clear to the Arctic Circle if we wish.

For pear stocks I am going to try everything I can think of. Some years ago I worked pears on Juneberry stock from a hint given me many years ago by Professor J.L. Budd. These grew well and were in full bloom when five feet high, but were lost in clearing off a block of trees. I hope to try this again on a larger scale. The mountain ash and hawthorn are sometimes used, but both will be expensive and perhaps short-lived. The quince is the dwarf stock of commerce but would need to be very heavily mulched to prevent root-killing. Such dwarf pears are splendid in the back yard, or for training up against the side of the house; the fruit is fine and large, and the trees fruit the second year. The pear will root in nursery by grafting with a long scion on apple seedlings. I hope there will be much work done along this line.

To sum up the question, I think there is a hardy pear in sight. We have the requisite pedigree back of it, and it seems that the quality we call immunity to blight is in some of these Chinese or Siberian pears. If we can combine the hardiness and blight-resistance of this Siberian pear with the large size and high quality of fruit of the European pear, with thousands of years of cultivation back of it, then we have the solution of the pear question in sight. Millions and millions of people are watching for a good hardy pear. (Applause.)

* * * * *

WARNING TO MUSHROOM GROWERS.—As the result of a serious case of mushroom poisoning in a mushroom grower's family recently, the mushroom specialists of the U.S. Department of Agriculture have issued a warning to commercial and other growers of mushrooms to regard with suspicion any abnormal mushrooms which appear in their beds. It seems that occasionally sporadic forms appear in mushroom beds, persist for a day or two, and then disappear. These are generally manure-inhabiting species and may be observed shortly after the beds have been cased. In the instance cited, however, these fungi appeared in considerable numbers at the time the edible *Agaricus campestris* should have been ready for the market, and the dealer

supposed it was probably a new brown variety and tried it in his own family. As a result, five persons were rendered absolutely helpless and were saved after several hours only through the assistance of a second physician who had had experience with this type of poisoning.

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In the opinion of the Department, this case is peculiarly significant and demonstrates that the grower must be able to distinguish *Agaricus campestris* from any of the wild forms of mushrooms that may appear in the beds. Under the circumstances, the Department strongly urges every grower to make himself thoroughly familiar with the cultivated species. Complete descriptions, with pictures of poisonous and cultivated species, are contained in Department Bulletin 175, “Mushrooms and Other Common Fungi,” which can be purchased for 30 cents from the Superintendent of Documents, Government Printing Office, Washington, D.C.

Manufacture of Cider Vinegar from Minnesota Apples.

PROF. W. G. BRIERLY, HORT. DEPT., UNIVERSITY FARM, ST. PAUL.

Cider making is an old process, carried on in a small way on the farm or more extensively in the commercial “quick process.” From apple cider many different products are obtained, chief of these being vinegar and others being bottled cider, boiled cider, apple butter and, more recently, concentrated cider and cider syrup. This discussion will consider only the manufacture of vinegar.

As a farm process, the making of cider vinegar utilizes an otherwise waste product, the culls or unmarketable varieties. It can be done on rainy days or when other work is slack. For the best results, however, as in any form of marketing, some vinegar should be made each year so that the market may be supplied regularly, and, further, to give the necessary experience which will mean a better quality of vinegar.

As a commercial process we find the making of cider is a regularly conducted manufacturing enterprise in which a considerable amount of capital is needed. Expert knowledge of vinegar making, especially of the “quick process,” is essential. On this basis it is not open to the apple grower and is a doubtful venture on a co-operative plan without the help of experts. Where a vinegar factory is established, however, it gives to the orchardist a means to dispose of his cull apples.

Considering the process as it can be carried on on the farm, there are a number of distinct steps, all of which are important. The first step is to prepare for the work. Get a good machine, as it will pay for itself in the added extract of juice. A good machine need not cost more than $25 and may be had for less. Casks must be obtained and sterilized with live steam or sulphur fumes, washed thoroughly, and kept in a convenient place where they will not dry. It is best as well to have the convenience of running water to wash the apples if dirty and to clean up the machine occasionally. Cleanliness should be provided for and insisted upon, as dirty and decaying apples not only give undesirable flavors, but the bacteria and molds feed upon the sugar in the cider and greatly reduce the strength of the vinegar. This is one reason why a rainy day is a good time for cider making, as dust and flies are less and molds are not so abundantly “planted” in the cider.

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The next step is the grinding and pressing and is very simple. With an efficient machine the cider is quickly ready for the casks.

Then follows the first fermentation, which very frequently is not properly managed, and poor vinegar results. The casks should be filled only two-thirds full, the bung left open but screened with cheesecloth or lightly fitted with a plug of cotton to admit air. Compressed yeast generally should be added, at the rate of one cake to each five gallons, first mixing the yeast in lukewarm water. If the cask is then placed in a warm place, at least sixty degrees—seventy degrees or more being better—we have the three requirements of proper fermentation, namely, air, warmth and yeast. This will give rapid fermentation, which will reduce the loss of sugars to a minimum. This fermentation should be allowed to go on until completed. If vinegar starts to form it will usually leave a residue of sugar and give a weaker vinegar. It will require from two weeks to a year to change all the sugars into alcohol, depending upon the management of the work. When finished the clear juice is “racked” or siphoned into a clean cask, through a straining cloth to insure the removal of all pomace or sediment.

[Illustration: Prof. W. G. Brierly, Horticultural Dept., University Farm, St. Paul, Minn.]

Then follows the fermentation to produce the acetic acid and finish the vinegar. A “starter” of “mother” can be used, but it is best to take out a gallon or more of the cider when “racking” and add a pint to a quart of a good grade cider vinegar. Let it stand in a warm place, well covered with cheesecloth, and in from four to ten days a granular, brownish cake should begin to form. This starter can then be put directly into the casks, a pint or more to each cask. If the starter develops a white, slimy coat, throw it out and start again. For all of this second stage of fermentation follow the same plan as at first. Fill the barrels not over two-thirds full, use a cotton plug or cheesecloth screen at the bung and keep at a warm temperature. The essentials again are air and warmth, with a good vinegar starter. Under these conditions the vinegar may be ready in from two to ten months. If the usual plan of “natural” fermentation is followed, and the cask is kept at a low temperature, it may be three years before the vinegar is ready.

When the vinegar seems to be completed, send a sample to the State Dairy and Food Commission at the Capitol for analysis. If they say it is completed, “rack” off and strain again into clean barrels, this time filling full and driving in the bung. This will prevent loss from evaporation, and the vinegar can be sold at any time. The state law requires that cider vinegars sold in the state measure up to a certain standard—namely, four per cent. of acetic acid, 1.6 grams per 100 cc. of solids, and .25 grams per 100 cc. of ash.

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So much for vinegar making in general. For Minnesota conditions little is known about the definite behavior of any apple varieties. This has led to the study of vinegar making as a problem for the Experiment Station. The Division of Horticulture is carrying on variety tests to determine the yields of juice at different stages of maturity, the efficiency of types of presses, labor costs per gallon, and the production of vinegar from each variety to determine its value. The Division of Agricultural Chemistry makes analyses of the sweet cider to determine the composition and vinegar prospects, and also analyzes the vinegars at various stages. The work has been carried on for two seasons and is showing some interesting facts. These must, however, be checked with further work before definite statements can be published.

As to machines, our results show that the press with press cloths will outyield nearly two to one the press with the barrel or drum. However, a strong grain sack used to catch the pomace and used to confine it in the drum will give a very satisfactory yield, but it requires a considerable amount of labor to do this.

As to labor costs per gallon, we have as yet no definite figures except that one man can grind and press a minimum of eight to nine gallons an hour. Two men can raise the output to at least thirteen gallons. At 25 cents per hour the cost per gallon on this basis varies between two and four cents. As the apples are of little value, and the labor generally “rainy day” labor, this seems to give an inexpensive product.

Our vinegars are as yet incomplete. The run of 1914 was very limited and of necessity stored in a cold cellar. It now tests two per cent. acetic acid, so is only half finished.

As to variety yields, the results of the work of two seasons compare very closely and show generally that there is a variation from a minimum of a scant two gallons up to more than a pint over three gallons from forty pounds of each variety. The forty-pound quantity is taken as representative of the bushel by measure. The varieties leading cider production are—the Hibernal and Wealthy, which generally have given us about three gallons per forty pounds, the Duchess and Patten running slightly lower in cider yield. The Longfield, Lowland Raspberry, Charlamoff and Whitney rank in a third group, according to our trials. This does not mean, however, that those in the latter group are not usable, as the Charlamoff and Whitney are among the highest in sugar content. These figures are greatly modified if the apples have been in storage or are over-ripe.

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The chemical analyses of the ciders show that, in general, Minnesota apples do not contain relatively high percentages of sugars. This varies with the season and increases with maturity. The highest total sugar content in ripe apples has been found in the Charlamoff at 9.25 per cent., followed in order by Whitney, 9.08 per cent., Wealthy 8.81 per cent., Duchess 8.60 per cent., Patten 8.21 per cent., Hibernal 7.85 per cent., and Longfield at 7.17 per cent. The significance of these figures is seen when the statement is made that it usually takes two per cent. sugars to make one per cent. of acetic acid. With the majority of our apples we must work carefully, or the vinegar will not meet the state standard of four per cent. acetic acid. This is further substantiated by the report of the State Dairy and Food Commission that the vinegar samples sent to them rarely come up to the standard.

From the data as we now have it we cannot draw definite conclusions, but in general it is safe to say that the making of vinegar from Minnesota apples is done on a close margin. This will mean careful work to get the most out of the fermentation, the use of yeast, warm cellars or store rooms and proper management of the casks as to filling and the entrance of air. The work is not expensive. There is a good demand for really good vinegar, and a market is provided for fruit which could not readily be sold in any other form.

A Summer in Our Garden.

MRS. GERTRUDE ELLIS SKINNER, AUSTIN.

Summer in our garden begins with the arrival of the first seed catalogue in January, and closes the day before its arrival the next January. We may be short on flowers in our garden, but we are long on seed catalogues in our library. We do not believe in catalogue houses excepting seed catalogues. We find them more marvelous than the Arabian Nights, more imaginative than Baron Manchausen, and more alluring than a circus poster. We care not who steals the Mona Lisa so long as Salzer sends us pictures of his cabbages. The art gallery of the Louvre may be robbed of its masterpiece without awakening a pang in our breasts, if Dreer will only send us the pictures of those roses that bloom in the paint-shops of Philadelphia. Morgan may purchase the choicest collections of paintings in Europe and hide them from the public in his New York mansion, if May will send us pictures of watermelons, such as were never imagined by Raphael, Michael Angelo or Correggio.

While the world watches the struggle for the ownership of some great railway system, the control of some big trust, the development of some enormous enterprise, we watch for the arrival of the seed catalogue to see which artist can get the most cabbages in a field, the most melons on a cart, or make the corn look most like the big trees of Yosemite. Don’t talk to us of the pleasures of bridge whist, it is not to be compared with the seed catalogue habit.

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In the seed catalogue we mark all the things we are going to buy, we mark all the new things. There is the wonderberry, sweeter than the blueberry, with the fragrance of the pineapple and the lusciousness of the strawberry! We mark the Himalaya-berry—which grows thirty feet, sometimes sixty feet in a single season. Why, one catalogue told of a man who picked 3,833-1/2 pounds of berries from a single vine, beside what his children ate. Our Himalaya vine grew four inches the first season and died the first winter. We were glad it did. We did not want such a monster running over our garden. We wanted to raise other things.

But we did not lose faith in our catalogues. We believe what they say just as the small boy believes he will see a lion eat a man at the circus, because the billboard pictures him doing it.

If we ordered all the seeds we mark in the catalogue in January, we would require a township for a garden, a Rockefeller to finance it and an army to hoe it. We did not understand the purpose of a catalogue for a long time. A catalogue is a stimulus. It's like an oyster cocktail before a dinner, a Scotch high-ball before the banquet and the singing before the sermon. Salzer knows no one ever raised such a crop of cabbages as he pictures or the world would be drowned in sauer kraut. If the Himalaya-berry bore as the catalogues say it does we should all be buried in jam. You horticulturists never expect to raise such an apple as Lindsay describes; if you did, they would be more valuable than the golden apples of Hesperides.

But when we get a catalogue we just naturally dream that what we shall raise will not only be as good but will excel the pictures. Alas, of such stuff are dreams made! We could not do our gardening without catalogues, but they are not true to life as we find it in our garden. We never got a catalogue that showed the striped bug on the cucumber, the slug on the rose bush, the louse on the aster, the cut worm on the phlox, the black bug on the syringa, the thousand and one pests, including the great American hen, the queen of the barnyard, but the Goth and vandal of the garden.

But the best part of summer in our garden is the work we do in winter. Then it is that our garden is most beautiful, for we work in the garden of imagination, where drouth does not blight, nor storms devastate, where the worm never cuts nor the bugs destroy. No dog ever uproots in the garden of imagination, nor doth the hen scratch. This is the perfect garden. Our golden glow blossoms in all of its auriferous splendor, the Oriental poppy is a barbaric blaze of glory, our roses are as fair as the tints of Aurora, the larkspur vies with the azure of heaven, the gladioli are like a galaxy of butterflies and our lilies like those which put Solomon in the shade. Every flower is in its proper place to make harmony complete. There is not a jarring note of color in our garden in the winter time.

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Then comes the spring in our garden, a time of faith, vigilance and hard work. Faith that the seed will grow, vigilance that it is planted deep enough and has the right conditions in which to grow. Vigilance against frost, weeds and insects. Planting, sowing, hoeing, transplanting, coaxing, hoping, expecting, working—we never do half that we planned to do in the springtime—there are not enough days, and the days we have are too short.

Then comes summer, real summer in our garden. Then flowers begin to bloom, and our friends tell us they are lovely. But we see the flaws and errors. We feel almost guilty to have our garden praised, so many glaring faults and shortcomings has it. The color scheme is wrong, there are false notes here and there. There are tall plants where short plants should be. There are spaces and breaks and again spots over-crowded. We water and hoe, train vines, prop plants, and kill the bugs, but we know the weak spots in our garden and vow that next summer we shall remedy every mistake.

[Illustration: Mrs. Gertrude Ellis Skinner among her gladoli.]

Then “summer in our garden” has an autumn. The garden is never so beautiful as when the first frost strikes it. Pillow-cases, sheets, shawls, aprons, coats and newspapers may for a brief time hold at bay the frost king, but he soon laughs at our efforts, crawls under the edges of the unsightly garments with which we protect our flowers, nips their petals, wilts their stems and blackens their leaves. We find them some morning hopelessly frozen. But the earth has ceased to give forth its aroma, the birds are winging southward, the waters of the brook run clear and cold, and the voice of the last cricket sounds lonesome in the land. We say to nature, “Work your will with our garden; the summer is over, and we are ready to plan for another season.”

And what have we learned from the “summer in our garden?” That no one can be happy in his garden unless he works for the joy of the working. He who loves his work loves nature. To him his garden is a great cathedral, boundless as his wonder, a place of worship. Above him the dome ever changing in color and design, beautiful in sunshine or storm and thrice beautiful when studded with the eternal lamps of night. The walls are the trees, the vines and the shrubs, waving in the distant horizon and flinging their branches on the sky line, or close at hand where we hear the voice of the wind among the leaves.

A wondrous floor is the garden’s cathedral of emerald green in the summer, sprinkled with flowers, of ermine whiteness in the winter, sparkling with the diamonds of frost. Its choir is the winds, the singing birds and the hum of insects. Its builder and maker is God. Man goeth to his garden in the springtime, and, behold, all is mystery. There is the mystery of life about him, in the flowing sap in the trees, the springing of the green grass, the awakening of the insect world, the hatching of the worm from the egg, the changing of the worm into the butterfly.

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The seed the gardener holds in his hand is a mystery. He knows what it will produce, but why one phlox seed will produce a red blossom and another a white is to him a miracle. He wonders at the prodigality of nature. In her economy, what is one or ten thousand seeds! She scatters them with lavish hand from ragweed, thistle or oak. If man could make but the single seed of the ragweed, he could make a world. The distance between a pansy and a planet is no greater than between man and a pansy. The gardener sees the same infinite care bestowed upon the lowest as upon the highest form of life, and he wonders at it. He looks into the face of a flower, scans the butterfly and notes the toadstool and sees that each is wonderful.

From the time he enters his garden in the springtime until he leaves it in the autumn, he will find a place and a time to worship in his cathedral. He enters it with the seed in his hand in the spring, and as he rakes away the ripened plants in the autumn he finds something still of the mystery of life. A puff-ball is before him, and he muses on its forming. The little puff-ball stands at one end of the scale of life and he, man, at the other, “close to the realm where angels have their birth, just on the boundary of the spirit land.” From the things visible in our garden we learn of the things invisible, and strong the faith of him who kneeling in adoration of the growing plant looks from nature to nature’s God and finds the peace which passeth understanding.

Bringing the Producer and Consumer Together.

R. S. MACKINTOSH, HORTICULTURAL SPECIALIST, AGRICULTURAL EXTENSION DIVISION, UNIVERSITY FARM, ST. PAUL.

The introduction of Mr. Producer to Mr. Consumer directly, and not by proxy, is the chief desire of the present time. The fact remains, however, that in the vast majority of cases Messrs. Proxy & Co. is brought in and breaks up the direct personal contact. The development of complex marketing means specialization and in a large degree sets it apart from production. When specialization becomes dominant, then standardization becomes necessary. Each producer is unable to keep in touch with all such movements and consequently finds it hard to keep abreast of the times. In this age of rapid transit, specialization, scientific discoveries, and the improvements resulting therefrom, seem somewhat out of place when compared with our present marketing systems. This does not mean that our marketing is entirely out of joint, but it does mean that there is something the matter or so many would not be discussing it. The consumer hears what the producer received, the producer hears what the consumer paid, and then somebody gets to thinking and talking. Discussions lead to investigations, and investigations lead to conferences. Just lately a large conference was held in Chicago, and certain plans were formulated to attempt to unravel some of the evils that exist in marketing. So much has been said that the U.S. Department of Agriculture has begun certain investigations, and we hope that the workers will find ways to solve some of the troubles in a logical and, we hope, sane way.

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A year ago your committee on marketing reported that there were certain things needed, and an ideal system was suggested to correct these faults. One of the basic factors emphasized was standardization. Another committee reported on changes needed in the statutes regarding the weight of a bushel of apples. Congress has enacted a law which specifies the size of a barrel for apples. New York, Massachusetts and other states have enacted grading laws. Some states require that the fruit be free of certain insect and disease injuries. Several states have laws regulating commission men. Most states have laws which do not allow the sale of food products that are decayed. These are all steps toward the standardization that is so necessary. In other words, the several laws have been passed to correct some of the troubles which have come up when so many hands handle the products. These laws were not needed in olden times when the consumer went directly to the producer's door and there bargained for his wares.

Minnesota is a state noted for co-operative enterprises. There are over two thousand such organizations doing more than $60,000,000.00 worth of business yearly. We know full well the value of the co-operative creameries and how butter has been brought up to a high standard. As citizens, we rejoice; as horticulturists, and citizens as well, we want our products to stand high in the estimation of others. I was much pained this summer while discussing the marketing of apples with several commission men to hear them say that they did not like to take local shipments. The reason was that the goods were usually below grade, and the returns did not always please the growers. It is evident that we must improve our methods in ways which will remove this stigma. Many of the commission men try to induce good grading and packing. They like to handle "top notch" goods, for it is cheaper to handle goods that move quickly than those that are a drag and require too much handling. The Agricultural Extension Division of the College of Agriculture is organized to give help, where help is needed, along a large number of agricultural lines.

Realizing these facts, we have been trying to get the ear of the producer and consumer in an effort to get them to do certain things. On the one hand, we want to have good varieties, and to help this lectures and demonstrations are given in the care of the orchard, pruning, spraying, thinning, picking, grading, packing and marketing. On the other hand we want more people to eat Minnesota apples. It is a campaign of education and publicity.

If one wishes to sell anything, he finds that he must advertise. He must advertise so much and in so many ways that people cannot help buying his wares. There are certain widely advertised articles that you must know, whether you are interested or not. One of these runs along the highways so often that you are shaken, even against your will, into consciousness of its existence, so that you cannot get along without having one, or at least seeing one. The latest edition seems to have put on feathers in the form of a white dove of peace. May it succeed. Advertising Minnesota apples has been attempted this past year.

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It was found necessary to provide a standard by which the buyer and seller could agree on apple grades. After consulting several persons, it was decided to adopt the following grades:

"A" Grade.—Hand picked, normal shape, good color (at least one-third colored), free from dirt, disease and insect injuries, and well packed. Limit of defects allowed: Not more than 10% of all kinds nor 5% of any one kind.

[Illustration: Prof. R. S. Mackintosh—Horticulturist connected with Extension Division, University Farm, St. Paul.]

"B" Grade.—Hand picked, practically normal shape, practically free from dirt, disease and insect injuries, and properly packed. Limit of defects allowed: Not more than 15% of all nor 5% of any one kind.

Only one variety and grade should be put in a package. In the grade specifications given, normal shape refers to the general form of well-grown specimens of the variety in question. For instance: The Wealthy is regular in outline and nearly round, while the Hibernal is somewhat flat and often irregular. In like manner the color must be typical of the variety, whether green, yellow or red. Red apples usually sell better than green or yellow varieties, although the quality may be even poorer. Fruit showing insect or disease injuries cannot be classed as well grown. Grading to size is very important. This is not specified because it depends upon the variety and season. Only apples above a selected minimum size, as 2-1/2 inches, the diameter at right angles to stem, should be placed in the same package. Defects refer to apples not up to grade in size, color or shape and having bruises, punctures, disease or insect injuries.

Fancy.—For persons having extra choice fruit, a fancy grade can be used. Well-grown specimens, hand picked, of normal shape, at least two-thirds colored, free from dirt, diseases and insect injuries and properly packed. Not more than 5% of combined defects allowed, of which only 2% can be of the same kind.

Hundreds of letters were sent to persons in the state, telling them that we would maintain an information bureau or clearing house to help them in finding markets for their apples. Several growers replied, and the names of persons who were anxious to buy apples were given them. Nine farmers' clubs asked for information as to where Minnesota apples could be bought. This is a beginning, and it shows that there is need for some sort of an organization that can find out where apples are and who wants them. The intention has not been to interfere with the regular trade routes, but to give the growers information as to who wants apples. As you will notice, this does not bring the producer directly to the door of the consumer. There must be some one to act as a go-between in most cases.

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It was just stated that Minnesota is a state having a very large number of co-operative business organizations. Among these are about two hundred live stock shipping associations having a very simple form of organization. A number of persons in a community, having considerable stock to ship, come together, adopt a simple set of by-laws which provide for the selection of a manager, his compensation—usually a certain percentage on the gross receipts—and a small amount for losses which may occur. No capital stock is required—only the actual living stock. The manager ships the stock at certain times, and when the returns come in deducts the amounts provided for expenses and then returns to each shipper his proportionate amount. In this way the stock is sold at the terminal yards the same day and with other stock from many sections. It is a very simple, satisfactory way of marketing.

The more I study and think of our apple situation, the more I am of the opinion that a very large part of our fruit could be marketed in a similar way. Some of our La Crescent friends ship together in carlots successfully. Why not others? This is the very best way to begin co-operation in a successful way. As Mr. Collingwood says: "Co-operation, like charity, should begin at home and be well nurtured." In other words, begin to co-operate at home in a small way and let the future large organizations take care of themselves.

To be specific, let the growers in a community meet and form a fruit-shipping association with by-laws patterned after the successful stock-shipping associations. Then the fruit should be well grown, picked in time, graded thoroughly and honestly packed and marked. Haul at once to car. The manager will take charge and ship as he thinks best. Each package must have the customary identification marks, so the manager can keep an accurate record of all transactions. If, by chance, trouble comes up, the shippers can pool their interests, and send a representative to find out the trouble. Thus they can do together what each cannot do alone. Even this does not bring the consumers directly in contact with the producers. It is, however, a step nearer.

The public auctions started in New York this season seem to have been successful, and it may mean an innovation which will improve marketing conditions in general. These auctions are held under the recently formed Department of Foods and Markets. The Department has contracted with a large auction company which advances the freight, conducts the sales, guarantees the accounts, and advances the net returns for the goods daily. The producer is able to get returns within two days. The total cost is 5% on the gross sales; 3% for the auction company and 2% for the Department of Markets for the advertising and for other overhead expenses. Posters have been issued to advertise New York State apples. As this Department has been working only for a short time, it is too early to tell whether it is a success in every way.

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We earnestly ask your co-operation in trying to solve the question of marketing Minnesota apples. All interested must assist in this important subject.

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WORLD'S TALLEST TREES.—The tallest trees are the Australian eucalyptus, which attain a height of 480 feet.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.

Minneapolis.

HARDY CHRYSANTHEMUMS.

The new type of hardy chrysanthemums called "early-flowering" has been largely developed by a Frenchman named August Nonin, of Paris, who has devoted much of his life to perfecting this strain from seedlings of the old-fashioned "mums" of our grandmothers' gardens. It is considered by far the most satisfactory kind to grow out of doors, blossoming earlier than the pompons. A few of the best of these early-flowering types are: White—Crawford White, Dorothy, Milka and Normandie; yellow—E'toile d'Or, Carrie, October Gold; pink—Beaurepaire, Eden, Le Danube; red and bronze shades—-Harvest Home, Firelight, A. Barham and Billancourt. These are the earliest bloomers of this type.

Hardy pompons are still most largely grown for outdoor flowering, but of these there is also a choice, as the earliest bloomers are the most desirable to use. Lilian Doty, a large-flowered, clear, bright pink, is considered the very best of these. Donald and Minta are other good pinks. The earliest whites are Queen of the Whites, Waco, Grace and Myer's Perfection. Jeanette, Wm. Sabey, Golden Climax and Zenobia are the best yellows, and Julia Lagravere, Urith and Tiber the best crimson and bronze shades. There are many other beautiful pompons, but they bloom too late for practical out-of-door use.

The single mums have of late been used successfully out-of-doors when early blooming varieties have been chosen.

Of these Elsa, Gladys Duckham and Mensa are the earliest whites: Ivor Grant, Mrs. Southbridge and Mrs. Buckingham the earliest pinks; Josephine, Golden Mensa and

Marion Sutherland the earliest yellows; and Silvia Slade, Ceddie Mason and Brightness the earliest crimson and bronze shades.

As soon as it is warm enough in the spring the plants should be set out about twelve inches apart in rich garden soil, and kept pinched back during May and June to insure a stocky growth. If one has old clumps in the garden, they should be taken up and divided and set in new earth just as any old perennial plant would be treated.

During the hot summer weather they should be well watered once a week and sprayed in the cool of the evening. This will keep down the black and green aphis, the worst enemies of mums. In case these pests become a menace a spray of tobacco water will end the trouble. A little bone meal or well rotted manure dug about the plants in August will help to produce fine blooms.

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A gardener who has never yet lost a plant through winter-killing treats them as follows: After they have finished blooming he cuts them down to about eight inches above the ground and lets the leaves blow in on the bed, covering to a depth of six or eight inches. Then he lays pine branches over the beds to prevent the leaves from blowing away. So treated, the plants will remain frozen all winter. They should in all cases be set in a well drained position, as they will not stand “wet feet.” Uncover with the other perennials in the spring.—Mrs. E. W. Gould.

BEE-KEEPER’S COLUMN.

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

The Minnesota honey crop of 1916 will probably be a record breaker. This brings up the question of how to market this crop to the best advantage. Let me state at once that the greatest obstacle to free and easy selling of honey is the careless, untidy, sometimes unsanitary way some bee-keepers put up their honey for the market—spoiling the appetite of the public for this most delicious of nature’s foods not only for themselves but also for progressive and up-to-date bee-keepers. The result of this big honey crop will be to eliminate the No. 2 and No. 3 bee-keeper and his honey from the market until No. 1 has sold out his product.

A short article like this cannot make a good bee-keeper out of a poor one, it can only serve as a reminder to those who know how “lest they forget.” Moreover, the most careless and backward bee-keepers imagine that they are crackerjacks at their trade, thus putting themselves beyond the possibility of becoming anything. It takes a thousand hammer-blows to drive home a truth or a useful idea.

If comb honey is your specialty observe the national grading and packing rules. They are printed in all bee papers and magazines, and have been given all possible publication to reach you.

To obtain fancy comb honey your sections must have been made over strong colonies in No. 1 white, new sections with extra thin top and bottom starters. After the honey flow is over in your locality (which you can detect by the tendency of bees to rob and be cross) remove your comb honey at once. By leaving it on, travel stained and propolis spotted sections will result. The snow white finish of the comb will be discolored, the wood will assume that “used and handled” appearance which is not attractive to the buyer. The sections must be graded fancy, No. 1 and No. 2. Every section must be scraped around the edges and all propolis removed. Some bee-keepers even polish the wood of the section until it looks as clean as if it just came from the factory.

After cleaning and grading put up your honey into standard shipping cases. Do not ship it in the super where it was raised nor in a soap box. If shipped to a distant market by

freight or express, eight shipping cases must be packed together into one honey crate provided with handles. The tendency of late is to put up each comb in a separate paper box with transparent front to keep the honey free from flies and finger-marks. This practice deserves universal adoption.

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If you produce extracted honey you may leave your honey with bees for a week or two after the honey flow is over. Extracting should be done in hot weather, during August or early part of September. A modern hand or power extractor is an absolute necessity. There are still a few old timers who “butcher” their bees late in the fall, and render the honey by the “hand mash and sheet strain” method, but they are only relics of a poetical past and going fast.

Honey to be extracted must be well capped over. If extracted too thin it will ferment and get sour. If left with bees too long it will be too thick and hard to extract. Extracting ought to be done in a bee-tight room to keep out robber bees. Extracted supers may be returned to the bees in the evening or piled up at a distance in a safe place for bees to clean out. Extracted honey must be left to stand in a settling tank for about a week, or until all air bubbles and wax particles have risen to the top. It should be put up into five gallon cans or barrels for wholesale trade. For retail trade it should be bottled when needed, else it will candy in the glass. Bottling it hot or heating it after bottling will delay crystallization for a considerable period. The bottles ought to be white, clean and labeled with your name. Each kind of container should be well packed in a wooden shipping case. Do not make it a practice to sell a large amount to a customer at once, sell rather smaller amounts at frequent intervals.

ORCHARD NOTES.

Conducted monthly by R. S. MACKINTOSH, Horticulturist, Extension Division, University Farm, St. Paul.

Once in a while it is well to pause for a few moments to consider some of the results of past efforts. We have been growing apples in Minnesota in large quantities. Insects and diseases are causing more damage each year, and this has lead us to pay more attention to the prevention of these pests. A regular spraying program has been outlined, and many persons have adopted it. What are the results? It seems to us that the results of spraying at West Concord, Minn., should be made known to the readers of the MINNESOTA HORTICULTURIST. It indicates very clearly the value of spraying and how someone in a community can take charge and diligently push for better methods. In this case the instructor in agriculture, with the aid of his superintendent and board of education, secured a power sprayer and began to spray the orchards in the vicinity. At first it was necessary to ask the owners if they might spray their trees. After three years, however, the owners appealed to Prof. Updegraff to have their trees sprayed. This year he had more work than he could manage. Demonstrations of this kind show the value of the work so vividly that the most skeptical gradually becomes convinced of its value.

Several schools have purchased spraying outfits. We hope that we shall hear from more of them in the future. In many cases the spraying outfit is used for whitewashing the interior of barns and other buildings.

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Reports that come to the Agricultural Extension Division indicate that there will be a surplus of apples in some sections this year. We want to assist in the distribution of the surplus and shall continue the Apple Clearing House again this year. If you have more apples than you can sell locally please let the division know what you have to sell. Address the Agricultural Extension Division, University Farm, St. Paul.

Apples for market must be graded and packed properly if they are to be sold through the regular trade routes. The barrel is the standard package in most parts of the country. The bushel basket is being used for early fruit in some markets. All fruit for sale should be *hand picked from the tree* (not from the ground) and allowed to cool. Grade according to size and freedom from insect and other injuries. Pack carefully so as to avoid bruising. When cover is put on press firmly in place. Do not allow fruit to shake about while in transit. Pick early maturing fruit while more or less green. Ripe fruit will not keep well during hot weather. (See page 321 of this number.)

Late August and September is the time when practically all our county fairs are held. It is hoped that the exhibits of fruits, vegetables and flowers will be large and of good quality. Follow the premium list very carefully. Put on the plate the right number of specimens. Pick apples so as to leave stems attached. Quality means specimens of perfect shape for the variety, free of insect or disease injuries, without bruises and well colored. Vegetables should be well selected in every particular. Select the specimens that you would like to use. The overgrown specimens are not always the best.

[Illustration: A VALLEY LAWN WITH SHRUBBERY ON BORDER OF WOODS. FORMERLY OCCUPIED BY HENHOUSE AND YARDS.

View on same grounds with garden pergola shown on page 331.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted In estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 SEPTEMBER, 1916 No. 9

The Pergola—Its Use and Misuse, Convenience and Expense.

CHAS. H. RAMSDELL, LANDSCAPE ARCHITECT, MINNEAPOLIS.

Let me take you by a brief word picture to Italy, the first home of the pergola as we see it hereabouts today. On the hills and vineyards above the sea, in that sunny land, I can see a beautiful home or villa, seemingly about to tumble off the rocky point on which it

rests. Indeed, so scant is the space about the building that none is left for trees to shade the white house from the heat of the tropic sun. But shade must be had to break the glare of the noonday.

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The vine and the grape thrive amazingly near the sea, and this necessity evolved the pergola. It was compact, could be made straight or curving, short or long, usually narrow but still supporting to some height the delicate leaves and fruit of the grape. Thus, the Italian secured his shade and made an interesting walk or approach. Because of its open work and light proportions the views of the beautiful Italian sea and sunset were not blocked but thereby improved, each view framed in by the pergola pillars, with the picturesque tracery of the vine clinging to them.

Here was its home, and here it was perfect in its setting. We Americans, in our zeal to secure all that's good, have brought it bodily to our homes. But like much else that's transplanted, we do not always look well to the new conditions as comparable to the old. The pergola is, however, too valuable a garden feature to do without. Our greater care should be to study our need, use the pergola when advisable for some other feature, like one of those illustrated on this sheet, when more appropriate.

In construction the pergola is usually made of materials to match the house, sometimes masonry or stone pillars as well as those of wood. The rafters and lighter beams should be made of the most durable wood, preferably cypress, and carefully painted. The pillars may be of classic design or of more modern lines, but if they are of a thickness greater than one-seventh of their height, they are not proportionate to the light load they carry. Preferably, the columns rest on and are anchored to concrete or stone footings in the ground. The supporting rafters from pillar to pillar are the heavier construction, the cross beams, *etc*., the lighter.

[Illustration: Pergola over garden gate, with planting to screen kitchen garden, in Minneapolis.]

The surface of the ground beneath the pergola should be made of weather proof brick or tile floors. They shed the surface water and make it useable in damp weather, not possible with the turf.

The cost of these structures is largely optional with the builder. One clever with carpenter's tools can build one at the cost of his time and lumber. The other limit cannot be set. Masonry pillars, cypress lumber, pavement of the floor, the size, cost of design, *etc*., will, upon occasion, bring up this cost to that of a small house. I have found a firm in Chicago who will ship one complete, ready to set up, following one's own design, or, after submitting standard designs and photographs of their work. They sell one 8 feet long, 7 feet 6 inches wide and 7 feet 6 inches high with 10-inch columns for $45.00, each additional 8-foot section $25.00, f.o.b., Chicago. The pictures shown of such a pergola are highly attractive. From this figure the cost runs up to $500.00 and even $1,000.00 for circular construction eight-four long and correspondingly heavy. Of

course, one can secure low figures from any local millwork company if a good detailed design is available. In this way good distinctive work is possible.

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Its uses are infinite. It may serve to connect the architectural lines of the house with garage or other smaller building. It may lead from house to garden, or along an overlook walk along the river or lake. It may encircle a garden pool or an important statue. It can be made an approach to a band stand, or other park building. It will make part of the garden background, but should not be depended upon without the higher foliage so eminently desirable.

[Illustration: A garden pergola erected last summer on clients' grounds south of Lake Harriet, Minneapolis—covering walk from house to garden, sixty five feet long.]

Do not make the mistake of expecting a pergola to serve as a porch or outdoor place to sit or sleep. One needs the roof of a tea house to keep off the evening dews or occasional shower. It cannot be made a large feature of the grounds like a garden. It is not important enough. It will not, without trees and high shrubs behind it, make any background as will a garden wall or lattice. It is no barrier along a street or of any use as a fence or division line. And sometimes the lines of a house or building may be better carried by a rose arch or vine arch without the expense of a pergola. Thus you see it has its limited place, and its use must be decided upon with good taste and judgment.

The pergola is almost incomplete without the growing vines on it. A four years' growth of Beta or Janesville grapes (which we don't have to lay down for winter), will give one a beautiful showing of the hanging fall fruit. The bittersweet is also good with yellow fall fruit. The several varieties of clematis are desirable if combined with the heavier growing grape or woodbine. The woodbine is good for its fall color, although weedy in growth.

The Minnesota honeysuckle should be mentioned, also the Dutchman's Pipe and the Solanum, all good in a limited way. The climbing roses are all right to use, although they lack foliage background and have to be laid down every winter. However, I like to believe the man who designed the first pergola had the grape vine in his mind in so doing, for the two fit conditions like hand and glove.

It is a structure of charming possibilities. Its lines curve as well as any other feature. Its proportions should be always light and graceful. It adds much to almost any garden or home grounds when carefully used. Its open work overhead typifies the freedom of the outdoors. It also recalls the vine and its growth to the light. And if we temper our enthusiasm with good sense, its use will be fortunate and the result a happy one.

Packing and Marketing Apples.

H. M. DUNLAP, PRES. ILL. ORCHARD CO., SAVOY, ILLS.

The growing of apples is one problem, the marketing is another. The two are intimately related but entirely different. It is essential in obtaining the best results to first grow good apples for the market. This, like the darkey's receipt for rabbit soup, comes first. The darkey says, "first kotch your rabbit."

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Many a grower who understands fairly well how to produce good fruit is lost when it comes to selling it to an advantage to himself. You notice that I said “to himself.” It is often done to the advantage of the buyer. Like most inventors the apple grower usually needs assistance in selling what he has produced. The grower who connects up with the best methods in this particular gets best results.

No one can long be successful whose methods are not careful and honest in the packing of apples.

Equipment for Harvesting the Apple Crop.—There are some who insist that the only way to pick apples is to use a basket lined with cloth. These insist that the use of the basket in picking is the most careful method and that the bruising of the apples is reduced to a minimum. I have, however, seen apples handled very roughly in baskets. The picker hangs the basket on the tree, on the ladder rung, or sets it on the ground and then proceeds to shoot the apples into the basket from distances of one foot or six or eight feet away.

The bottomless picking sack, with broad straps across the shoulders, has come into use within the past few years in many commercial orchards. My experience is that either the basket or sack is good if rightly handled, and either may be objectionable if care is not exercised.

My own experience after using both is in favor of the sack. If care is used no more bruising will be done than with the basket, and it is far more expeditious. Both hands are at liberty for use in the picking. The sack should not be shifted about, and the picker should not be allowed to lean against the rungs of the ladder with the filled sack between. The sack should be lowered into the picking crate so that the apples have no drop in emptying the sack. Pointed ladders are the best for tall trees and less liable to injure the tree or turn turtle and upset the picker.

A packing house is essential if best results are to be obtained, but many growers use the canvas-covered table in the orchard, picking and packing the product from sixteen to thirty-six trees at a sitting, and then moving the table to the next center, and in this way the entire orchard. In good weather this is not so bad as might seem, but at times the sun is very hot, or sudden showers saturate everything, and in the late fall the weather is too cold and frosty for comfort. On the whole, therefore, a good sized packing house or shed built at a convenient place in or near the orchard is the more desirable method of handling the crop. This building must be large enough to give room for a sorting table three feet wide by sixteen or more feet in length, or, better still, room for an apple grading machine of best pattern, which will occupy about three feet by twenty feet. There should be a space on one side or end of the building for unloading the bushel crates with which all well regulated orchards should be equipped, when

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they come from the orchard. These crates can be stacked up four or five deep, and there should be adequate room for these based on necessities. There should be room for at least a day's supply of apple barrels and a place to cooper them up by driving the hoops and nailing same. There should be enough room to face and fill barrels and head them up and to stack up enough for half a day's hauling ahead.

The size of this building will depend upon whether you are barreling 100 barrels per day or 1,000 barrels. For the former a building 28x20 feet will answer very well. For the latter amount 60x100 feet would be none too large. This building should have skylights in the roof. I build these of ordinary greenhouse sash about 3x6 feet, usually putting in two of these in each building on the north or east side of the roof, according to the slope, and directly over the sorting end of the table. This will give you light an average of thirty minutes more each day and prolong the day's work that much, or at least make it possible to do better work on cloudy days and in the evenings.

The building should be approachable on all four sides with the wagon, and doors either sliding or hinged should open at least ten feet wide for taking apples in and out. For example, I have my sheds arranged to take the fruit as it comes from the orchard on one side of the building. The number one apples go out one door, and in case I use a grader the number two go out another side. The cider apples also take their route. The fourth side is used for supplying empty barrels as needed. Thus you see the necessity for getting to all four sides. On the side where the filled barrels are loaded onto the wagon there should be a raised platform so that the loading can be carefully and easily done. A bin for the cider or vinegar apples should be built with a roof on same.

Low-wheeled, platform wagons are needed to haul fruit from the orchard to the packing house.

The standard barrel of three bushels capacity is used generally by the commercial orchardist in preference to the box. Good hoops are growing scarcer every year, and some, including myself, are using two or four of the six hoops required of the twisted splice steel wire variety as being both safer and more economical. In transit or in storage they hold better and do not break and scatter the contents of the barrel over the car floor or storage warehouse.

The best floor for the apple house is concrete. The next best is to cover the ground with coal cinders and lay 2x4 flat on the cinders, filling between them with cinders to a level and nailing the floor boards to these 2x4. This gives a good solid floor at little expense.

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The walls are of 4x4 uprights, about eight feet apart, resting on 8x8x12 concrete blocks with a half inch iron rod imbedded in the concrete and countersunk in lower end of upright 4x4 to keep the latter in place. Nail ties of 2x4 are used, and to these are nailed common lumber surfaced. The roof consists of 2x4 or 2x6 rafters, usually three feet apart, with 1x6 boards spaced about three feet apart as sheeting. The covering in this case is of galvanized corrugated iron, suitable length, of No. 26 gauge. The doors of this building should be on rollers, and with two or more double doors on each of the four sides to give plenty of light and easy access to and from the building. The roof and dry floor are the important parts of such a building, and you only need the walls as a support and occasionally to break off the wind when weather becomes chilly. What you should avoid in a packing house is narrow doors, dark interior and access from only one or two sides.

Picking.—I have found it most satisfactory to pick by the bushel, keeping a foreman in the orchard to see that crates are filled full, ladders and apples carefully handled. Each picker is provided with tickets of a certain number which corresponds to the one opposite his name on the sheet tacked to a small board or clip carried by the foreman. Each picker is assigned a tree, and his empty boxes are distributed to him from the wagon. When filled the number is tabulated by the foreman and loaded onto the wagon and hauled to the packing shed. Here they are stacked up and afterwards emptied onto the sorting tables or machine grader, and from thence into the barrels.

Hauling to Market.—The barrels when filled are not allowed to lie around, but are hauled immediately to the car or storage. Failure of winter apples to keep in storage may often be traced to the packing shed, where the apples stand in the crates or lie in the barrels for a number of days, perhaps a week or two in warm weather, before they are forwarded to storage. Sometimes delays occur at the storage owing to rush, and apples remain sometimes for a week or ten days in cars before they are unloaded. It behooves the grower not only to watch his own packing house for delays, but the storage company also. In one instance I lost $1,000 on five cars of apples that were without refrigeration five weeks owing to the storage warehouse not being completed. I knew nothing about this until two years afterwards.

Hauling to the station is done on wagons or motor trucks equipped with a rack that permits the barrels being carried lying down, but supported at each end of the barrel so that the weight of the barrel does not come upon the bilge. They can be so racked up that one wagon will carry fifty-five barrels. A three-ton truck will carry forty barrels of apples and haul forty more on trailer. Such an outfit in one of my orchards makes five trips in one day a distance of four miles, traversing forty miles and

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carrying 400 barrels of apples. One and one-half miles of this is over a well-graded dirt road, and two and one-half over brick and concrete pavement. In our Clay County, Illinois, orchards we have two 12-25 gasoline tractors that are used for cultivating during the summer and for hauling apples in the fall. These machines easily haul 110 barrels of apples on two wagons and make two trips a distance of five miles from orchard to town.

Loading Cars.—I am surprised at the lack of knowledge of how to properly load barreled apples into cars. Over half the cars going to market are improperly loaded. The best way is to place all the barrels crosswise of the cars with lower tier to the right side of the car, and the second tier the left of the car with the bilge lying in the hollows of the lower tier. The third tier should be at the right side again directly over the lower tier. If a fourth tier is added they should be at the left and directly over the second tier. In this way your apples are loaded to carry with the least injury to the apples. Being uniformly loaded they are easily counted from the top after they are in the car, and your loader can verify his wagon load count after the apples are all in and thus prevent mistakes.

Packing Apples.—The packing season is a busy one. Often the grower finds himself short of help, and when this is hard to get he is sure up against it if he wants to do a good job of packing.

First make your estimate of the crop you have to harvest. If inexperienced, get an experienced man to help you. You need this estimate for two reasons. You must determine the number of packages you need, which must be contracted for in advance, and you need to know how much labor you need to get the crop in within the time limit. You should not begin harvesting too early, for immature fruit, poorly colored, brings a lower price, and you do not want to be so late that the fruit mellows up or drops from the trees before it is gathered or is caught by a freeze.

I will relate a little experience of mine in the latter connection. In the autumn of 1911 I had a heavy crop on a hundred and twenty acre orchard. The season was rainy, and we lost six days during October, which put us across the line into November with our picking. The last days of October or first of November brought a severe freeze when the mercury went to twenty, or twelve below freezing. This lasted two nights and one day. The apples were frozen absolutely solid through and through on the trees. As I had over 12,000 bushels, all Willow Twigs, unharvested, it was an anxious time for me. The second day was cloudy with the temperature at thirty-four degrees, just freezing, and the following night it remained at the same point, for we were enough interested to note the temperature. This continued up until noon of the third day, when the frost was out of the apples and we proceeded with our picking. These apples kept perfectly and were sold the next

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May at $4.50 per barrel. There was no perceptible difference between the apples picked before or after the freeze. Two years later my experience was different. We were caught with 1,000 bushels on the trees by an equally severe freeze. The sun came out bright the following morning, and by noon the temperature was up to fifty degrees. The apples turned brown and looked like they had been baked. They were good only for vinegar. The variety in both cases was Willow.

In packing apples it is a good plan to use a corrugated paper cap on both ends of the barrel, in addition to a waxed paper next to the apples on the face end, stenciled with the name of the grower and his postoffice address. Use uniform sized apples for the face as much as possible, and of good color. The face is permitted to be 20 per cent. better than the contents. Drop facing I consider best for the second layer rather than double facing, as it holds the face apple in position better and presents a more solid face to the buyer when opened. The barrels should be filled uniformly from bottom to top with an even grade of fruit. No reputable packer will attempt any fraud upon the purchaser in this respect. In tailing off the barrel preparatory to putting in the head, the better way is to face the apples on their side in concentric rings with the color side of the apple up. I would not select these apples as to size or color, but let them correctly represent both as they run through the barrel. There can be no objection, however, to your putting the colored side of the apple up. We should always look as well as we can, and first impressions if good, while not always lasting, are desirable in the apple business of inspecting packages. In filling the barrel care must be taken to gently settle the apples into place by shaking the barrel from time to time as it is filled. After the bottom is faced off the corrugated cap is placed on the apples, with the smooth side next to the apples, and the head pressed into place. It is well to use headliners to secure the heads and not trust to the use of nails alone. Have some regard for the man who has to open these heads in storage or the salesroom. Try a few yourself if you never have, and you will use headliners for him who comes after if for no other reason.

Mr. Kellogg: How do you get rid of the waste apples that would rot in the orchard?

Mr. Dunlap: We have a large vinegar plant, and we convert the cider into vinegar and sell it as cider vinegar. We have sometimes shipped the fresh product of the cider mill to factories, where it is made into vinegar. Then there are evaporators for evaporating them. Take a certain grade of apples not good to grind up into cider, and they evaporate this grade of apples. Then there are canning factories that also take them. The cider mill is a very good way to work up your culls and then sell as vinegar.

A Member: What do these apple graders cost?

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Mr. Dunlap: From $75.00 to $125.00. The price usually depends upon the equipment.

A Member: Do you use clear cider for vinegar?

Mr. Dunlap: I use clear cider for making vinegar, and if it is too strong to meet the requirements of the law we dilute it when we sell it.

A Member: I would like to ask if you have any difficulty in getting your cider vinegar up to the requirements of the law?

Mr. Dunlap: We do not have any trouble about that, except that made from summer apples. Any cider that will grade 18 or 24 with the saccharimeter in the fall of the year, when it is made, will make good vinegar.

A Member: Do you pack all one-size of apples in a barrel?

Mr. Dunlap: No.

A Member: Do you use very nearly the same size apples in a barrel, or do you put large ones at the top and bottom?

Mr. Dunlap: I have heard of growers doing that, but the only way to pack a barrel honestly is to select your facers—the law permits that they may have 20 per cent. advantage of the rest of the barrel. The rest of the barrel ought to be graded uniformly throughout. I don't mean by that they should all be apples of three or four inches diameter, but that they run above a certain figure with a minimum of 2-1/4 or 2-1/2, depending upon the variety you are packing. In running them over graders, which sizes them, all over that size go over the apron and into the barrel.

A Member: Do you face both ends of the barrel?

Mr. Dunlap: Yes, sir, we do. We do not undertake to select for the bottom or tail of the barrel apples as to size or color, but we do this—we lay those apples around in concentric rings and turn the color side or best looking side of the apple up and as nearly level as may be across the top and just the right height, so that when they are pressed into the barrel the barrel will be tight enough so as not to have the apples loose, and yet not have them bruised in the heading. It takes practice to do that just at the right height.

The barrel should be shaken as it is being filled. If you do not shake often when being filled and settle the apples down so they reach the place where they belong, no matter how tight you make your barrel, when it gets into the car and on the train and in motion that constant shaking and jar will loosen the apples, and you will have a slack barrel.

A Member: What sort of apples go to the canneries?

Mr. Dunlap: That, of course, depends upon the season. If the season is such that the No. 2 apples are not worth any great amount of money, they will buy everything except cull stock below the strictly No. 1 apple and use them in the canning factory. If the price is high they will probably take the drops, those dropped in picking, or good sound drops. We usually make a practice of cleaning up our drops once a week off the ground in picking time. Before we begin picking we clean the ground entirely and run that through the vinegar factory, into the cider mill, and after that is done any apples that drop in picking they are disposed of in various ways, sometimes to the evaporator, sometimes to the canning factory and sometimes they are shipped in bulk if they are good sound apples and not injured in any way except perhaps for a few bruises.

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A Member: In debating the question of the grower and the cannery we are anxious to know just how far it is practical to use apples—what apples we can use after grading them, say, for instance, into Nos. 1 and 2? Can we use a deformed apple? For instance, do the canners in your country buy deformed apples—I mean lacking in roundness?

Mr. Dunlap: They can use them; they are a little more expensive to handle when you put them on the fork to peel them. Of course, they have to use the knife on them afterwards in those places where they are not perfect, cutting out any imperfect spots on them. But as a rule they require pretty fair quality of apple for cannery and above a certain size. They wouldn't want to use anything less than two inches in diameter, and from that on, and they get as good apples as they possibly can. They have to limit themselves as to prices according to how much they can get for their product.

A Member: What grader do you recommend?

Mr. Dunlap: Well, I don't think that I care to advertise any grader. I am not interested in any.

A Member: You are a long way from home, and it might enlighten the rest of us.

Mr. Dunlap: There are several graders on the market, and for all I know, giving good service. I am using the Trescott, made in New York.

A Member: What is the matter with the Hardy?

Mr. Dunlap: I never used the Hardy—I don't know about that. Some of them will bruise the apples more than others.

Mr. Sauter: What form of packing for apples will bring the best prices?

Mr. Dunlap: I investigated that. I have packed as high as a couple of thousand boxes of apples, and I have taken the very best I had and barreled. I picked out the extra selects and boxed them. Then I took a No. 1 grade from those that that were left and the No. 2 grade, and my No. 1 grade in barrels were disposed of before I could sell my boxes at all in the market. The boxes were the last thing I could dispose of. Considering the extra cost of boxing I was out of pocket in selling them in boxes. Bushel baskets are all right, you can pack the basket with no more expense than packing a barrel.

Mr. Brackett: What can a cannery afford to pay for apples?

Mr. Dunlap: I have never been in the cannery business, I could not tell.

Mr. Brackett: They are talking of starting a cannery where I live and I wondered what they can afford to pay.

Mr. Dunlap: Some five or six years ago I sold a number of hundred bushels to canneries at 60 cents per hundred pounds. Whether they can afford to pay that or not I don't know. I haven't sold any to them for several years now. In fact, I should judge they couldn't afford to pay that for them because they went out of business.

Mr. Brackett: In other words, they can't pay over 35 or 30 cents a bushel?

Mr. Dunlap: I don't know what they can afford to pay.

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A Member: We had a canning factory that paid 40 cents a bushel of 50 pounds, that would be 80 cents a hundred.

Mr. Brackett: Are they still in business?

A Member: Yes, sir.

Mr. Sauter: We had one that paid 52 cents a bushel.

Mr. Dunlap: If they were to can these apples in Illinois and ship them up here they have got to pay freight to come in competition with your apples.

Mr. Sauter: I sprayed last spring first with lime-sulphur, and my sprayer worked fine. I had a hand sprayer, but when I mixed the lime-sulphur and the arsenate of lead it almost stopped up. What was the matter, was it the mixture or the sprayer?

Mr. Dunlap: Most all of these mixtures when you put them together ought to be more or less diluted.

Mr. Sauter: How long must they stand dissolved?

Mr. Dunlap: The lime-sulphur is in solution, and if you have that in your water tank the best way is to put your arsenate of lead in in the form of a paste and dilute it until you get it so that there is about two pounds of arsenate of lead to a gallon of water, and with that you can pour it into your tank and if you have an agitator in there you won't have any difficulty with it. In the early days of spraying when we used blue vitriol with lime, we tried a concentrated solution of the blue vitriol and lime and found we couldn't get it through the strainer, but by diluting it, putting our blue vitriol in one tank, and putting half of our water that we intended putting in the sprayer in that, and taking another tank and putting half the water and the lime in that and then putting the two together in this diluted solution, we didn't have any trouble, but in putting in the concentrated solutions together we had a sticky mess and all sorts of trouble. It would not go through the strainer.

Mr. Sauter: How does the powdered arsenate compare with the paste?

Mr. Dunlap: I haven't had any personal experience with the powder and I would have to refer you to the experiment station.

Mr. Sauter: Powder mixes a great deal easier.

Mr. Dunlap: Yes, sir. I had this experience with hydrated lime. The hydrated lime, as you know, comes in sacks and in the form of flour, and all you have to do is just to pour that into the water, and there is no trouble about mixing it at all. With lime from barrels that we used for making bordeaux, we would slake it and run it off into barrels, and

there we diluted it so that we got two pounds to every gallon of water, our stock solution. But with the hydrated lime we can take so much out, so much by weight, and put it into the tank, and it dissolves right in the water. But we found this difficulty as between slaked lime and the hydrated lime. While the hydrated is very nice to use it did not possess the adhesive quality that the regular slaked lime did, and it would wash off the trees and take the vitriol solution with it, and we discontinued its use.

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Mr. Sauter: You think it best for anybody with a small orchard to make his own lime-sulphur solution?

Mr. Dunlap: That depends on how he is equipped. It costs a great deal less to make your own solution than it does to buy it. Whether you could afford to do it or not depends upon the amount you spray and your equipment. You really ought to have, in making your own lime-sulphur, a steam boiler, although you can make it in an ordinary farm feed boiler. You can boil it right in that and turn it out after it is made, stirring it with a wooden paddle while cooking. I find that if we are equipped for it we will make a product that is equal to the imported product, but we ought to have a little more equipment. We ought to have steam and run this steam into our cooking vat to keep it boiling at the right temperature right along, and boil it for an hour, and then have a mechanical agitator in the bottom of the tub that keeps it stirred up, and keep the cover closed down as nearly tight as possible so as to exclude the air as much as possible, letting the surplus steam escape, and in that way we get a product as good as anything we are able to buy, at less than half the price. If one is using a great quantity that is the way to do it, but in small quantities I don't think it would pay to bother with it. (Applause.)

Marketing Fruit at Mankato.

P. L. KEENE, UNIVERSITY FARM, ST. PAUL.

(Gideon Memorial Contest.)

Mankato has a population of about twelve thousand and is just about within the car-lot market. In seasons of low production it can easily use all the fruit grown in the vicinity, but in seasons of good production some must be shipped out. This irregular supply makes it difficult to obtain a satisfactory method of marketing the fruit.

Nearly all kinds of fruit are grown here. Apples, strawberries and raspberries are grown to the greatest extent. There are several orchards having from five hundred to a thousand trees, while many small fruit growers have several acres of strawberries and raspberries. Plums, blackberries, currants and gooseberries are grown on a smaller scale, so that there is seldom enough produced to make it necessary to ship them.

The number of varieties grown is very great, as it is in almost every locality where the industry is relatively young. There are over forty varieties of apples grown on a more or less large scale. This makes the marketing problem still more difficult. Many of the growers are beginning to specialize in two or three varieties, such as Wealthy, Patten, Northwestern and Malinda. Last year some of the growers produced as many as five carloads. Small fruits are brought in by the wagon load during the heaviest part of the season, making it possible for the fruit houses to load a car in a day.

The commercial growers use good, practical methods of culture, keeping the land well cultivated and using cover crops and mulch; but many of the small growers of half-way fruit men—those who do not specialize in fruit growing—neglect their orchards. Most growers properly prune and thin their trees and bushes, while many are beginning to spray.

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In the picking, grading and packing of the fruit is where the great majority fail. After they have grown the fruit carefully and successfully, they fail to properly harvest and dispose of it. This fault lies in the fact that they have specialized in the production of their product and have given little time or attention to the marketing of it. They realize, though, that success in fruit growing depends as largely upon proper marketing as upon proper growing.

The first step in marketing is the picking of the fruit. Fruit, as any other product, should be picked at a certain time; and the grower who allows his fruit to remain on the tree or bush too long, as is often done with the apple, until his work is caught up, is the grower who receives unsatisfactory prices for his product. Many farmers bring windfalls and bruised apples mixed with the hand picked ones and expect as much as the grower who carefully picks his apples. The picking utensils are also often a cause of injury. Tin pails, wooden buckets and boxes are used to too great an extent. These naturally bruise more or less of the apples as they are put into the pails, especially if extreme care is not used. The pouring of the fruit from one receptacle into another is still another source of injury.

The small fruit grower usually handles his fruit with greater care than the apple grower does, for the simple reason that improper handling of these fruits soon shows itself, and the grower may find that he is unable to dispose of his fruit. The most common cause of injury to small fruit is over-ripeness.

[Illustration: P. L. Keene.]

The improper sorting and grading of fruit is another cause of unprofitable returns. All bruised, wormy or injured apples should be discarded at picking time. The presence of only a few inferior fruits in a lot will bring the price down considerably. The same holds true with berries, and is even more important, for if one berry rots it soon spreads disease to the other berries. For this reason the sorting out of all inferior fruit is essential, even more so than grading.

The grading aids in getting better prices but is not necessary for profitable results. If small fruit is well sorted, the growers claim that it is not necessary to grade it, for the fruit will then be fairly uniform.

With apples, grading is distinctly beneficial. Many marketable apples may be blemished so that their appearance is hurt, while their keeping and shipping qualities are but slightly injured. The best grade must contain apples uniform in size, shape and color, and free from all blemishes. Hence it is readily seen why at least two grades are essential. The growers at Mankato do not grade their apples to more than one grade and this amounts only to sorting. The best of the commercial apple growers carefully sort out the small and injured fruits, but a large portion of the growers even neglect this to some extent.

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The method of packing the fruit is very variable, and in fact a large part of it is not packed at all. Most of the small fruit growers use the sixteen quart crate, while the apple, if it is packed at all, is packed in barrels. One requirement of a package is that it be clean, and if it must be clean a secondhand package cannot be used. Many fall down here by using secondhand, odd sized and dirty crates or barrels. The shipping crate should be kept out of the field and off of the ground. The place for it is in the packing house.

The apple growers often take their barrels into the field to fill them and thus more or less soil them. This is not done to any great extent at Mankato, for most of the barrel packing is done at the fruit houses, the growers bringing in the apples loose in a wagonbox. This is a good system as the apples are only handled three times: from the tree to the picking basket, from the picking basket to the wagonbox, and from here into barrels. By this method the apples are sorted both at the picking and barreling time. If the apples are to be graded or packed at the farm, a packing house should be provided at or near the orchard.

It is needless to speak of the slack and inefficient method of marketing apples in sacks, salt barrels and odd boxes; but this is still done by some half-way growers. They often have to either take the fruit back and feed it to the pigs or give it away. Even when they are able to sell it, they barely cover expense of picking and marketing.

Several methods of selling their fruit are available to the growers around Mankato. The different methods used are (1) selling direct to consumer, (2) selling to stores, (3) selling to wholesale houses, (4) selling to commission men.

The amount handled in the “direct to the consumer” way is rather large in the case of small fruit, but there is very little so-called “apple peddling” done. Some growers have regular customers whom they supply yearly with a barrel or more of apples, but this is usually some friend or relative. Some growers peddle out their summer apples by driving through the residence sections of the city and selling to anyone who wants to buy and in such quantities as they desire, but not all growers care to follow this plan. Sales are always made for cash, except perhaps where a person is a regular customer. This method is too unsatisfactory to be used for winter apples but is often advantageous in disposing of a large crop of summer apples. The fruit is not usually in very good shape, and is often that which the fruit dealers have rejected. The fruit is marketed in any package that happens to be handy, or loose, in the box, and is measured out usually in small quantities to the buyer.

[Illustration: A load of apples from P.L. Keene’s orchard, near Mankato]

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The handling of berries direct to consumer is much more systematized and therefore proves more satisfactory to both parties concerned. The majority of growers sell a considerable quantity in this way. They pack in sixteen quart crates, and usually will not divide a crate. The berries are for the most part delivered on order of the customer, for cash. Each grower has his regular customers, and some advertise to a limited extent. This method is usually satisfactory to the grower for he sells at a fixed price, and over that which he could get at the stores. He finds that it pays him to furnish good berries, for if he delivers a poor crate the lady receiving that crate is sure to make it known to her neighbors, while a good crate will add to his reputation. Therefore, the grower will take particular pains to have the boxes well filled with good berries and delivered promptly, in order to hold this trade. In compensation he receives a good price, regular customers and a sure market for his product.

The amount handled through the stores is about equal to that handled direct to the consumer, but in some seasons it is not as great. The grower demands cash, for he can get it at the other places, while most of the stores prefer cash rather than a trade basis, on account of the bother of handling the trade checks. Some stores, by offering a higher trade price, try to draw trade, but this does not attract the commercial grower. It may, however, attract the half-way grower. Most stores do not try to handle more than they can dispose of themselves. It is the small grower who sells to the stores. The large grower cannot get the prices that will pay him to bother with the store trade, while the fruit houses do not want to handle the small fruit grower's product, for it is usually of inferior quality. Hence, the store trade is a necessity under present conditions, even though it is not a very satisfactory method.

The apples are brought to the stores in the same packages as to the consumer direct. The berries are handled in the same packages, but the condition and quality are more apt to be inferior than with those sold to the consumer. The stores usually re-sort the fruit before they sell it. They very seldom ship fruit. In case they get more on their hands than they can sell, they either store it for a few days, or sell to the wholesale fruit houses.

There is more fruit handled by either one of the two wholesale fruit houses than by any other single way in Mankato. They handle the bulk of the apple crop grown commercially but will not take inferior fruit. The small fruit growers market a considerable portion of their crops through them, especially in years when they have more than they can dispose of to consumers. The wholesale houses offer no fixed price, except it be in a contract with some individual grower whom they know will bring in good fruit. When a load comes in they look it over and bid on it. If the grower is satisfied with the price, he sells, and if not he tries the other house or the stores.

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The commercial growers usually bring in their apples loose in the wagon-box, and the apples are packed into barrels here. This insures a clean barrel, properly packed. It enables the buyer to look over the load as it is being unloaded. One or two growers have a reputation good enough that the houses will buy their fruit barreled. All small fruits are handled in the sixteen quart crates and are not repacked. The grower delivers them as up to grade on his reputation, which will not last long if he does not furnish good berries. The grower usually tells the wholesaler when they were picked and the condition they are in. They do a cash business only.

Very little has been handled through the commission men of other cities. A few carloads have been shipped to Minneapolis, but returns were not as satisfactory as when sold to the wholesale houses. In shipping the grower has to take more risk and do more work, such as packing and loading the car, than when he sells to the wholesaler. Most growers prefer to sell to the houses than to do this extra work, which they are neither used to, nor capable of handling. Besides this, most growers do not have enough fruit at any one time to load a car.

There is no co-operative association at the present time, but the growers were trying to organize one last winter. In a certain way there is an agreement among the small fruit growers, in that nearly all of them agree to market their fruit in the sixteen quart crate and stick to certain prices as far as possible, and not to cut prices under other growers. This applies especially to the “direct to the consumer” trade. There are no street venders to whom the growers can sell nor with whom they would have to compete, and there is no city market at Mankato.

Storage conditions have not been developed. The wholesale houses have small storage rooms of their own, but do little storing of home grown products, as they ship them out as soon as they get a carload. The stores store a few days in case they get an over-supply on hand. The growers store apples in their own cellars, often keeping them until the following spring. A few city people buy apples in the fall and store for winter use, but it is not very satisfactory for the storage houses do not regulate the temperature accurately enough.

* * * * *

PRUNING OF CURRANTS AND GOOSEBERRIES.—The main reason that currant and gooseberry bushes do not yield satisfactory crops from year to year is due to the lack of proper pruning.

Both currants and gooseberries produce their fruit on canes that are at least two years old, the first season being generally utilized for the growing of the canes, the second for the formation of fruit buds or spurs, and the third a full crop may be expected. These canes will bear for two and even three years, but each year after the third they begin to show a decided decline—the fruit becomes smaller

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and less valuable. In order to keep the production up to the standard, the bush should be placed on the rotation basis, that is, each year a few new, strong shoots should be permitted to grow. All the rest should be cut out, and also each spring a like number of the oldest canes should be removed. In other words, we should grow the same number of new canes that we take out in old canes. In this way, we eliminate the old and exhausted canes and keep the bushes in strong, vigorous growth. Further, as the season progresses, all shoots beyond those that we wish to use for fruiting later on should be removed and not permitted to utilize the food supply that should go to the fruiting canes.—E.P. Sandsten, Col. Agri. College.

Support for an Overloaded Fruit Tree.

MISS NELLIE B. PENDERGAST, DULUTH.

Some years ago the writer wearied of the many objectionable features connected with propping overloaded apple trees, and found relief in a new application of the maxim of modern charity—“help people to help themselves.”

The average apple tree is quite capable of supporting its load of fruit, with a little assistance in applying its strength. This is satisfactorily given by overhead supports. My method is as follows:

Take a piece of gas pipe, the diameter depending on the size of the tree and consequent weight of the load, and long enough to extend some two or three feet above the tree. The required height would be governed by the spread of the branches and the distance between the trunk of the tree and the proper point for support of the limbs.

The pipe is placed against the trunk of the tree, pushed a few inches into the ground, and tied in several places tightly to the tree. On the top (which must be screw-threaded) is screwed an ordinary gas pipe end. Heavy cords are then run through holes in the top piece and tied to the branches wherever needed—the same cord often being made to tie several branches which are in line perpendicularly.

[Illustration: View of apple tree with fruit laden branches supported by pipe or wire.]

The branches should be wrapped with a bit of burlap or other suitable padding under the cord, as otherwise the friction resulting from the inevitable swaying of the heavy limbs on windy days would result in rubbing the bark off and possibly entirely girdling the branch. Pads should also be placed between the gas pipe and the tree trunk wherever there is contact, and under the rope where tied.

What Frisky is Telling the Veteran Horticulturist.

CHAS. F. GARDNER, OSAGE, IOWA.

I am your cunning little squirrel, and as you have named me Frisky and have adopted me as a regular member of your family, I will tell you some little things I know about horticulture, or more properly, forest tree planting.

[Illustration: Our squirrel.]

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My ancestors from way back through geological ages have all been lovers of nut trees and especially conifers. If you knew of the great districts covered with valuable timber that have come into existence by reason of our planting of nuts and conifer seed, you would be very much surprised. While we gather large quantities of seed for use as food during the long, cold winter months, each one of us secretes several thousand seed annually, widely scattered, in good places for trees to grow. The most of these scattered seeds remain in the ground and germinate where they were planted.

My grandfather on my mother's side has told me that some of his relatives in Scotland were once accused of doing considerable injury to plantations of firs and pines by gnawing off the top shoots, which you know make pretty good eating for a hungry little squirrel. Wasn't that a great thing to make a fuss about? I believe my grandpa knew as much as you do about the real existence and natural history of the mastodon, the megatherium, the paleotherium and the pterodactyl.

In the planting of forest trees we were assisted by birds. I will name a few who helped us the most in this northern latitude, or, as you call it, "the blizzard belt." You showed me the other day two beautiful oak trees, on your grounds that were planted by crows. Bluejays are great seed planters, also mourning doves; and the wild pigeons, now extinct, were great planters of many nut trees. Almost every variety of birds has assisted us in the planting of the seeds of trees, bushes and, in fact, all plants that bear valuable fruits or nutritious seeds.

[Illustration: Chas. F. Gardner at his best.]

While I think of it, I will tell you that I was born in a beautiful nest, made of moss, twigs and dry leaves curiously interwoven in the fork of a tree at a considerable height from the ground. I had four little brothers and sisters. We loved each other dearly and had a good time all cuddled up in our sweet little home. I wish you would let me go and visit them sometime this summer. Now if you have no objection I will take a little nap.—-Frisky.

Top-Working.

O. W. MOORE, VETERAN HORTICULTURIST, SPRING VALLEY.

From my experience in fruit growing I have come to the conclusion that the best method to apply in starting a commercial orchard in this section of country would be to gather apple seed from Duchess and Hibernal apples and plant them, in order that we might grow hardy seedling roots to be used in making root-grafts. After growing these apple seedlings one year I would graft short pieces of their roots to long Hibernal scions, plant them out in the nursery row and grow them the first year as a whip or single shoot. The second year before growth starts in the spring I would cut those whips back to the height where I wanted to start the head of the tree. After growth starts rub off all the

buds except from four to six at the top, these being left to form the head of the tree. The trunk of the tree below these buds should be kept clear of all growth at all times.

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By this method we get uniform trees, as the heads, or tops, are all of an equal distance from the ground and all run very nearly the same size. Now we have those trees two years old in the nursery row, and as a foundation for hardiness we have done our best. We have taken seed from our hardiest apples to grow our seedling roots; we have grafted Hibernal scions onto those roots, which is supposed to be the hardiest apple wood that we have. Still there is one point that has not been touched upon, and that is, that it is not to be supposed that all of those seedling roots from the seed of our hardiest apples will be hardy. You may ask why? Well, because mother nature does not do business that way. We hear now and then the remark, “He is a good mixer.” Well, if any man or set of men can beat mother nature at mixing they will have to do better in the future than they have done in the past.

But remember that we have the Hibernal as a scion above those roots, and that is the best apple wood to root from the scion that I know of. Some may ask, why not use the Virginia crab? I answer, for the reasons above stated, as I have tried both.

Our trees are two years old now and are ready to be planted in the orchard where they are to remain. Grow them in orchards one year. But if from drouth or some other cause they do not make a satisfactory growth, grow them two years. Then top-work their four or six limbs about six inches from their forks to any kind of apple that you wish to produce in a commercial way—but leave all small growth below those unions the first year. The second year cut everything away but the scions.

If the planter will follow the above methods I am willing to stake my reputation as a fruit grower that he will have an orchard that will stay with him and give satisfaction.

Very many apple trees, especially seedlings, when they come to bearing age are found to be worthless or nearly so. If those trees are taken in hand at any time under ten years old they can be readily top-worked to some good apple and completely changed in two years’ time. The first year work center limbs or leaders, leaving the lower growth to be worked the second year. The third year by cutting everything away but the growth of the scions we have the tree changed over to a better variety of fruit. As to the size of limbs to graft I have always made it a point to never work limbs over one inch in diameter. But from one inch down to whip-grafting size, limbs from three-quarters to one inch, we set two scions. The wound heals sooner with two scions than with one. If there is too much growth in a year or two, cut a part of it away just above the union.

Evergreens.

JENS A. JENSEN, ROSE CREEK.

Why not grow evergreens in the place of willows? When I came to Mower County if there were any trees planted they were willows, a few Lombardy poplars and Balm of Gilead.

Since 1890 there has been a great deal of planting of evergreens, especially around Austin and Rose Creek.

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Some people think it hard to grow evergreens. One mistake they make is in planting too large trees. Another is in planting them in June grass sod, a sod that will not wet down one inch in a rain that lasts twenty-four hours.

Evergreens should be planted in cultivated land, and then they will grow surprisingly fast. Plant trees from one to two feet. If wanted for a windbreak, plant eight feet apart; if two rows are wanted, plant trees sixteen feet apart, in rows four feet apart, the trees planted alternately. Norway, White and Black Hills spruce, also White, Scotch and Jack pine are doing well here.

IN MEMORIAM—EZRA F. PABODY

EZRA F. PABODY was born in Vernon, Indiana, July 26th, 1838. His father's name was Ezra F. Pabody, and his mother's maiden name was Mabel Butler. Comrade Pabody was married in Oxford, Ohio, October 10th, 1866, to Emma A. Brown.

[Illustration: Portrait of the late Ezra F. Pabody, from a photograph taken ten years ago.]

His education was acquired by attending, first, the common schools at Vernon, Indiana, until he was sixteen years of age; and in September, 1854, he entered Hanover College, where he spent five years. In 1859, he entered Miami University, Oxford, Ohio, and graduated from that University in June, 1860. In September of that same year he entered Princeton Theological Seminary, where he studied for one year with a view to entering the ministry, but the condition of his health interfered with his carrying out this purpose.

In 1861, having come to Minnesota, and as volunteers were being enlisted to crush the rebellion, which threatened our country with destruction, his spirit of patriotism impelled him to offer his services to aid in maintaining the government. Accordingly he enlisted at Fort Snelling, September 25th, 1861, and was enrolled in Company "A," Third Minnesota Volunteers. In November of that year he was appointed Hospital Steward of the Regiment, but he was unable long to endure the activities of the service, and on July 9th, 1862, was discharged on account of disability. However, his loyal spirit would not allow him to rest if there was a place where he might serve effectively, and accordingly, on August 24th, 1862, he enlisted again,—this time in the 79th Indiana Volunteer Infantry, and was assigned to duty as Hospital Steward, in which office he continued until discharged for disability December 18th, 1862.

After his army service, he engaged in the drug business at Vernon, Indiana. In 1875 he removed to Minneapolis and here followed the same line of business until 1888.

In August, 1890, he was prevailed upon to take up City Mission work in connection with Westminster Church, and was ordained to the Gospel ministry in 1900.

Retiring from the active work of the ministry in 1903, he passed the remaining years of his life in his quiet home at Zumbra Heights, Lake Minnetonka, where the death angel found him September 21st, 1915, after a long period of illness.

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His memory will be lastingly perpetuated by the development of his city mission work, known as “Riverside Mission,” a neglected portion of Minneapolis, embracing what is known as “The River Flats,” where the inhabitants, mostly foreigners, and in need of religious instruction, were taught by this faithful missionary and his estimable and consecrated wife to speak and sing the language of Heaven.

The faithful wife and co-laborer, one son, E. Fitch Pabody, and one daughter, Eleanor (Mrs. Ward H. Benton), all of Minneapolis, survive him.

Mr. Pabody is, of course, best known to the members of this society on account of his service with it in the past thirteen years. While not one of the oldest members of the society from a point of years in his connection with the society, in point of service he ranks very high, for during all the period of his service he was always finding something to do for the association. Several times he was on the program, in a number of official capacities he served the society, and especially as a member of the reception committee during a number of our annual meetings was he of largest use to the association, and his courteous and kindly ways we especially remember. Mr. Pabody was very near to the writer personally, and his taking away is largely in the nature of a personal loss. Mr. Pabody had a great love for horticultural pursuits. His garden and orchard occupied very much of his thoughts during the later years of his life, when he lived on the shores of Lake Minnetonka. It is hard to part with these old members who have so much endeared themselves to us in these many thoughtful ways.—Secy.

Bread Cast upon the Waters.

C. S. HARRISON, YORK, NEB.

The instance recited below has nothing particularly to do with horticulture but a good deal to do with a “horticulturist,” C. S. Harrison, of York, Neb., that picturesque veteran in horticulture, who has been an attendant at our meetings now for so many years, adding such a strong interest to our annual gatherings. Mr. Harrison recited at our late meeting the incident referred to here—without the denouement, which came to him in California this winter, where he met Mr. Lindbergh, one of Minnesota congressmen. As a result of this incident we had Mr. Harrison with again at our late summer meeting.—-Secy.

In 1861 I was living in Sauk Center, Minn., where I preached the first sermon. I had a tract of country under my care 100 miles in extent and had all sorts of work to do. Ten miles from Sauk Center there was a sturdy Swede who was at one time speaker in one branch of the Swedish parliament and for a while secretary to the king. He moved to Minnesota about the year ’60. It seems he had not learned the art of graft, and he was poor. He took up a preemption and built him a little log house 12x16. One day he took a load of logs to the mill and, stumbling, fell on the saw. This caught him in the back and split it open, and also took a stab at his right arm.

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It was hot weather and no surgeon within fifty miles. I followed him to his home; we did not think he could live. I picked out the sawdust and rags from his back and kept the wounded arm wrapped in cold water, and now for a surgeon I got a horse from a neighbor and a man to ride him. I said, “Don’t hurt the horse but go as fast as it is safe.” Twenty miles ahead I knew another man with whom he could exchange horses, and then another relay brought him to the doctor. Dr. Hunter proved to be a good surgeon. We had kept the patient with such care that with his clean habits and robust constitution he underwent the operation all right. I helped the doctor, and we took off the arm near the shoulder. I had a busy time until the surgeon came. I stayed with the man all day, then drove home ten miles and was by his side early. It took the doctor about three days to get there. The horses were poor, and the auto did not exist even in a dream. By the next December the old hero was out chopping rails with his left hand.

How poor the people were! Every dollar had a big task before it. The good doctor only charged $20. I rode quite a distance—got a little here and there and paid the bill. A son of the old man, C. A. Lindbergh, is now representative in congress from the 6th district of Minnesota. We discovered each other this winter. I have kept up a pleasant correspondence. His daughter, Eva, who helps her father, has just written me that she is going to be married in Minneapolis in June, and she wants me to perform the ceremony. All the friends and relatives will be there, and she wants the man who saved her grandpa. Thus, after fifty-five years, stirring memories of the past are awakened and happy anticipations of the future.—C. S. Harrison.

SECRETARY’S CORNER

MORE EVERBEARING STRAWBERRIES.—Mr. Walter Ferguson, of Mankato, has pretty near the record number of strawberry plants raised last year. From four plants of No. 1017 everbearing strawberries he reports having raised several over six hundred. He says he reset twelve new plants in July and they produced over three hundred.

ADVANCE PREMIUM LIST, ANNUAL MEETING, 1916.—Elsewhere in this number will be found an advance list of premiums to be offered on vegetables and apples at the coming annual meeting of the society. There will be practically no change from this list, though there may be slight additions to it. Possible exhibitors may feel safe to save material for exhibition in accordance with the premiums therein offered.

PASSING OF J.F. BENJAMIN.—Members of the society who have attended our annual meetings for the last ten or more years will readily recall the face and figure of this very loyal member of the society, who was always at hand to serve in any capacity as opportunity came to him. Mr. Benjamin was a successful fruit grower, not only from a financial standpoint but from his love of the art. We hope to publish a suitable sketch of his life at some later date.

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MUNICIPAL CAMPS IN NATIONAL FORESTS.—The City of Fresno, California, has established a fifteen-acre camp in an adjoining national forest, providing low cost outings for the school children of that city and their parents. Los Angeles is doing something similar on even a larger scale, and other municipalities are following suit. Minnesota has splendid national forests, and the time may come when the state or some of the municipalities of the state may be able to make similar use of these forests for the benefit of our people who are not able to go to larger expense to secure needed summer outing.

THE APPLE CROP.—The Department of Agriculture in its August 1st report forecasts an apple crop of seventy-one million barrels against seventy-six million last year and a yearly average for the past five years of sixty-six million. The favored regions in apple growing this year are in the New England states and the Pacific states, the Central states showing a very large falling off in the apple crop, anywhere from four-fifths to one-fourth of previous years.

NATIONAL VEGETABLE GROWERS' ASSOCIATION.—It seems there is an association of this character, called "Vegetable Growers' Association of America," and it will hold its next annual meeting in LaSalle Hotel, Chicago, September 26-29. Representatives of local vegetable growers' associations' will probably do well to get in touch with this national gathering. If any go from this state the secretary will be glad to receive from them a report of the meeting. Marketing, soil fertility, heating, packing, spraying and other subjects will be covered on the program. For further information address James B. Foley, Secretary, 3100 South Spaulding Avenue, Chicago.

APPLE TREES AS A WINDBREAK.—John W. Maher, of Devils Lake, N.D., in correspondence has spoken at two different times of the use of apple trees as one feature of windbreaks in his vicinity, using such varieties as Duchess, Patten's Greening, Hibernal, *etc*. In this connection he says "probably it is only the amateur horticulturist who sets a row of young apple trees in the stubble fields as a windbreak for apple grafts, but this has been done here and the windbreak is satisfactory. I believe that the apple is more hardy in this kind of soil than it is generally considered to be. If the apple tree is properly limbed so as to shade its trunk and larger limbs it is a real success."

HORTICULTURAL SOCIETY PERIODICALS.—February, 1894, the first number of the monthly issued by this society was published and sent out to its members. Publishing the report in this way as a monthly was an experiment, which has proved to be a very successful one indeed, and this method of publication has now for a long time been a permanent feature of the work of this society. In 1894 the society had about six hundred members. The increase in the membership of the association since that period has brought the roll to high water mark this year at 3,700. At

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that time as far as we know no other horticultural society was publishing its report as a monthly. Quite a number of state societies are now doing something of this sort, though not exactly following the same plan as the Minnesota society, our report appearing as a monthly magazine and being bound up later with list of members, index, *etc*., making altogether the annual report. The only association that has exactly followed our plan is the Manitoba Society. Wisconsin, Kansas, Nebraska, Virginia and other associations not now recalled are sending out a monthly to their membership. Illinois and perhaps some others are publishing a quarterly. Some of the state boards of horticulture are publishing a monthly, notably the California board, and in some cases the state boards of agriculture are doing this also. The plan inaugurated by this society is being slowly popularized and will undoubtedly continue to be made use of more and more as the study and practice of horticulture develops in our country.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

GARDEN HELPS FOR SEPTEMBER.

September Meeting of the Garden Flower Society will be held on the twenty-first, at 2:30 p.m., at the Minneapolis Public Library.

Topics, “Fall Work in the Garden.”

“Planting for Fall and Winter Effects.”

“Vines and Their Uses.”

Have you taken any photographs of your garden, its individual flowers, or wild flowers for our photographic contest? It is not too late yet to get good pictures. Every member is urged to enter this competition.

Plant peonies this month. Old clumps of hardy perennials may be divided and reset early this month. Flowering bulbs intended to be in bloom at Christmas should be potted now. Grass seed for new lawns or bad places in old ones can be sown this month.

The daffodil makes an early growth and should be planted this month. After the first killing frosts the tender roots, like cannas, gladioli, elephant's ears, and dahlias, can be lifted with a fork and spread out under cover to dry, then stored in a cool cellar, free from frost.

Do not cultivate the soil after September first.

All newly set plants should be mulched lightly.

All litter about the garden can be cleared away. Any plants that have been infested with insects or diseased should be burned. Leave no harbors for the eggs of insects, such as old weeds, grasses or litter of any kind.

Seeds of native plants which you wish to naturalize should be gathered and sowed immediately in a shaded, well drained location, where the soil has some humus.

Lily-of-the-valley should be planted this month.

Try planting a few sweet peas late in September or early October.

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Important September blooming flowers are phlox, Japanese anemones; perennial asters, or Michaelmas daisy, so-called because they are supposed to be at their best on Michaelmas Day, September 29th; helleniums, helianthus, hardy chrysanthemum, pyrethrum uliginosum, boltonia.

If you have not these flowers, try and visit some garden where they are blooming in order to know what kinds to grow.

Poppies for next June's blooming can be sown this month.

Be prepared for the first early frosts, having ready to use some light covering, such as cheesecloth. The garden can be prolonged from two to six weeks by this slight protection.

ORCHARD NOTES.

Conducted monthly by R. S. MACKINTOSH, Horticulturalist,
Extension Division, University Farm, St. Paul.

A CONFERENCE OF HORTICULTURAL EXTENSION WORKERS.

A conference of the Horticultural Extension leaders of Wisconsin, Kansas, Nebraska, South Dakota, Iowa and Minnesota was held early in August at the Iowa State College, at Ames. The subject of apple and potato clearing houses was the chief question discussed. The work of this kind was started by Professor Greene in Kansas when they had the big apple crop in 1913. Later Iowa and Minnesota undertook similar work. It is expected that a co-operative plan will be formulated which will be of greater value than when each state works alone.

The visiting members were very glad to have President Pearson discuss co-operation as he saw it while visiting a dozen or more countries in Europe.

One hour was spent in an automobile tour of the grounds and farms. Considerable land from one to three miles from the main campus is now used for experimental work. One of the latest additions to the horticultural equipment is a cold storage plant and range of greenhouses, costing over sixty thousand dollars.

HORTICULTURAL TOUR IN WESTERN IOWA AND EASTERN NEBRASKA.

The horticultural societies of Iowa and Nebraska joined in an automobile tour of the orchards, vineyards, nurseries, and truck farms August 2 to 4. The first day was spent in and around Council Bluffs. Interest centered around the large Co-operative Grape Growers' Association. A grand picnic dinner was served by the ladies. This association has been in active operation for fifteen years. Professor Beach emphasized the value of the work that is being done, and especially the value of having a contented lot of people in a community mutually interested in one kind of work. On the return trip a stop was made at the experimental apple orchard that is conducted by the Horticultural Department of the Iowa State College. This orchard of 900 trees was leased in 1910 for ten years to determine if an old orchard that has been unprofitable could be made profitable.

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Careful records have been kept of expenses and of the size and grade of all fruits produced under the several soil treatments. To date six crops have been harvested from the 475 trees under experiment. The lowest was 1,700 bushels in 1911 and the largest was 6,000 bushels in 1915. It is estimated that there is about thirty per cent. of a crop on the trees this year. Demonstrations were given in spraying, dynamiting trees, treating trees affected with blister canker, and grading apples with a large grading machine.

The second day was spent in orchards near Omaha. Some excellent orchards that have been very profitable were visited. It had been very dry in that region, consequently the fruit was undersized.

The third day was spent in southwestern Iowa, from Hamburg to Glenwood. It is impossible to tell about all the good things seen on this trip. We saw all kinds of pruning, cultivated and “sod cultivated” orchards and, above all, corn, corn and more corn. At Shenandoah the nurserymen and seedsmen took charge of the party and entertained all in a very hospitable manner. There were ninety at the noon banquet. In the afternoon they showed us the large nurseries and seed warehouse.

Toward the end of the trip we stopped at a 40-acre orchard, mostly Grimes Golden. A hailstorm had injured the fruit very much.

One of the great lessons gained from the 150-mile automobile tour was the fact that *spraying* is *one* of the *most important orchard operations*. It was interesting to hear what some of the older orchardists would say when they saw fruit injured by scab. It is an important matter with them, because it means dollars to have disease-free fruit to market.

[Illustration: VETERAN DOUGLAS FIR, STANDING MILES OUT FROM THE PROTECTING MOUNTAIN, EXPOSED TO ALL THE FIERCE WINDS OF THE PLAINS.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 OCTOBER, 1916 No. 10

Camping on the Yellowstone Trail.

CLARENCE WEDGE, NURSERYMAN, ALBERT LEA, MINN.

I suppose that civilization is the correct thing for mortals to aspire to. As a boy, while I hated it with a bitter hatred, I accepted it as inevitable because my elders approved it and because it seemed indissolubly linked to the school, the church and the things of good repute. As I grow older the yoke sits easier on my shoulders, but doubts have increased as to its necessary connection with the good, the true and the beautiful. It surely kills the sweet virtue of hospitality. In my home church lately there was a call for volunteers to entertain a visiting

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delegation, and I was interested in observing how perfectly the number that might be accommodated in any home was in inverse ratio to the size and furnishings of the house. High heeled shoes and hobble skirts, two-story starched collars and tile hats are fashion signs of civilization, but I cannot see why a ring in the nose and a tattooed arm might not have answered just as well. I am getting harder to convince that a broad foot, shaped on the lines laid down by the Creator, is less beautiful or desirable than the one-toe pointed shoe, decreed just now by our particular brand of culture, and today I would as lief defend the cult of the simple red man as the savagery that disgraces the lands across the water.

Whatever the merits of the matter, for one month of the year we and our tent and automobile abandon ourselves to barbarism, and live as we please. This year we chose to spend our month on the Yellowstone Trail, the road that leads from the Twin Cities to the Yellowstone National Park, and which is different from other roads leading in the same direction mainly by its yellow mark, faithfully directing the traveler on his way and preventing the loss of time in getting directions at doubtful cross roads. Our party consisted of a young botanist, and his wife, my wife, myself and our small boy Alan. Our equipment consisted of a tent, 7x7 ft., weighing, stakes, poles, partition and all, 16-1/2 lbs.; a trunk on the running board made to hold bedding and grub box, and an oil cloth to use as a tent floor. Like the Indians we go light, and live the simple life while on the trail. We get off at six o'clock in the morning, eating our breakfast on the move as we get hungry; lunch at noon by the roadside, and camp early, seeking the most interesting spot, from the top of a butte to a pleasant river valley—and cooking the one square meal of the day by such a brushwood fire as we are able to gather.

[Illustration: "Us" and some others at a mountain cabin.]

For the first few days we try to provide some straw to temper the hard earth, but as the days go by, and we get used to roughing it, we sleep soundly with nothing but a blanket and oil cloth between us and mother earth. We pin back the tent door, and with the night wind fanning our faces, close our eyes to the stars and flickering campfire. Some who have never camped are afraid of bugs, snakes and wild animals. We have spent our vacation month this way for twenty-five years, have camped in most of the counties of Minnesota, and in Iowa, the Dakotas and Montana, and have never had but one unpleasant experience of the kind. That was one night when we pitched our tent after dark on the bottoms below Fort Snelling, and did not know till we had laid ourselves down that a colony of ants had pre-empted the spot before us. We did not get much sleep, but we had the comfort of feeling that they were nice, clean, self-respecting, self-defending ants. Would that our experience in hotels had been equally fortunate!

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[Illustration: A young Douglas fir.]

Leaving the western boundary of the forests of Minnesota near Glencoe and going across the prairie and plains to the mountain forests of Montana is an interesting experience. The only trees in Western Minnesota and the Dakotas are those found along the lakes and water courses, and west of the Missouri the trees and shrubby growth, even in such places, becomes very scanty or entirely disappears, giving a weird appearance to one who has always associated water and trees together in his mind. As we draw near the Montana line, trees begin to appear on the tops of the buttes and high bluffs on the distant horizon. Traveling on the railroad I have wondered what they were. With our own private car we satisfied our curiosity by zig-zagging our way up to a camping place among them, the first night they came in sight. Of course they were our old friends, the Ponderosa pine, whose name will always be associated with our grand old man from Nebraska. They ought to be renamed the Harrison pine. How they endure the drouth and cold in a soil so poor that grass withers and dies out, and how they stand erect where every other living thing bows to the bleak winds and blizzards of the prairies, is one of the mysteries of plant life. What a splendid bonfire we made of their boughs that night, flaring as a beacon out over the ocean of prairie about us!

The day before we had passed by hundreds of clumps of a beautiful blue lupine with finely cut foliage and profusion of color that rivaled any flower of its shade I have seen in cultivation. On the way home we gathered a handful of seed from which we shall hope to grow some plants at home. We tried to dig a few to transplant, but their roots seemed to go down, down, till with my short handled shovel, I got discouraged. The herbage of the plains has learned to dig deep for water.

[Illustration: A camp by the Red River of the North, Mrs. Wedge sitting by a giant cottonwood. Our 16 lb. tent at the right.]

Leaving the Yellowstone at Big Timber and striking across the plains to the Snowy Mountains, we found the Ponderosa pine, and soon the Flexilis pine, wherever a rocky ridge is lifted above the level of the plains, so that these trees were in sight a large share of the time, even far away from large rivers and groups of mountains. If a homestead anywhere in that state is not cozily protected by bright colored evergreens it is not because there is any difficulty in getting trees that will thrive in that soil.

[Illustration: A young Ponderosa pine.]

The Snowy Mountains are in the center of Montana, quite unsheltered from the other ranges of the Rockies. It is the meeting place of the flora of the mountains and the plains. I think it is the eastern limit of that peerless tree of the Rockies, the Douglas fir. I gave my impressions of this tree to the society a year or two ago. I am still more in love with it from what I again saw last August in

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its native Snowy Mountains, and from the bright, sturdy little trees that have been growing at my home in Minnesota for two years past, giving assurance of their willingness to be transplanted to our moister air. It is the coming evergreen for the prairies, and it will be a happy day for all who plant an evergreen west of the natural timber when the Douglas fir has displaced the trees that come from the cool, moist forests of Europe and the sheltered woods of our own lake regions.

I think the Snowys are also about the eastern limit of the little broad-leaved evergreen called the Oregon grape, that I believe every one in Minnesota can grow for Christmas greens. From my first acquaintance with it I got the impression that it required shade, but this time I noted that it was growing all over the bare ridges that radiate from the mountains, wherever it was possible for a little snow to lodge. We can substitute a light sprinkling of straw when snow is lacking. It certainly does not require shade.

The Mariposa lily is a unique flower that springs up in open places and produces a white blossom about the size and shape of the wild morning glory. It grows about a foot high and produces one or two flowers on each stalk. It must have a long period of bloom for ripe seed pods, and blooming plants were common at the same time in August.

The Canadian buffalo berry and a dwarfish birch are two mountain plants of no small ornamental value for the plains. They may not endure the moister air near the Mississippi, but there we have already many useful natives, like the black haw and thorn apple, that are as yet almost unnoticed.

[Illustration: Group of Douglas fir on the mountainside. Thirteen trees in a space of only two square rods. None less than two feet in diameter.]

One of the principal charms about the great country traversed by the Yellowstone Trail is its newness and freshness. Millions of acres just as the Indian, the buffalo and the coyote left them—broad stretches as far as eye can reach without a sign of human habitation. But this is fast passing away. Out among the sage brush in land as poor and desert-like as could well be imagined, homes are being mapped out by the thousand, and crops of grain were grown this year that rival the best yield in any of the older states. The time is close at hand when the main highways will be built up and made so hard and smooth that two hundred and fifty miles will be made as easily as our average runs of one hundred and fifty. The way will be safer and speedier, but it will lack some of the spice of adventure, and it will be harder to realize the simple life about the camp fire that now seems to harmonize so well with the wildness of the plains.

The Minnesota Orchard.

A QUESTION AND ANSWER EXERCISE LED BY J. P. ANDREWS, NURSERYMAN, FARIBAULT.

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Mr. Andrews: This is a very important subject. We have been talking about it a long, long time, and we have advanced a little, ought to have advanced quite a little more, and this exercise is along the road of improvement in that line. Anything that is bothering us, anything that is in the way of our success with the apple orchard, ask what questions you can, not that I can answer them all, but there are some good orchardists around here that I know I can call on, in case I can not. In this exercise the questions come first, and it is for you fellows to start the ball rolling.

There is one thing we are lacking, that is winter apples. We have enough of fall apples, seems to me, so we can get along very well, but we are looking for something a little better quality than Malinda and that will keep somewhere near as long. All these new seedlings that have been introduced in the past and big premiums offered, they seem to have stopped right there and we are not getting the benefit of but one or two. If they had been adapted to the north, as they should have been, we undoubtedly could have had several good varieties of apples that we could recommend for planting a considerable ways north of here that are good. As it is now we are really looking in this southern part of the country for keeping apples.

I should think if we could get these new varieties of seedlings that are keeping well introduced into the Fruit-Breeding Farm and let Supt. Haralson handle them under number and send them off to the north of us a good ways, we could have them tested. Those that have exhibited these new seedlings and got premiums for them, they ought to be a little more free to get them in some shape so that they will be tested and we will learn their worth. They have their premiums, they got those simply because they are good keepers. Well, now, that isn't anything in their favor for Minnesota planting, not very much. Of course, good keepers, that is a good thing, good quality is another thing, but the first thing is hardiness, and the people who have been drawing these premiums have been seemingly backward in getting them in shape to test. They are afraid to put them out for fear somebody might steal them, but if Mr. Haralson had the handling of them under number nobody could steal them. You have got title to them and control them just as well as when you keep them right on your place where they haven't a chance to show whether they are hardy or not. There is the weak point in this seedling business for Minnesota, I think.

But the apple orchards of Minnesota, if you are not all getting the good results that you want from your orchards, if you are not all getting a full crop, what is the reason? The last year and this year we have failed of getting a good crop of apples or almost any crop, whereas before, ever since the old orchard was planted in 1878, why, we have regarded the apple crop as really a very much surer crop than almost any of the farm crops, but the last two years we have failed to get a crop.

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I attribute the poor crop a year ago to such an excessive crop as we had the year before that. Two years ago everything was loaded, breaking down, because we didn't thin them as we ought to, and we could hardly expect very much the next year. This last year, you know we had frosts quite frequent up to about the 10th of June, I think that was the reason we had such a failure this year. Our own orchard is on ground that is about 225 feet above Faribault, so we have got air drainage, and we would expect to escape frosts on that account and have as good a crop as anybody else would in that neighborhood. But that wasn't the case. We didn't get any apples, and yet during county fair why there was quite a nice show of nice fruit that they had picked up a few here and a few there, where really their location seems to me could not have been any better than ours. I don't know what the reason was, but it was very patchy, and I didn't dream we would have such a good show of fruit as we did, and I couldn't tell where it came from.

Mr. Philips: I think when the trees are loaded so heavily, if you would pick off a third of them you would get more out of the balance of the crop.

Mr. Andrews: Yes, I think that. The question is, if we pick off a third of a heavy crop, if we have a heavy crop, if that wouldn't help the next crop. It surely would.

Mr. Philips: Help that crop, too, in the price.

Mr. Andrews: Yes, sir, it will pay that year besides paying the next year, too; it will pay double.

Mr. Philips: It is a good plan any year.

Mr. Andrews: Yes, we ought to do that, we are lacking in that work of thinning the fruit. We sometimes have a late frost that will take off part of them, thin them that way, or wind, or something of that kind, and we rather depend on that feature of it. Then in that time of the year we are very busy and liable to have some things neglected, and that seems to be the one that is almost always neglected.

Mr. Brackett: Would you advocate the extensive planting of apples in this climate?

Mr. Andrews: I would not. At the same time you take it in the southern part of the state I presume they can grow them there. They can grow there many things we can't think of growing in this part of the state unless it be along Lake Minnetonka.

Mr. Older: Where you have an orchard ten years old, is it best to seed it down or still continue to cultivate it? In the west they have to cultivate. What is the best in this country? I know one man says it is best to keep on cultivating while it is growing, and another man says that that will kill the trees. I want to know which is the best.

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Mr. Andrews: I think cultivation is the thing that ought to be done until the trees get well to bearing, anyway, and then it furnishes nitrogen to the soil to seed it down to clover. If we don't do that we are very liable to neglect that element in the soil. The better way to my mind is to cultivate for eight or ten years, and then I do think it is all right perhaps, for farmers, I mean, who will neglect the cultivation if they depend on it. That is, if they make up their minds it is better to cultivate than it is to seed down, their trees are more apt to be neglected. During the busy part of the season they won't cultivate as constantly as they ought to. If they would do that I have not much doubt but what cultivation would be all right right along, if you will furnish that nitrogen that ought to be in the soil for the protection of the crop. Clover is the easiest way to get that, and the trees will be more sure to have the benefit of that if you sow to clover and grow a crop of hay and turn it under, possibly let it be into clover two years, but turn that under and cultivate for two or three years and then put into clover again. I think that would be preferable for the farmer, for the farmer especially, than it would to undertake to either cultivate all the time or seed down all the time.

I don't believe it is a good thing to seed down where there are young trees growing and while the orchard is young. If you will plant your potatoes in that orchard between the rows and cultivate it, you will do the cultivating. I haven't got very much faith in the average farmer—I don't mean you horticulturists—but the average farmer. If he will plant trees and you advise him to cultivate them while they are young, they will be neglected after the first year or so. He may while the fever is on, he may cultivate them one year and the next year about half cultivate them, and the following years they will grow up to grass and weeds. Whereas, if he plants potatoes he gets just the right cultivation for the trees if he cultivates the ground enough to get a good crop of potatoes. Then in the fall when he digs the potatoes he loosens up the ground, and it takes up the moisture, and after the fall rains they go into winter quarters in good shape. It seems to me that is as near right as I could recommend.

Mr. Hansen: What distance apart ought those apple trees to be?

Mr. Older: Another question along that line. Suppose we concede that a young orchard ought to be cultivated until it gets eight or ten years old, then which is the best when you seed it to clover to cut the clover and throw the hay around the trees for a mulch or just take the hay away, or what?

Mr. Andrews: I think it would be better to put the hay around the trees for mulching. If the hay is used and the barnyard manure is taken to the orchard that would fill the bill pretty well.

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Now, the distance apart? Grown trees really need about thirty feet apart each way. If you run the rows north and south and put them thirty feet apart, and sixteen feet or a rod apart in the row, with a view to taking out every other tree, you might have to go under bonds to take them out when they are needed to come out (laughter), or else you would leave them there until you hurt your other trees. If you would take out every other tree when they get to interfering after several years, eight or ten years, you can grow a double crop of apples in your orchard, but if you do the way you probably will do, leave them right there until they get too close, you will—

Mr. Hansen: Spoil all of them?

Mr. Andrews: Yes. Then you better put them out a little farther apart, and, as I said, two rods apart each way I don't believe is too far. Our old orchard that we put out in 1877 is just on its last legs now. At that time, you know, we didn't know anything about what varieties to plant, we didn't have as many as we have now. The old orchard only had the Duchess and Wealthy for standards, and half of the orchard was into crabs, because I thought at that time crabs was the only thing that would be any ways sure of staying by us. Well, those trees are about through their usefulness now, the standards. They have borne well until the last two years, generally loaded, and they were put out at that time fourteen feet apart each way, breaking joints so that they didn't come directly opposite. And when they got to be twelve or fifteen years old, it was difficult to get through there with a team or with any satisfaction, it was rubbing the limbs too much. Then the next orchard we put out on the farm was twenty-four feet by fifteen or sixteen feet in the row, the rows twenty-four feet apart. I wish they were a little farther apart, although that hasn't bothered very much about getting through between the rows, but it shows that a tree that is any ways spreading in its habit really needs about two rods each way. Are there any other questions?

Mr. Brackett: Do you think a Wealthy orchard under thorough cultivation, making a rank growth, do you think it is as hardy as an orchard seeded down, and do you think that a Wealthy orchard would blight more than other kinds?

Mr. Andrews: If the ground is rich and under thorough cultivation it does tend to cause fire blight. I haven't followed it on anything but young orchards. When they have commenced to bear then we have generally seeded down and turned in the hogs, and we have rather neglected the cultivation after that. I do think that if we had cultivated a little more often it would have been better.

Mr. Older: What do you consider the best to seed down with, clover or alfalfa?

Mr. Andrews: I have never tried alfalfa. I don't see why it wouldn't be all right, if you don't try to keep it too long. It would furnish the nitrogen all right.

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Mr. Older: Which kind of seeding down would you prefer, what kind of clover? Would you want the Alsike clover or sweet clover for an apple orchard?

Mr. Andrews: I haven't tried anything but the medium clover. The sweet clover I think would be rather a rank grower.

Mr. Older: If you are going to mow it, why not mow the sweet clover same as the other?

Mr. Andrews: That would be all right. If you were going to use it for mulching, I think it would be the thing, because it would be better for mulching than for feeding.

Mr. Ludlow: I would like to give a little experience in putting in alfalfa in an orchard. We got the seed, the Grimm alfalfa, I think, is the name of it, and I got a good stand. We got seed from it the first year, and I sowed more, but there seemed to be something about the alfalfa that would draw the pocket-gophers from two miles around. The second year I think I had nineteen of my thriftiest apple tree roots all eaten off. I didn't know there was one in the field because there were no mounds at all. In the spring I found where they were at work, and I catch on an average of twenty pocket-gophers out of that mound every year. Talk about cultivating, the pocket-gophers will cultivate it, and the alfalfa is pretty much all eaten out and it has come into bluegrass.

Mr. Harrison: That question as to alfalfa; the experience is always that the roots go too deep so it hurts the apple trees. Red clover seems to be the clover that is favored by most people.

Mr. Andrews: Mr. Ludlow spoke of the pocket-gopher favoring alfalfa. We have a patch of alfalfa right near the apple trees. I don't remember that I have noticed any pocket-gophers work in that piece at all. On the opposite side of the road, where it is clover and timothy, why, they work there tremendously. I know Brother Ludlow was telling us a little while ago at dinner about pocket-gophers working on his place, and I wouldn't wonder if he is blessed with an extra colony of them there.

Mr. Ludlow: I try to catch them all out every year. I catch out on an average about eighteen to twenty every fall, so as to catch them before they increase early in the spring. It seems as though they came from a distance. I know one came into my garden this year. I didn't know there was a gopher within a mile, and in one night he made four mounds in the middle of my strawberry bed.

Mrs. Glenzke: Did you ever try poisoning them?

Mr. Ludlow: No, I never did. I am most successful in catching them in a trap.

Mr. Brackett: Have you got any pocket-gophers that do not make mounds? Do you understand that?

Mr. Ludlow: No, sir, I don't understand that, but when they came in and killed the nineteen trees in the fall I hadn't seen a mound there. In the spring I found where they were at work, and then I went after them.

City "Foresters" and Municipal Forests.

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PROF. E. G. CHENEY, UNIVERSITY FARM, ST. PAUL.

Several cities in the state have appointed “city foresters.” This is a step in the right direction, if it is a precursor to the establishment of municipal forests for these men to manage; otherwise it is a misnomer and can only be misleading to the people. The city governments, in an endeavor to create a complete park organization, have so far adopted this title from European practice without much regard to the duties of the officer. A forester handles trees in mass formations,—sometimes for timber production, sometimes for the protection of water-sheds, sometimes for aesthetic effect or park purposes,—but always in the mass.

The handling of shade trees such as we have in our city streets is the work of an arborist. The planting of large ornamental trees, the pruning of the individual for formal effect, the filling of cavities and the bracing of weak parts, are no part of a forester’s work; nor do they necessarily fall within his knowledge. An expert should undoubtedly be in charge of the work, but an expert arborist, not a forester. The title is, therefore, when combined with the present duties, unfortunate, because it gives the people—still struggling with a hazy conception of forestry—a wrong idea of the true character of the real forester’s work.

Two very obvious ways of avoiding the difficulty present themselves,—either to change the title or to change the duties. The former would probably be much easier of accomplishment, but the latter is without question the course which the city ought to pursue. Since the cities have adopted the title of “city forester,” and so obtained a more complete park organization on paper, why not make the improvement real by adopting the rest of the European practice and creating city forests for these new officers to handle? That would indeed be a real improvement, and one without which any city park system is lamentably lame.

Nearly every large city has some large park within in limits kept in a more or less natural condition as a recreation ground for its people, thus recognizing its influence for health and social betterment. How much it would increase this influence if there were a considerable tract of forest within easy reach of the city! How much better approach it would make to the city than the unsightly waste places so often encountered! How much better setting it would make for the suburban residence sections!

Such a municipal forest is not a Utopian dream, but a practical thing well within the reach of almost any city. The law passed by the last legislature makes it possible for a city to purchase land for such a purpose either within or without the city limits. The activities of the present park boards show that money can be obtained to carry out such plans. The establishment of the forests would be less expensive than is generally imagined. The amount of money expended on the Gateway Park in Minneapolis would

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buy hundreds of acres of city land within fifteen miles of the city. With the aid of a municipal nursery, such as every park system should have, this land could be planted up at a total expense, for stock and labor, of six to eight dollars per acre. The cost of maintenance would be limited to the patrol of the tract to prevent fire and trespass. Of course, there might be no money revenue from the forest for many years, but in a comparatively short time it would begin to fulfill its purpose as a park, and once the timber is mature, there would be a continuous net annual income of from five to ten dollars per acre. Suppose that the city had 10,000 acres of such forest paying a net annual revenue—in addition to its full services as a park—of from $50,000 to $100,000 toward the maintenance of the other city parks, and it must be remembered that for every dollar of net revenue the forest would pay an additional dollar or more in wages to swell the coffers of the city;—certainly that would be something very much better than anything that the city has at present.

St. Paul, with the bottom lands and cliffs on either side of the river between Hastings and Minneapolis, could make a beautiful and profitable park of what now threatens to develop into a monumental waste. Duluth could make a forest which would be unsurpassed in beauty and usefulness by any in the world out of the brushy, unoccupied, rock-bound hills as far west as Thompson. Mankato has a glorious chance for the same work along the Minnesota valley. Virginia and Hibbing could do nothing better than make such use of the rocky, mine-scarred hills in their vicinity.

And so opportunity might be cited for almost any city in the state. For the municipal forest need not be confined to the big cities. In fact, in some respects the smaller city has an advantage over the larger place. Suitable land can usually be obtained near the city at a much more reasonable price and the revenue obtained bear a much larger ratio to the total expenses of the town. There are some small towns in Germany where the entire running expenses are paid by the revenues of the town forest, and one or two where the forest not only pays all of the taxes but also pays a cash pension to a number of the older inhabitants.

Certainly our towns, looking forward to an endless and progressive existence, cannot afford to neglect this opportunity to develop a useful park, to provide a source of cheap wood and lumber for future generations and a substantial revenue for the city.

Expert advice need not be employed until the size and revenue of the forest warrants it, for the State Forest Service stands ready to help—by the selection of land, the formulation of plans, and consultation—any city that is wise enough to take advantage of this law.

The “city forester” can then be a forester indeed, and one of the good points of the European city government will have been adopted in fact as well as in name.

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The Salome Apple.

H. W. HARRISON, ROCHESTER, MINN. SO. MINN. HORT. SOCIETY.

The Salome apple is named after one of the faithful Bible characters, Salome, who was associated with Martha and Mary while our Savior was on earth and was also a witness of his crucifixion. Thus the name alone commands respect. It was originated in eastern Canada, and it was introduced here some twenty-five years ago by the Princeton Nursery Company of Illinois and has proven to be very hardy on different soils and locations. It is grown in the southern tier of counties of Minnesota and as far north as New Ulm.

Like all good things it has had a hard fight to overcome its opponents. At the time it was introduced here there were Ben Davis and other tender varieties delivered in its place in certain localities. These not being hardy of course gave the Salome a black eye. Nevertheless it is an apple that should be grown extensively because of its hardiness, its clean appearance and upright growth, spreading just enough to admit air and light.

Its fruit will keep in ordinary cellars until May or June. It is medium in size and color, red streaked with green and yellow. Flesh is yellow and sub acid. Like all winter varieties it is slow to come in bearing but yielding heavily when it does bear, whenever other varieties do. Let us not lose sight of this excellent fruit in our desire to produce something new and original.

How May the State University and the Horticultural Society Best Co-Operate?

GEO. E. VINCENT, PRESIDENT MINN. STATE UNIVERSITY, MINNEAPOLIS.

Now, so far as I can understand, the only excuse for interpolating me in a program of this kind is that you are giving so much attention to technical subjects, you are working so hard, you need from time to time relief in order that you may not suffer from brain fever or any of the ailments of overstudy. I am confident from this point of view anything I may have to say will meet that need completely.

The relationship between this society and the university strikes me as typically American. There are two ways of doing things—leaving public undertakings entirely to private initiative, to individuals, to voluntary groups; that is one plan. There is another plan which consists in putting everything into the hands of the state. Constituted authority takes charge of the whole life of the citizen's, all the activities and enterprise are made public, state affairs.

Those are the two extremes. The dangers of those two methods are very obvious. Many enterprises left to private initiative will be done in haphazard fashion; there will be duplication and waste. When the state undertakes all these enterprises it changes the

whole aspect. Public management may make for a certain efficiency, but it sooner or later undermines the initiative, the feeling of responsibility of the individual. We are a practical people, we compromise and combine the various methods of doing things. It is the typical American way to combine private initiative with a certain measure of state co-operation. The work for horticulture in the state of Minnesota has been developed under exactly these conditions.

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If I remember rightly, this society was organized in 1867. It has assumed a definite leadership in the development of horticulture in the state of Minnesota; the university has gradually been adapting itself, so to speak, to the work of this society. The society and the university have officially been in close relationship. I believe that in the early days the secretary was at the same time a university officer and for the last twenty-five years, I am told that at least one expert of the university staff has always been a member of the executive board of this society. This has made a personal bond.

Then the society has done a great many important things. You have stood by at times when people were not perfectly certain about the importance of various kinds of scientific work. You have been steadfast. Sometimes it required courage to stand for the scientific ideals which the university was attempting to carry out in important work that had a bearing upon horticulture.

And you have, of course, the chief responsibility and distinction of having seen to it that our fruit-breeding farm should be established. I believe you were also kind enough to pick out the site, although none of you were personally interested in the particular real estate ultimately purchased.

So that we feel—we of the university feel—that the work of horticulture in this state is distinctly a co-operative undertaking, and that the leadership and enterprise and vision of this society have been the chief things that developed horticulture in Minnesota to the point it has reached. But we do believe that the co-operation of your university is an important and, we hope, from now on will be an increasingly important thing. Certain work is going on constantly at the University in the various departments, and that work is of distinct benefit because you recognize it.

We had a good illustration a few minutes ago. The professor of soils was having his brains picked, as he had a perfect right to have, by you. You were asking him questions, and I noticed once or twice he said he didn't know. That must have inspired confidence in him; I have a good deal of faith in people who don't know it all. That shows two things—they have a sense of humor, and they expect to find out. There is something pathetic in a person who knows it all; it is a case of arrested development.

So out of the department of soils you expect to get the result of careful and scientific study of the nature of soils. From the department of plant pathology you expect to learn about the various forms of plant diseases and the way in which these may be eliminated. From the department of entomology you expect to learn something about the troublesome insects, which are so universal an annoyance. I think they simply exist to test our character, to see whether we have courage to go on, bugs or no bugs. We do the best we can to become familiar with the

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habits of these nefarious creatures and let you know what we know. So I might call attention to one or two other departments—but you know how much is being accomplished. You get regular reports. You have a committee to visit and investigate our fruit-breeding farms. If I may judge from the reports which your committee makes —I don't know whether it is because it is one of your children and you are indulgent—-your committee seems to think good things are being done and distinct progress recorded at the fruit-breeding farm. With your support and confidence we are enlarging the work there. It seems we should have more land in the early future, and we may ask for your co-operation in convincing the powers that be that such increase of territory is necessary.

How many members have you? 3,407 members, I believe. Perhaps you have more since that number was given this morning. At any rate, there is a good number, and when you think of all the wisdom and all the experience that those 3,407 people have, it seems a great pity not to get it organized in better form. Come and pick some more brains while these brains are still available and organize this great mass of knowledge.

Here is the next problem. Who are the people that are going to take your places? Who is to have a gold watch given him fifty years from now—or given to her fifty years from now? This thing is to go on, and how? It goes on by discovering in Minnesota the horticulturally-minded people in the state; you must always be on the lookout for people who are to do the big things. The great European governments are considering how they are going to keep their armies recruited, how the next generation is to be brought in and organized. That is the same problem in every nation. It is extremely necessary to put out dragnets for specialists. There are probably thousands of men in Minnesota who are horticulturists, they are dormant horticulturists, and your business and ours is to try to discover them. So the problem with us is how to get out the dragnet.

You know there is a great biological principle that is illustrated in the lower types of animals. Millions of fish eggs are produced for every hundred that actually fertilize and amount to anything. So when you are looking for results in a great subject, when you are trying to discover people, when you are putting out a dragnet, you have to try a very large number with the hope of discovering the relatively few who really show the divine spark, who are really the men that you are looking for.

It is a very interesting thing when you come to think about it, all the while we are looking for special ability in modern activities we do it by fashion. Fashion is something that victimizes the ladies. They do not care for fashion itself, it is thrust upon them from the outside. Most women conform to fashion on the principle of protective coloring; they do not care for it themselves, but they do not want to be conspicuous by not conforming; so they protect themselves that way.

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I consider fashion is a beneficial thing when you look at it the right way. By fashion all kinds of new things are started throughout the country, and you discover certain people who have a special aptitude. It becomes the fashion to do various things, and in many cases people become interested and develop their own special tastes and faculties.

I am tremendously interested just now in rural education. We want a rural school that will be attractive. We are interested in getting houses for the teachers to be built right alongside the school house. Then there will be the garden in connection with the house, the flower garden and the tree planting. Some of us are looking forward to the time when the rural school will be the most charming spot in all the countryside, not a place from which the teacher escapes at the earliest possible moment on Friday to return reluctantly on Monday morning, but a place where she wants to remain, where the rural school will be the center of the community and community life. It will be an attractive place for the best kind of teacher. When we can get to that point we shall be able to establish in the rural regions an institution that will be a vital part of the whole community and a thing of joy and of beauty.

That gospel might be extended to the tree planting on the farmstead. You know what the state art society had been doing. There is another dragnet. You have seen the Minnesota Art Journal, which is dealing with the problems in tree planting of the farm, planting around the farm house; That in connection with the modern farm house that has been suggested, these things have a very important bearing upon problems in which both you and the university are interested.

And then we can look forward to the time when you will have your permanent home, if not on the farm grounds themselves at least near there, where we could co-operate and use the same building, so that while it would be yours you will feel that it is being utilized throughout the year in such a way that the expenditure of the money would be justified.

There is a fine vista ahead of us, a vista of the things to be, accomplished by means of this American combination of private initiative and enterprise and idealism and the support of the state for certain details of work which can be best accomplished in that way.

The Shelter Belt for Orchard and Home Grounds.

A DISCUSSION LED BY JOHN W. MAHER, NURSERYMAN, DEVILS LAKE, N. DAK.

Mr. Maher: The subject this morning is to be on “Shelter-Belt for Orchard and Home Grounds.” I am satisfied, provided the “Home Grounds” include the whole farm.

The entire farm needs shelter, particularly from the hot, drying winds and other destructive winds that uncover and cut down crops in springtime and carry away the fertile top soil; and the summer winds, hot winds, of course, that eat up the moisture;

and those destructive winds that sometimes harvest our barley and other crops before they are cut. We need protection from all these winds, and in this latitude these winds blow uniformly from the southwest. So every farm should be protected from them by a substantial shelter-belt on the west and south sides, which can also be the farm wood-lot.

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[Illustration: Apple tree windbreak at Devil's Lake Nursery. Hibernal in the foreground. Patten's Greening in the distance.]

There is another phase of protection that has been emphasized this year very much, and that is, protection against summer frosts and late spring frosts. A gentleman living at McIntosh, near Crookston, in this state, told me that corn matured up there wherever it was protected from the north wind. At the Devils Lake Nursery we had a 400-bushel per acre potato crop protected only by the blocks of nursery stock, whereas the yield in the vicinity was from nothing to fifty bushels per acre—and I believe if Mr. Andrews will inquire into the location of the good apple crops about Faribault he will probably find they were saved by similar shelter protection, or the natural lay of the land.

Mr. Kellogg: What is your best windbreak?

Mr. Maher: The evergreen is the best windbreak for the reason that it gives more shelter, retains its leaves in the winter and fewer rows of trees will make a good shelter-belt. The variety—that is, west of the timber line in Minnesota—I should say the best would be the Ponderosa pine, or bull pine, after that the jack pine may be, or else the Colorado blue spruce and the Black Hills spruce.

Mr. Kellogg: Colorado spruce is too expensive to set out as a windbreak.

Mr. Maher: Well, the green varieties. I don't see why they should be any more costly than the others. Of course, they are held at a higher price, but they make a good windbreak because they are easily grown and are perfectly hardy to stand the dry atmosphere and the hot winds.

[Illustration: American Elm windbreak at Devil's Lake, N.D.]

Mr. Kellogg: What is the reason there are so few of them really blue?

Mr. Maher: I don't know. There is only a small percentage, probably 15 per cent., that are blue. I think the dryer atmosphere produces more blue than the more humid atmosphere. We have more blues in North Dakota than you will find even here. I believe it is the dry atmosphere and the intense sunlight that causes the blue, because the red cedar in North Dakota, the native red cedar, is really a silver cedar and has a blue sheen, or rather, a silver sheen.

A Member: How large do the trees have to be to be of benefit?

Mr. Maher: I have a friend out of Devils Lake who had 160 acres of flax destroyed by a spring wind that hits the earth at such an angle. It picked up the earth and cut the flax off, by reason of the clay hitting the little plant, except about a hundred foot strip along the west side, and that was protected by a growth of grass and weeds not to exceed a

foot in height. So it depends on the kind of wind a great deal and the angle at which the wind strikes the grounds.

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Now, the distance that a windbreak will protect a field has been studied out and measured and demonstrated by a great number of men. Mr. McGee, at Indian Head, gave a great deal of thought and study to the windbreak proposition and measured the distances that the shelter-belt would shelter the crops, and he came to the conclusion that for every foot in height there would be an absolute protection for a rod in distance, and outside of that actual protection there would be a long distance that would be partially protected. The same study was made by a gentleman in Iowa—I can't call his name just now—and he came to practically the same conclusion as to the distance that the protection reached in proportion to the height of shelter-belt.

[Illustration: Mountain Ash windbreak at Devil's Lake, N.D.]

A Member: I want a shelter mostly for apple trees. Would it be five or six years before I receive any benefit, or seven or eight years?

Mr. Maher: Plant your protection when you plant your apple trees, and you will have your protection sooner than you have your apples. If you are going to do that, don't put the shelter too close to the apple trees, which is a very common fault.

A Member: How much distance would you allow for the roots?

[Illustration: White Willow windbreak at Devil's Lake, N.D.]

Mr. Maher: I should say not less than 100 feet, anyway.

Mr. Moyer: I live in southwestern Minnesota, about thirty miles from the South Dakota line, and I think it is a mistake to recommend the white spruce for planting out there. The white spruce naturally grows towards the North Pole, it extends even up to the Arctic Circle. Twenty-four years ago I purchased a dozen white spruce from Robert Douglas, who was then alive, and planted them northwest of my house. About five years ago they began to fail, and now only two or three are alive, and they are covered with dead branches. I feel sure that the white spruce have been injured by the hot winds that come across the prairies from the southwest. I don't think they can stand it. There is a variety of white spruce that grows in the Black Hills, which I think will be decided to be a different species when botanists come to study it, that will stand our prairies. Another tree that we like is the Colorado blue spruce; it is hardy and grows excellently. About twenty-three years ago, when Professor Verner was at the head of the Forestry Department at Washington he sent me 8,000 evergreens, and I set them out. They were bull pine and the Scotch pine and Austrian pine. I was over to look at them the other day. The Scotch pine, which have been set now twenty-three years, are over thirty feet high, the Austrian pine about two-thirds as high, and the bull pine, Ponderosa, is about as high as the Austrian pine. He told me to set these trees about two feet apart each way. I thought that too thick, so I set them in rows six

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feet apart and about two or three feet apart in the rows. He wished me to alternate the planting with deciduous trees. He recommended that I add a few deciduous trees, green ash and box elder and a few elm, and I set them as far as they would go, but they didn't go very far in setting the 8,000 evergreens. Then I thought it would be a good idea to use the wolfberry that grows wild on the prairies. I set them alternately with some of the evergreens, but as they have a very liberal root system it was hard to get them out. The finest tree in the plantation is the Austrian pine, and if it continues to do as well as it has the last three or four years I think the Austrian pine is going to be a very valuable pine for shelter-belt.

Mr. Kellogg: Have you tested the Douglas spruce?

Mr. Moyer: Not to a great extent. It does well in some localities.

[Illustration: Soft, or Silver, Maple windbreak—to be succeeded by permanent windbreak of Bur Oak—shown growing between man and boy.]

Mr. Maher: I think the real test is to get them as near native to your place as you can. The area over which the white spruce grows is greater than that of any other spruce, possibly greater than any other evergreen, especially through the northern latitudes. I don't think there is any question about the Black Hills spruce being the white spruce that was left there growing when the other timber was destroyed, if we can adopt that theory. The white spruce from seed from the Northwest, from the British Columbia countries especially, is perfectly hardy with you. It is perfectly hardy with us at Devils Lake, which is a very much more severe test, whereas the white spruce from its southern limits may not be hardy even here. I think the Black Hills spruce is perfectly hardy. The distance north and south relatively is not so important with reference to growing trees as to get them from too far in the humid district. The white spruce that I would be afraid of would be the seed from New England and from the farther east limits of its growth, where the conditions are so much more humid.

Mr. Kellogg: Do you find any trouble with too much protection for orchards?

Mr. Maher: Where the protection is too close to the orchards I think it is very bad. It destroys the air drainage—

Mr. Kellogg: That is why they are liable to blight.

Mr. Maher: And they blight also. The air drainage is interfered with, and you get blight, and you also smother the orchard. I don't know but what the apple and the Americana plum are about as hardy trees as we have anywhere. I don't make any attempt to protect them specially except from the south and west. I don't put any northern

windbreak around any orchards I set out. Of course, we may lose a crop with a spring frost all right when northern protection might save it, but with us up in our country if we have a good spring frost it is usually heavy enough to catch them anyway.

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[Illustration: Norway Poplar windbreak at Devil's Lake, N.D.]

I have a question here: How long should a shelter-belt be cultivated? Now, that is a point on which I think too much emphasis is placed. If you set out your trees as Judge Moyer did his, close together, inside of a few years they will take care of themselves, they will form forest conditions very quickly, and cultivation is not necessary any more. Of course, if you set your trees a great distance apart where there is nothing to protect them from the burning sun, and the ground bakes and dries, then you must cultivate or mulch, but I think cultivation much better than mulching.

Another question: How many rows of trees make a good windbreak? My idea is that it takes twenty rows to make a good one—of deciduous trees, of course. Two or three rows of evergreens, planted not further than eight feet apart and with joints broken, probably makes as good a windbreak as the twenty rows of deciduous trees and take less ground.

Mr. Horton: Wouldn't you have an open space in those trees? You wouldn't put them all together?

Mr. Maher: If I had twenty rows of trees I would put them together.

Mr. Horton: Would you have an open space outside of those twenty trees for the snow to lodge in?

[Illustration: Ponderosa Pine windbreak—at Devil's Lake (N.D.) Nursery.]

Mr. Maher: I have never known the snow to do any hurt in a twenty row windbreak. It distributes itself in there, and the more comes the better.

Mr. Horton: I have seen them broken badly with the snow.

Mr. Maher: That would be probably the poplars and trees that break easily.

Mr. Horton: On my farm I put out a row of twenty trees. Outside of that I left a space on the north and west six rods wide, and I put out some golden willows outside of that, and that made an open space for the snow to fall in.

Mr. Maher: That is a very good plan, to have a row of willows back of your shelter-belt, especially around the home and orchard and barn ground, to hold the snow back.

Mr. Moyer: I found that the snow drifted into my evergreens but didn't break them. I used lilac bushes; I planted a long row. Lilacs are very common, and I got enough to plant a long row. They are now ten feet high, and it is a magnificent sight in summer.

Mr. Maher: I know the lilac is a splendid thing, better than the golden willow, because they last longer. They are more hardy, and they make a better protection, and as far as wood goes from the golden willows you get nothing except branches unless it is the white willow.

I have another question here: What would you plant around the garden? For a windbreak around the garden orchard, that should have an inside protection, and the shelter-belt itself should be too far away from the garden to be sufficient protection. Around the garden I would plant Juneberry or dogwood or any of those common native berry plants. They will afford the very best kind of protection, just as good as the lilacs and just as hardy, and at the same time will produce food for the birds and bring them about your garden and keep them with you and shelter them.

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Mr. Kellogg: The barberry—

Mr. Mahler: The barberry would be all right, but I prefer the Juneberry and the mulberry and the dogwood, because they come up a little higher. The barberry is all right.

Mr. Kellogg: I had barberry, and I dug it all up.

Mr. Maher: It spread too much?

Mr. Richardson: I like the Russian mulberry.

Mr. Maher: Yes, sir.

Mr. Richardson: Is the mulberry hardy with you?

Mr. Maher: No, sir.

Mr. Moyer: The buckthorn makes a very good protection.

Mr. Maher: Yes, sir.

Mr. Huestis: How would the golden elder do as a hedge?

Mr. Maher: It would be a protection, but it is liable to spread too much.

Mr. Huestis: Do you know whether the mulberry is hardy in Minnesota or not?

Mr. Maher: I think from here south it is hardy, especially southeast.

Mr. Moyer: It occurs to me that the Tartarian honeysuckle is about as good as any thing you can plant for birds. It is perfectly hardy on the prairies and grows up ten or fifteen feet high.

Mr. Maher: The Tartarian honeysuckle and several varieties of the bush honeysuckles are splendid, and they are hardy and will grow anywhere.

A Member: Did I understand some one to say that the mulberry was not hardy?

Mr. Maher: It was stated that it wasn't hardy in North Dakota.

A Member: I put mulberry trees in my garden yard that have been bearing mulberries for years and years.

Mr. Maher: I think the mulberry is hardy from here south and especially southeast. I don't think it would grow out on the prairie very far.

Mr. Richardson: It grows on the prairies southwest of here.

My Color Scheme.

MRS. R. P. BOYINGTON, NEMADJI.

"Oh, my garden lying whitely in
The moonlight and the dew,
With its soft caressing coloring,
Breathing peace to all who view."

Our garden color scheme this year was a number of red, white and blue pictures, these pictures being supported, on the different sides, by brilliant, oriental color effects.

The first picture had for its north side the south side of the cottage, which was covered with climbing roses (American Pillars and Crimson Rambler). A bed of petunias, six feet wide and as long as the cottage, came next, and was separated from about four hundred delphiniums (belladonna) by a walk which was bordered on both sides by a row of candytuft and a row of forget-me-nots, blue as a baby's eye. To the south of the delphiniums was a great bank of bridal wreath chrysanthemums, white as the driven snow.

A walk on the east had the same—candytuft and forget-me-not border. To the south and west of this picture were irises and Oriental poppies in all the gorgeous coloring of the Orient, with a small space on the west where hundreds of pansies nodded their lovely faces to the stately blue larkspurs. Are we sure, as has been said, that God forgot to put a soul in flowers?

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To the east, beyond the walk, is another picture—Shasta daisies and blue cornflowers. On the north side is a brilliant hedge of red sweet peas. On the east and south of this most exquisite picture are Iceland poppies, red pyrethrums, and here and there are clumps of dark red sweet william. In the early morn, just after the "morning stars have sung together," and the forces of day are slowly coming into action, this is a wonderous picture.

On the north side of the cottage is a screened-in porch. Here cardinal climber gives its myriads of cheerful bloom, while blue lobelia and white anemones, with the porch boxes filled with vinca atmosphere of beauty and cheer to those who come and take the social cup that truly cheers. The broad lawn slopes north to the driveway. To the east, separating the lawn from the walk, which is west of the canna beds, is a border of dusty miller next the grass and one row each of blue anchusa and red snapdragon. The silver leaved poplars in the distance give a soft sheen to the whole picture.

Away to the west is a spruce hedge and inside the hedge red hollyhocks and phlox with a great row of crimson poppies. A simple garden made of simple things, and yet as we go through it to our peony bed, that gorgeous flower, standing alone in its regal, queenly beauty, we do not wonder that when one of old walked with God it was in the cool of the evening and in a garden.

"Where in all the dim resplendent spaces,
The mazy stars drift through
To my garden lying whitely in
The moonlight and the dew."

My Experience in Grape Culture.

JOSEPH TUCKER, AUSTIN. SO. MINN. HORT. SOCIETY

During fifteen years I have had in my garden several varieties of grapes, namely, the Concord, Worden, Moore's Early and a green grape (not certain of its name). All have done remarkably well whenever the season was reasonably favorable. I mean by that the absence of the late spring and the early fall frosts, which are the greatest drawbacks to grape culture. For that reason I would not advise anyone to undertake it as a business venture on a large scale. On the other hand, where it is desired to supply the family table with fresh fruit as long as it will keep, also to add a variety of jellies and preserves for the winter, a dozen of vines will supply an ordinary family with grapes whose flavor I have never seen surpassed.

You who do not always expect money to grow on everything you touch, you who admire and love a plant or vine and feel well repaid for your labor to see it grow and bear fruit,

you who have a vacant corner in your garden well adapted to that purpose, I urge you most earnestly to plant some grape vines, and I assure you that with some knowledge of their care and a determination not to fail you will succeed, and you will eventually be able to see a pretty sight—for, to my mind, nothing is handsomer than a well trimmed grape row with the ripening fruit. The soil that will grow corn will produce good grapes. My advice is to select early ripening varieties, for then you will only have the possible spring frost to contend with, and that is easy to guard against.

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Do not fail to adopt some system of pruning, for that is the most essential part of the secret to grow good grapes. Other necessary information will no doubt be furnished by any reliable nurseryman with whom you are dealing. I wish to say in conclusion that so far I have had no trouble from any insects attacking the vines or fruit, and I have always been able to produce fruit that commands the first premium wherever exhibited.

Protect the Garden against Winter Weather.

U.S. DEPT. OF AGRICULTURE.

At this season many inquiries come to the United States Department of Agriculture regarding the protection of garden plants and shrubs during the winter. Such flowers as peonies and hollyhocks will come up again the following year if they are properly protected during the winter, while others, like cannas and dahlias, which are more accustomed to warm climes, must have their roots or bulbs dug up and stored in a cellar. The department's specialists give the following suggestions for "putting the garden to bed":

Hardy Perennials.—Cover hardy perennials, such as peonies, larkspur, hollyhocks, columbines, iris, platycodons and perennial poppies, with a good coating of manure or other litter to a depth of 3 or 4 inches. In more southern localities this will hold the frost in the ground and keep the plant from alternately freezing and thawing; in more northern regions the manure will protect the plant from freezing to a depth that will cut off its water supply.

Cannas and Dahlias.—As soon as the tops of cannas, dahlias, gladiolus, caladiums and similar plants are killed by frost, dig up the roots or bulbs and store them in a cellar where the temperature will remain at 55 degrees, and should never go below 50 or above 60 degrees. Do not shake any more earth from the clumps of cannas and dahlias than is necessary in removing them from the ground. Place the plants on racks or in slat boxes so the air may circulate freely through them. No frost must reach the roots nor must they become too warm or dry.

Shrubs.—As a rule shrubs should not be trimmed in the fall. This process is timely immediately after the blooming period, if this is in the spring, as in the case of the snowball. If the shrubs bloom in the fall, as do some hydrangeas, the rose of Sharon, and some lilacs, they should not be cut directly after blooming but in the spring of the following year. Lilacs, snowballs and mock orange should be let alone during the winter, being neither trimmed nor covered with straw and manure.

Roses.—Almost all kinds of roses are hardy in the vicinities of Washington, D.C., and St. Louis and to the south of a line drawn between these points. From Washington northward local conditions influence the successful cultivation of certain varieties.

Some roses, as the brier and rugosa, need no protection, but other varieties, such as the hybrid perpetuals, teas and hybrid-teas, need

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special care, particularly north of the fortieth parallel. Teas and hybrid teas hardly succeed in Chicago, although the hybrid-perpetuals grow as far north as Canada. All these classes do well on Long Island and in Boston near the sea when proper care is given them. These varieties in the vicinity of Washington need merely a little manure on the ground to prevent alternate freezing and thawing. Farther north, however, they should be treated as follows:

Cut the tops to within 30 inches of the ground. Cover the roots with coarse manure or leaves or similar litter. Hold this in place by evergreen boughs which also acts as a protection. Brush from deciduous trees or shrubs may be substituted for the evergreen boughs except in the most northern regions.

Mounds of earth about six or eight inches in height should be drawn about the base of the rose bushes to keep them from mice. As an added protection against mice, permit the ground to freeze slightly before winter protection is supplied. In fact, roses should not be protected until after the first light freeze, which may be expected in Washington, D.C., about the first of December, but earlier farther north. (Tops must be protected in Minnesota.—Sec.)

Climbing Roses.—In the latitude of Philadelphia and farther south climbing roses usually need no protection during the winter unless they are a particularly tender variety. Farther north these roses need protection similar to that given to the tea and hybrid tea roses.

Where it is possible to do so, remove climbing roses from their supports, and cover the branches with a little dirt. A little fall trimming might be desirable to lessen the space occupied by the branches on the ground. Such side branches as are not to be needed for next season's blooming may be cut off. Such cutting off and shortening of the ends as would otherwise be done in the spring may be done in the fall before covering, merely for convenience.

Growing Asparagus.

A DISCUSSION LED BY E. W. RECORD, MARKET GARDENER, BROOKLYN CENTER.

A Member: I want to ask if many put salt on asparagus?

Mr. Record: Salt is very good, but I think only for the reason that it makes the plant tender and keeps down insects. But if I was to use anything to keep insects down I should use Paris green. Shorts or bran, that is the best for cutworms. Everybody knows that with the least scratch or mar on the side of the asparagus it will grow

crooked, and then it is a pretty hard proposition to get it into the bunch ready for market in any kind of shape.

A Member: Some have the idea that salt helps the growth of the plant.

Mr. Record: Well, I never found it did.

Mr. Baldwin: I would like to know how to control rust on the stems in the summer time.

Mr. Record: Well, I can’t answer, but I find that the Palmetto has less rust on it than any other variety. I have never been bothered with asparagus rust yet.

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Mr. Baldwin: After the bed gets to be a few years old the grass and weeds commence to come up. After you get through cutting, it is pretty hard work to get in there and clean them out. Do you find it the best way to hoe them after you get through cutting?

Mr. Record: I will tell you. I cultivate right over the tops of the rows and keep on cultivating until the asparagus comes up and begins to sprout. By the time the weeds come up the second time, it is time to quit cutting.

Mr. Baldwin: How deep do you put the plant below the surface in transplanting?

Mr. Record: From twelve to fourteen inches. In the east they are growing asparagus, and they set out their plants, and they fill in and wait until the asparagus comes up and then they fill with rotted manure and never fertilize any more, but here there are very few that do that. I never did, but I find in putting on manure broadcast a year afterwards the shoots were very crooked. I did that one year only. After I put it on I thought I would have something good, and I didn't have anything. As soon as it comes up it starts to get crooked.

Mr. Baldwin: You mean to say that putting manure on top makes the asparagus crooked?

Mr. Record: That was my experience.

Mr. Baldwin: I have always practiced that. I think what makes it crooked is cultivating the top and cutting the crowns off.

A Member: When the weeds come in we disk it.

Mr. Record: I never like to disk it. If your bed is very old you are liable to cut some of your crowns rather than to keep the weeds out.

A Member: Your manure would be all gone then?

Mr. Record: I know there was a man right adjoining me who had an asparagus bed, and he used a lot of rotten manure the summer before, and he got very little asparagus that was marketable. I asked him what the trouble was, and he said he didn't know. This year he had a good crop. I can't say it was the manure that did that, only it looks that way.

A Member: How would you start a new planting?

Mr. Record: I would plow my ground thoroughly and get it in good shape.

A Member: Wouldn't fertilize the first season?

Mr. Record: I would. I would fertilize my asparagus ground two years.

A Member: I mean in preparing your patch for the new planting?

Mr. Record: I would first plow and harrow and then fertilize. Plow both ways from fourteen to sixteen inches deep and with a fine cultivator loosen up the bottom of furrow and put in the plants and cover with a little earth. Then with the horse keep filling in the furrow. I saw this summer several men with hoes working. That is all right, but it takes a long time, especially with the proposition we are up against about hired help. I can do it just as well with the horse and four times as fast. The second year you can harrow it any way you want to.

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A Member: Common corn land, is that fit for raising asparagus?

Mr. Record: Yes, sir, asparagus will grow on poor ground better than many other vegetables will.

A Member: Will it improve that land by fertilizing with top dressing?

Mr. Record: I think so.

A Member: The heavy land I suppose wouldn't be good for it?

Mr. Record: They raise good asparagus on clay land, but I don't think it will grow as good as on sandy soil. It is not quite so warm; it packs harder and I think more liable to grow crooked.

A Member: I was called out to see a man's asparagus bed. He asked me what kind of ground I thought it must be, and I said a light soil. This man had a heavy clay, and it rained on it, and then the sun came out very hot and the top cooked, and when the little shoots were to come up they turned back. That ground wasn't good for asparagus.

Mr. Record: It should have been harrowed well after that rain.

A Member: You see he couldn't get in there.

A Member: What fertilizer is good? Is bone meal good?

Mr. Record: Any commercial fertilizer is good, I think. Bone meal is good.

Mr. Crawford: Can you raise asparagus successfully in the shade or a partial shade?

Mr. Record: Well, I wouldn't want too much. I have shade on both sides of mine; it is a hedge. I notice it isn't near so good next to the hedge as it is out in the middle of the bed, although shade on both sides protects it from the wind and makes it hotter. The hotter it is, the faster it will grow.

Mr. Crawford: I asked the question because I have a west line shade several years old, trees are willow and box elder. Considerable of the ground is a loss to me, practically so, from that shade.

Mr. Record: I don't think it is a very good place for asparagus.

A Member: I would like to ask if a person on clay soil could use sawdust to work in?

Mr. Record: Horse manure with sawdust, we use a great deal of that, that is, planing mill shavings. That is all right. That will loosen up the ground some, but when it is turned over, of course, it will harden up again if there comes a good hard rain on it.

A Member: How many years have you maintained a bed?

Mr. Record: Why, it will go from twelve to fourteen years, although the place that I am on now, I know that was good for twenty-five or twenty-six. It is practically gone now, but for twenty years it was good. But of late years it won't run over twelve to fifteen.

Mr. Willard: I would like to ask something about changing an old asparagus bed to a new position.

Mr. Record: I wouldn't advise you to use the old roots. You get a bed quicker by using plants that are two years old, and of course there are some plants better than others. I bought my plants in the east. Now they have good plants here, a good many of them, too, but I have never seen anything as good as I got for my last bed. The best way if I was going into it, being a market gardener, would be to go to some neighbor that had a good straight bed and get my own seed. It is very easy to save, and most anyone would give a man all he wanted and charge him nothing. All he would do would be to gather it up.

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Mr. Miller: I would like to ask—I only grow for kitchen garden and I presume most of us are in the same boat—we were told to plow a furrow deeply and fill it with good manure and to plant the roots with the crowns about four inches below the surface of the bed.

Mr Record: Well, I wouldn't fertilize it first. I would, as I say, plow my furrow and loosen up the bottom of it, so that the plants will get a chance to get started. You know if you are plowing it out or shoveling it out it will get down to hard ground. That isn't so good. You loosen up the bottom and put your plants evenly over the ground and put in a little dirt, and if you have it a little barnyard manure.

Mr. Miller: I suppose the idea of putting that in the bottom is that it is so hard to cultivate the manure on the top without doing as you mentioned?

The Running Out of Varieties.

PROF. C. B. WALDRON, HORTICULTURIST, AGRI. COLLEGE, N.D.

There is no fact more familiar to gardeners, orchardists and farmers than the "running out" of varieties, and no question that is more obscure as to its causes. The possibility of deterioration of varieties is noted to a greater or less extent in all field and garden crops, particularly with those that are most highly developed, or which represent the greatest departure from the original species.

It is evident that the cause must lie either in the environment which surrounds the variety or in the selection which it has received, or in a combination of the two. It is held also by some that aside from the influence of soil and climate, and in spite of the most rigid selection, there is an inherent tendency in varieties to depart in a more or less marked degree from the type in which they first appeared. This is particularly true of new varieties that have not yet become established. Almost before the plant breeder can determine their type they have broken up into so many distinct forms that it is impossible to get any further than the first generation.

This has been noted several times with new varieties of squashes and other cucurbits, and to a similar but less marked degree with tomatoes and some other garden crops. These might well be termed evanescent varieties, and since they never become fixed or find their way into cultivation they are of interest only to the plant breeder.

The influence of environment, particularly soil and climate, upon the size, quality and productiveness of certain garden crops is well known, though just what effect this may have in determining the hereditary character of a variety has never been very well worked out and is still a matter of much doubt. We know, for instance, that there is a tendency for corn grown in the middle or southern latitude to attain to a larger size and require a longer period for maturity than the same corn grown in the north. This

tendency is shown in the first generation, but whether it appears as a constant hereditary character or not is still open to discussion.

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There are those who maintain that it is just as practical to develop a dwarf, early variety of corn in the middle latitudes with careful selection as it is to develop a variety of equal earliness when the planting is done in the north. These maintain that the reason the dwarf, early varieties of corn are not normally developed in the middle latitudes is because the selection in those places is usually made from the large plants which yield well, instead of from the small, early plants, such as would be naturally selected at the north.

By the same reasoning it is held that the constant growing of any species or variety in the northern latitudes does not increase hardiness but only enables us to determine which is hardy, thereby enabling us by selection to increase the hardiness of our varieties.

[Illustration: Cat-leaf weeping birch and shrubbery on campus of Agricultural College at Fargo, N.D.]

We must admit that this reasoning has a sound scientific basis, its principal weakness at the present time being that there has not been enough experimental work done to determine how general and constant its application is.

However true it may be as a scientific principle, we have on the other hand the undoubted fact that varieties of certain plants, like the cauliflower, are so strongly modified by environment that the varieties disappear altogether as such unless the breeding plants are grown under very definite conditions. It is well known that cauliflower seed can be grown, for instance, only in certain parts of Europe around the North Sea and to a limited extent in the vicinity of Seattle, and that cauliflower seed from any other region produces plants which not only lose all varietal characteristics but which scarcely resemble cauliflower at all.

As an illustration of this same principle millet affords an excellent example. Grown at the north for a number of years, without change of seed, it becomes short with stiff straw and very large heads, yielding a large quantity of seed. When grown as far south as Tennessee for a period of five years only, it assumes a very different character, being tall and leafy with small heads and not very productive of seed. It might be possible by very rigid selection to develop a variety of millet that would tend to be tall and leafy even in the north, but it is doubtful if it would remain so, and the difficulty of keeping it up to type would be too great to make it profitable.

All this is equivalent to saying that there are certain unstable varieties that are so influenced by climate that it is not good practice to try and keep them up to any given standard except when they are grown in regions which naturally develop the type that we are seeking to maintain.

The more striking examples coming under this class are cauliflower, millet, onions, tobacco and some of the flowering plants.

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A few years ago it was supposed that the running out of varieties of celery was due to a similar cause, that is, to unfavorable environment. To this was ascribed the pithy quality that characterized some of the varieties. Upon further investigations, however, it was found that this pithy condition came about through carelessness in seed selection. There is a more or less inherent tendency in all celery to become pithy, and unless these plants are carefully excluded, the varieties will run out from that cause.

The different varieties of tomatoes, egg plant and the cucurbits do not seem to be especially affected by soil and climate, and in such instances the varieties can be kept up only by rigid selection, no matter how favorable that environment is under which they are grown. With these plants there is always the inherent tendency to go back more or less to the wild state, and lapse of care in seed selection for a period of only a few years will result in a variety very different from the one which we had in the beginning.

It will be seen from this that in some instances the best plan is for each farmer or gardener to develop his own strains of crops that he grows, while in other cases it is best to leave the selection to those that are working in a more favored environment so far as those varieties are concerned.

There still remains to be considered the plants that are propagated asexually, like potatoes and all our cultivated fruits. From the fact that a number of our standard varieties of apples and some other fruits date back one hundred years or more, and are still as productive as at the beginning, it is evident that some asexually propagated varieties may be considered almost fixed or permanent.

[Illustration: Niobe willow (Salix vitellina, var. pendula nova), on campus N.D. Agri. College, Fargo.]

The buds or scions from which new trees are started are taken indiscriminately from the bearing trees, and since there is no great variation in them the varieties do not tend to change. Whether they could be improved by taking scions from only the most productive trees is still a question. There are some who consider this possible, but we do not yet have enough experimental evidence to establish it as a fact. So far it would seem that about the only crop which is propagated asexually that is likely to deteriorate, or is capable of improvement, is one that is directly modified by soil and climate.

The potato is the most striking example of this class of crops. It is well known that the potato responds very readily in the matter of size, yield and quality to certain types of soil and climatic conditions. It is also known that the qualities thus acquired seem to be more or less permanent; that is, that potatoes brought from the north, especially those which have been grown in heavy soil, will produce a crop some ten days earlier and thirty per cent larger than a

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crop grown from seed produced in a region six hundred miles farther south. Early Ohio potatoes grown in North Dakota, when used for seed in southern Iowa, give a much larger and somewhat earlier crop than the native grown seed. This would indicate that the potato is bound to run out in a measure if grown continually in southern latitudes, and in this instance a change of seed, using always the seed from the northern latitudes and the heavier soil, is necessary, in order to keep the variety up to standard.

[Illustration: Carnege library and flower beds at N.D. Agricultural College, Fargo.]

It will be seen that while there is no question as to the fact of varieties running out, that they differ a great deal in this respect, and it is only through a knowledge of the facts covering each variety, or at least the varieties of each species, that would enable a grower to know what to do in order to keep a variety up to the highest standard.

Mr. Kellogg: What is the matter with the old Wilson strawberry?

Mr. Waldron: I think people forgot about it and began growing better varieties. I know there is an impression among strawberry growers that the Wilson strawberry has run out. I don't know. I know it has been supplanted by other varieties, and the general impression of most men is that it is because other varieties, better varieties, came in and that variety was neglected.

Mr. Kellogg: It can be found in eastern catalogs now.

Mr. Waldron: Isn't it as good now as it was?

Mr. Kellogg: That is what I want to know.

Mr. Waldron: I understand that it is from the people that have grown them. I don't know of any strawberry in my career from the first time that I have been working in strawberries that seems to be any poorer now than it was twenty-five or thirty years ago. The Wilson might be an exception. I know that has been referred to as an instance of deterioration of variety. The strawberry might be so dependent on climatic and soil conditions that it might be classed with the potatoes and not be in a class with the apples, which don't seem to deteriorate.

Mr. Kellogg: Is there such a thing as a pedigreed strawberry plant that is taken from runners?

Mr. Waldron: We have experiments going on at the agricultural college now. We set out a number of plants from strawberry growers that advertise a pedigreed strawberry, and beside those we have strawberry plants from growers who don't advertise them as pedigreed. This year we ought to get some returns on that; last year the patch was

flooded out—we had very heavy June rains. We have about ten varieties from a large number of different growers, some supposed to be perfect and some not. We are going to have some report of them at the next horticultural meeting. I don't believe there is anything much in pedigreed strawberries.

The President: In the state of North Dakota our friend here who has just spoken occupies the same position in the hearts and minds of the people of his state as do our friends Haralson, Hansen and Patten in this section. His work is along a little different line, his being almost purely an agricultural section, but he is a very practical man and is doing splendid work up there.

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Mr. Doty: I wish to say a word on this strawberry question. Some years ago the postmaster at Monticello wanted to know of me what kind of strawberries to set out; I was handling nursery goods at that time. I told him I would recommend to him the Wilson, the Warfield and the Haverland. The Wilson I would set in the center. He had six square rods. He set them out. The second year he invited me up to his patch and asked me to guess on how many strawberries he had raised on that patch. I said: "Six bushels"—I thought I would put it high. But he said: "I have picked twelve bushels from that patch." I said: "It can't be possible," and he said: "Come right into my shop here. I have a paper here and I put down every single quart of strawberries that I have sold here." I figured it up and found that he had twelve bushels out of that patch. I told him to set the Wilson in the center, the Warfield on one side and the Haverland on the other. He did so and that was the result, the best result that I have ever known.

The President: How many years ago?

Mr. Doty: Well, it was about fifteen years ago.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

October is one of the best months in which to plant shrubs. After the leaves show them to be dormant they can be safely moved and will become established before very cold weather.

Each year we are learning that *more* planting can be done in the fall if done early enough, and by so doing one escapes a part of the rush that comes in the spring. "Anything that is hardy can be moved in the fall," an old nurseryman once said to me, and it has been a safe rule to follow. But note the word "hardy" in his advice. All stock, either shrubbery or perennials, that are planted in the fall should be well mulched.

The bulbs for the spring garden, except those that require early planting, will also need to be put in this month in order to make a good root growth before frost overtakes them. Here we are able to achieve exact results as they very seldom disappoint us as to color or time of blooming as some other plants do.

Have you tried planting your bulbs with any of the ground cover plants that will take away the bare look that most bulb beds have? The arabis with its snowy blossoms is beautiful beneath the early tulips. The violas—with such a wide range of color—make lovely backgrounds for the later tulips, as also do the creeping phlox and the native

lavender blue divaricata phlox. A bed of this beneath pale pink Darwin tulips is one of the lovely memories of last spring's garden.

Another snowy white flower is the perennial candytuft, Iberis. Blooming at the same time and remaining lovely for a long period it combines well with any of the tall tulips or narcissi or daffodils. Alyssum saxatile, with its sheet of gold, and the dear forget-me-nots, both grow well beneath the tulips. The fine lacey tufts of meadow rue are lovely among the pink and white and rose tulips. Surely the bulb beds need not be bare.

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The very early blossoms are always the most welcome. So plant some bulbs, at least twenty-five, of scillas, snowdrops, snowflakes (Leucojum vernum). These, if left undisturbed, will increase greatly. The chionodoxas, grape hyacinths and crocuses are all well worth planting, but do not put the latter in the grass as they will not do well there in our climate.

FOR OUR ROSE GROWERS.

Members of the American Rose Society have been raising money to employ a trained plant pathologist to study diseases of roses. The work has been begun under Dr. L. M. Massey, of the New York State College of Agriculture, Cornell University, Ithaca, N.Y.

By co-operating with Dr. Massey all growers of roses will greatly increase the efficiency of the investigations. A rose disease survey will first be made. It is here that all rose growers can help by sending specimens of diseased plants, with a statement regarding varieties affected, nature and extent of the injury, time of appearance of the disease and any other things that have been noticed regarding it. Information for the control of the disease will be given by Dr. Massey. The following directions are given to those sending specimens:

“The material sent should be freshly collected and should show various stages of the development of the disease. Where roots are sent it will usually be undesirable to enclose any soil. Where convenient specimens should be mailed so as to reach Ithaca the latter part of the week. Place leaves, buds, *etc*., between the leaves of an old newspaper, a few between each two sheets. Then roll into a tight bundle and wrap in stout paper. Attach one of the franked tags (which may be had upon request), on which you have written your name and address, and mail. It will go postage free—H.H. Whetzel, Head of the Department of Plant Pathology, New York State College of Agriculture, Cornell University, Ithaca.”

* * * * *

Meeting of Garden Flower Society, St. Paul, Wilder building, 2:30 p.m., October 19. Topics: “How I Made My Garden Pay” and “Work of Garden Clubs.” Reports of seed trials.

[Illustration: DISTANT VIEW OF A FIELD OF THREE YEAR OLD SEEDLING PEONIES ON THE GROUNDS OF BRAND NURSERY CO., AT FARIBAULT, MINN.]

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 NOVEMBER, 1916 No. 11

Peonies—Old and New.

A.M. BRAND, NURSERYMAN, FARIBAULT.

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About the first thing I can remember, as I look back over the years that are past, is my father's field of peonies, and of a man standing at a table with a large peony clump before him cutting it up into divisions. I remember wondering how such beautiful flowers could come out of such an ugly, dirty root. The bright little eyes, some red, some white and others pink interested me, and boy fashion I put many questions to the man about them. And then my father came by and noticing my interest in the matter, though a busy man, stopped and explained to me the process of dividing the roots.

That was forty years ago, but from that day to this I have watched with ever increasing interest the growth and handling of peonies. I was but a small boy then, but I remember my father gave me his big pruning knife, and under his guidance I divided my first peony. And I thought I had done fairly well, for he patted me on the head and said it was well done and that some day I would make a nurseryman.

The peony industry as far as the West was concerned was in its infancy then. We had few varieties—peony buyers had not yet become critical. I can remember of but four sorts: the white variety, Whitleyii, now called Queen Victoria; the red Pottsii and the two pinks, Fragrans and Humeii. Peonies were then sold as red peonies, white peonies and pink peonies, and that was all there was to it, and the customer felt very lucky if he got the color he ordered.

But a wonderful change came over the industry along in the nineties. Some of the better varieties had worked west in different ways, and people began to waken to the fact that there were more than simply red peonies, white peonies and pink peonies. Such varieties as Festiva Maxima, Edulis Superba, Marie Lemoine, Eugene Verdier and the like came to us. Flower lovers slowly began to realize that the old, despised "piny" of mother's garden was a thing of the past, and that here in its stead we had a glorious and beautiful flower. And as the better varieties have continued to come from year to year, the interest in the flower has continued to increase until now I think I am safe in saying that in the colder portion of our country at least, and in our own state in particular, the interest manifested in the peony is greater than that taken in any other flower.

And it is of this modern peony that I am asked to tell you—of its cultivation and care, how it is multiplied and how the new sorts are produced.

Right here at the start I wish to correct an erroneous impression about the peony that has been spread broadcast throughout the land by means of not too carefully edited catalogues and misinformed salesmen.

We often hear an agent say or we read in some catalogue, "When you have the peony planted all is done." Now this is not true. It comes a long ways from being true. I think the very results which the following out of this belief have brought about are accountable for the production of more poor peonies than all other causes put together.

The peony, it is true, will stand more abuse than any other flower you can name and still give fairly good results, but if you want good peonies you must take good care of them.

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The planting season opens about the first of September in Minnesota—probably the middle of the month is safer—and it continues right up to the freeze-up in the fall and up to the middle of May in the spring. We have lifted peonies that have grown a foot in the spring, packed them carefully, shipped them to middle Wisconsin, and in the fall had the shipment reported as having done splendidly. September planted roots will bloom the following season. After that there is little choice between fall and spring planting.

The peony root will stand lots of abuse after being thoroughly ripe, but still it is best to handle it with care. Keep it fresh and plump until planted. If accidentally it becomes shriveled, immerse for twenty-four hours in a pail of water. This will revive it. Remove from the water and plant immediately. The roots should be planted with the tops of the buds from two to three inches below the surface—not more than three inches at the most.

Many times you will notice that you have a nice, thrifty looking plant, but that it does not bloom. Nine times out of ten if you examine into the matter you will find that your plant was set from six to eight inches deep—and this is why it didn't bloom. Another cause of peonies not blooming is their being planted in lawns where the soil is impoverished by the roots of large trees.

The common method of propagation of established varieties is by division. Grafting is resorted to by professionals in some instances, but that does not interest us here.

The peony will do well in any well drained soil, though a rich sandy loam is the best. It will give splendid results in heavy clay if well cultivated and if at the blooming season in case of drouth the plants are well watered.

Of all soils a sandy one is the poorest for the production of bloom, although, on the contrary, for the rapid production of roots the lighter soils are ideal. Such soils not only produce roots much more rapidly than the heavier soils, but produce a root that divides easier and to better advantage. But it is with the cultivation of the plant that we are most interested.

As I have said before, no plant will stand more abuse than the peony and still give fairly good results, but if given a good soil and then good cultivation we have no flower that will give us more satisfaction for the care we give it.

When grown in large numbers peonies should be planted, if possible, so that the plants can be cultivated with a horse. Deep cultivation seems to bring the best flowers. Where we can give horse cultivation we start the cultivator just as early in the spring as we can. As a rule we start by the middle of April and keep it going through the plants once a week at least, and oftener if necessary, right up to the time when the buds start to open. Cultivation here ceases until the blooming season is over and is then resumed often enough to destroy all weeds up to the first of August. We use one and two-horse

cultivators and run the shovels to within three or four inches of the plants and two to three inches deep.

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But few of us can cultivate in this way. Field cultivating methods are hard to apply to the lawn and garden. But we may get the same results in other ways. Clumps of peonies on the lawn should be so planted that a cultivated space encircling the plant at least a foot wide is left. This space should be covered in the fall with a mulch of well rotted barnyard manure which should be forked or spaded into the soil in the spring. And the soil about the plant should be thoroughly forked over, to a depth of two to four inches, three or four times before the blooming season.

Where the plants are planted in borders and beds in the garden, mulch and cultivate in the same way, stirring the soil all about and between the plants. Care should be taken in applying the manure mulch not to get it directly over the plant if the tops have been cut back. The stems are hollow as they die out in the fall, and thawing snow and occasional rains of winter leach the strength out of the manure, and this filters down through these hollow stems and comes in contact with the roots and rots them.

For the sake of protection the peony needs no winter mulch. For this latitude it is perfectly hardy.

After the blooming season cut all the blossom stems back to the leaves for looks. Do not cut the leaf stalk back until about the middle of September. By that time the plant is dormant, and all top growth can be removed with perfect safety.

Most of us are willing to spend this time and labor if we get results and to get the best results with peonies we must have good varieties. Of named peonies there are somewhere in the neighborhood of 2,000 varieties. Large collections now catalogue all the way from 250 to 500 sorts. From such collections it is hard for those not thoroughly familiar with the merits of the varieties to make an intelligent selection of moderate priced peonies for a small planting. For people so situated I make the following suggestion of varieties:

White: Candissima, Festiva Maxima, Duchess de Nemours, Duke of Wellington, Couronne d'Or, Queen Victoria, Avalanche, Madam de Verneville, Mons Dupont, Marie Lemoine.

Pink: Edulis Superba, Model de Perfection, Monsieur Jules Elie, Livingston, Mathilde de Roseneck, Alexander Dumas.

Light Pink: Eugene Verdier, Delicatissima, Marguerite Gerard, Dorchester Eugene Verdier.

Red: Richard Carvel, Felix Crousse, Meissonier, Rachel, Delachii, Purpurea Superba and Rubra Superba.

So much for the old peonies. Now to the new ones. And the question naturally comes, why any new ones? With over 2,000 varieties shouldn't we be satisfied? No! Many of the varieties catalogued might be eliminated, and we should be the gainer thereby. I believe I am safe in saying that if the present list were cut down to 300 sorts it would cover all the varieties worth while. And there is such a great chance for improvement! So many beautiful varieties coming to us of late years beckon us on. Crousse, Dessert and Lemoine have set the pace, and we of America will not be left behind.

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[Illustration: Looking up the rows of a bed of our seedlings three years after transplanting. The white variety in the centre of the picture is Frances Willard, considered by us one of the world's best whites. At the time this picture was taken, the flowers were just opening, so one gets no idea of the size of the blooms after they open.]

Either eighteen or nineteen years ago my father definitely set about the bringing forth of a line of new peonies. For years he had been experimenting with seedling apples. His immense collection of peonies gave him the idea of producing something better along that line. A great bed was planted out from which to collect seed. Hundreds of the best varieties obtainable were planted in this bed, two of each variety, with a very liberal use of the three varieties, Edulis Superba, Fragrans and Triumph de l'Ex. de Lille. Some twelve varieties of the most vigorous singles of all colors were also used. Bees and the elements were allowed to do the cross-fertilizing. In the fall of 1899 the first seed, amounting in all to about a peck, was harvested and planted. This seed was allowed to dry and was planted just before it froze up, directly into the field where the plants were to remain and bloom.

The seed was planted about two inches deep, in rows two feet apart, with the seeds six inches apart in the row. Immediately after the ground froze a two-inch mulch of coarse slough hay was spread all over the field. This was removed in the spring and the field kept perfectly clean that season by hand weeding, as cultivation could not be practiced. No seed germinated that year. That fall the ground was again mulched, and this mulch removed early the next, or second, spring.

This second season just as soon as nature began to quicken the little peonies began to pierce the soil. Standing at one end of the field and looking down the rows one could fairly see the little fellows burst forth from their long confinement and thrust their little red heads in serried ranks through the brown earth. They reminded one of line upon line of miniature red-coated soldiers on parade.

A fourteen-tooth Planet Jr. horse cultivator was immediately started amongst them, and intense cultivation given the bed that season. By the end of the growing season the little plants were from two to four inches high.

The next spring, the third from the planting of the seed, the young plants burst through the ground strong and robust. Cultivation was started immediately, as during the season before, and the plants made rapid growth. By the middle of May, most of them were eight inches high with an abundance of foliage.

We noticed a few buds appear this season. The strong, vigorous development of the buds, of one plant in particular, continued to claim our attention, and we watched it with intense interest. Day by day the buds grew larger, and then finally a day came when the first petal lifted, and the next morning the petals spread forth in all their glory. It was

a gem, we realized we had something first class. My father said after he had studied it a while, “It pays me for all my time, and money, and work. If I never get another as good I shall be satisfied.” It was a beautiful dark red, very early, as good a red as Terry’s Rachel. We named it Richard Carvel.

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Six other plants bloomed that season. One was of the Japanese type. The others singles.

By the next spring the small plants were well established, and we knew by their vigorous growth that we might expect the most of them to bloom that season.

Thorough cultivation was given from the start, and by the middle of May the bed was covered with a mass of buds. June came. The blooming season was at hand. Slowly the buds began to show color. Here and there over the field a petal began to lift. A short space of anxious waiting, and then a day came when it seemed as if the bed had been touched by a hand of magic, for from one end to the other it was one solid blaze of color. Before us were thousands upon thousands of flowers and no two alike.

As quick as the flowers began to open we started to grade and mark them. It took two men working steadily for a week to inspect and mark this bed. Everything that looked choice was marked No. 1. Everything that looked as though it stood a chance of coming choice, if given a better chance, was marked No. 2. All other doubles were marked double with their color. And all singles were marked single with their color.

When the digging season came those marked Nos. 1 and 2 were lifted and divided and each planted in a bed specially prepared for them. Each sort was staked. These plants were set in rows three and one-half feet apart and three feet apart in the row.

Intense cultivation was given them for three years. The performance of each sort was recorded for each year. At the end of the third year those sorts which had come good two years out of the three were again lifted and planted in another soil and watched closely for another period of three years. This gave us a pretty definite knowledge of their behavior, made us acquainted with them. It toned down, as I might say, the enthusiasm with which we first selected them, allowed of our making careful comparison with the best sorts, and finally enabled us to keep what were really choice. We did not have any need for the others.

Of the ones first selected as No. 1 from the seed bed, about thirty-five in number, we finally kept eight; of those marked No. 2, about sixty. We afterwards selected two as first class.

Those plants simply marked double in the seed bed were planted in a regular field bed by themselves. Each plant was divided and staked. This bed was allowed to stand three years and the plants were carefully noted each year as they bloomed for varieties that we might have accidentally overlooked in the seed bed. Among these thousands of plants we found two sorts which we called first class. One of these, though it is sixteen years since the seed was planted, we are just about to send out.

I have given you the history of this single bed because it shows about how the seedling peony must be handled. We have since varied our method in handling in a single respect. We no longer plant our seed direct in the field. We find it much better to plant broadcast in seed beds. These are much more economical to keep clean the first year. After the little seedlings are one year old or, better, after they are two years old, we lift them in September and plant them in a permanent bed.

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[Illustration: Our seedling Harriet Farnsley, a very late all one color pink. This variety is in bloom at the same time as Richardson's Rubra Grandiflora, at a time when most good peonies are gone. The flower from which this photo was taken measured seven inches across.]

Now if any of you are tempted to grow peonies from seed let me warn you not to get too enthusiastic in anticipating results. The chances are that 999 out of every 1,000 will have to be discarded. Test thoroughly before you decide to keep. The flower my father and I both decided our best when it first bloomed we no longer keep. Our best flower is one we took no particular notice of the first two years it blossomed.

But do not let me discourage you. Though eight or ten choice varieties may seem small returns, still there is a pleasure in the work that you cannot fail but feel. And when you go forth into your fields after your stocks of better sorts have increased so that you can have each kind blooming about you in long rows, and as you see first this beautiful variety and then that come into bloom, you feel well repaid for the years of waiting and the labor you have bestowed upon them.

Mr. Brand: A great many people ask the question whether just as soon as the peony has blossomed they cannot cut the top off. It would be a great mistake to do so. Your peony growth does not complete its development until about the middle of September, and if you cut the top off just as soon as the plant has blossomed you are going to have a great many of them rot. We had a very striking illustration of this two years ago. Just as our peony season was closing we had a severe hailstorm which cut our peony beds right off down to the ground. We couldn't save the tops if we had wanted to. That fall when we dug our roots it was almost impossible to fill our orders, because the roots were in such terrible shape. The tops were removed before they ought to have been.

Talking about disappointments with peonies, I think the peony I was most impressed with of all the seedlings we have had came good but once. That was eleven or twelve years ago. As I look back upon it I think this was the most beautiful flower we ever grew, but it never came good but that once. I was so impressed with its beauty that I took it from where it bloomed in the seedbed and planted it at my house in the garden. When it came on to bloom, it was a disappointment and has been such ever since. I still keep it, hoping that some year it may bloom again as it did that first year.

Mr. Harrison: Not a bit of it. They are the most lying vegetable on the face of the earth. May I ask if Mr. Peterson, of Chicago, is here? He is an expert peony man. I presume we will all like to hear from him.

Mr. Peterson: I haven't anything to add; if you want to ask questions I will be glad to answer them.

The President: Ladies and gentlemen, you probably know that Mr. Peterson is one of the expert peony men of the United States. In fact, as far as fifteen years back we were able to get some of the newer and better varieties from this gentleman. I never had the pleasure of meeting him, but we want to meet you, Mr. Peterson. You have all heard of Mr. Peterson, the peony man of Chicago and a life member of this society. (Applause.)

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Mr. Peterson: I have nothing to add. I have been in the game a good many years. We have systematically kept track of over three hundred varieties since 1888, so that it may be if you have any questions to ask I might be able to answer them, and I would be glad to. The proposition that Mr. Brand has stated is actually within the facts. We have raised thousands of seedlings, and not one of them do we now grow. You see some of the Peterson seedlings listed in other people's catalogues, but I don't have one myself.

A Member: What kind of varieties would you suggest for the ordinary home garden, best dozen varieties?

Mr. Peterson: I would name for the white peonies, the Madam de Verneville, Avalanche, Couronnes d'Or; of the pale pink, Delicatissima, Marie Crousse, Grandiflora; of the red, Monsieur Martin Cohuzac, Monsieur Krelage, Felix Crousse; of the deep pink, Modeste Guerin, M. Jules Elie and Claire Dubois. I do think that Mr. Brand has some of exceptional merit that will probably be put in the red class. I don't know his others, but Felix Crousse is undoubtedly the best of its type in the red.

A Member: Have you tried out the Baroness Schroeder?

Mr. Peterson: I surely have. It is very fine, but it is a little changeable, not only in its habits but in its shade. If you want a perfect white, it isn't that, it is a nearly flesh white. I would say that the Madame Emile Lemoine is finer.

A Member: Do you advise spraying for them?

Mr. Peterson: No, but I tell you what was asked of me today, which is the secret of having no disease in our plants. Any two-year-old plant in our field that doesn't bloom, we dig it up and throw it away, and that will nip any trouble in the bud, and then you will not get any strain that is not blooming. If we see any other defect, any that won't head good, we take it up and throw it away. That one point I think all of you can well follow, and that is, to dig up every two-year-old plant that doesn't bloom and throw it away, that is, during the blooming season.

Mr. Harrison: Some varieties will bloom and some won't. You have got to punish the whole on account of the few?

Mr. Peterson: I do that. If I have a two-year-old plant that is blooming in a section I keep it and follow it up.

Mr. Harrison: Any special rule about multiplying or dividing?

Mr. Peterson: No, except to divide in September, even possibly the last week of August, and the earlier they are divided at that time when the eyes are large, the better it is.

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CAN FRUIT WITHOUT SUGAR.—*Canning Specialists Say Boiling Water May Be Used Instead of Sirup.* Fruit for use in pies or salads or as stewed fruit can be put up or canned without the use of any sugar at all, according to the canning specialists of the department. They, therefore, advise those who, because of the high price of sugar, have been thinking of reducing the amount of fruit they put up to can as much of their surplus as possible by the use of boiling water when sugar sirup is beyond their means. Any fruit, they say, may be successfully sterilized and retained in the pack by simply adding boiling water instead of the hot sirup. The use of sugar, of course, is desirable in the canning of all kinds of fruits and makes a better and ready sweetened product. Moreover, most of the fruits when canned in water alone do not retain their natural flavor, texture and color as well as fruit put up in sirup. Fruit canned without sugar to be used for sauces or desserts must be sweetened.

Fruit Retail Methods and Costs.

CLARENCE W. MOOMAW AND M.M. STEWART, FRUIT AND PRODUCE MARKETERS,
PORTLAND, OREGON.

On studying the various phases of city apple marketing, special attention was given to retail methods and costs. The purpose of this study was chiefly to learn whether the wholesale supply controls the price. The cost of operation as a factor in determining retail prices also was investigated as far as possible.

Retail apple distributors may be classed as follows:

(a) Fruit-stand vendors.

(b) Fancy grocers, fruiterers, *etc*., catering almost exclusively to high-class or fashionable trade and doing a very extensive credit business.

(c) Grocers catering to a cheaper class of trade, largely upon a cash basis.

(d) Hucksters or street peddlers.

Relatively high prices were charged for apples purchased at fruit stands. Extra fancy Northwestern and Colorado Jonathans were sold to the dealers during October and November at prices ranging from $1 to $1.25 per box. Apples which grade 150 to the box retailed at two for five cents, or $3.75 per box. This meant a gross profit of about 250 per cent. In the ninety-six size, extra fancy Jonathans sold at three for ten cents, or $3.20 per box, showing a gross profit of about 200 per cent.

In the East Side tenement section of New York City it was learned that by reason of the cheap prices prevailing and the heavy supply of apples arriving the peddlers were operating to the detriment of fruit stands. The fruit-stand dealers were selling only about

one-third to one-half the quantity of fruit handled in former seasons. The pushcart and wagon peddlers as a rule buy packed or loose fruit cheap and go direct to the homes of the residents, selling at prices considerably below the fruit-stand men. The peddlers handle a large quantity, make quick cash sales, and pay no rents. Other dealers incur heavy operating expenses and generally sell not for the purpose of moving a large quantity, but for the highest price obtainable. Consequently, the movement is restricted.

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The largest profits were found usually in barreled apples. For instance, New York B grade, two inches minimum, approximately 600 apples to the barrel, sold for a cent each or $6 per barrel. These apples cost the retail dealer not over $2 per barrel delivered to his store, allowance being made for jobber's profit and drayage. The investigator saw "A grade" fruit, 2-1/2 inches minimum, averaging about 400 apples per barrel, which cost the retailer not over $3, being displayed for sale at two for five cents, or $11.25 per barrel. Such prices prevailed at no less than twenty-five retail stores visited in one day. Apples were being offered for sale at retail all over New York City at prices ranging from one cent each at the cheap corner fruit stands, to fifty cents and eighty cents per dozen at the fanciest fruit stores.

In general, it may be said that the gross profits of fruit-stand vendors range from 100 to 250 per cent. Operating expenses other than rent in most cities except New York are not relatively high and all sales are on a strictly cash basis; hence the net profits on good fruit are large.

Grocers catering to high-class trade buy only the best apples. Extra fancy Jonathans, Grimes, *etc*., preferably 138's and 150's size, were purchased at $1 to $1.25 per box. These apples were taken from the box and repacked in small splint trays similar to the peach basket used in a six-basket carrier. Each box of apples filled approximately ten trays. Each tray sold for thirty cents; hence the box brought $3, representing a gross profit of about $1.75. Extra fancy Delicious and Winter Banana, 72's size, purchased at $2 per box, retailed at five cents each, or $3.60 per box. Other sizes and varieties brought corresponding prices. No attempt was made by this class of grocers to stimulate consumption by temporarily reducing prices.

The retail prices quoted above were maintained consistently throughout the 1914 season, regardless of prevailing jobbing prices. The large margins charged by the retailers, for the most part, were due apparently to the small amount of business handled, the perishable nature of the commodity, and the cost of operation.

An elaborate and efficient delivery service must be maintained by the grocers, and many small deliveries are made each day at an actual loss to the dealer. A large proportion of the grocery-store patrons buy on credit and pay when it becomes convenient. Many of these accounts are never paid. Hence it becomes apparent that the good customer who pays his bill regularly each week, or who pays cash, must suffer for the shortcomings of others. However, there can be little doubt that reducing prices would materially increase consumption and in the end result in equally good profits for the dealers. Reduced prices and better business practice should prove to be very beneficial to grower, dealer and consumer.

The profits derived from the sale of cheaper grades of apples to the poorer class of consumers are not so large. It was learned that those catering to such trade operated on a margin of 75 to 100 per cent. of the purchase price.

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Raspberries.

F. C. ERKEL, FRUIT GROWER, ROCKFORD.

Raspberries are so easily grown it is surprising we do not find more farmers and back lot gardeners in the city giving them attention. I believe more people would raise raspberries if they could be made to realize what great returns they would receive for a little work and care. As a commercial proposition raspberries are the poor man's friend, yielding large returns with very small investment and requiring but little land.

I will attempt to give a few essentials in raspberry culture without going into detail, with the hopes that at least a few more patches of raspberries may be planted as a result of my effort. With the main points of raspberry culture given, there is no reason why any one with ordinary intelligence can not solve the details and meet with success.

Raspberries have a little advantage over strawberries with the man who is not greatly enthused over small fruit culture. When once established the plantings do not have to be renewed annually but with ordinary care will last several years, in fact they will stand more Junegrass sod and weeds and general neglect and still produce results than anything else I know of unless it is apple trees.

Another point in favor of raspberries over strawberries is that it is not quite so hard on the back to pick them, and when large quantities are grown it is easier to get pickers.

Red raspberries will succeed on most any kind of soil so long as it is kept reasonably well fertilized and supplied with humus. They prefer a moist loam, and a northern slope is preferable to a southern slope because not so quickly affected by drought. Good drainage is necessary, and if planted on low ground where water is liable to stand at any time the ground should be tiled or otherwise drained.

Raspberries may be planted either in the fall or spring, or the plants may be dug in the fall, heeled in outside, covered with mulch, or they may be stored in the cellar and planted in spring.

Plants bought from a nursery in the spring should be unpacked immediately on arrival, the roots dipped in thin mud, then heeled in until permanently planted, even if the delay is but a day or two.

The tops of the plants should be cut, leaving but a few inches, and if any blossoms appear the first season it would be better to remove them to prevent fruiting. It would be expecting too much of a newly transplanted plant to make much of any growth and produce fruit the same season. If allowed to fruit the first season but little fruit could be expected at best, and it would leave the plant dwarfed if indeed it were not killed outright.

The suckers that come up the first season will produce the next season's crop, after which they die down and should be removed, other suckers taking their places annually. Not over two or three suckers should be allowed to each plant the first year; after the first year leave five to eight in each hill, depending on the kind of soil, fertility, *etc*.

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When plants are cheap and plentiful it is customary to use two in each hill to insure a good stand the first year, but it is reasonable to expect, however, where there are two root systems in each hill instead of one that in after years there would be more troublesome suckers to remove than if there was but one root in each hill, and this is no small matter with some varieties.

To obtain planting stock large clusters of roots may be divided to propagate from, but these usually have but few fibrous roots and are not as good as first year's growth suckers, springing from roots near the parent plant. Red raspberries may also be propagated from root cuttings or even from seeds, the latter not coming true to variety, however.

Plantings should preferably be made on ground plowed the fall previous, but spring plowed ground will answer if thoroughly disced, harrowed and planked and then repeated, to make the ground firm.

If the ground is poor add a liberal dressing of well decayed barnyard dressing before plowing, or if not well decayed wait until after planting to apply the manure. Future cultivations will mix the dressing with the surface soil where the roots will be able to reach it, since raspberry plants are close surface feeders, and for this reason all cultivations should be shallow after the root system has formed.

When the matted row system of planting is adopted, the late Prof. Green advised using a heavy mulch for two feet on each side of the rows to preserve moisture and discourage weed growth close to the plants, cultivating only a strip through the middle.

Raspberries may be planted in rows five or six feet apart to allow cultivation both ways, or in rows seven feet apart with plants two or three feet apart in the rows with the idea of allowing a matted row and cultivating but one way after the first season.

The matted row is hardly to be recommended unless one is willing to use a hoe rather freely to keep the plants free from weeds where the cultivator can not reach them, or unless he can provide a good, deep mulch to discourage weed growth.

Rows should preferably run north and south, so the fruit will be shaded during the middle of the day, but this is not absolutely necessary.

In setting the plants place them just a little deeper than they grew originally, carry them to the field in pails of water or thin mud, avoiding exposure of the roots to the air unprotected, but do not use water in the holes unless the ground is extremely dry. Firm the ground well close to the plant, and cultivate between rows all summer to preserve moisture, whether weeds are troublesome or not, up to September 1st and be sure to cultivate shallow after the roots begin to occupy the ground.

Hills that grow exceedingly tall and rank may be cut back to about two and a half feet in height in the spring, or if one is willing to take the trouble to pinch off the end of the plants at this height during the growing season they will get bushy plants better able to hold up a load of fruit—besides cutting back has a tendency to produce larger fruit.

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We only grow two varieties of red raspberries, both of which are perfectly hardy without winter covering, so we have no suggestions to make or experiences to relate regarding winter protection. I am afraid I would be tempted to quit the business if I had to cover our raspberry bushes for winter protection. I think it would be as big a task as all the rest of the work combined except picking, and I let some one else do that part.

For a home garden it is even more desirable to select a variety that is hardy without winter covering than when grown in a commercial way, for this is one of the tasks that is liable to be neglected unless one makes a business of it.

In choosing a variety the other qualities to look for besides hardiness without winter covering are size, color, flavor, prolificacy and good shipping qualities.

We are located only twenty-five miles northwest of Minneapolis, and one would naturally suppose we would market our berries there, but we get better prices in towns along the Soo railroad in western Minnesota and the Dakotas.

Although our berries are a variety that crumble unless left on the bushes until ripe they do not spoil readily, which is probably due to the fact they are quite acid, and we ship to points in North Dakota nearly as far west as Chicago is east of us with very little loss. Wherever our berries have been introduced they have made friends, and there is hardly ever a time that we do not have standing orders for two or three times as many berries as we can furnish.

We usually ship in flat cases, two boxes deep, twenty-four pints to a crate, which brought us $2.00, $2.25 and $2.50 per crate net, f.o.b. shipping point.

There is but one other berry grower near us, so we do not have much difficulty in getting pickers. The first year we built a couple of small cottages to accommodate people from the city who might care to combine berry picking with a few days' outing, and it was surprising what a good class this proposition appealed to, but we now have enough local pickers to care for our crop.

The profits in raspberry culture vary all the way from little or nothing above cost of production up to several hundred dollars per acre, depending on the season and how well cared for.

Whether raspberry culture is a money making proposition or not in a commercial way, there certainly is no good reason why every farm or city garden should not have at least a few hills of raspberries for home use. Even leaving the matter of cost out of the question, there is a difference between fruit just off the bushes and that which has stood around in hot, dusty places several hours or longer waiting for a purchaser. Try it and be convinced!

* * * * *

TO INOCULATE SEED.—Coating the seed of legumes with inoculated soil before planting is a simple method of insuring soil inoculation at slight cost. County agents in Illinois have found ordinary furniture glue effective in holding particles of inoculated soil to the seeds. This method gives each individual seed some of the particles of inoculated soil, which it carries with it when it is planted. The scheme requires but a small amount of inoculated soil and costs but a few cents an acre. The method is described in Farmers' Bulletin 704 of the U.S. Department of Agriculture.

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Dissolve two handfuls of furniture glue for every gallon of boiling water and allow the solution to cool. Put the seed in a washtub and then sprinkle enough of the solution on the seed to moisten but not to wet it (one quart per bushel is sufficient) and stir the mixture thoroughly until all the seed are moistened.

Secure the inoculated soil from a place where the same kind of plants as the seed are growing, making sure that the roots have a vigorous development of nodules. Dry the soil in the shade, preferably in the barn or basement, and pulverize it thoroughly into a dust. Scatter this dust over the moistened seed, using from one half to one gallon of dirt for each bushel of seed, mixing thoroughly until the seed no longer stick together. The seed are then ready to sow.

The Flower Garden.

(AN EXERCISE LED BY G. C. HAWKINS, FLORIST, MINNEAPOLIS, AT THE 1915 ANNUAL MEETING.)

Mr. Hawkins: We have a question box and I would be glad to have any one use it or rise and state their question. I will answer, giving my experience.

The first question I will read is—“What would you advise about covering in the garden in a season like this?” There are now two questions to be answered. First, what kind of covering? Second, how much?

The first question can be answered this way. Every garden is benefited by a good covering of well decayed manure. Second. Any light covering of straw or horse manure with plenty of straw in it is very good. Leaves make a good covering if they can be kept dry, but leaves when not covered get wet, pack down over a plant and too often do more damage than good. The advantage of covering, or mulching, is to prevent thawing and freezing. To keep plants frozen from fall until spring would be ideal. The ideal winter is one when the snow falls early and stays on during the winter. We should cover lightly the plants that need protection, and when the snow falls, as a warm blanket, the plants will come through the winter in perfect shape.

Mr. Hawkins: We have a question box and would be glad to have any one use it, or rise and ask your question, and we will endeavor to answer it and give our experience along that line.

Mr. Horton: What would you advise for plants that are infected with aphis?

Mr. Hawkins: Spraying is one of the best things and for that we use a weak tobacco solution, so as to moisten the plants, a light mist will do the work. I want to tell a little experience in growing peonies. Last year I tried the experiment of using ground bone around them, which is one of the best fertilizers we have. It contains nearly all the

elements of a perfect fertilizer. Just as soon as the little joints come out of the ground, dig a trench about three inches from the main bush, about two inches deep and fill with ground bone and watch the result. I carried this plan out with wonderful success, getting 350 perfect blossoms on twenty-five bushes. It takes bone about thirty days to commence to dissolve. The day of the automobile has brought need for a new fertilizer, and we must carefully select the best that can be had. We must turn back again to the green crops and the artificial fertilizers. This also works well with roses.

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Mr. Reckstrom: Would bone do that was bought for the chickens?

Mr. Hawkins: Yes. You understand the finer the particles the quicker it commences to dissolve.

A Member: Where can ground bone be obtained?

Mr. Hawkins: All first class seedsmen have it from small packages of ten pounds to 100 pound sacks.

Mr. Bell: I tried hardwood ashes, and that seemed to be the best thing I struck. There were some shrub lilacs that didn't blossom. One winter I just put the ashes right on, probably a bushel around the one large bush. After that I had plenty of blossoms. On peonies and roses the result seems to be very good.

[Illustration: Residence of G. C. Hawkins, 2913 Fremont Avenue South, Minneapolis.]

Mr. Hawkins: No question but what ashes are very fine, for the simple reason the potash in hardwood ashes is a very good fertilizer. I would like to ask some one to give his experience in regard to rust on the tiger lily and the phlox. The perennial phlox is one of the most beautiful flowers we have, and there has been considerable trouble this year with a rust which takes all the leaves off the stalk and is injurious to the blossoms. I did not find any successful remedy for it, and I would be very glad if some member would give his experience.

Mrs. Sawyer: I think you will find bordeaux mixture is good as anything for the rust on phlox. There is another mixture given for use in the English gardens, but their conditions are not the same as ours. It seems that changing the location of the phlox may do it good. Phlox is a plant that wants free circulation of air. Sometimes they get crowded in the garden, and a combination of heat and moisture produces the rust. By changing them to some other ground sometimes it entirely disappears.

Mr. Hawkins: Mrs. Sawyer thinks this would be a remedy, as they require a circulation of fresh air and keep down moisture. We know this, phlox should be divided every third year. If you lift some you will find in the middle a woody dry substance absolutely detrimental to a large, healthy growing phlox. If you take off the little plants that come at the outside of this and replant them you will find your flowers will be much larger the next year. If we leave bunches of phlox in the same place successive years they become small. If you separate them it will add vigor to your plant, and the flowers will do better. I would like to ask what success you have had with growing tritoma, the flame flower? Have you had any difficulty in raising them?

Mrs. Tillotson: I have one blossom that seemed to take such a long time to get above the ground I wondered what was the matter with it.

Mr. Hawkins: Mrs. Gould, can you give us any enlightenment?

Mrs. Gould: I never raised them, I got some bulbs this year. I know you have to take them up in the winter and store them like gladiolus, and they do not require very heavy soil.

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Mrs. Countryman: Will yucca filamentosa ever blossom in a garden in St. Paul?

Mrs. Sawyer: It will, but it doesn't always. It does blossom in Minnesota, but I know that people have a great deal of difficulty getting blossoms.

Mrs. Countryman: I have five plants growing four years and have never seen a blossom yet.

Mr. Hawkins: I have had two growing three years, and I never have seen the color of a blossom yet.

A Member: What kind is that?

Mr. Hawkins: It is the yucca filamentosa. It is an evergreen. It should throw up a tall stalk with large branches and plenty of white flowers, I think hundreds of flowers—that is the description. It is a beautiful thing in the garden anyway.

Mrs. Countryman: I have seen them in blossom in California.

Mr. Richardson: I have seen them blossom many times in Winnebago.

Mrs. Countryman: Give us the culture instructions.

Mr. Richardson: I grew in nursery rows some odd stuff, had the same culture that the nursery had. But when it blossomed one year I have been told on good authority it would be five years before that stalk would blossom again, only blossoms once in five years, but by having many stalks they don't all blossom at the same time. I have had them two or three years in succession but not on the same stalk.

Mrs. Countryman: Do you cover them winters?

Mr. Richardson: Never.

Mr. Hawkins: I think the only reason why the yucca filamentosa doesn't do well is because it is a plant of the southwest and grows in a warmer climate.

Mrs. Sawyer: I had a varied experience in growing those plants, and I took a great deal of pains to learn all I could from different sources and different people, and I believe our trouble is our late frosts, I think that is conceded by people who have really gone into the question thoroughly. Our late frosts injure them more than anything else. A little protection in the spring is what they need more than protection in winter, and we know that they don't want a wet place.

Mr. Hawkins: I want to recommend a flower that should be very popular. It is perfectly hardy, blossoms for years, the hardy pyrethrum. It is a daisy-like flower, absolutely free

from insects and a sure bloomer. We have plants in the garden that have bloomed six years. It comes in many shades, from white to deep crimson, blooms from the 15th of May to the 1st of July and makes a beautiful showing. In regard to iris, did any one have any trouble with their iris coming a little ahead of time last year and being frozen?

Mrs. Sawyer: I guess they all froze off. I don't think it was because they were ahead of time; it was because of the frost.

Mr. Hawkins: What would you recommend?

Mrs. Sawyer: I don't think there is anything to do in weather like last spring, you can't cover anything away from a hard black frost like that was.

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[Illustration: G. C. Hawkins, of Minneapolis.]

Mr. Hawkins: We have several hundred plants on a southern slope, and I thought perhaps the sun beating against the southern slope is what started them earlier.

Mrs. Sawyer: Ours weren't on a southern slope, pretty near level, rather north than anything else, and they got frozen.

A Member: What causes the rot in the iris?

Mr. Hawkins: That depends upon the kind of iris. With the bulbous rooted iris, the bulb is filled full of water during the heavy rains, and if you add more water to it it simply decays. The Siberian and many of the fibrous rooted iris will stand a great deal of water.

A Member: Does the German?

Mr. Hawkins: The German is a bulbous root. As I said, it takes all the moisture it needs. That is one reason why iris never wilts down in a dry spell. It always looks fresh and green.

A Member: I would like to say it is well not to plant the iris deep. The natural iris will lie almost on top of the ground, and they like to have the sun beat down on them. The iris likes to bask in the sun.

Mr. Hawkins: This would prove to you that the bulb takes enough water to support it and doesn't need any more because it rests on the top and basks in the sun. Has any one tried anything new in the garden that will stand our climate?

Mrs. Norton: I would suggest that hardy alum-root, or heuchera. It is a perfectly hardy perennial, can stand our worst winters without any covering, and it grows about so high from the ground (indicating two or three feet), with its geranium-like leaves, and the flower grows about three feet high, all covered with pink bells on the stems. It is a very decorative plant and perfectly hardy. I think it has been much neglected in the Northwest because it is so perfectly hardy and it increases very rapidly. I have over one hundred.

Mr. Hawkins: I would like Mrs. Gibbs to say a word.

Mrs. Gibbs: The only thing I can say is that I enjoy being around among other people's gardens. I think that is one of the best places to find out things that we want; so many times we buy something that sounds well, but when we have it planted it doesn't look as well. I think one of the best ways is to visit gardens and especially those that use labels.

A Member: I would like to ask about the trollius.

Mr. Hawkins: Has any one had experience in raising trollius?

Mrs. Gould: I have had experience in not raising them. I planted three years, and after getting the seeds from all the seedsmen I discovered in a book on plants that the seed would have to be in the ground two years in order to germinate. I didn't know that and left them in only a few months. I think the only way is to buy the plants. It is a very beautiful plant, yellow and shaped like golden glow, belongs to the same family as the buttercup.

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A Member: I would like to ask about the hollyhocks. I saw such beautiful hollyhocks around Lake Minnetonka and I have never been able to make them winter. I would like to ask about that.

Mr. Hawkins: We have three plants, hollyhocks, digitalis and canterbury bells, and nearly all have the same trouble with them. If we mulch them we are liable to have the center decay and the plants practically useless. It is a question of mulching them too much or not mulching them. I would like to have you speak up and tell us your experience. I have in mind a gentleman who raises splendid hollyhocks in the neighborhood of the lakes. Takes no care of them, and yet he had one this year seventeen feet high, which took care of itself and had any amount of blossoms. I tried that experiment several years myself of mulching them, and the crown rotted. These are three of the best flowers of the garden, and we ought to have some certain way of keeping them.

A Member: Have you ever tried mulching them with corn stalks?

Mr. Hawkins: Yes, I have tried it but lost them.

A Member: I had very good luck with them that way.

A Member: It is more a question of drainage than of mulching.

Mr. Hawkins: That might be.

Mrs. Gould: I wish simply to say that the trouble with winter grown hollyhocks and canterbury bells is that they will head so tall and must be kept dry. I always cover the hollyhocks and if I had the others I think I would cover them. I uncover mine early in the spring, and if it gets cold put on a little more straw. You are almost sure to uncover them the wrong time. With foxgloves I think it is almost unnecessary to cover them.

Mr. Hawkins: In our gardens the hollyhocks form one of the best backgrounds we can have, beautiful, tall, stately stalks, and the canterbury bells, certainly nothing more beautiful than they. Then we come to the other, the digitalis, which is equally as beautiful. We must give our attention to the protection and growth of these in years to come because they are three of the beautiful things of the garden. It has been suggested that digitalis be potted and put inside the cold frame and leaves put over them. I think leaves are a splendid protection if you can keep them dry. If I were using them as a mulch I would keep out the water by covering with roofing paper to keep them dry.

Mrs. Countryman: I am told on good authority that the hollyhock is a true perennial and not a biennial.

Mrs. White: It is listed in the foreign catalogs as both a perennial and a biennial.

Mrs. Countryman: Wouldn't the hollyhock come under the heading of being perennial but not a permanent perennial?

Mr. Hawkins: It might be classed that way. There seems to be a difference of opinion as to just what it is. I have known them to come six or seven years in the same spot.

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TIE TRAP FOR RABBITS.—An inexpensive and permanent sewer tile trap for cottontail rabbits has proved very effective in Kansas. To make the trap, proceed as follows:

“Set a 12 by 6-inch ‘T’ sewer tile with the long end downward, and bury it so that the 6-inch opening at the side is below the surface of the ground. Connect two lengths of 6-inch sewer pipe horizontally with the side opening. Second grade or even broken tile will do. Cover the joints with soil so as to exclude light. Provide a tight removable cover, such as an old harrow disk, for the top of the large tile. The projecting end of the small tile is then surrounded with rocks, brush, or wood, so as to make the hole look inviting to rabbits and encourage them to frequent the den. Rabbits, of course, are free to go in or out of these dens, which should be constructed in promising spots on the farm and in the orchard. A trained dog will locate inhabited dens. The outlet is closed with a disk of wood on a stake, or the dog guards the opening. The cover is lifted and the rabbits captured by hand.

“These traps are especially suitable for open lands and prairies, where rabbits cannot find natural hiding places. They are permanent and cost nothing for repairs from year to year. If it is desired to poison rabbits, the baits may be placed inside these traps, out of the way of domestic animals or birds. This trap also furnishes an excellent means of obtaining rabbits for the table, or even for market.”—U.S. Dept. of Agri.

Blueberry Culture.

U.S. DEPT. OF AGRICULTURE.

Blueberries thrive best on soils which are so acid that they are usually considered almost worthless for ordinary agricultural purposes. Blueberry culture, therefore, offers possibilities of profit to individual land-owners in districts in which the general conditions are especially hard and unpromising. Blueberries can not be grown in ordinary fertile soils.

Although frequently confused, especially in the South and in the Middle West, blueberries and huckleberries are quite distinct. In New England the name “huckleberry” is restricted to berries which contain 10 large seeds with bony coverings like minute peach pits which crackle between the teeth, while the name “blueberry” is applied to various species of berries containing many but very small seeds. It is the latter, not the large-seeded huckleberry, which offers possibilities for profitable culture.

At the present stage of the blueberry industry it is best to begin by transplanting the most promising wild bushes, selecting them for the size, flavor, color and earliness of the berry as well as for the vigor and productiveness of the bush. These plants can be propagated in various ways, which are described in detail in a professional paper of the department, Bulletin No. 334, by Frederick V. Coville. The aim of the cultivator should be to secure bushes which will produce large berries. These cost less to pick than

small ones and bring a higher price on the market. A berry eleven-sixteenths of an inch in diameter has already been produced under field culture.

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The three fundamental requirements for successful blueberry culture are: (1) An acid soil, especially one composed of peat and sand; (2) good drainage and thorough aeration of the surface soil; and (3) permanent but moderate soil moisture. Next in importance to these essentials is a location such that the berries may reach the market without delay. The best prices are obtained about the beginning of the wild blueberry season. The main crop of wild blueberries comes from northern New England, Canada and northern Michigan. A location to the south of these areas where the berries will mature earlier is, therefore, to be desired for the commercial cultivator. One of the most promising districts now known is the cranberry region of New Jersey, where berries mature early and the shipping facilities to the market in Philadelphia, New York and Boston are good.

Another important factor to be considered in selecting a location for a blueberry patch is the possibility of late spring freezes. For this reason the bottoms of valleys should be avoided. Freezing seldom injures the blueberry plant itself, but the fruit crop is often destroyed in this way. From past observations it appears that wild blueberries growing in or around bodies of water frequently escape the injurious effects of late spring freezes, and it seems, therefore, that a flooding equipment for blueberry plantations similar to those used for cranberry bogs may, under certain circumstances, prove commercially advantageous.

At the present time, however, only a beginning has been made in blueberry culture. The yield and profits in field plantations from improved bushes have not as yet been ascertained. There is, however, one small planting in Indiana where complete records have been maintained for the past six years. This plantation was started in 1889 in a natural blueberry bog, which was first drained and then set with wild blueberry bushes transplanted without selection for individual productiveness or size of berries. On this plantation the yield per acre has averaged 1,741 quarts for the past six years. This average would have been somewhat higher except for the almost total failure of the crop in 1910, due to late spring freezes. An average of 14-1/2 cents a quart has been received for the berries and the net profit per acre is estimated at $116 a year. In this estimate allowance has been made for interest, taxes and depreciation. The expense for weeding, cultivation, and irrigation is placed at $20 an acre and the cost of picking at five cents a quart.

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HOMEMADE FIRELESS COOKER.—A wooden or tin pail, lined with two thicknesses of paper and provided with a close-fitting cover, may be used for the outside container of the cooker. Allow for three inches of packing on all sides and at the bottom of the pail. A gallon oyster can will serve very well for the nest, which should be wrapped on the outside next to the packing with asbestos and a piece of asbestos placed under the bottom to prevent the scorching of the packing when hot soapstones are used. Shredded newspaper and excelsior make a good packing. Pack this very tightly around and to the top of the nest, the top of which should be about three inches below the lid of the outside container. A piece of cardboard cut to fit inside the lard can with a circle cut out of the center around the top of the oyster can or nest will hide the packing and make a neat finish. Place a three-inch cushion of unbleached muslin, stuffed tightly with excelsior, on top of the lid of the nest. When the top of the outside container is placed on and hooked down, it will be tight enough to cause a pressure. If a tin pail is used for the outside container, it may be enameled white, or a wooden pail stained brown, making a neat-looking appliance for any kitchen. Regular aluminum fireless-cooker utensils may be used for cooking the food in the nest, but any kind of a vessel with a close-fitting top and one that fits closely in the nest is suitable.—U.S. Dept. Agri.

Hardy Perennials.

MISS GRACE E. KIMBALL, WALTHAM.

There has been very little in my work with hardy perennials that seems worth relating. For many years, in Austin, we had iris, peonies and phlox in our garden. While my love for flowers and outdoor work led me to spend all my time, outside of office hours, in the garden, the iris and peonies, especially, never gave any trouble but grew and blossomed in the most approved fashion. With the phlox we have had more trouble, sometimes in dry seasons not getting the bloom we should, and finally, the last year we were there, losing nearly all the roots we had. I am now inclined to think that had we divided and transplanted them some years before, we would not have lost them.

It was only a few years ago that I began to realize that herbaceous perennials could, with success, be planted in the fall in our climate, and it was not until two years ago that I made any attempt at fall planting. That year I was quite successful, but last year, wishing to divide as close as possible, especially with the iris, I evidently overdid the matter, with the result that I lost many of my plants. However, I learned my lesson, and this year they were not divided so closely, and I am hoping that they will come through the winter all right.

With the hardy perennials easily raised from seed my first experience was with the oriental poppy. I had greatly desired to have some in the garden and, not knowing that the fall was the time to plant them, ordered some one spring. They failed to grow, so the next year I attempted to raise them from seed, starting them in the house as I did my pansy seed. But I was far from successful in that way, and having read some

articles on the difficulty of raising them from seed, also learning that they should be set out in the fall, I made up my mind they were not worth bothering with.

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However, father suggested I might succeed by planting the seed in the shade out of doors, and even though it was quite late in the summer I got more seed and sowed it broadcast in a hedge of lilacs, syringas and so forth, kept the ground moist, and in a short time had many plants coming up. I also had ordered a few to be shipped me in the fall.

By fall my seedlings were large enough to be transplanted into boxes, to be moved as we were moving from Austin to Waltham. With those I had ordered for fall delivery, they were moved to our new place, the boxes sunk in the ground, and the next spring put into a hedge with other plants—for while they do not stand transportation very well in the spring, I have been successful in transplanting them from one part of our grounds to another at that season.

Since coming to Waltham I have started the seeds of the poppy, larkspur, columbine and gaillardia in a grove near the house, where they are easily kept moist. If I get the seed in early in the spring, the plants are often large enough to transplant in the fall. However I like better to plant the seed later, about the time the first blossoms from each variety have ripened their seed. The seedlings will then be large enough to withstand the winter with a little protection and ready for spring transplanting.

With a comparatively small amount of work, and very ordinary care, once the plants are set out anyone can have continuous bloom from early spring until frosts come, by setting iris, peonies, phlox, columbine, poppies, larkspur, gaillardia, giant daisy and painted daisy. Such a selection would make a big variety of color and form in the garden, and all but the first three kinds can be very easily raised from seed. Or not wishing so many kinds, one can have flowers all summer by a careful selection of several varieties of iris, peonies and phlox.

Why Should We Grow Seedling Apples?

ISAAC JOHNSON, WEST UNION, IA.

There is no work in fruit growing that has more taken my attention and given me more pleasure than the growing of seedling apples. For many years I have been of the opinion that apples for this severe climate must be grown from seed. If we succeed in growing hardy, productive and good keeping varieties, they must be native, or raised at home. By experimental work along in this line of growing fruit we have come to this conclusion that fruit trees do best grow at home.

In looking over the list of apples we grow this far north, we all know that the hardiest and the most productive kind are seedlings, either from Minnesota, Iowa or Wisconsin. Minnesota has the Wealthy, the banner apple; for early and late fall apple it has no equal. Wisconsin has the Northwestern Greening and the Wolf River, which are very

large, showy and good market apples. We all know what Mr. Patten has done along in this line of growing seedlings.

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At the state horticultural meeting in Des Moines, December last, was exhibited one hundred varieties of seedlings and a large number of those, to my judgment, were good keepers and fine looking apples. Hundreds and hundreds of varieties of apples have been imported from Russia, and I for one have tested fifty or sixty of those Russian varieties, but at the state meeting, where I exhibited seventy-seven varieties, I was able to show only three Russian varieties, Longfield, Antinovka and Volga Cross. I think I have reason to ask what would we have for apples today if there had not been any seedlings raised? Why does the State of Minnesota offer one thousand dollars for a seedling apple tree that is as hardy as the Duchess with fruit as good as the Wealthy and that keeps as well as the Malinda? Because to get such a variety it must come from seed.

Planting for Color Effects in the Garden.

MRS. H. B. TILLOTSON, MINNEAPOLIS.

The most attractive flower bed in my garden this year has been the one planted for a blue and white effect. From earliest spring, soon after the snow had gone, until now, October 4th, there has been something interesting and beautiful blooming there.

In the middle of the summer it was one tangled mass of lilies, delphinium, phlox and gypsophila, their perfume filling the whole garden. As the lilies faded and the delphinium grew old and went to seed, the old stalks were cut away. The phlox and delphinium bloomed again in a little while, and in September the candidum lilies began to come through the ground, getting ready for next year.

The bed is three feet wide by thirty long, and was covered last winter with loose straw and leaves, with a few cornstalks to hold them in place. Early in April this was raked off and the edges of the bed made straight, for the grass always grows in a little each year. The warm sunshine soon brought out the scilla and crocus, almost carpeting the whole bed. One would not think of the other things hiding under their leaves.

The forget-me-nots began to look green along the edge, and up through the fading crocus and scilla came a few straggling grape hyacinths, blue and white, and one lonely plant of the Virginia cowslip (Mertensia)—more could have been used with good effect, for they too disappear after awhile.

The Virginia cowslip staid in bloom until the forget-me-nots were a mass of blossoms, and the blue Darwin tulips (pink, really, with a blue spot in the bottom of the cup, just back of them) were in all their glory. In the middle of the bed the Madonna lilies, and belladona delphinium had covered the ground with green. In spots the wild violets were in blossom—they had crept in some way from the dirt—I think it had been taken from the woods near by.

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Watching each day, for the friends I knew would soon be coming, I found the first shoots of the hardy phlox, which I knew to be G. Von Losburg and Miss Lingard. Double blue bachelor buttons, self sown, were there, some transplanted to fill in the bare spots, and poppies; I didn't know what color they would be, for the wind and the birds had sown the seed; but the leaves were a beautiful grey-green, and I let them grow. I had almost given up the double baby breath (gypsophila paniculata, fl. pl.), but finally it came all the way down the bed, about every five or six feet, between the delphinium and the phlox. There were perhaps a dozen plants of phlox, a dozen of belladona delphinium and six baby breath through the middle of the bed, and on each side a row of the intense blue Chinese delphinium.

Just outside these, and next to the forget-me-nots and tulips, are the bachelor buttons, and, coming through it all, a hundred candidum lilies, their waxy white blossoms glistening in the sunshine, and the perfume so heavy you knew they were there long before you could see them. The poppies, too, were there; they were double, like a peony, rose-pink with a white edge. I was glad I let them grow, for I don't think I ever saw a more beautiful sight.

I let it all grow and bloom as long as it would, hating to touch it for fear of spoiling all. Finally I was obliged to clear away the old stalks, and it looked rather bare for a time. But I brought some white asters from the reserve garden. The Baron Hulot gladoli were soon in bloom. The phlox sent up tiny shoots for new bloom from the base of each leaf, and the second crop of bachelor buttons came along. White schizanthus along the edge, covered up the old forget-me-nots, and funkia lilies (subcordata) threw up their buds. The delphinium all began to bloom again, the grey-green leaves of the baby breath was still there, and soon my bed was all abloom again and staid so the rest of the summer.

But never did it equal the glory of those first ten days of July.

The Fall-Bearing Strawberries.

CHARLES F. GARDNER, NURSERYMAN, OSAGE, IA.

(SO. MINN. HORT. SOCIETY.)

There are now such excellent varieties of fall bearing strawberries on the market that a person can have no good excuse for not planting some in his garden. Select the ground for the bed where you will get the whole benefit from the rays of the sun. I want no trees, bushes, or tall growing plants of any kind near the bed. The farther away, the better.

The earth should be made quite rich with well rotted compost. I like the plan of preparing the bed a long time before you get ready to set your plants. You can then

work the soil over, time after time, and every time kill a crop of weeds. More plants are set in the spring than any other time, but they will grow and do well if set in midsummer or any time after that up to the middle of October. Get through

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setting in September if you can. If you set later, in October, cover the plants with a slight covering of straw as soon as planted. Then afterwards, when you make a business of covering put on a little more, cover them nicely—but you are liable to kill them if you put on too much. Two inches deep I find to be about the right depth to go through our ordinary winters. I mean two inches after the straw has settled. I think many persons spoil their plants, or at least injure them severely, by putting on too heavy a coat of covering. I will also tell you to beware of using horse-manure as a covering for strawberries. Clean straw or hay is the best of covering. (Fall planting of strawberries not advisable in Minnesota.—Secy.)

Most people do not trim the plants enough before they are set. All fruit stems should be cut off, if there are any, and the most of the old leaves removed, two or three of the youngest leaves on the plant is all that should be left. These will start right off into a vigorous growth, and you will soon have strong, healthy plants. I think it pays to put a small handful of tobacco dust on and around each hill. You can generally get it at your nearest greenhouse—or you can find out there where to send for it. Get enough to put it on two or three times during the early and latter part of summer.

Do not select ground for your new bed that has been in strawberries; take ground that has never had strawberries on, or at least that two or three crops of some kind have been taken from it since it was covered with strawberry vines.

After the plants are set, they should be well firmed; it is absolutely necessary that they should be very solid in the earth. They should not be too deep nor too shallow, one is as bad as the other. The crown buds should be in plain sight, after the ground is firmed and leveled, just in sight and no more. A little temporary hilling will do no harm, but the ground should be kept as level as possible. All cultivation should be shallow so as to not disturb the roots of the plants. This is also a very important item. Just remember that every plant loosened after it is set means death to the plant if it is not reset at once. Cultivate often when the ground is not too wet. Keep your bed entirely free of grass and weeds. This is easily done if all work is done when it should be. The time to kill weeds is when the seed first sprouts; don't wait until the weed plants are an inch or more high; if you do you will never keep them clean, and then you will never have success in your work.

[Illustration: Chas. F. Gardner at work in his everbearing strawberry experiment grounds.]

Cut all fruit stems off as fast as they appear, until your plants get well rooted, and then let them bear as much as they want to. But if some plants set an unusually large number it is well to cut out part of the fruit. If rightly thinned you will increase the yield in quarts.

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If fruit is the main object, after the plants are well located and begin to set fruit for your main crop, they can be mulched with clean straw or hay, carefully tucked up around each hill. This will keep the fruit clean and conserve the moisture in the soil, and you can stop cultivating. If plants are the main object, then you can not use the mulching, but must keep the cultivator going between the rows. Well informed growers of the strawberry plant generally have beds on purpose for fruit in one place, and in another place one to grow plants.

No one will make a success in growing strawberries unless he can learn to detect the rogues that appear from time to time in strawberry patches or in the fields. These rogues are generally plants that have come up from the seed that has been scattered in one way and another over the bed. Berries are stepped on and mashed, other berries are overlooked and rot on the ground, but the seed remain and germinate when the time comes for it in the spring, and some of these plants are not destroyed by cultivation or by hoeing, and soon make trouble for the grower. No seedling will be like the original plants that were first set, and many of them will be strong growing plants, good runners but worthless for fruit. When you set a new lot of plants you get some of these seedlings, and that is how the mixture comes in. I have counted one hundred and fifty seedling plants around one old plant in the spring. Of course the most of these where good tillage is practised are destroyed, but some remain in spite of all you can do unless you pay the very closest attention and learn to distinguish rogues from the true named varieties. All rogues must be kept out if you keep the variety true to name. Of course once in a while a rogue will prove to be a valuable variety, as was the case when Mr. Cooper found the Pan American eighteen years ago, from which our fall varieties owe their parentage. If you want to be successful remember to keep in mind the value of constant selection and keeping your parent stock true to name.

When you first set out your plants, go over them and examine them closely and see that everything is right. Then remember that the first sign of a good fall bearing variety is to see it throw out fruit stalks. You can cut these off, so that the stub of the fruit stem will show that it has sent up a flower stalk. You can see the stub. In this way in a small patch you can easily keep track of them. If some plants do not throw out fruit stems, mark them so you can tell them, and if they pass the season without trying to fruit, you must refrain from setting out any of the runners that appear, or there is liability of trouble. Let such plants alone for another year’s trial. Then if they do no better, dig them up and destroy them. Once in a while they prove to be all right, but often they are worthless.

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Learn to tell a variety by a careful examination of the plant at different times during the season. Fix the general color of the leaf in your mind, its shape and size. Notice whether the fruit stems are long or short, whether the blossoms are above the leaves, in plain sight, or are hidden below. Are there many fruit buds to the stalk, or but few? Are the blossoms pistillate or staminate? Are the petals large or small? Are the stamens long or short? Are the anthers well or poorly formed? They should be plump and well filled before they are ready to open.

Is the receptacle on which the pistils sit well formed and capable of being developed into a perfect berry, or do they look ungainly in shape? Are the petals pure white or slightly crimson? Are there many runners, or few, or none? Do the new runners bear blossoms and fruit? If so, when do they commence to bud and bloom? When do the berries begin to ripen? Notice the size and shape of the fruit, also the color. You can tell much from the taste of the berry. No two varieties taste exactly alike. Some are real sweet and some kinds real sour. Then there are all grades between.

The perfume, or fragrance, of the fruit of the common strawberry when fully ripened under proper conditions of sunlight and moisture has long been esteemed and highly appreciated by mankind in general, and in this respect the fall-bearing strawberry varies greatly. The most of the varieties excel all common kinds as to perfume and that delicate strawberry flavor which nearly everybody loves so well. Once in a while a musk-scented variety is developed, like the Milo on our grounds, which as yet has never been sent out. By paying close attention to these things you can soon learn to distinguish many varieties at any time during the growing season.

In 1898 Mr. Cooper found his seedling which he called the Pan American. From that small beginning there are now many varieties, perhaps thousands, that excel the parent plant, and perhaps a hundred varieties of great value. Some varieties have very superior merit. I will mention a few: Progressive, Peerless, Advance, Danville, Forward, Prince, Will, Milo, Nathaniel, 480, and there are others which might be mentioned. Good reports have reached me of kinds produced at your Horticultural Experiment farm by Prof. Haralson, but I have never tried them. My private opinion is that several kinds I have not mentioned will very soon take a back seat, as the saying is. The best varieties are bound to come to the front.

The best advertisement one can have is the ability to ship thousands of quarts during the whole autumn. This season we shipped 22,565 quarts, mostly sold in pint boxes. They netted us from 12-1/2 to 18 cents per pint. At home we kept them on the market during the whole season at 15 cents per quart. We lost as many as 5,000 quarts by violent storms during the season. It was a fair season for growing plants, but there was too much water to grow the best of fruit.

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Heredity in Gladioli.

G. D. BLACK, GLADIOLUS SPECIALIST, INDEPENDENCE, IA.

(SO. MINN. HORT. SOCIETY.)

As heredity is a comparatively new word, it may be well to define it at the beginning of this paper. Webster says “It is the transmission of mental or physical characteristics or qualities from parent to offspring, the tendency of an organism to reproduce the characteristics of the progenitor.”

Most of the species of gladioli are native in the temperate zone of Southern Africa, where they have grown for so long a time that they will reproduce themselves in a marked degree from seeds.

Some have grown in the moist soils of the valleys for so many generations that they have become adapted to these conditions and will not thrive on the elevated plateaus and mountain slopes. Those which are native in the higher and cooler altitudes will not grow well in the lower lands.

A species or variety becomes acclimated when it is grown in one locality for several successive generations, because it is one of nature’s laws that it takes on new characteristics that improve it for existence there. These characters are changing more or less during each generation on account of environment.

We can not aid nature in strengthening and improving the desirable qualities unless we follow nature’s laws. By crossing two varieties that have certain desirable characters in common we may be able to make these characteristics more dominant.

Much of the crossbreeding of the gladiolus has been done in such an unscientific manner that it is surprising that so much improvement has been made. This improvement is mostly the result of extra care and cultivation, and the selection of the best each generation. In order to retain the benefit of any extra care and cultivation it has to pass on as a heritage to the succeeding generation and is there incorporated among its characteristics. Each generation should be an advance toward the desired ideal.

There is no doubt in my mind that the ruffling and doubling of the petals in flowers that have been under cultivation for several generations is caused by the extra feeding and care that they have received.

Most species of gladioli in their wild state are small and lacking in beauty. Abnormal or freak varieties should not be selected as the best for breeding, because they are usually the result of a violent cross, and are nearly always weak as propagators and sometimes entirely sterile.

Princeps has a very large flower, but the spike is short and only two or three blooms are open at one time. It was originated by Dr. Van Fleet by crossing Mrs. Beecher and Cruentus. Burbank crossed Princeps and America, and quite a number of the seedlings show the markings of Mrs. Beecher, one of their grandparents, but with shorter spikes. In this cross Princeps transmits the undesirable character of short spikes but leaves out the abnormal size of flower, and the best characters of America are lacking. The parentage of America is very much in doubt, as three prominent gladiolus breeders claim the honor of originating it.

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There are many characteristics to be considered when making selections for breeding besides the color and size of the flower. The bulbs of some varieties will stand considerable freezing while other varieties will not. This same characteristic is noticed in the foliage. The severe frost that killed our corn crop on August 30th so impaired Panama, Hiawatha and some others that very few blooms of these varieties opened afterwards. The foliage of some varieties remained green after a temperature of twelve degrees below freezing.

A representative of a Holland bulb growing firm who called on me a few days ago says that Niagara is a very weak grower in Holland and Panama is a very vigorous grower. My experience with these varieties is just the reverse. This seems to show that sometimes the difference in climate may cause certain characters in the plant to act differently—if the Hollander is not mistaken.

A few varieties are sometimes subject to blight and rust. Some are only slightly affected, and many others are entirely blight proof.

There are so many characteristics to be considered by the scientific breeder that it is almost impossible to enumerate them all in this paper.

There is yet a great work to be done in breeding out the undesirable traits and incorporating the improvements which we desire.

Civic Improvement.

MRS. ALBERTSON, PRES. CIVIC IMPROVEMENT LEAGUE, AUSTIN.

This is a subject so broad and so closely connected with “The City Beautiful” one can hardly find a starting point, but we might begin with the one word—civic—which has drawn to itself many minds, much sober thought and from some much hard work.

The fear was widespread that woman would work havoc if she attempted to spell the task, but how needless, for the word civic can be spelled with accuracy from whichever end approached.

What was the beginning of the civic league and the city beautiful? It began at home, where most women’s work begins. To have a beautiful home one must have the right kind of house. To have the beautiful house to make the beautiful home the setting must be made to correspond—so after the house, the lawn; after the lawn, the boulevard. Then the work spread. Streets needed cleaning, unsightly billboards had to be removed, perhaps an adjoining vacant lot had a careless owner whose pride needed pricking. So the need of a civic league grew, and now it has become a vital spark in many cities all over the Union. Minnesota has over thirty civic clubs doing specific work. Is it entirely the work for women? No. Is it entirely the work for men? No. It is a

work for both. It is a work that is very contagious and a contagion that needs no quarantine.

Civic league work envelopes many lines of improvement. Streets and alleys sometimes need to be reported to the proper committee of the city council; the disposal of rubbish and garbage has confronted many civic societies. There is nothing so conducive to unsanitary conditions and so disfiguring to a beautiful street as glimpses and often broad views of alleys and back yards that have become dump piles and garbage receivers.

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Besides the effect on one's love for cleanliness and beauty, it breeds disease—and so public sanitation was added to the civic league work.

In some cities the societies are taking up the work of smoke abatement. I might say that we have a few offending chimneys in our own city beautiful. Every member of the city council should be a member of the civic league, for much more could be done by co-operation. There is great need of the civic improvement league and park board working together, for their aim is one—to make the city beautiful.

The work that gives the most beauty to the city after the good foundation of cleanliness, public sanitation and removal of public nuisances is that done in the parks. I am glad cities are making larger appropriations for parks, and I hope our city will have more in the future, for there are great possibilities of making our city not only a city beautiful, but a most beautiful city. Parks should be well lighted, playgrounds for children are almost a necessity, the river banks should be kept clean—but most of all the natural beauties of a place must be preserved and trees should be planted. Shade is needed as a good background. There is nothing that will enhance a beautiful statue, fountain or other park ornament like a setting of good trees.

If possible to have it there is no more attractive spot in a park than a lily pool. The old idea of laying out parks according to some geometrical pattern is giving way to the development of walk lines of practical use, recognizing both traffic requirements and the desirability of location for numerous park benches. What will lend more charm to a park than a beautiful drive bordered with noble trees leading up to some focal point or opening a way to some particular vista that would otherwise be lost!

The park board should not limit its work to parks alone, but wherever there is a spot, triangle corner or any other kind of available place, there should be planted shrubs or flower beds. They soon become a public pride and cheer many passersby. We have a number of bright spots in our city, beginning in the spring with a beautiful bed of tulips. May another year bring us many more! One forgets the mud and the disagreeable days of spring in watching the bulbs thrust their little pointed noses through the cold earth and the development of the buds until they burst open into a blaze of color, flaunting their gorgeous heads in a farewell to old winter and giving a cheery welcome to the coming summer.

BEE-KEEPER'S COLUMN.

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

If not already done the beekeeper should at once make his final preparations towards a successful wintering of bees. There are several conditions under which the bees winter

well, all of which are more or less understood. The chief of these are a strong colony of young bees, sufficient amount of good stores, and the proper place to keep the bees.

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Bees that were queenless late in the fall or bees that had an old queen who stopped laying very early in the season, will have only few and old bees for wintering and will not have vitality enough to survive. Such colonies should be united with some other good colony or if too far gone they should be destroyed. Weak colonies should be united until they are strong enough to occupy and fill when clustered at least six frames.

The best stores to winter bees on is pure honey capped over. Honey dew will kill the bees in winter. If you have any black honey in your hives you had better remove it and replace with white honey. A ten frame hive ready for winter ought to contain from 35 to 40 pounds of honey. A complete hive if put on a scale should weigh not less than from 50 to 60 pounds. The best way to supply food to the bees is to remove the dry combs and insert next to the cluster full combs of honey. Feeding sugar is a dangerous undertaking, and it should not be resorted to unless necessity compels one to do it, and then feeding should be done early in the season to allow the bees to invert the sugar, cap it over and consume such stores which are not capped over before winter. The hives that winter best are those which contain no uncapped honey in the frames.

For the bulk of beekeepers cellar wintering in Minnesota is to be recommended. The things to be looked after in cellar wintering are: first, that the temperature of the cellar does not go much below 45 degrees, at least not for any length of time. Second, that the entrances are kept open and clear of dead bees and are guarded with four to the inch wire screen against mice. Third, that the moisture generated by the bees does not accumulate on the walls and covers of the hives. This is most essential. Moisture absorbing material should be used in place of a wooden cover, for instance flax board or gunnysacks, or a super filled with shavings over a queen excluder. The bees must have free passage over the top of the frames. We wintered the bees at University Farm without loss by using nothing else but the one inch flax board on top of the hive, which kept the hive positively dry all winter.

Your cellar should be dark, should have some ventilation, and the bees should never be disturbed during their winter sleep. By following these recommendations, you will be delighted to find your bees in the spring in a most flourishing condition for next summer's work.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

After the frosts have killed the *dahlia* foliage the tubers should be dug and stored before the cold becomes so great. They may be injured by it.

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The stems should be cut to about three or four inches of the roots, using a sharp knife, so as to make a clean cut. To the stems attach the label firmly. Loosen the earth about each clump before attempting to lift it, then run the spade or fork as far under it as possible and pry it gently out. In this way the tubes will not be broken or injured where they join the stem, which is the only place where they can make the next season's growth. Most of the soil will drop off as they dry. Lay the roots so that water will not have a chance to collect in the soft hollow stems, or crown rot may trouble you.

A cool, dry shed is a good place in which to cure the roots. Lay them on boards and turn them occasionally so they will dry evenly.

In a week's time they should be ready to store for winter, the best place being a frost-proof cellar. Unless this is very dry, it is best to have boards raised a few inches above the floor on which to lay them. This will allow a current of air to pass under them. If a damp cellar must be used, air slaked lime sprinkled under the boards will help to keep them dry. Cover them a little with dry sand. The best temperature is 40 degrees.

Cannas can be lifted and stored at once. Cut the stems off short, leaving enough to attach the labels to. They keep best if lifted with as much soil about them as possible. The clumps can be set close together, on boards arranged in the same way as for dahlias. They will stand a slightly warmer temperature than dahlias.

Tuberous begonias, unlike dahlias and cannas, should be lifted without cutting the stems. They should be cured in the sun for at least two weeks and during that time turned to dry evenly and kept perfectly dry. A cold frame is a good place in which to do this. When the stems part readily from the bulbs, the latter can be packed in boxes and stored in any dry place where the temperature will not fall below 40 degrees. These are among the tenderest bulbs and should be the first to be lifted.

Gladioli should be lifted with their stems intact, tied in bundles and hung in a dry shed to dry. When thoroughly dry, the stems can be cut off and the bulbs packed in boxes and stored the same as the begonias. They are especially sensitive to heat, and if the air is too dry the bulbs will shrivel and lose much of their vitality.

Montbretias should be lifted out and stored in the same way as the gladioli.

Tuberoses should be lifted with the stems intact and spread out to dry or hung in a dry place. When thoroughly cured, cut off the stems close to the bulb and store in the same way as gladioli.

Caladium, or Elephant's Ears, should be lifted without disturbing the stem or leaves. As the leaves dry they can be removed, but the stem should not be cut near the bulb, as this is the point of growth the following year. They can be stored with the dahlias and cannas and are not apt to shrivel, as the bulb is so large and fleshy.

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Zephyrunthes, summer blooming hyacinths, tritomas, and tigridias should be lifted, cured, and stored in the same manner as gladioli.

All of these are subject to rot, so it is well to examine them occasionally. If any rot is found, remove the affected bulbs, and if those remaining appear damp, dust lightly with air-slaked lime. Flowers of sulphur can also be used to dust them with to prevent this trouble. Should the bulbs be getting too dry, cover with sand. In our climate of extremes, it is necessary to examine them at intervals, and be prompt in the use of a remedy if any of these adverse conditions are discovered.

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NOTICE.

The November meeting of the Garden Flower Society will be held in the Minneapolis Park Board greenhouses, thirty-eighth street and Bryant avenue, November 16, 2:30 p.m. Take Monroe and Bryant car. St. Paul members will transfer from the Selby-Lake at Bryant avenue. This will be a chrysanthemum show, and a talk on hardy chrysanthemums will be given.

SECRETARY'S CORNER

MINNESOTA CROP IMPROVEMENT ASSOCIATION.—Will hold its annual meeting this year at Fairmont on Feb. 21-22-23. The seed growers of Minnesota would be especially interested in this meeting, at which there are to be a number of seed contests, particulars in regard to which are not at hand. They may be secured by addressing the secretary, Prof. C. P. Bull, University Farm, St. Paul, Minn.

THE VEGETABLE GROWERS CONVENTION.—This convention, which is I understand an annual gathering of the vegetable growers of America, was largely attended in Chicago the last week in September. A report received of the meeting indicates an attendance of eight hundred vegetable growers, including two hundred fifty from the vicinity of Chicago. The city entertained them with an inspection trip, throughout Cook County and later a party of them went to Racine and visited the experimental gardens operated by Prof. R. L. Jones, of the Wisconsin University. Perhaps we may have a fuller report of this meeting from some of our Minnesota growers who were in attendance.

THE SOCIAL ELEMENT AT OUR ANNUAL MEETING.—Making the West Hotel the headquarters of the society at the same time that the meeting is held in the building gives an especially good opportunity for renewing and cultivating acquaintance amongst the members in attendance. This was particularly noticeable last year, and without doubt one of the most enjoyable features of the gathering. Placing emphasis upon this,

an additional room has been engaged for the coming meeting on the same floor and adjoining the rooms occupied last year, which will be fitted up especially for a reception room where members and their friends may gather and rest as they visit and talk of the many things of interest connected with our society and its work. A suitable sign will direct members to this reception room, and we anticipate that it will be made use of largely.

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THE PRIZE WINNER IN THE GARDEN AND CANNING CONTEST.—The Horticultural Society is offering $10.00 to pay railroad fare and traveling expenses to attend the annual meeting of our society by the boy or girl making the best record in the state in the “garden and canning contest” carried on by the Minnesota Extension Division. The successful contestant will tell in his or her way how it was that success was secured in the contest. Besides this prize of $10.00 each of the ten boys or girls scoring next highest in this contest will receive an annual membership for 1917 in the State Horticultural Society. The name of the successful contestant is not yet announced.

DELEGATES FROM SISTER SOCIETIES.—Several delegates have been appointed from horticultural societies in adjoining states, notices of which have reached this office.

Mr. D. E. Bingham, of Sturgeon Bay, Wis., is to represent the Wisconsin State Horticultural Society. Mr. Bingham has made fruit growing his life work, a man of large experience, whose services are in demand in that state also as an institute lecturer. We shall have an opportunity to profit by his experience at our meeting, as you will note by consulting the program.

Mr. G. D. Black, of Independence, Ia., is to represent the Northeast Iowa Society. Mr. Black has been with us before and he will find many who recall his presence here in previous years. He is to give us on the program his later experience in connection with the growing of the gladioli, a work to which he has given large attention for many years.

From South Dakota is coming the president of that society, Rev. S. A. Hassold, from Kimball, S.D.

Other visitors from Iowa not officially sent to us who have signified an intention to be present are: Chas. F. Gardner, Osage, Ia.; E. M. Reeves, Waverly. Prof. S. A. Beach is also to spend the last two days of the annual meeting with us and his name will be found upon our program on several topics. No professional horticulturist in America is better or more favorably known than Prof. Beach, and our membership who are interested in orcharding should not fail to hear what he has to say on the subjects he presents.

Mr. N. A. Rasmussen, of Oshkosh, Wis., is also to be with us and will be found several times on the program. Being an expert in market gardening we are going to work him to the limit while he is with us. We anticipate that Secretary Cranefield of the Wisconsin Society, will also spend the week with us. Prof. C.B. Waldron will be here as representative of the North Dakota Society, and also Prof. F.W. Broderick of Winnipeg as representing the Winnipeg Horticultural Society—and of course our Prof. N.E. Hansen, of South Dakota. All of these friends will be found on the program.

There may be others, but this will do for a start.

[Illustration: VIEW OVER VEGETABLE TABLE AND ACROSS FRUIT EXHIBIT AT 1916 MINNESOTA STATE FAIR. MR. THOS. REDPATH, SUPT. FRUIT EXHIBIT.]

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While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 44 DECEMBER, 1916 No. 12

Perennial Garden at Carmarken, White Bear.

J. W. TAYLOR, ST. PAUL.

We have had so many inquiries about our garden as to how we make things grow, and as to the best plants to use, that we take pleasure in answering through the Horticulturist and giving the result of our experience in making an attractive perennial garden. Our soil is sandy loam, very quick and warm, except in one place where it is low and there is a heavy black soil over clay. It has been well enriched with well rotted manure and cultivated as much as possible every spring, where it could be done without disturbing plants and bulbs. The arrangement of flowers as regards the blending and careful selection so that one bloom does not kill another is the secret of a beautiful garden. Acres of flowers placed without any regard to color, no matter how expensive individual plants may be, is not pleasing to the eye. It is like a crowd of mixed people, and we know crowds are never beautiful. There is incompatibility among flowers as there is among people, and the compatible must be associated or there is no harmony.

What do we raise and how do we do it? We will, in the space allowed, answer this as best we can. It is not necessary to spend a great lot of money if one uses good judgment and knows where to buy. Take that grand flower, the peony. One can spend as much money as one pleases on these. There is just now a fad regarding these flowers, and some rich people are paying as high as $30.00 a root for certain kinds, but it is not necessary. The most really lovely gardens I have seen in the East and West have not been filled with plants bought at fancy prices. We have some that originally cost us a good deal of money and which are now cheap, as for instance, the Henryii lily. We bought the first we heard of at one dollar and one-half each. Now they can be bought for thirty cents. In peonies, Baroness Schroeder, an ivory white, is selling for three dollars a root, while the most beautiful of all the whites according to my taste, Festiva Maxima, can be bought for fifty cents. The Kelways are all fine. The best cost about one dollar each. In our garden, among others, the Pallas, Edulis Superba, Golden Harvest, Madame Crousse and Queen Victoria, all fine, cost us fifty cents each. We have a row all around our garden of these splendid flowers, many varieties, some very rare, and nothing could be more gorgeous in color or more effective than this

border. Hundreds of people came to see this peony show this year and were extravagant in their praise.

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The perfect harmony of arrangement was what pleased. We made many friends happy with armfuls of them to take home. That is the pleasure of your garden, the enjoyment one gets from making others happy. We especially notice how pleased the children were, the girls more so than the boys, perhaps, as they wandered along the paths fondling this or that bloom with loving fingers. With such an amount of bloom it is easy to send bouquets to the childrens' hospitals and to sick friends. We plant the peonies with the crown just under the earth, two feet apart. In the fall we cut off the old stalks and replace them over the plants after putting a good dressing of rotted manure on the beds.

Another flower, which is very attractive, is the larkspur Belladonna, turquoise blue. It shows from a great distance as its heavenly blue meets the eye. When arranged in a vase with white flowers it makes the most beautiful, choice and refined bouquet we know of. The Formosum is a lovely dark blue and very striking. Give them plenty of water and some wood ashes to keep off the slugs. Cut off the stalks after blooming, about August first, and they will bloom again in autumn. We had this year a large clump of Madonna lilies and next to them a large bunch of larkspur. The effect was stunning. Just before the larkspur came the whole north end of the garden was aflame with Oriental poppies, hundreds of them. No other flower produces the effect upon one that this great proud, wonderful flower does. It is the queen of the show. We transplant this in September in ordinary soil. Or we sow the seeds in August and transplant the seedlings as soon as up. They need no protection, but we protect everything with straw and branches. The branches to keep the straw from packing too hard and keeping the air out. Protection of roses is necessary, of course. We had a great collection this season. Our plan is to cut them back to within a foot of the ground then fill a box with leaves and turn over them. We never lose a rose thus protected. Neither sun nor mice injure them.

Another grand flower is Digitalis, or foxglove. These gladden your heart as the medicine made from them strengthens it. Get the mixed plants or seed, Gloxinia flora. When in bloom, look into their little gloves and note the wonder of nature's coloring. With us they grow six feet tall in black, heavy soil. They self-sow, and the plants of the present year bloom the next. A bed of these make a most gorgeous, dignified group in your garden. They are hardy with a very slight covering. Many with us self-sow and live through the winter without any protection. We made up a bed of these self-sowed in fall of 1915. They were a glory this summer. A few years ago every one said, don't waste your time on Japanese Iris. They thrive with us and bear blooms fully as large as a tea plate and of most exquisite beauty. We divide them every third year and in the spring cover them with old fertilizer and water them well. They grow in a heavy soil with some sand worked in. Our best varieties are Oriole, Distinction, Alice Kiernga, Beauty of Japan and Blue Flag.

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The Gladiolus is another bright and interesting addition to our floral family. The best we have are Marie de Ruyter, a pretty blue; Badenia, lavender; Golden King, a magnificent yellow; Florence, lilac blotched; Mazie, corn color; and Dawn, shell pink. Plant these bulbs in succession, three weeks apart, from April first, six inches deep, so they will stand up, and eighteen inches between rows. In this way you will have them until frost. For the house cut them when first bud comes out, and they will all blossom in water.

A flower which attracts much attention with us is the Canterbury Bell, cup and saucer variety, in different colors. Very showy. This is not a perennial but a biennial. We plant our seeds in July and transplant in September or October. The Persicifolia in white and blue is a hardy perennial and grows on stalks two to three feet high, a great favorite among white flowers. In some soils they do not do well, but with us grow rampant. We prefer the white. We cut over two thousand stalks this summer from one hundred fifty plants.

Of Tulips, which are so welcome in early spring, the Darwin leads all. We love them as we do the Stars of Bethlehem, the Hyacinths, Narcissi and the darling little blue flowers, Scilla Siberica, that come with the Snowdrops and Crocuses before the snow is gone. We thus have bloom from snow to snow. Always something bright, and that is another strong reason for a perennial garden.

We have many calls from persons wishing to buy plants or seeds. We do not sell either, but gladly give away our surplus. We have furnished many gardens in this way all about us and thus added to the beauty of the surrounding country and made ourselves and others happy. Our collection of Lilies, Auratums, Speciosums, Tigers, Madonnas, are all planted six to eight inches deep and, after spreading manure are covered with straw, after frost. We cover all bulb beds with manure in the fall. Among lilies all but the Auratums last years, but these lose their vitality in two or three seasons. Plant all lilies in fall except Madonnas, which should be put in in August. Two fine flowers we would recommend to flower lovers: the Amaryllis Hallii, or, as we call it, the wonder flower, which grows a large bunch of leaves in spring and in June they all die down. In August there springs up a single stalk from the apparently dead plant, bearing a lily-like bunch of flowers of charming colors. It is as hardy as an oak. The other is the Dictamnus, or gas plant. Most beautiful and very hardy. Get one white and one pink and plant near each other. They are fine. Of course we have named but a small part of our collection, but will be glad to give any further information to our Horticulturist readers and will be glad to welcome them at our grounds any time.

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CANNING FRUITS WITHOUT SIRUP.—Can the product the same day it is picked. Cull, stem, or seed, and clean the fruit by placing it in a strainer and pouring water over it until it is clean. Pack the product thoroughly in glass jars or tin cans until they are full; use the handle of a tablespoon, wooden ladle, or table knife for packing purposes. Pour over the fruit boiling water from a kettle, place rubbers and caps in position, partially seal if using glass jars, seal completely if using tin cans. Place the containers in a sterilizing vat, such as a wash boiler with false bottom, or other receptacle improvised for the purpose. If using a hot-water bath outfit, process for 30 minutes; count time after the water has reached the boiling point; the water must cover the highest jar in container. After sterilizing seal glass jars, wrap in paper to prevent bleaching, and store in a dry, cool place.

If you are canning in tin cans it will improve the product to plunge the cans quickly into cold water immediately after sterilization. When using a steam pressure canner instead of the hot-water bath, sterilize for 10 minutes with 5 pounds of steam pressure. Never allow the pressure to go over 10 pounds.

The Minnesota State Fruit-Breeding Farm.

CHAS. HARALSON, SUPT., EXCELSIOR.

The Minnesota State Fruit-Breeding Farm was established eight years ago, principally for breeding new varieties of fruit adapted to our climate and conditions. The aim of this work is to assist the people in getting better commercial varieties of the various fruits grown in the state, so that better returns could be secured for the people engaged in the various lines of fruit growing. Some of the plant-breeding work is beginning to show results, a few varieties of fruit are being distributed in a small way for trial in different localities.

A great deal of work has been done with apples. Seedlings have been grown by the thousands every year with the idea of selecting some desirable varieties when the trees come into fruiting. Hardiness of tree, long keeping and good quality of fruit are the most desirable points we are looking for in our selections. A great deal of crossing under glass is being done with apples; a number of seedlings, the results of this crossing work, are planted every spring.

Some of the six thousand Malinda apple seedlings planted seven years ago have fruited to some extent for the last three years. These show a great variation in fruit, both in color, quality and long keeping. Some of the fruit ripens with the Duchess, while others will keep until spring in good condition. There is a chance for some desirable varieties out of this lot, but it will take several years to determine whether we have anything better than the Wealthy. The Wealthy is by far our best commercial variety, but we are looking for something that will keep until spring.

Gooseberries and currants are easily raised and are perfectly hardy with us, but we are working to get some improvement on these varieties. Many thousand seedlings are being grown for this purpose. Our native gooseberries are used in breeding work with the cultivated varieties to a great extent, as they are hardy, strong growers and resistant to mildew.

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As to cherries, we have none that are satisfactory. Some work has been carried on for several years, but we have not obtained anything of special value so far. The most promising combinations are Compass cherry crossed with the cultivated varieties. None of these have fruited, but we have some hope for a hardy cherry from these seedlings.

Peaches and apricots are not hardy in Minnesota, and consequently nobody thinks of planting them. Some years ago we started crossing the sand cherry with peaches and apricots. The results were a number of seedlings, but all turned out to be worthless; the trees after several years growth were small, or grew mostly in bush form. They blossomed every spring but never set any fruit on account of some imperfection in the flowers. Four years ago we started to use the Compass cherry as the male parent, and this combination is more promising. The seedlings make a good growth and a fairly good sized tree, practically as hardy as the Compass cherry. The seedlings resemble the apricots and peaches in blossom, tree and foliage. This fruit will not be exactly an apricot or a peach, but may take the place of these fruits in a small way.

[Illustration: No. 7 Hybrid Seedling Plum—from Minnesota State Fruit-Breeding Farm, at Zumbra Heights.]

The Compass cherry crossed with Prunus Pissardi, or purple leaf plum, is a very interesting combination. We have about fifty seedlings growing. Most of them have the purple foliage and bark, are very ornamental and can be used with effect for lawns and landscape planting where large shrubs are wanted.

The grapes. The Vitis Labrusca, such as Concord, Worden, Moore's Early and many other varieties, are not hardy unless protected during winter. There is a demand for hardy grapes that do not need any winter protection. At the Fruit-Breeding Farm this problem has been taken up on a large scale. The Beta grape is hardy but lacks in size and quality. This variety has been used to grow many thousands of seedlings from, and also used in cross-breeding with the better varieties. A large percent of Beta seedlings come true to seed or nearly so. This gives us several hundred varieties equal to Beta, and some of them are quite an improvement in size and quality over the parent and practically as hardy as the wild grape. Many of these are worthy of propagation where hardiness is the main object. Very few of the hybrid grape seedlings have fruited, but indications are that in a few years we will have grapes equal in size and quality to any of our commercial varieties.

Experiments are being carried on in a small way with pears, roses and nuts. Our native hazelnuts can be improved by selection and crossing with the filberts. The same is true with the Rosa Rugosa and our native roses.

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In breeding strawberries we probably have had better success than with any other fruit we have attempted to improve. The breeding work was done in the greenhouse during winter and early spring and seed planted as soon as berries were ripe. The plants were transplanted to flats and later planted out in the field, where they remained until fruiting, when the selections were made. We have fruited approximately 60,000 seedlings. These have been weeded out so there are about 400 left, and these will be cut down to a few of the best varieties. At present we have one everbearing and one June-bearing variety which have proven to be very productive, of good size, good quality and good plantmakers. These plants have been sent out as premiums to members of the State Horticultural Society for the last two years and will be distributed the same way next spring.

In raspberries we have several varieties which are promising. King x Loudan, No. 4, is a variety that has been sent out as premium the last three years. This variety is amongst the hardiest, the berries are dark red, very large and the most productive of all the varieties growing on the place. This has also been sent out as premium through the Horticultural Society.

In plums we probably have had the best success. Some of the first breeding work was with Burbank x (crossed with) Wolf and Abundance x Wolf. We have twenty-eight seedlings of Burbank x Wolf and forty-five Abundance x Wolf which have fruited several years. We have varying degrees of hardiness in these seedlings. Most of them have withstood our winters at the fruit farm without injury, as well as in most of the southern half of the state.

Among the Abundance x Wolf hybrids eight of the seedlings are only partly hardy, while of the Burbank x Wolf only one or two have shown themselves to be particularly weak in this respect.

Type of fruit. In general the Burbank type of fruit is dominant. The flesh of these hybrids runs quite uniformly yellow, varying in degrees, however, from a deep yellow to a yellowish green. Some of them have a yellow skin with a blush or a streak of red, while others are a deep red even before ripe. The fruit in size varies from both smaller and larger than the parents. Firmness characterises most of the hybrids. We are also getting good shipping quality, and in Burbank x Wolf No. 12 we have a plum measuring one and three-quarters inches and more in diameter and a perfect freestone. This plum will be used extensively in further plant-breeding.

In shape of tree the two hybrids differ materially. The Burbank x Wolf hybrids make spreading trees more or less, while the Abundance x Wolf grows more upright and does not need quite as much room.

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TENT CATERPILLAR.—As soon as small nests are detected, they should be destroyed. When in convenient reach, the nests may be torn out with a brush, with gloved hand, or otherwise, and the larvae crushed on the ground, care being taken to destroy any caterpillars which have remained on the tree.

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The use of a torch to burn out the nests will be found convenient when they occur in the higher parts of the trees. In using the torch great care is necessary that no important injury be done to the tree; it should not be used in burning out nests except in the smaller branches and twigs, the killing of which would be of no special importance. Nests in the larger limbs should be destroyed by hand, as the use of the torch may kill the bark, resulting in permanent injury.

Tent caterpillars are readily destroyed by arsenicals sprayed on the foliage of trees infested by them. Any of the arsenical insecticides may be used, as Paris green, Scheele's green, arsenate of lead, *etc*. The first two are used at the rate of one-half pound to 50 gallons of water. The milk of lime made from 2 to 3 pounds of stone lime should be added to neutralize any caustic effect of the arsenical on the foliage. Arsenate of lead is used at the rate of 2 pounds to each 50 gallons of water.

On stone fruits, such as cherry, peach, and plum, arsenicals are likely to cause injury to foliage and must be used with caution if at all. On such trees the arsenate of lead is preferable, as it is less injurious to foliage, and on all trees sticks much better. In spraying for the tent caterpillar only, applications should be made while the caterpillars are yet small, as they then succumb more quickly to poisons than when more nearly full grown, and prompt treatment stops further defoliation of the trees.—U. S. Dept. Agri.

Color Combinations in the Garden.

MISS ELIZABETH STARR, 2224 FREMONT SO., MINNEAPOLIS.

English books on gardening set forth two principal methods of making a garden: first, to have each part perfect for a short time each year and then let it melt into the background for the rest of the season; second, to have every part of the garden showing some flowers all through the summer.

These two methods suggest the impressionistic and miniature schools of painting. With the first method it is possible to get great masses of color and brilliant effects to be viewed at a distance, but it requires a great deal of space, with a perennial garden at least, for unfortunately most of our perennials are in their greatest glory for only a few weeks at a time. The second method fills more nearly the needs of the small garden, where the vistas are short and the individual plant is under close inspection. The greatest difficulty is this, that the amateur cannot resist the lure of a great variety of plants, and unless a vigorous thinning out is faithfully practiced and the habit of growth, the period of blooming, the height and color of each individual is carefully studied, the effect of the whole is very apt to be mussy and distracting to the eye, whereas the ideal garden is soothing in effect.

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I have only been studying the problem for the last five or six years, so that I am still decidedly an amateur, but I have kept a faithful record of the time of flowering of each variety I have grown in my garden and have discovered that the time of blooming does not vary more than five days for each plant no matter whether the season be wet or dry. With this record at hand I can arrange each part of my garden with a view to the succession of bloom throughout the summer. I can place plants with clashing colors side by side with the calm assurance that they will not clash because their periods of blooming do not overlap. In this way I can completely change the color of certain parts of my garden during the summer if I so desire.

In studying combinations for the garden we must take into consideration the harmony and contrast of color, texture, form, height and the succession of bloom. We must also see that plants requiring the same soil and the same care are put together. In my garden I use both annuals and perennials but am limited in choice to those plants that are perfectly hardy, that will stand infinite neglect, drought, much wind, a stiff soil, that do not require especial protection in the winter, that will be in bloom all summer long and be beautiful. This, as I have found, is a rather difficult task.

[Illustration: Perennial border. Edging of pinks and Shasta daisies, pink canterbury bells and Festiva Maxima peony. Behind, pyrethrum, uliginosum and hollyhocks. Blue flowering flax adds depth to the pink and white.]

There is a great diversity of opinion as to how to set out plants. Some say, “Give each plant plenty of room; let it expand as much as it will.” Others say, “Each six inches of ground should have its plant; set them so closely that no dirt will show between; in this way each individual plant will be finer than when set out singly and the leaves will form a shade for the ground.” I have used the latter method, for, since we have no means of watering, the conservation of moisture is an important item. The chief objection is that there is a constant danger of overcrowding, and it requires a frequent resetting of plants as they increase in size from year to year.

[Illustration: Yellow iris against the blue of distant hills.]

I have a border on the north side of my garden that is six feet wide and about seventy feet long. It is my aim to keep this in bloom all through the summer long. There is a background of purple and white lilacs and cut-leaf spirea. The first thing that comes in the spring is poet’s narcissus, then groups of Darwin tulips; both of these are naturalized and remain in the ground from year to year. Next comes the perennial blue flax, a half dozen plants set at intervals down the border, that every morning from mid-April until August are a mass of blue. Clumps of May-flowering iris and then June-flowering iris and four large peony plants make the border bright

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until the latter part of June, when alternating groups of field daisies and pink and red sweet williams are in full bloom at one end of the border, and summer-flowering cosmos holds sway at the other end, while the flax, bachelor's buttons and daisies fill the center with blue and white. By the middle of July the calendulas, coreopsis and annual larkspur make a vivid display where the narcissus was before. These four make a very good combination, for if the bed is well made and the narcissus planted deep, the coreopsis and larkspur seed themselves, and with the exception of a deep raking in the late fall the bed needs no attention except thinning out for three years, and it is in bloom for at least four months of the season.

[Illustration: Pink and white pinks, field and Shasta daisies, canterbury bells and hollyhocks.]

In this border I have at last found a place for the magenta phlox that usually fights with the whole garden. I put it in front of a single row of pink and white cosmos, flank it on one side with pink and white verbenas, on the other with mixed scabiosas and in front of all a single row of Shasta daisies. This combination pleases the family as well as the phlox.

On the south side of the garden, against a low buckthorn hedge is a narrower border of sky-blue belladonna, delphinium, buttercups and achillea, with an edging of Chinese pinks. I had thought the complementary colors of the delphinium and buttercups would set each other off, but it is a very poor combination, for the foliage is so much alike that there is no contrast there, and when the plants are not in bloom it is almost impossible to tell which is which so as to take out the buttercups, whose yellow is too bright. Shasta daisies set off the delphiniums to perfection with the wonderful purity of their white and yellow and pleasing contrast of form, foliage and height. With Emperor narcissus bulbs set between the plants, there are flowers in the border the whole season.

Another very poor combination that is in my garden, much to my sorrow, is hemerocallis and siberica iris. They started out about three feet from each other, but the hemerocallis spreads so quickly that now they form a mass that is almost impossible to break apart. Another mistake I made was to put Shasta daisies and field daisies near together. It is unfair to the smaller daisies, for although they are fully two inches in diameter, yet they appear dwarfed beside the giants.

There is one point in my garden that is vivid throughout the summer. First comes the orange lilium elegans, then scarlet lychnis and later, tiger lilies. Another bit is gorgeous from the first of August until frost; it is made up of blue and white campanula pyramidalis, that grow quite five feet high, and Mrs. Francis King gladioli.

An important thing to think of is the line of vision from each point of vantage of the house—the endwise view of a multicolored bed of fairy columbines against a light green willow from the sewing room window, from the library the blue of a Juniata iris swaying four feet up in the air in front of a sweet briar, from the front porch pale yellow Flavescens iris through a mist of purple sweet rockets.

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The garden is in its glory during the iris season. At a conservative estimate we have about twenty-five hundred of them in our little garden, ranging through all the colors of the rainbow and blooming from April until late June. They may easily make such an increase that it is baffling to cope with, but they are so beautiful and so amenable to the experimenting of an amateur that we feel as though we couldn't get enough of them. Last summer a wonderful effect was achieved by putting dark blue and mahogany-colored pansies beside Jacquesiana and Othello iris, this repeating the color and texture in different plants.

[Illustration: Rocky Mountain columbine against the willow hedge, with perennial candytuft as edging.]

We leave the garden through a wooden arch. Climbing over one side of this is a Thousandschon rose, and on the other side a Dr. Van Fleet grows rank. A wild clematis is planted beside each rose and fills the top of the arch. I am rather dubious about the combination, for I fear the clematis may grow so heavy that it will choke out the roses, but this summer at least it was beautiful, and another summer will come to try other combinations.

Truck Crop and Garden Insects.

AN EXERCISE LED BY PROF. WM. MOORE, ENTOMOLOGICAL DEPARTMENT, UNIVERSITY
FARM, ST. PAUL.

There is one insect that probably all those who are in the market garden business are very much interested in, and that is the cabbage maggot. As you all know, in the spring of the year, after cabbages are put out, frequently you will find the cabbages slowly dying, one dying one day and two or three the next day, and so on until sometimes fifty per cent or more of the cabbages die. At first it is not exactly apparent what is killing the cabbages, but when one is pulled up it will be noticed that a little maggot is working in the root of the cabbage. This insect is commonly known as the cabbage maggot.

For a number of years work has been carried on with the cabbage maggot, and all sorts of treatments have been tried, many without any great success. The unfortunate part is that usually the market gardener don't take much thought of this maggot until it is actually doing the injury, and at that time they are mighty difficult to handle.

There have been several different treatments advised, one of which is fresh hellebore, about two ounces steeped in a quart of boiling water and then diluted to a gallon and poured upon the base of the plant. It will destroy the maggots, but hellebore is very expensive and, as probably most of you know, there isn't a great amount of profit in cabbage; so any treatment will have to be a cheap treatment, or you will use up your profit.

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During the last two years I have been working along a line which is entirely different from the treatment of the maggot, and that is based upon the fact that the fly which lays the egg which produces the maggot in the cabbage comes out early in the spring and flies about the field for probably a week or ten days or two weeks before it lays its eggs, and during that period it eats any sweet material which happens to be on hand. With this as a basis we thought we might be able to poison the flies and thus prevent injury from the maggots, and we have tried several different spray mixtures along that line. One mixture which we use is a mixture which is normally used against the fruit flies which are oftentimes injurious to fruit, particularly in the east and in tropical countries. This contains three ounces of arsenate of lead, two and half pounds of brown sugar and four gallons of water. The idea is to spray this in the field, spraying it on the plants as soon as the plants are put out in the field. We have more or less definite dates for the appearance of the flies in the field and for their disappearance again. But, as you know, the season varies, and the result is somewhat uncertain. So probably the best method is to base it upon the time you plant out your cabbage. In the early seasons you will plant your cabbages early, and in the late seasons later. So plant out your cabbage and then spray them every week until the 10th of May.

You should spray them, not to cover the leaves with the poison, but merely sufficient so that there are a few drops of this poisoned material on the leaves so that the flies can eat it. Flies will come there and feed upon this mixture and die.

It is rather peculiar that we started work here about the same time on the cabbage maggot that they started work on the onion maggot along similar lines in Wisconsin. I don't think that either knew that the other was working towards that end. They used a different mixture, one-fifth ounce of sodium arsenite, one-half pint of New Orleans molasses and one gallon of water. This was sprayed over the onions and was very successful in controlling the onion maggot.

I tried their mixture this last year. They published some of their results last year, so it gave me an opportunity to watch their mixture in comparison with the lead arsenate. They claimed the lead arsenate did not act as quickly as the sodium arsenite. That is true, but when you have a ten-day period to kill the fly it don't make much difference whether it dies in ten hours or twenty-four. The flies are not doing any injury. If you take the lead arsenate and sugar and water and put it in a jar, the arsenate always sinks to the bottom, and if you were to test it that way, the fly would feed on the top and you might not get a quick result. But if you spray it on, the lead arsenate will kill as quickly as the sodium arsenite.

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There is an objection to the use of arsenite in that sodium arsenite is a soluble poison and will burn the leaves of the cabbage. Of course, that is not particularly serious as those are the first leaves the cabbages have and the cabbage soon gets over any slight injury, but many truck gardeners probably would object to that. In the onion you have a different shaped leaf, and the injury is not so apparent. Last summer I found that New Orleans molasses would give you a little bit better result than the sugar, and it is cheaper. The objection to the New Orleans molasses is the sticky nature of the material in handling.

I might mention in regard to opening cans of New Orleans molasses. If you never opened one and try this treatment, be careful about opening the can. The lid is pushed down tight and under warm conditions, or if the molasses has been in a warm room there is a certain amount of fermentation and gas under pressure, and if you pry it open quickly you find the lid flies up in the air and you will probably be smeared over with molasses.

I employed my spray, that is, one ounce of lead arsenate, one-half pint of New Orleans molasses and one gallon of water last season. The check plots had cabbages attacked by the maggots, probably 10 or 15 per cent of the plants dying from the attack. Last year was a very good season, that is, many of the plants seriously attacked put out roots again, and those were able to grow again in the sprayed plots. The infestation of the sprayed plots was probably about 30 to 40 per cent. of the plants, but they only contained probably one maggot each, which is very slight and not sufficient to do any damage.

There is one market gardener whose cabbage patch we sprayed, I think, only a part of two rows, and we thought we would leave the rest of his patch as a control. Apparently the amount of material we put on there was sufficient to attract the flies from the whole field. Not a single cabbage died, and he was pleased with the result of the spray.

Mr. Miller: What do you do for root aphis?

Mr. Moore: Root aphis can very easily be controlled with tobacco extract. It is put upon the root of any plant that is affected, a tablespoonful to a gallon of water. There are a number of different tobacco extracts on the market. Some of them contain 15 per cent. of nicotine, some contain 20, some 25 and some 40, and I think there is one brand that contains 45 per cent. You will find that the brands that contain the most nicotine are the most expensive, but in proportion you use less material. Thus 20 per cent. tobacco extract would take two tablespoonfuls to the gallon, while 40 per cent. would take only one. It is the nicotine which is the working portion of it.

Mr. Miller: Then you can use the black leaf forty?

Mr. Moore: It is very good, it is 40 per cent. nicotine. There is another product put out by the same company, a black leaf, only 15 or 20 per cent. This is cheaper, but you have to use more of it. If anything probably the more expensive would be the cheaper in the long run.

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Mr. Wintersteen: The maggots that attack the radishes and turnips are the same as the cabbage maggot?

Mr. Moore: Yes, sir.

Mr. Wintersteen: Why is it I have no trouble with the cabbages, and yet I can raise no radishes or turnips in the same ground?

Mr. Moore: The radishes and turnips are attacked and the cabbages are not?

Mr. Wintersteen: Yes, sir.

Mr. Moore: Which do you raise, early cabbages?

Mr. Wintersteen: Yes, sir.

Mr. Moore: What variety do you raise?

Mr. Wintersteen: The Wakefield, generally.

Mr. Moore: Some varieties of cabbages are not nearly so severely attacked as others. I think of the two that they would prefer radishes probably. Growing them side by side you find they infest the radishes. That was my experience last year. I grew the first generation of cabbages, and the second generation I took over into the radishes because I wanted to treat them there.

Mr. Rasmussen: Did you say the same fly attacks the onion and the cabbage?

Mr. Moore: The onion has two different flies, one which is black in color, with light colored bands across the wings, and that one passes the winter as a larva in the old onions left in the field. It is an injurious practice to leave old onions there to breed these maggots. If they were taken out and destroyed you could do away with that one. The cabbage fly is different. When you use the spray it would probably be all right to use the sodium arsenite for the onion and the lead arsenate for the cabbage. The type of leaf is entirely different, and on the cabbage you are apt to burn them with the sodium arsenite while the lead arsenate will give you practically the same result.

Mr. Goudy: The cabbage butterfly, does that come from the same maggot?

Mr. Moore: No; this maggot is on the root, the cabbage butterfly lays its eggs on the leaf. You get the cabbage worm from the cabbage butterfly.

Mr. Goudy: What do you do for that?

Mr. Moore: Paris green is used to a great extent, but many people have a horror of using Paris green. Last year, I think it was, I was called up on the phone by some one and I advised him to use Paris green. He said that he was afraid it might poison everybody. I explained to him there was no danger from it, as you know the cabbage leaves grow from the inside, not from the outside, and the spray would be on the outside leaves. Besides that, we usually spray early for the cabbage worm while the heads come on later.

Mr. Goudy: Did you ever try capsicum, sprinkling that on the heads?

Mr. Moore: No, sir.

Mr. Goudy: I saved my cabbages one year by using that.

Mr. Moore: Some people claim salt is good. One of the students mentioned it to me. One applied it by putting a spoonful around over the head, another dissolved a tablespoonful in about ten quarts of water and sprayed it on. Salt is rather injurious to vegetation as a rule. Of course, they only put it on the leaves, and the cabbage is a hardy plant. Air slaked lime is also good, but would have to be applied several times. With the arsenate you apply it once and kill all the brood.

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Mr. Ludlow: We took them all off of mine one year by using boiling hot water.

Mr. Moore: Yes, sir; water is very good. The objection is, on a large scale it is not feasible.

Mr. Miller: Slug shot is very good.

Mr. Moore: Yes, sir; it doesn't contain very much poison, but it is sufficient to kill the cabbage worm.

Mr. Cadoo: I used just simply wood ashes.

Mr. Moore: The cabbage worm is one that is very easy to handle.

A Member: I have always used salt. I think it makes a more firm and solid head, that is my theory, I don't know whether I am right or not. I have been doing that for years.

Mr. Moore: I don't know. I never heard of the treatment with salt until two or three days ago when several students mentioned that they used salt. Some people won't use Paris green. There was one case a man said his wife wouldn't let him do it even if she knew it wasn't poison; she didn't like the idea of Paris green on cabbage.

Mr. Ingersoll: Is there anything you can suggest to control the yellows in asters?

Mr. Moore: The yellows in asters has been a problem which has been very amusing there at the farm. A man sends in an aster to the entomological department, we examine it and can't find anything that belongs to our department, and we send it to the plant pathological department, and they send it back to us. Last year we made a point in every case of yellows in asters to send some one to investigate and find out what was going on to produce it. In some cases it seemed to be a fungous disease. One case I know turned out to be a fungous disease, the very next one was due to plant lice on the roots of the asters. In that case I don't think you get quite the distinct yellows of the asters, but rather the plants wilt and become weak and finally die. That can very easily be controlled with tobacco extract, pouring it upon the buds of the plants. We do not know definitely about the yellows. We think it is more or less of a physiological disease of the plant, not due to an insect. This last year we have not found any what we would call the true yellows. There is an insect that produces similar trouble on other plants, a plant bug, which is hard to secure because it flies away. That is the reason we have been sending out to see exactly what is going on in the field, and we didn't see any evidence of their work this year. Another thing, it seems to be a year in which the asters did fairly well, and there was very little yellows.

Mr. Ingersoll: You think that irregular watering might make any difference or very solid rooting?

Mr. Moore: It might do something of the sort. The most we heard of the yellows was the year before last, and we were held up at the time with other work and could not investigate properly. Any one here that has yellows in asters next year, we would be very glad to hear from him and send some one out to find the cause. It wouldn't surprise me that it was something in the treatment of the aster.

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Mr. Cadoo: Do angleworms hurt house plants?

Mr. Moore: Not as a rule. They do eat a small amount of vegetation, but ordinarily in a house plant, if you have, say, a worm in a pot, I think it is rather beneficial than injurious, because it keeps the soil stirred up.

Mr. Rasmussen: What is the spray for the cabbage and onion maggot?

Mr. Moore: Unfortunately I am a very poor person to remember figures, and I carry this around with me. One spray is three ounces of lead arsenate, two and a half pounds of brown sugar to four gallons of water, but we found that probably a little better spray was to use the New Orleans molasses instead of the sugar and the formula is: One ounce of lead arsenate, one-half pint of New Orleans molasses and one gallon of water. The spray that was used for the onion maggot and was devised over in Wisconsin is: One-fifth ounce of sodium arsenite, one-half pint of New Orleans molasses and one gallon of water.

Mr. Rasmussen: The Wisconsin spray is what I used to spray my place several years, and I was wondering if it was the same.

Mr. Moore: It was peculiar that they started to work on the onion maggot in Wisconsin at the same time we started on the cabbage maggot here.

Mr. Rasmussen: We have controlled the onion maggots almost entirely, but the cabbage maggots are very difficult.

Mr. Moore: In our control plots it controlled it very well. Our plants were infested only with a few maggots, but not sufficient to do any injury.

The Wealthy Apple.

F. H. BALLOU.

(THE OPINION OF AN OHIO APPLE GROWER—FROM A BULLETIN ISSUED BY OHIO
STATE HORTICULTURAL SOCIETY.)

The value of a variety of apple commercially usually decides its place in the estimation of growers. Naturally the later maturing, longer keeping or winter varieties are generally accorded this preference. Orchardists in the southern part of Ohio doubtless would elect Rome Beauty queen of money makers, were the question put to a vote. Apple producers of northern Ohio or western New York would as surely vote for Baldwin. But what variety would you—Mr. Lover-of-apples-and-apple products—vote for and plant if but a single variety and space for but a single tree were available? After twenty years observation and enjoyment of apple precocity, apple dependability and all-around apple

excellence throughout a long season, the writer continues annually to cast his ballot for Wealthy.

[Illustration: Mr. Rolla Sfubbs, of Bederwood, Lake Minnetonka, under his favorite tree, the Wealthy.]

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True the Wealthy has its faults—so have all the other varieties of apples of individual choice—and so have we—the growers; but for early fruitage, prolificacy, excellence for culinary use, extended period of usefulness, richness and delicacy of flavor when ripened in a cool cellar and good keeping qualities when under proper conditions it is placed in cold storage, there are few if any varieties other than this that combine so many splendid and desirable characteristics. From mid-July to mid-September of the present year we have been using Wealthy for culinary purposes with steadily increasing enjoyment as their quality has gradually become finer and finer. At this writing, September 18, we have in the cellar attractively colored, well ripened, pink-and-white-fleshed Wealthy delightful for dessert use; and there are yet Wealthy—firm and crisp—-on the trees for later autumn use if kept in the cellar, or early winter and holiday use if placed in cold storage.

If we could have but one apple tree that tree would be a Wealthy. This statement is made with full knowledge and appreciation of the many other excellent varieties of various seasons, including Grimes, Jonathan, Stayman and Delicious.

Law Fixes Standards for Containers for Fruits, Berries and Vegetables in Interstate Commerce.

(TAKEN FROM “WISCONSIN HORTICULTURE,” THE ORGAN OF WIS. STATE HORTICULTURAL SOCIETY.)

Standards for Climax baskets for grapes, other fruits and vegetables, and other types of baskets and containers used for small fruits, berries, and vegetables in interstate commerce, are fixed by an act approved by the President August 31, 1916. The law will become effective November 1, 1917.

The effect of the act will be to require the use of the standards in manufacturing, sale, or shipment for all interstate commerce, whether the containers are filled or unfilled. A large part of the traffic in fruits and vegetables in this country enters interstate commerce. The law relates only to the containers and will not affect local regulations in regard to heaped measure or other method of filling. A special exemption from the operations of the law is made for all containers manufactured, sold, or shipped, when intended for export to foreign countries, and when such containers accord with the specifications of the foreign purchasers, or comply with the laws of the country to which the shipment is destined.

Standards of three capacities are fixed for Climax baskets—2, 4 and 12 quarts, dry measure. These containers, often known as “grape baskets,” have relatively narrow, flat bottoms, rounded at each end, and thin sides flaring slightly from the perpendicular. The handle is hooped over at the middle from side to side. In addition to fixing the capacities of these standard baskets of this type, the law also prescribes their dimensions.

The other standards are for “baskets or other containers for small fruits, berries, and vegetables.” They are to have capacities only of one-half pint, 1 pint, 1 quart, or multiples of 1 quart, dry measure. Such containers may be of any shape so long as their capacities accurately accord with the standard requirements.

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The examination and test of containers to determine whether they comply with the provisions of the act are made duties of the department, and the Secretary of Agriculture is empowered to establish and promulgate rules and regulations allowing such reasonable tolerances and variations as may be found necessary.

Penalties are provided by the act for the manufacture for shipment, sale for shipment, or shipment in interstate commerce of Climax baskets, and containers for small fruits, berries, and vegetables, not in accord with the standards. It is provided, however:

That no dealer shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the manufacturer, wholesaler, jobber, or other party residing within the United States from whom such Climax baskets, baskets, or other containers, as defined in this act, were purchased, to the effect that said Climax baskets, baskets, or other containers are correct within the meaning of this act. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of Climax baskets, baskets, or other containers, to such dealer, and in such case said party or parties shall be amenable to the prosecutions, fines, and other penalties which would attach in due course to the dealer under the provisions of this act. —Department of Agriculture.

[Illustration: A PLANT-CHIMERA: TWO VARIETIES OF APPLE IN ONE.

Golden Russet and Boston Stripe combined in the same fruit, as the result of a graft. Trees producing these apples bear only a few fruits of this combination; the rest of the crop belongs entirely to one or other of the two varieties concerned. The explanation of these chimeras is that the original buds of the scion failed to grow, after the graft was made, but an adventitious bud arose exactly at the juncture of stock and scion, and included cells derived from both. These cells grow side by side but remain quite distinct in the same stem, each kind of cell reproducing its own sort. From “Journal of Heredity,” May, 1914. Published by the “American Genetic Association,” Washington, D. C.]

The Rhubarb Plant.

LUDVIG MOSBAEK, ASKOV.

Rhubarb, or pieplant, as it is more commonly called, is one of the hardiest and at the same time a most delicious fruit. When the stalks are used at the right stage and given the proper care by the cook, they are almost equal to fresh peaches.

Rhubarb can be transplanted every month in the year, but the best time is early spring or August. There are especially two things rhubarb will not stand, “wet feet and deep planting.” Most beneficial is good natural or artificial drainage and rich soil, made so by a good coat of manure, plowed or spaded in, and a liberal top dressing every fall, cultivated or hoed in on the top soil the next spring. Fifty plants or divisions of a good

tender variety planted 3 to 4 feet apart will supply an average household with more delicious fresh fruit and juice for six months of the year than five times the space of ground devoted to currants, gooseberries or any other fruit, and if you have from 50 to 100 plants you can afford to pick the first stalk that sprouts up in April and still figure on having an abundance to keep you well supplied all summer.

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Do you really know what a delicious beverage can be made from the juice of rhubarb mixed in cool water? Take it along in the hayfield a hot summer day. And even if you can not keep it cool the acid contained in the juice still makes it a delicious and stimulating drink where you would loathe the taste of a stale beer. There are about a hundred other ways to prepare rhubarb, not forgetting a well cooled rhubarb mush served with cool milk in the evening or for that matter three times a day; nothing cheaper, nor healthier. The fresh acid contained in the rhubarb purifies the blood and puts new vigor in your body and soul, is better and cheaper than any patent medicines, and from the growth of 50 to 100 plants you can eat every day for six months and preserve enough in fresh, cool water in airtight jars to last you all winter. But you can do still better with your rhubarb. You can add three months more and make it nine months of the year for fresh, crisp, delicious fruit. I will tell you how.

When your rhubarb gets 3-4 years old and very big and strong clumps of roots, divide some of the best and make a new planting and dig some of the balance before frost in the fall. Leave them on top of the ground until they have had a good freeze—this is very essential to success—then place the roots as you dug them in a dark corner in your cellar or in a barrel in your cellar, exclude all light, keep the soil moderately wet and after Christmas and until spring you will have an abundance of brittle, fine flavored stalks that are fully equal to and perhaps more tender than the outdoor grown. Years ago in Chicago I grew rhubarb in a dark house 36x80 ft., built for that purpose, and the stalks generally commanded a price of 12 to 15c a pound in the right market in January, February and March.

It is better not to pull any stalks the summer you transplant, at least not until September. Next year in May and June you can have stalks from 1/2 to 1 pound and over. When you pull stalks don't take the outer two or three leaves but only the tender ones, and strip them off in succession so you do not come back to the same plants to pull for four to six weeks or more. Just as quick as the plant shows flower stems cut them off close to the ground and keep them off, never allow them to show their heads.

I have grown rhubarb for market and for domestic use for about forty years, having one time as much as five acres, and I will assure you if you will follow directions you will appreciate rhubarb more than before and get out of it all it is worth.

* * * * *

TREES PLANTED BY MACHINE.—A machine which plants from ten to fifteen thousand forest trees seedlings a day is now being used at the Letchworth Park Forest and Arboretum, in Wyoming County, N. Y., according to officials of the Forest Service who are acting as advisers in the work. Previously the planting had been done by hand at the rate of 1,200 to 1,500 trees each day per man.

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The machine was designed to set out cabbage and tomato plants, but works equally well with trees. It is about the size of an ordinary mowing machine and is operated by three men and two horses. One man drives the team while the other two handle the seedlings. The machine makes a furrow in which the trees are set at any desired distance, and an automatic device indicates where they should be dropped. Two metal-tired wheels push and roll the dirt firmly down around the roots. This is a very desirable feature, it is said, because the trees are apt to die if this is not well done. Two attachments make it possible to place water and fertilizer at the roots of each seedling. Another attachment marks the line on which the next row of trees is to be planted.

No cost figures are available yet, but officials say that the cost will be much less than when the planting is done by hand. It is stated that the machine can be used on any land which has been cleared and is not too rough to plow and harrow.—U. S. Dept. Agri.

The Greenhouse versus Hotbeds.

FRANK H. GIBBS, MARKET GARDENER, ST. ANTHONY PARK.

In discussing the subject assigned me, I will only speak of hotbeds and hothouses as used for the purpose of growing vegetables and early vegetable plants.

The hotbed is still very desirable where it is wanted on a small scale to grow early vegetables for the home or market, as the small cost for an outfit is very small as compared to hothouses. Sash 4x5 ft., which is the favorite size with market gardeners, can be purchased for about $2.00 each glazed, and a box 5x16 ft. to hold four sash can be made for $1.50, making an outlay less than $10.00 for 80 sq. ft. of bed. With good care sash and boxes will last eight years.

Where the beds are put down in early February two crops of lettuce and one crop of cucumbers can be grown, and when the spring is late three crops of lettuce before outdoor lettuce appears on the market, when the beds are given over entirely to the cucumber crop. Lettuce at that time generally sells for 25c per dozen, and cucumbers from 50c down to 15c per dozen, according to the season. From three to five hundred cabbage, cauliflower or lettuce plants can be grown under each sash, or from 150 to 300 tomatoes, peppers or egg plants can likewise be grown under each sash, or where lettuce is grown to maturity six dozen per sash.

The cost of the horse manure for the beds varies greatly, as some are situated where it can be secured very reasonably, while with others the cost would be prohibitive. The amount required also varies according to the season they are put down. When the beds are put down early in February, three cords of manure are necessary for each box. When they are put down March 1st, one-half that amount is needed. Where there is no desire to get the early market, and the beds are put down March 15th, one cord is

plenty for each box. I have never tried to figure out just what the cost of putting down each box is, or what is the cost of ventilating and watering; but if they are neglected and the plants get burned or frozen, the cost is much more than if they were given proper attention, and, besides, much time is lost in getting another start, as they are generally left several days to see if the plants will recover, which they seldom do.

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The cost of hothouses varies so greatly for the size of the house that it is hard to draw a comparison. A modern steel frame house containing 10,000 sq. ft. of glass can be built for about $4,000.00, or a house one-half that size can be built for $10,000.00 and is no better than its cheaper rival. A small house say 16x80 ft., heated with a brick furnace and flue and hot water coil can be built for from $350.00 to $400.00, where one does not have to hire skilled labor. A hothouse of any size is very satisfactory, as in cold, stormy weather, when we can't even look into a hotbed, plants can be kept growing and there is always something we can do and be comfortable while we are doing it. It is impossible to use a hotbed all winter, as no matter how much manure is put into it in the fall it will cool out and be worthless long before spring.

[Illustration: Showing hotbeds and greenhouse at F. H. Gibbs' market gardens.]

With a good hothouse four crops of lettuce can be raised during the fall and winter, and a crop of cucumbers in the spring and early summer.

Each crop of lettuce sells for from 20c to 25c per dozen; the plants are set six inches apart each way, making about four per square foot of bench room.

The cucumber crop generally pays as well as two crops of lettuce and is usually planted to come into bearing early in June and kept bearing through July, or until the outdoor cucumbers are on the market. In the so-called summer just passed (1915), there were no outdoor cucumbers, and they were kept bearing through August and September. Cucumbers grown in hotbeds cannot be kept in bearing more than six weeks before the vines go to pieces and will not sell for as high a price as hothouse grown. With favorable weather I have always thought I could grow a crop of lettuce in less time in a hotbed than in a hothouse, but with cold, cloudy weather the advantage is on the side of the hothouse. Much less time is required to do the ventilating and watering in a hothouse than with beds, and the soil must be in the highest state of fertility for either one.

While hotbeds will always be desirable in many localities on account of the small first cost, the days of the large commercial hotbed yard is passed, and there are now around Minneapolis 5,000 hotbed sash that will not be put down next spring, or if put down, used only on cold frames, all owing to the scarcity of fresh horse manure.

While it is a great satisfaction to have a hothouse or hotbeds and grow vegetables in winter, the life of the market gardener is not one continuous round of pleasure, as lice, white fly, red spider and thrip, mildew and fungous rot are always ready for a fight, and the gardener must always be on his guard and beat them to it at their first appearance, or the labor of weeks will be lost.

An Ideal Flower Garden for a Country Home.

M. H. WETHERBEE, FLORIST, CHARLES CITY, IOWA.

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In laying out grounds for country homes or remodeling them, space should be of the first importance, and where space permits there is no better arrangement than a fine border on one side of the lawn with a driveway between the lawn and the border, leading from the street to the house and barns. The border should be wide enough to have a nice variety of shrubs for a background, and there should be space for the hardy perennials and bulbs, which should not be planted solidly but placed in clumps and arranged according to height and blooming season and as to color effect.

I will mention a few of the hardy shrubs and plants that we can all grow with success. While the catalogues are filled with a large list of so-called hardy stock, we must remember that we live in a good sized country and what would be hardy in Southern Iowa, Missouri and Illinois, would not stand the winters of Northern Iowa or of Minnesota or other localities of the same latitude. In shrubs we can be sure of a variety of lilacs, snowballs, and hydrangea paniculata. Some of the newer varieties are fine and bloom in August, when few other shrubs are flowering. Spirea Van Houttii, best known as Bridal Wreath, we might include and a few of the hardy vines if a trellis or other support was given for them, such as clematis paniculata, coccinea and jackmani, the large purple and white honeysuckle, Chinese matrimony vine, *etc*.

Among hardy roses, which are called the queen of all flowers, are the Rugosa type, which will stand the winters with no protection and continue to flower all summer. While the flowers of that type are single or semi-double, the bushes would be handsome without any flowers. This type also produces hips, which adds to their attractiveness, and these may be made into jelly in the fall if so desired. I would advise to plant some of the most hardy of the hybrid perpetual roses, such as General Jacqueminot, Magna Charta, Mrs. Chas. Wood, Mrs. John Lang, Mad. Plantier, with some of the climbers, such as the Rambler in variety, Prairie Queen, Baltimore Belle and, perhaps, some others, with the understanding that the hybrids and climbers should have protection in some form for the winter months.

Then in hardy perennials there is such a variety to select from that one hardly knows where to begin or when to stop. Of course everyone wants a few peonies, and some of the hardy phlox, in such a variety of color. Then the delphinium, or hardy larkspurs, are fine bloomers. The blue and white platycodon are sure to flower, while the German iris are good and the Japan iris are fine flowers, but have to have good protection to stand our winters. For fine white flowers we have the showy achilleas in variety and gypsophila paniculata, called baby breath as a common name. Then we must have plenty of space for a variety of annuals, such as sweet peas, cosmos, pansies, verbenas, *etc*. Also, we would grow geraniums in variety, a few summer carnations, and the selection can be large or small, but almost every one will want some dahlia and gladiolus bulbs. Those that like yellow, or lemon, lilies can plant them and have a mass of flowers during June. The Japan lilies, especially the rubrum variety, are good bloomers and quite hardy.

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The Planting and Care of Hardy Perennials.

MISS GRACE E. KIMBALL, WALTHAM. (SO. MINN. HORT. SOCIETY.)

The most important essential in the planting of hardy perennials is the preparation of the ground. It must be deeply spaded or plowed and thoroughly pulverized. While most kinds of plants will do well in any good garden soil, most gardens need more or less fertilizer to make the ground good garden soil. So it is well at the time of spading or plowing to see that enough fertilizer is applied to insure good growth and blossom. But care must be used that no fresh stable manure comes in contact with the roots. If it must be used see that it is put in the bottom of the hole or trench dug for the plants, and covered several inches with earth.

When the ground is well prepared and properly fertilized comes the planting, and as many plants need somewhat different handling, it is well for one starting a garden to understand just how each kind should be set. The iris, for instance, likes to be very near the surface of the ground. In fact it seems to delight in pushing the earth off the fleshy part of the root and basking in the sun, while the small roots lie very close to the surface. The oriental poppy must be planted with the crown well above the ground, or else when any moisture settles on it the crown will rot, and the plant die. The gaillardia, larkspur and columbine should be planted about as the oriental poppy with the crowns perhaps not quite as much above the ground, while the peony should be set so that the bud is covered two or three inches.

Since fall planting of herbaceous perennials has come into prominence one can choose either spring or fall for most of their planting, as most plants do well set at either time. But the oriental poppy does not ship nor transplant well in the spring. It dies down after blossoming—one may think they have lost their plants then—and starts up again in August or September. Just as it is starting then seems to be the safest time to plant.

August and September are considered the best months to do fall planting, although some advocate setting peonies until it freezes. Still I think it safer to plant earlier than that.

If I were beginning a hardy garden, one that I could add to from time to time, I would try to set out in the fall plants that bloom in the spring or early summer, and in the spring those that bloom in the fall. Nothing is gained by setting iris or peonies in the spring, for nine times out of ten they will not bloom the same season they are set, while if set in the fall nearly all varieties of either the iris or peony will bloom the next year. On the other hand, phlox set in the spring scarcely ever fails to bloom in the late summer or early fall, and keeps it up until freezing weather. The phlox, however, should be taken up and divided every two or three years to obtain the best results.

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After planting comes the cultivating, which should be kept up all summer. Especially after a rain should the ground be stirred to keep it from baking. In exceedingly dry seasons by keeping a dust mulch around the plants one can avoid having to do much watering—for unless you water thoroughly at such a time it is better not to water at all. However, if it finally becomes necessary to apply water, the dust mulch has kept the ground in condition to absorb all the water that is used.

In the fall after the ground has frozen a light covering of some kind should be thrown over the plants. This is to protect them from the thawing and freezing that takes place from time to time during the winter and early spring. After the first year, when the foliage has increased so as to be some protection, it is not as necessary to cover, although no doubt a little more covering would be beneficial. Some growers of the peony, however, advocate cutting off the leaves in the fall, and in such a case a covering would be necessary.

We found a very satisfactory way for both covering and fertilizing was to throw a fork full of dressing around each plant in the fall and work it into the ground in the spring.

IN MEMORIAM—J. F. BENJAMIN.

PASSED JULY 15, 1916. AGED 59 YEARS.

“John Franklin Benjamin was born at Belvidere, Illinois, May 6, 1857. That same year his parents moved to Hutchinson and he, at the age of five years, was one of the two score of little children who spent hours of terror in the stockade when it was attacked by the Indians on September 4, 1862. As he grew up he attended the Hutchinson school, his boyhood being spent on the farm. He was married in October, 1889, to Minnie L. Walker. The following year they moved to Pierce county, Neb., where Mr. Benjamin purchased and for ten years managed a large ranch. In 1890 they returned to Hutchinson and proceeded to open and improve Highland Home Fruit Farm, which was thenceforth Mr. Benjamin’s abiding place until the summons came that ended all his earthly hopes and plans.

“He was an active factor in farmers’ co-operative society affairs and supported all movements for the moral and educational uplift of the community. He had been for many years a member of the M. E. church and of the Woodmen’s and Royal Neighbors’ camps and a valued and active member of each of these societies.

[Illustration: John Franklin Benjamin.]

“Mr. Benjamin left no children, and the wife who has been his devoted helpmate for twenty-seven years survives to face the coming years of bereavement alone.

“His had been a useful life, a life of ceaseless and honorable toil, and that beautiful and valuable property, Highland Home Fruit Farm, largely the product of the work of his own hands, is a monument to his memory which will long endure to be admired and enjoyed by others as one of the model rural places of Minnesota. Few men in the space of twenty-five years have accomplished more than did J. F. Benjamin in establishing the fine, modern home, the large orchard and small fruit and flower gardens and well stocked farm, all of which he had tended with loving hands.”

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Mr. Benjamin was well known by the members of this society who have attended its annual meetings within the last ten or fifteen years. During this period he has been an active member of the society, often serving on the program or in some other way as opportunity came to him. He was one of the most loyal members of the association, practicing what he preached, and doing all within his power to extend the usefulness of the society. I had a close personal acquaintance with Mr. Benjamin and the highest respect for his character and attainments. As a comparatively young man we anticipated his presence with us for a long period of time, but in this we are sadly disappointed. His wife in a recent letter says, “One of his greatest pleasures was cultivating and taking care of the flowers which surrounded his home. After a hard day’s work in the field, he would labor with his flowers and shrubbery until far into the night. He enjoyed taking or sending flowers to the sick, and many bouquets of his choicest blossoms he gave his friends as they drove past or called to admire his beautiful grounds.” In this spirit Mr. Benjamin labored to reach others and widen the wholesome influence of his life.—Sec’y.

PROGRAM 50th ANNUAL MEETING

Our Semi-Centennial Anniversary

Minnesota State Horticultural Society,

To be held in the West Hotel, Minneapolis, December 5, 6, 7, 8, 1916.

A Great Program.

Study this program carefully and select such features as you especially desire to participate in—but you are more than welcome to all.

Discussion follows each topic.

Discussions are “free for all,” whether members or not. Ask questions or express opinions freely.

DEMONSTRATIONS.

These demonstrations will be given between 1:00 and 1:45 each day of the meeting in rooms adjoining the hall in which the meeting is held. They will be conducted by those whose names are here given, both of whom are connected with the Horticultural Department at University Farm.

Grafting, Fred Haralson, Hort. Foreman. Pruning, Frank Daniels, Instructor In Hort.

IMPORTANT.

All participants on this program are limited to fifteen minutes except where a longer period is specifically mentioned.

Time for discussion is allowed after each number.

NOTICE OF BEE-KEEPERS' MEETING.

The Minnesota State Bee-Keepers' Society will hold its annual meeting in the "Moorish Room," West Hotel, Minneapolis, on Tuesday and Wednesday, Dec. 5 and 6, 1916. Program can be had of L. V. France, University Farm, St. Paul.

NOTICE.—A bell will be rung five minutes before the exercises begin in the Audience Room.

Persons entering the audience room when any one is addressing the meeting from the platform are requested to take seats in the rear of the room, going forward only after the speaker has concluded—and thus avoid much confusion.

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TUESDAY MORNING SESSION.

10:00 o'clock.

Every member attending should not fail to be in his seat promptly when this session opens.

Invocation	Rev. C. S. Harrison, York, Neb.
Song	Mr. Trafford N. Jayne, Minneapolis
President's Annual Greeting	Thos. E. Cashman, Owatonna

Top-Working Young Apple Trees.
E. G. Lee, St. Paul.

Evergreens.
C. S. Harrison, York, Neb.

Preparing and Handling the Apple Crop.
E. A. Smith, Lake City.

My Prize Orchard.
1. Henry Dunsmore, Olivia.
2. E. W. Mayman, Sauk Rapids.

Appointment of committees on award of premiums.

TUESDAY AFTERNOON SESSION.

1:30 o'clock.

A half hour "Question and Answer Exercise" on "Bees in the Garden and Orchard," led by J. Kimball, of Duluth.

2 o'clock.

President Cashman in the Chair. Reception of Delegates.

FRUITS.

Strawberry Culture with Irrigation.
N. A. Rasmussen, Oskosh, Wis., President
Wisconsin State Hort. Society.

Raspberry Culture.
A. O. Hawkins, Wayzata.

Raspberry Diseases in Minnesota.
G. R. Hoerner, Asst. in Plant Pathology,
University Farm, St. Paul.

Everbearing Strawberry Field.
A. Brackett, Excelsior.

Everbearing Strawberries at Osage, Ia., in 1916.
Chas. F. Gardner, Osage, Ia.

Opening Up the Fruit Farm.
D. E. Bingham, Delegate Wisconsin
State Hort. Society, Sturgeon Bay, Wis.

The Native Plum, Its Hybrids and Their Improvement.
Dewain Cook, Jeffers.

Winter Injury to Plums in 1916-17.
M. J. Dorsey, Section of Fruit Breeding,
University Farm.

Lantern Talks.

1. Snapshots on the Road. Nurseries; Top-working; Blister Rust.
Prof. F. L. Washburn, State Entomologist,
University Farm.

2. Nature of Plant Diseases.
G. R. Bisby, Asst. Plant Pathologist,
University Farm.

TUESDAY EVENING SESSION.

8:00 o’clock.

MINNESOTA STATE FLORISTS’ SOCIETY.

Prof. LeRoy Cady, President, in the Chair.

Program:

Storing and Handling Gladiolus Bulbs.
G. D. Black, Delegate, N. E. Ia. State Horticultural Society, Independence, Ia.

Resources of Present-Day Florists.
W. E. Tricker, St. Paul.

Greenhouse Management.
Prof. Wm. Moore, University Farm.

Some Native Shrubs and Their Uses.
E. Meyer, Minneapolis.

WEDNESDAY FORENOON SESSION.

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9:00 o'clock.

A half hour question and answer exercise on "The Vegetable Garden," led by Alfred Perkins, Market Gardener, St. Paul.

9:30 o'clock.

N. H. Reeves, Pres. Minneapolis Market Gardeners' Society, presiding.

The Vegetable Garden.

A Successful Cabbage Field.
E. C. Willard, Mankato.

Hotbeds and Cold Frames Nine Months In the Year. (30 min.)
N. A. Rasmussen. Pres. Wisconsin State
Hort. Society, Sturgeon Bay, Wis.

Improvement of Vegetable Varieties by Selection.
Richard Wellington, Horticulturist, University Farm.

Some Phases of Onion Growing.
W. T. Tapley, Asst. in Horticulture, University Farm.

Irrigation in the Market Garden.
C. E. Warner, Osseo.

The Cultivation of Cabbages.
Nic Lebens, Minneapolis.

Growing Radishes.
Chas. Hoffman, White Bear.

A Winter Garden In the Cellar.
N. A. Rasmussen, Sturgeon Bay, Wis.

Home Canning.
Mrs. Louis M. Glenzke, Hopkins.

WEDNESDAY AFTERNOON SESSION.

1:30 o'clock.

The Question and Answer Exercise to occupy this half-hour will be on "The Flower Garden," and led by Mrs. H. A. Boardman, St. Paul.

2:00 o'clock.

President Cashman In the Chair.

My Spraying Experience—four five-minute paper.
1. Harold Simmons, Howard Lake.
2. E. Yanish, St. Paul.
3. A. H. Reed, Glencoe.
4. J. J. Dobbin, Excelsior.

Orchard Pests In Minnesota During 1916.
1. Diseases.
   Prof. E. C. Stakman. Head of Section
   Plant Pathology, University Farm.
2. Insects.
   A. G. Ruggles, Asst. Entomologist,
   University Farm.

3:15 o'clock.

MINN. GARDEN FLOWER SOCIETY.

Mrs. E. W. Gould, Pres., Minneapolis.

Some New Plants at Home and Abroad.
Professor N. E. Hansen, Brookings, S. D.

The Home Setting As the Architect Sees It.
Mr. Harry W. Jones, Minneapolis.

A Composite on Composites—Useful Plants for Fall Bloom.
Mrs. Phelps Wyman, Minneapolis.

Lantern Talk by E. G. Cheyney, Prof. of Forestry, State University. Illustrated with many views from the forest regions of Northern Minnesota.

WEDNESDAY EVENING SESSION.

7:30 o'clock, Dec. 6, 1916.

N. W. PEONY AND IRIS SOCIETY.

Fifteen-minute musical program by orchestra.

The Modern Iris.
Mr. C. S. Harrison, York, Neb.

Peonies, Their Care and Culture.
Mr. John E. Stryker, St. Paul, Minn.

Peonies for Pleasure.
Mr. Lee Bonnewitz, Van Wert, Ohio.

Peonies for Profit.
Mrs. Wm. Crawford, La Porte, Ind.

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Peonies and Their Possibilities.
  Mr. D. W. C. Ruff, St. Paul, Minn.

Music. Selection by Orchestra.

General Discussion.

THURSDAY FORENOON SESSION.

9:00 o'clock.

A thirty-minute "Question and Answer" exercise on "Success in Orcharding," led by J. F. Harrison, a successful orchardist, Excelsior.

9:30 o'clock.

President Cashman in the Chair.

Evergreens for Prairie Homes.
  M. Soholt, Madison.

Windbreaks by the Mile.
  T. A. Hoverstad, Minneapolis.

Arrangement of Farm Buildings and Grounds for Convenience
  and Artistic Effect.
  E. M. Reeves, Waverly, Ia.

Report of Committee on Fruit List.
  J. P. Andrews, G. W. Strand, T. E. Cashman.

Adoption of Fruit List.

Annual Reports.

Report of Executive Board, J. M. Underwood, Chairman, Lake City.

Report of Secretary, A. W. Latham.

Report of Treasurer, Geo. W. Strand, Taylors Falls.

On account of the very full program the annual reports of the vice-presidents, superintendents of Trial Stations and Auxiliary Societies, will be filed with the secretary for publication without reading. (See list on page 20.)

The Successful Orchard. (30 min.)
S. A. Beach, Prof. of Horticulture, Iowa
State Agricultural College, Ames, Ia.

Development of Horticulture in Western
Canada.
Prof. F. W. Brodrick, Horticulturist,
Manitoba Agricultural College.

Contestants, Gideon Memorial Fund—by Students at University Farm School.

THURSDAY AFTERNOON SESSION.

1:30 o'clock.

Discuss these subjects.

"Ornamentation of Home Grounds" will be the subject of the half-hour "Question and Answer Exercise," led by C. H. Ramsdell, Landscape Architect, Minneapolis.

2:00 o'clock.

President Cashman in the Chair.

Horticultural Work with the Boys' and Girls' Clubs in Minnesota.
T. A. Erickson, State Club Leader, University Farm.

Boy or Girl prize winner in the state-wide garden and canning contest.

Compulsory Spraying for Fruit Insects and Diseases.
K. A. Kirkpatrick, Agricultural Agent,
Hennepin County, Wayzata.

Annual Election of Officers.

3:00 o'clock.

Semi-Centennial Anniversary Session.

J. M. Underwood, Lake City, Presiding.

Song.
Trafford N. Jayne.

Some History.
A. W. Latham, Secretary.

The Heroes of Minnesota Horticulture.
Clarence Wedge, Albert Lea.

Personal Recollections.
A. J. Philips, West Salem, Wis.

The Ladies of the Society.
Mrs. Jennie Stager, Sauk Rapids.

Greeting from University Farm.
A. F. Woods, Dean.

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The Minnesota Society and the Northwest.
  Prof. C. B. Waldron, Agri. College, N. D.

Looking Ahead.
  C. S. Harrison, York, Neb.

To conclude with a lantern slide talk, “Veterans of Minnesota Horticulture.” Slides prepared by Prof. LeRoy Cady.

FRIDAY FORENOON SESSION.

9:00 o’clock.

A thirty-minute “Question and Answer Exercise” on the general subject of “Birds a Factor In Horticulture,” led by R. E. Olmstead, Excelsior.

9:30 o’clock.

President in the Chair.

Potato Selection.
  P. E. Clement, Moorhead.

Vinegar a By-Product of the Minnesota Orchard.
  W. G. Brierley, Horticulturist, University Farm.

Our Horticultural Building.
  A consultation.

Plant Breeders’ Auxiliary.

Clarence Wedge, President, in the Chair.

Annual Report, 1916, Minn. Fruit Breeding Farm.
  Chas. Haralson, Supt., Excelsior.

Report of Committee on Fruit Breeding Farm.
  S. A. Stockwell, Minneapolis.
  C. S. Harrison, Excelsior.

Fruit Breeding.
  Prof. S. A. Beach, Horticulturist, Ames, Iowa.

Pedigree in Plants.
  Prof. C. B. Waldron, Agricultural College, N. D.

Origin and Development of Hardy, Blight Resisting Pears.
  Chas. G. Patten, Charles City, Ia.

New Creations in Horticulture for 1916.
  Prof. N. E. Hansen, Brookings, S. D.

FRIDAY AFTERNOON.

1:30 o'clock.

The "Question and Answer" half hour will be occupied with this subject, "The Home Orchard," led by Henry Husser, Minneapolis.

2:00 o'clock.

The Minnesota Orchard.
  J. F. Bartlett, Excelsior.

The New Farmers Fruit.
  Freeman Thorp, Hubert. (30 min.)

The Unfruitful Tree and How to Correct It. (30 min.)
  Prof. S. A. Beach, Ames, Ia.

Orcharding In Minnesota.
  Richard Wellington, Horticulturist, University Farm.

The Minnesota Apple Crop in 1916.
  R. S. Mackintosh, Horticulturist, Extension Division, University Farm.

4:00 o'clock.

Two-minute speeches by members.

4:30 o'clock.

Closing remarks by the President.

PREMIUM LIST, ANNUAL MEETING, 1916.

Thos. Redpath, General Supt.

Geo. W. Strand, Clerk.

FLORAL DISPLAY.

W. H. Bofferding, 710 No. 2nd St., Minneapolis, Supt.

PLANTS.

To be staged Monday p.m., Dec. 4, 1916.

1st. 2nd. 3rd.
Collection of 12 specimen Palms $10.00 $7.00 $4.00
Collection of 12 specimen Ferns 10.00 7.00 4.00
Collection of 12 specimen
Blooming Plants 12.00 9.00 6.00
(Covering 25 square feet.)

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CUT FLOWERS.

To be staged before 10:00 a.m., Tuesday, Dec. 5.

	1st.	2nd.	3rd.
12 Roses, Red, any variety	$3.00	$2.00	$1.00
12 Roses, Pink, any variety	3.00	2.00	1.00
12 Roses, White, any variety	3.00	2.00	1.00
12 Roses, Yellow, any var'ty	3.00	2.00	1.00

To be staged before 10:00 a.m., Wednesday, Dec. 6.

	1st.	2nd.	3rd.
12 Chrysanthemums, Yellow	$4.00	$3.00	$2.00
12 Chrysanthemums, any other color	4.00	3.00	2.00
25 Carnations, Red, any variety	3.00	2.00	1.00
25 Carnations, Pink, any variety	3.00	2.00	1.00
25 Carnations, white, any variety	3.00	2.00	1.00

To be staged before 10:00 a.m., Thursday, Dec. 7.

1st. 2nd. 3rd. Basket arranged for effect, diameter not to exceed 12 inches $10.00 $7.00 $4.00

Best Bridal Bouquet—Diploma.
Best Corsage Bouquet—Diploma.
Best Bridesmaid's Bouquet—Diploma.

VEGETABLES.

Entries to be made by Tuesday, Nov. 28. N. H. Reeves, Mpls., Supt.

	1st.	2nd.	3rd.	4th.
Beets, 1 peck	$3.50	$2.00	$1.00	$0.50
Cabbages, 3 heads	3.50	2.00	1.00	.50
Carrots, 1 peck	3.50	2.00	1.00	.50
Celery, 1 doz. stalks	3.50	2.00	1.00	.50
Celeriac, 1 doz. roots	3.50	2.00	1.00	.50

Lettuce, 1 doz. heads	3.50	2.00	1.00	.50
Onions, 1 peck Red	3.50	2.00	1.00	.50
Onions, 1 peck White	3.50	2.00	1.00	.50
Onions, 1 pk. Yellow	3.50	2.00	1.00	.50
Onions, 1 peck White Pickling	3.50	2.00	1.00	.50
Parsley, 1 doz. bnhs.	3.50	2.00	1.00	.50
Parsnips, 1/2 bushel	3.50	2.00	1.00	.50
Potatoes, 1 bu. early variety	3.50	2.00	1.00	.50
Pie Pumpkins, three specimens	3.50	2.00	1.00	.50
Radish, fresh, 1 doz. bunches	3.50	2.00	1.00	.50
Salsify, 1 doz. bnchs.	3.50	2.00	1.00	.50
Hubbard Squash, 3 specimens	3.50	2.00	1.00	.50
White Turnips, 1 pk	3.50	2.00	1.00	.50
Rutabagas, 1/2 bu	3.50	2.00	1.00	.50

EARLY WINTER SEEDLING.—The fruit shown must not have been kept in cold storage. Premium $50.00, to be divided pro rata.

LATE WINTER SEEDLING.—Same conditions as for early winter seedlings except that if found necessary the fruit shown may be retained and final decision reserved until later in the winter. Premium $50.00 to be divided pro rata.

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In each of the above two classes the varieties receiving the three highest awards will be designated as having received the first, second and third premium respectively.

APPLES (not including crabs).

No inferior fruit can be shown.

1st. 2nd. 3rd. Each variety (may or may not have been in cold storage) included in the 1916 fruit list of the society, or in the 1916 premium list of the Minnesota State Fair
$0.75 $0.50 $0.25

Collection, not to exceed
ten nor less than six varieties $20.00 to be divided pro rata

Pecks of Apples.

Peck of any variety of apples, the fruit exhibited to be at the disposal of the society. An exhibitor may enter a peck of each of as many different kinds as he pleases. $25.00 to be divided pro rata.

Top-Worked Apples.

Collection of named varieties grown on scions top-grafted on other trees. Accompanying the name of each variety, shown on the same label (to be furnished by the management), must be noted the name of the variety on which it is top-worked. $25.00, to be divided pro rata.

BOXES AND BARRELS OF APPLES.

Must have been packed by the exhibitor.

Only one variety (not less than 2-3/4 in. in diameter) can be shown in a box. Bushel boxes of the standard size must be used. Awards will be based on the quality of the fruit, packing, *etc*.

SINGLE BOX of any variety of apples, including seedlings, $25.00, to be divided pro rata. Also 1st $15.00, 2nd $10.00, 3rd $5.00.

1st. 2nd. 3rd. 4th.
BARREL of apples,
any variety, $25.00,
to be divided pro
rata. Also $20.00 $15.00 $10.00 $5.00

GRAPES.

1st. 2nd. 3rd.
Collection, not more than
10 nor less than 6 varieties $8.00 $6.00 $4.00

$100 SEEDLING APPLE PRIZE.

The fifth prize of $100.00 will be awarded this season “for the best late winter seedling apple keeping till March 1st under ordinary cellar conditions” under the offer made first in 1905, restricted, of course, to the contestants who have duly registered.

NUTS.

1st. 2nd. 3rd. 4th. Each variety of edible nuts, one quart $1.00 $0.75 $0.50 $0.25

* * * * *

Program Notes:

You can become a life member of the State Horticultural Society by payment of $10.00, in two annual payments of $5.00 each if you prefer. This will entitle you to a file of our bound reports, a library in itself.

The annual business meeting of the Minn. Garden Flower Society will be held Wednesday morning at 10:00 o’clock in an adjoining room.

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Are you a member of the Garden Flower Society? If you are growing flowers you should join it at once. Consult the secretary, Mrs. M. L. Countryman.

Membership fees to be paid to the Assistant Secretary In the Hallway.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So.
Minneapolis.

The Garden Flower Society will have an all-day meeting at the Agricultural College the first Friday in January next. This meeting is to be held with the session of the Farmers' Short Course in Room 20, Horticultural Building. Arrangements will be made so that lunches may be had on the grounds, probably at the dining hall.

The program covers a wide range of subjects, and as time will be given for discussion and answering of questions brought up, this will prove a most helpful meeting to all of our members.

Our own annual meeting will be held on Wednesday, December sixth. The business meeting and election of officers being held in the morning, the program in the afternoon —at the West Hotel—in connection with the Horticultural Society.

Will not each member make an especial effort to bring in a new member at that time or before? The only reason we have not a thousand members is because we and our work are so little known. If you will tell your friends who have gardens what we are doing, you will have no difficulty in helping us add to our membership. Since last January we have received sixty-six new members. Can't we make it an even hundred for this year? With *your help*, we *can*. The program for our annual meeting will be found in the official program, printed elsewhere in this number. Here is the program for the meeting at the Agricultural College, Friday, January 5th. Come and bring your garden problems with you.

* * * * *

(Program for Meeting, January 5, 1917, 10 a.m., Agricultural College.)

1. Perennials for Busy People — Mrs. H. B. Tillotson
2. Perennials from Seed to Seed — Mr. E. Meyer
3. Native Perennials for Garden Use — Miss M. Fanning
4. Best Hardy Vines and Their Use — Mrs. E. W. Gould

5. Best Annuals Mrs. H. A. Boardman

1:30 P.M.

1. Fruits for Ornamental Planting Mr. Phelps Wyman 2. Native Shrubs for the Home Grounds Mr. Paul Mueller 3. Proper Preparation of the Garden Soil Professor F. J. Alway 4. A Watering System for the Garden Mrs. C. E. Warner 5. Growing Bedding Plants for the Market Mrs. F. H. Gibbs 6. Growing Cut Flowers for the Market {Miss Sabra Ellison

{Mr. F. H. Ellison

7. Special Purpose Plants—
Honey Plants Prof. Oswald
Medicinal Plants Dr. Newcomb

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Question Box.

SECRETARY'S CORNER

THIS IS YOUR VACATION.—If you are a fruit grower or a flower grower or vegetable grower or interested in home life or in any of the varied matters directly or indirectly connected with horticulture, the annual meeting is just the place for you. *Make it a real winter vacation.* Bring your wife and others of the family if possible and stay with us at the West Hotel for the four days of the meeting. It will be one of the bright spots in your life, as you recall the pleasures of this great and fruitful gathering.

ANNUAL SOCIETY BANQUET.—Special pains have been taken in preparing the program for this banquet on account of the fact that this is our anniversary session in part, and you will not be disappointed if you anticipate a rich treat, with two or three hundred of the most congenial people on earth, who will sit down to supper together at the West Hotel at 6:30 p. m., Thursday, December 7th,—a wholesome repast and an intellectual feast, don't miss it. You will feel that you really belong to the brotherhood after dining with us.

DELEGATES TO THE ANNUAL MEETING.—Besides the delegates at our annual meeting from abroad referred to in the November number, there is to be with us also as representative of the Iowa State Horticultural Society, Mr. P. F. Kinne, of Storm Lake, Iowa. We have pretty good assurance also that Secy. Greene, of the Iowa Society, will visit with us at some time during the meeting, and we don't know how many more of the good Iowa people will find their way here. A late note from Chas. G. Patten assures us of his attendance at the meeting, when he will give us a full report of his experimental work in growing seedling pears at his station at Charles City, Iowa. We are looking forward confidently to something of large practical value from his work.

PROGRAM OF ANNUAL MEETING.—The program of the coming annual meeting of the society will be found in an abbreviated form in this number of our magazine. It has been sent, however, in all its completeness, in a separate enclosure to all the members of the society, accompanied by a blank form to be filled out by members who purpose to attend and desire to have their names in the Badge Book, and also for those who renew their memberships. Quite a number of questions are asked on this blank form, and it is important that they should all be answered. It is especially important that the names of friends whom you would like to see members of the society should be given to the secretary on these blanks and at an early date so that copies of the program can be sent them in good season.

The program, as you will note, is an exceedingly diversified one, special emphasis being laid on orcharding, vegetable growing and ornamental horticulture. An increasing

interest in flower growing is emphasized by the programs of three auxiliary societies devoted to these branches of horticulture.

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Aren't you coming to this splendid meeting? Study the program and consider the advantages of intercourse and companionship with those who have so much in common as the members of the Horticultural Society. Don't fail to *attend promptly the first session*, which is always a full one, right on the minute.

JOURNAL OF ANNUAL MEETING, 1915

Minnesota State Horticultural Society

Held on Second Floor of the West Hotel, Minneapolis, December 7, 8, 9 and 10, 1915.

Tuesday Morning Session, 10 o'clock.

Meeting was opened at 10 o'clock a.m., December 7, 1915, by President Thomas E. Cashman. Invocation was made by Rev. C. S. Harrison, of York, Nebraska, which was followed by a song by Mr. Trafford N. Jayne, of Minneapolis. The president then read his annual greeting. (See index.)

President Cashman: How may University Farm and the Minnesota State Horticultural Society be mutually helpful in developing the farms and homes of the Northwest? by our good friend, the dean of agriculture of this state, Mr. A. F. Woods. (Applause.) (See index.)

Discussion.

President Cashman: Anything further before we pass to the next subject? If not, we will now call on one of our oldest members and one of our best friends, Mr. George J. Kellogg, of Wisconsin, who will tell us something about the strawberry business. (See index.)

Discussion.

President Cashman: I am sure we are all very much indebted to Mr. Kellogg. Now, we have another very good friend with us from Nebraska. He is going to tell us about "The Nurseryman as King." Mr. C. S. Harrison, of York, Nebraska. (See index.)

President Cashman: This morning we heard from our good friend, Dean Woods, then we heard from Wisconsin and later from Nebraska. We have enjoyed all three, all very instructive and very entertaining, and we hope to hear from them again. We hope later to hear from another Wisconsin man, Mr. Philips. Those three men have always contributed a great deal to the success of our meetings. I understand that Wisconsin has sent another representative, Mr. A. C. Graves, of Sturgeon Bay. It has been announced that he is with us. If so, we will be pleased to have him come forward and have a word of greeting from him, representing the Wisconsin Horticultural Society.

Mr. Graves: Mr. President and members of the Minnesota Horticultural Society: I am very pleased to be here this morning and listen to this program and these deliberations. I expect to spend some enjoyable days with you, and on behalf of the Wisconsin Horticultural Society I am pleased to bring to you their greetings on this occasion. Thank you. (Applause.)

President Cashman: We hope to hear from you later, Mr. Graves, and would be pleased to have you take part in our deliberations. I presume that there are other delegates here, but if so they have not been announced. If there are others I hope they will hand their credentials to the secretary so we may call on them later.

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Meeting adjourned until 1:30 p.m.

December 7, 1915, Afternoon Session.

The Minnesota Orchard. Discussion led by J. P. Andrews, Faribault, Minn. (See index.)

The President: Ladies and gentlemen, the time has now arrived to continue with the regular proceedings of the society. Mr. Rasmussen, president of the Wisconsin State Horticultural Society, is with us and will be on the program later, but we will have a few words from him now. (Applause.).

Mr. Rasmussen (Wisconsin): Mr. President and members of the Minnesota Horticultural Society: I didn't expect to be caught this way. I was going to be real shrewd, I was not going to let you know I was coming. I told the secretary of our society not to let you know I was coming, but he notified your secretary that I was coming and that is the way they happened to get me on the program. I was going to sneak in and get all the good out of it and was not going to give anything back; I will admit that is not a fair game. I feel about like a fellow who had to make a talk at a banquet. He said he was not a speaker, but they insisted. They would not let him back out. So he got up and feeling kind of shaky, like I am now, he reached his hand down to get hold of his chair, as he thought, but touched his wife's shoulder, and she got up. She thought she had to. He started, "Ladies and gentlemen, this thing was forced on me. (Laughter.)" So this was kind of forced upon me. I know that your program is full so I will not detain you any longer. My time is tomorrow, and I will take you through my garden tomorrow. (Applause.)

The President: We are all pleased to have Mr. Rasmussen with us, and we hope we will hear from him often during the deliberations of the meeting. I was pleased indeed to see so many present this forenoon. Secretary Latham thought he had plenty of room for all who might attend, but I don't think there was a vacant chair here this forenoon. I was pleased indeed to note so many new faces, so many young men present. You are the people we want to see. The older men have always contributed and done their part and have made these meetings a grand success, but it will soon devolve upon the younger men of this society to take their places. We want you to help them at these meetings, and I was glad that you did so this forenoon. We hope that the young men will feel at home and that they will continue to take part, that they will ask questions and tell us about their successes and their failures, and I hope the older members will help make it pleasant for these young men.

We will take up the subject of fruits this afternoon, and I am now going to call on a plum specialist, a man that we look to to tell us about the plum troubles in this state, Mr. Dewain Cook, who will tell us about the "Plums We Already Have and Plums That Are on the Way—the Brown Rot a Controlling Factor," Mr. Dewain Cook, of Jeffers, Minnesota. (See index.)

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Discussion.

The President: We have heard of some of the troubles of those that plant plum trees. The next speaker will probably tell us how to meet those troubles, how to combat the plum pocket fungus. We are fortunate to have with us a scientific man that makes a study of these subjects. I refer to Professor Stakman, of the University Farm, St. Paul. "The Control and Cure of Brown Rot, *etc*.," by Prof. E. C. Stakman. (See index.)

Discussion.

The President: I will now call on Mr. C. A. Pfeiffer, of Winona, to talk to us on "The Surprise Plum a Success." (See index.)

Discussion.

The President: "Thirty Years in Raspberries," by a gentleman that knows how to make money by the raising of raspberries, Mr. Gust. Johnson, of Minneapolis. (See index.)

Discussion.

The President: We will now call upon Mr. Simmons to tell us about "My Orchard Crop of 1915—from Start to Finish." (See index.)

The President: As you know, Mr. Simmons is one of the most successful orchardists in Minnesota. Do you wish to ask him any questions?

Discussion.

Mr. Cashman: We are very much indebted to Mr. Simmons for this splendid paper and for his advice. We must hurry on to the next subject, which is "Fruit Growing a Successful Industry in Minnesota," by A. W. Richardson, Howard Lake, Minn. (See index.)

The President: I am sure you will all agree this was a very instructive and interesting paper. We have about three minutes in which to discuss it.

Discussion.

Two lantern talks followed—one by Earl Ferris of Hampton, Ia., on "Evergreens," and one by A. G. Tolaas on "Diseases of the Potato."

December 8, 1915, Morning Session.

Discussion on "The Vegetable Garden," led by H. J. Baldwin, Northfield, Minn. (See index.)

N. H. Reeves, president Minneapolis Market Gardeners' Association, in the chair.

President Reeves: We will now have a paper on "Growing Beans and Sweet Corn," by P. B. Marien, of St. Paul. (See index.)

Discussion.

The President: We will now listen to a paper on "Growing Vegetables for Canning," by Mr. M. H. Hegerle, president of Canning Company, St. Bonifacius. Mr. Hegerle not being present, we will ask Mr. Rasmussen, president of the Wisconsin Horticultural Society, to tell us "How We Grow Vegetables in Oshkosh, Wisconsin." (Applause.) (See index.)

President Reeves: Is Mr. Hegerle in the room?

Mr. Hegerle: Yes.

President Reeves: Then we will listen to Mr. Hegerle's talk on "Growing Vegetables for Canning." (See index.)

Discussion.

President Reeves: "Greenhouse vs. Hotbeds, Investment, Care and Result Compared," by Mr. F. H. Gibbs. (See index.)

President Reeves: "Growing the Tomato," by C. W. Purdham, market gardener, Brooklyn Center. (See index.)

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Discussion.

President Reeves: We will now listen to a paper by E. W. Record on "Asparagus by the Acre." (See index.)

President Reeves: You will be entertained with a demonstration of the coldpack method of canning fruits and vegetables by Professor R. S. Mackintosh and Miss Mary L. Bull.

After the demonstration the session adjourned until 1:30 o'clock p.m.

December 8, 1915, Afternoon Session.

Question and answer exercise on "The Flower Garden," led by Mr. G. C. Hawkins, of Minneapolis.

The President: I regret to have to announce that one of the big guns who was to be with us on this afternoon's program, Professor J. C. Whitten, of Missouri, is unable to be with us on account of sickness. Secretary Latham received a letter from him just a short time ago, stating that he was sick abed and the doctor would not permit him to leave. We have another very able gentleman whom I will call upon at this time to take Mr. Whitten's place. His name is H. G. Street, of Hebron, Ill., who will tell us about "Marketing Fruit Direct." (Applause.) (See index.)

Discussion.

The President: We appreciate very much this fine paper by Mr. Street. We have another very important subject this afternoon. We will have a paper by Mr. W. G. Brierly, Assistant Horticulturist at the University Farm, on "The Manufacture of Cider Vinegar on the Farm." (Applause.) (See index.)

Reading by Miss Mary Bonn.

The President: We will now turn the meeting over to the Garden Flower Society and request the president, Mrs. Ruff, to take the chair. (In the absence of Mrs. Ruff, Mrs. E. W. Gould presided.)

Mrs. Gould: Our first number will be a paper on the Minnesota State Flower, by Mr. E. A. Smith, of Lake City. (Applause.)

Mr. Smith: I wish to add one word to the name of my paper and that is "Flag," so that it will read "Minnesota State Flower and State Flag." I have the two subjects so closely associated that I can not separate them. (See index.)

Discussion.

Mr. Smith: I now come to the point in my paper. I move you, Madam President, that the Minnesota State Horticultural Society and its auxiliary societies through its secretary present the following resolution to the next legislature of the state for adoption at that time: Resolved, that, whereas the State of Minnesota has adopted a state flower which, on account of its being a native of the woods and bogs, is not generally known or recognized and, whereas, the State of Minnesota in 1893 adopted by legislative vote a state flag, which emblem is not generally known to the residents of the state, and believing that familiarity with the state flower and the state flag will do good and create loyalty to the state and Union, be it resolved, that we, the Minnesota State Horticultural Society and auxiliary societies, do hereby petition and pray the state legislature of Minnesota to have printed an attractive picture of the state flower and the state flag, properly framed, and present a copy of it to each public school of the state with the request that it be placed upon the walls of the school room, also that it be furnished free of cost to such other public buildings as may be deemed advisable.

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I trust, Madam President, that this resolution will not only be seconded but it will meet with the unanimous approval of the society.

Mr. Hawkins: I second the motion.

Mrs. Gould: I do not know that we could vote with the Horticultural Society. This is not a meeting of that society but simply a meeting of the Flower Society. Will some one enlighten me?

Miss White: Madam President, if we could not vote as a society, could we not vote to recommend this resolution to the Horticultural Society?

A Member: Yes, or to the two societies to be taken up at their business meeting, perhaps.

Miss White: Recommend it be passed by the parent society.

A Member: Madam President, why should it not be the flag itself and not a picture of the flag?

Mrs. Gould: Will you make that motion?

Miss White: I move that the resolution as presented by Mr. Smith be endorsed by this Garden Flower Society and referred to the parent society for their adoption. I will offer that as a substitute.

A Member: I second the motion.

Motion was carried.

Mrs. Gould: Our next subject is “The Pergola, Its Use and Misuse, Its Convenience and Expense,” by Charles H. Ramsdell, of Minneapolis. (See index.)

Mrs. Gould: Our next paper is “Hardy Perennials,” by Miss Grace E. Kimball, of Waltham. (See index.)

Mrs. Gould: This spring our president, Mrs. Ruff, offered prizes for the best papers on planting for color effect. The judges after reading these papers carefully selected three. Miss Starr is first, Mrs. Tillotson second and Mrs. Boyington third. These papers will now be read, Miss Starr giving the first one. (See index.)

Mrs. Gould: Mrs. Tillotson will follow with her paper. (See index.)

Mrs. Gould: Mrs. Wyman will read Mrs. Boyington’s paper. Mrs. Boyington was unable to be with us today. (See index.)

Mrs. Gould: Mrs. Countryman will read a paper written by Mr. Swanson on the judging of flowers. (See index.)

Mrs. Gould: Our meeting will close with Professor Washburn's talk on "Bird Conservation," which will be given with slides and music.

Professor Washburn gives lantern talk.

December 9, 1915, Morning Session.

Half hour question and answer exercise on "Truck Crop and Garden Insects," led by Professor Wm. Moore. (See index.)

The President: The committee on fruit list has been working very hard trying to determine why we have particular varieties on the list and the changes, if any, that should be made. Mr. J. P. Andrews, the chairman of the committee, is the man who has been doing most of this work, and we will be glad to hear from him at this time. He is quite radical and in favor of many changes as you will note when he reads his report.

Mr. Andrews: There are very few changes, and you know it has been the policy of this society rather to be conservative and not jump at anything until we know what it is. (Reads new fruit list.)

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Mr. Andrews: I move its adoption.

Motion was seconded and carried unanimously.

Mr. Andrews: I would like to call attention to the fact that a great many criticize that we do not change the list from time to time. I have thought that for a long time. Two or three years ago there was a little move towards making it so we could change it. We are putting up some nice, big premiums for late winter apples and early winter apples, and there are undoubtedly some seedlings that would be all right to put upon the list if we knew more about them. It seems to me it is foolish to pay those premiums and then drop it right there. We do not know any more about whether they are hardy or not than if they had been grown in Missouri. They may have grown well through some protection or favorable location, but when you commence grafting from a seedling it does not give satisfaction as a grafted tree and in different localities of the country.

We want to know whether the new seedlings are hardy enough for this climate, not that they are simply of good quality to eat and perhaps will keep. We find that out here, but we do not find out anything about the hardiness.

I think we ought to require a person who has produced a good seedling and gotten a good premium for it to send some of its scions to the superintendent of the Fruit-Breeding Farm for testing and let him send it out to points north of here, between here and the northern part of the state, to see how much hardiness it has. Hardiness is the quality we want more than anything else. We have gotten along so far with the Hibernal, and we ought not to be so particular about quality as about hardiness. They ought to be required to give Mr. Haralson a few of the scions or buds so that he could try them there at the fruit-breeding farm and send them out to more northern locations under number, so that the originator will be just as well protected, and it will add so much to the value of the new seedling that he ought to be anxious to do it instead of holding it back as is now done.

I move you that we have some arrangement whereby those drawing the premiums for the first and second qualities, keeping qualities and eating qualities, *etc*., shall be obliged to give to Mr. Haralson something to work on, either scions or buds of those varieties, so that they can be tested in that way and we know what they are, otherwise it leaves it for any one to introduce a new variety just about on the same ground that some other varieties have been introduced in the state, made a nice, large thing for the man that introduced them to the public and sold them but afterwards proved a great disappointment to almost every man who ever planted them. I move that we make such an arrangement, and we recommend that the state fair do the same.

Mr. Horton: I second the motion.

The President: It is moved and seconded that some arrangement be made requiring people who enter seedling apples for prizes at the horticultural meeting and the state fair to furnish scions or buds of such varieties to the central station to Superintendent Charles Haralson that he may determine whether the trees are hardy and suitable for this climate or not.

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Mr. Andrews: We need this provision so that Superintendent Haralson could visit those trees and see what they looked like.

Mr. Latham: I move that this matter be referred to the executive board to develop a workable plan to secure the purposes which Mr. Andrews has in view.

The President: Do you accept that as a substitute?

Mr. Andrews: I would if it wasn't for this one thing. It was left that way a year or two ago, and it hasn't amounted to a thing. I do not care if it is left to the executive committee if Mr. Latham will vouch for its being put through.

Mr. Latham: Don't you remember as the result of that action we prepared forms to be used by those who examined the seedlings and decided what seedlings should be further tested and all that sort of thing. We have those forms for use if the committee wants to use them.

Mr. Andrews: Those ought to be so as to hold the premium money back until we get some material to test.

Mr. Latham: I will say a few words. It is not such a simple matter as it seems. Here come perhaps fifty people who have grown seedlings. We tell them we are very desirous that all the seedlings in the state that have promise of merit be shown. In the division of the premium money they do not get more than four or five dollars apiece, the best of them do not get more than eight or ten dollars. Then here comes a resolution which says, "Before you draw this money you have to furnish scions to the state fruit-breeding farm with the privilege of sending out to other stations in the state for testing." The average man who owns a seedling that is really a good thing begins to think about it, and we will not get what we want. If a man has a seedling that is better than the Duchess and Wealthy and has hardiness as well there are lots of buyers around here that have their eyes open. There has been a half a dozen I know of picked up in the last few years really first class, fine and hardy. Those trees are being tested out. It would be a splendid thing if we could get a really good seedling, as Mr. Andrews says, but a resolution of this kind will not result in doing what we want to do.

I would like to have it referred to the executive board so they can work out a practical plan. Mr. Andrews is a member of the board. I renew my motion.

Motion is seconded.

The President: The original motion as given by Mr. Andrews is that those people offering seedlings for prizes, before they receive premiums—

Mr. Andrews: The first or second premiums, I said, because that would shut out all of the others.

The President:—before receiving the first or second premiums, that they be required or that they will agree to furnish scions or buds for experimental purposes, these scions or buds to be sent to the central station to Mr. Haralson for the purpose of testing them out as to hardiness, under number. Now, the amendment made by Mr. Latham is to the effect that this matter be referred to the executive committee. We will first put the amendment that it be referred to the executive committee to work out a practical plan.

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Mr. Heustis: And report next year.

The President: That they work out a practical plan and put it in operation. Was it your idea that we report next year or that the plan be put in operation?

Mr. Latham: No objection to reporting next year. If they can work out a plan they can also put it in practical operation.

Mr. Andrews: I do not think that I am after this now, gentlemen, any more than every one of you ought to be after it. We ought to know more about the hardiness of these trees. This list has stood almost identically the same list for eight or nine years, pretty nearly the same, and we are not getting ahead at all. We do not know any more about the hardiness of these trees we have been putting out than we did before.

The amendment was carried.

The President: This matter will therefore be referred to the executive board. The next in order is the annual report of the executive board, Mr. J. M. Underwood, of Lake City, chairman. Mr. Underwood is sojourning in the sunny south. He has sent a report, however, to Secretary Latham, and Mr. Latham has requested me to read it. This was written at St. Augustine, Florida. (See index.)

The President: Any one wish to make any comments on this report? If not, we will pass to the report of the secretary, Mr. Latham.

Mr. Latham: Do you wish to have the report read or have it published later? It will be published anyway.

Mr. Miller: Let it be considered as read and approved and filed for publication. (See index.)

Motion is seconded and carried.

The President: We will now have the report of George W. Strand, treasurer. (See index.)

The President: What will you do with the report of the treasurer? You have heard the reading of it.

Upon motion the report was adopted and filed.

The President: The next order of business would be the paper by Professor J. C. Whitten but Mr. Whitten is not present, I am sorry to say, and I am now going to call on Mr. O. M. Heustis as he is present to tell us about his “Dwarf Apple Trees.” (See index.)

The President: We are very much indebted to the doctor for his interesting talk. Is Professor Mackintosh in the room? I was going to ask him to read a paper on "Successful Cold Storage Plant for Apples," sent in by Mr. Hanson. I am sorry that Mr. Hanson is not able to be present, he is ill at home.

Professor Mackintosh not being present, paper was read by Mr. Clarence Wedge.

The President: Mr. Wedge will have a word for us at this time. He has a suggestion to make.

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Mr. Wedge: Ladies and gentlemen, fellow members: Once a year our society has been in the habit of bestowing the highest honor within its gift upon some of the members that have honored the society for so many years with their services and have made themselves in that way so valuable to the public that we feel that they deserve the highest recognition which we are able to give them as a society. It becomes my great pleasure at this time, standing in the place of my friend, Mr. Underwood, who is absent, to propose the following names to you which have been recommended by the executive board for this honor. There are five of them, the names are: John Bisbee, of Madelia; Charles Haralson, our superintendent at Excelsior; Mr. F. W. Kimball, of Waltham; Mr. John R. Cummins, of Minneapolis, and Mr. S. H. Drum, of Owatonna.

Mr. Bisbee has undertaken and is carrying on one of the largest experiments in seedling apples in the Northwest. He seems to be a very quiet member among us, but he is one of the working members who are doing the things that the society most needs.

I do not need to tell you anything about the work of Charles Haralson, the superintendent of our fruit-breeding farm at Zumbra Heights. His work has approved itself to us all so much that I think he really deserves the statement that was made by one of our older members that he has outdone Burbank. He certainly has for this part of the country.

Mr. F. W. Kimball, a very dear personal friend of mine, has been carrying on experiments in orcharding for the past twenty-five years about, in the neighborhood of Austin, Minnesota, and has now removed to Waltham. His experiments there in top-working have been among the most useful and among the largest that have been undertaken in any part of the state. He perhaps deserve the same reputation in our state that our friend, Mr. Philips, has in Wisconsin. I do not want to say this to disparage anybody else, but he has certainly made a very large and very valuable addition to our knowledge of the value of top-working.

Mr. John R. Cummins, of Minneapolis, whom we have with us this morning, is one who has been a very persistent experimenter in all lines. I remember particularly going to his place some ten or fifteen years ago and going over the remarkable collection of ornamental trees and plants that he was growing, many of which I did not think it was possible to grow at Albert Lea, and there he was succeeding with them and developing them at a point 100 miles north of us. We certainly owe him a deal of credit for his perseverance and his enterprise. We are glad that he is with us today.

Mr. S. H. Drum, of Owatonna, is one who has also been one of our most faithful members, whose experiments have been in fruits, and he has brought great encouragement to us in the southern part of Minnesota. He has now moved to Owatonna and, not being content with the best, he has started out with a new plantation with two kinds of fruit, and I think he is topping the market with the very best.

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Mr. President, I move that these names be added to the list of honorary life members of the Minnesota Horticultural Society.

There are several seconds to the motion.

The President: A very fitting tribute, I am sure. Are there any remarks? The name of Mr. Cummins calls my attention to the fact that about twelve years ago he presented this society with the gavel that I hold in my hand. This gavel is made of black walnut grown by Mr. Cummins on his own place. I do not suppose that he made the gavel himself, but it is made of material raised on his own farm, and when this gavel comes down good and hard I want you to think of Mr. Cummins. Are you ready for the question, that those gentlemen suggested be made honorary life members?

Motion is carried unanimously.

The President: I am now going to call on the young men from the University Farm who are contestants for the Gideon Memorial Fund. (See index.)

Contestants thereupon read their essays.

The President: I will now ask the judges to retire and decide which of these young men is entitled to this prize money. For the benefit of some of the newer members who may not understand the situation I will say that some years ago a number of the members of this society believed that we should commemorate the good work done by Peter M. Gideon. A sum of money was raised to be known as the Gideon Memorial Fund. It was decided that that money be placed at interest and that the interest derived therefrom be offered as prizes to young men attending our agricultural school or college. They were to deliver addresses at the meetings of the Minnesota Horticultural Society, and the young men preparing the best papers and making the best talks would be awarded this prize money, the accrued interest from this fund. So we have annually three young men from the agricultural college that present papers or make addresses on subjects that are of importance to this society. This is a memorial for Peter M. Gideon, who has done such splendid work for the fruit raisers of the Northwest.

While we are waiting for the report of the judges I will ask Mr. Ludlow to come forward and tell us about a letter that he received from Peter M. Gideon, November 2, 1885, and which was accompanied by Mr. Gideon's last catalog.

Judges announce their decision. (Applause.)

Premiums Awarded to Gideon Memorial Contestants:

1. The Plum Curculio—Edward A. Nelson. 2. Standardizing the Potato—A. W. Aamodt. 3. Marketing Fruit at Mankato—P. L. Keene.

The President: I am now going to call on some of the delegates to this meeting. Mr. George H. Whiting, representing the South Dakota Horticultural Society, we will ask him to come forward and say a word.

Mr. Whiting: Mr. President, ladies and gentlemen: I do not know why Mr. Cashman should ask me to come forward. I have not very much to say and could have said it back there just as well. Perhaps you will wish I had stayed back there.

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I will say it is a pleasure to me to be with the Minnesota horticulturists again. I have met with you quite a number of years but not in the capacity of delegate. I did not expect to be a delegate this time, thought I would leave the place for some younger man, but there seemed to be no other present, and so I had to accept. I rather felt as though I was not competent or did not care to take the responsibility of making a report. I am getting old and a little tired, and I do not like to do so much of that kind of work as I used to. However, I presume I will have to do the best I can and let it go at that.

I will say you have a wonderful society here. It is a wonder to me sometimes how you keep up the interest, how to keep up so much interest in this work. There is no other state in the Union that has such a good, live society. I attended a great many of the state societies last year. I had the pleasure of attending the Missouri State Society. I can say that you discount them and then some. An old state like Missouri and a fruit state, you might say, it is supposed to be in the fruit belt, and still you fellows up north here have all the vim and the snap and determination to do things that those fellows do not do at all. It is more in the man, I think sometimes, than it is in the location.

It used to be said that Minnesota was not a fruit state, you could not grow apples in Minnesota. Well, I believe Mr. Gideon said that if he could not grow apples in Minnesota he would not live there, something to that effect, and he did not intend to leave the state either. Now, you all know what success he made, and you that follow have a great deal to be thankful for the work he did, and you are hoping—and I presume you will be successful—to obtain an apple that is even better than the Wealthy.

I am glad that you take so much interest in this matter of new seedlings. It will surely develop something some day, there is no question about it. Of course, you cannot tell when, and you cannot tell who will be the lucky man to get the thousand dollars, but undoubtedly there is more at stake than the thousand dollars; that is a very small item.

I think I will not take up your time. It is getting on, and I have not thought of making any talk, have nothing prepared and nothing in my head. I thank you for your attention. (Applause.)

The President: I am going to call on our good friend, Professor Hansen, secretary of the South Dakota Horticultural Society, who has done so much for us.

Mr. Wedge: Mr. Hansen is not here. I just want to say a word that might interest some of the younger members of the society in regard to our friend who has just left the floor, Mr. Whiting, of Yankton. He is the original Dakota nurseryman, who went out in the days of the pioneers before I think there was any such thing as South Dakota, and he has stayed on the job ever since. That is not so wonderful, for others, lots of people, have stayed on the job, but he has made money out of the business and got rich. I think he deserves some very special praise. (Applause.)

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The President: Is Professor Waldron in the room? Here he comes. He is the leading light of North Dakota and a gentleman who has been with us before. (Applause.)

Mr. Waldron: These people will think North Dakota is a dark place if this is a leading light. What is the occasion of this?

The President: Tell us your troubles.

Mr. Waldron: When we had a good wheat crop we did not have any troubles. We forget our other troubles whenever we can get something like 100 million bushels of wheat. Our horticultural troubles have been quite numerous. We had a frost every year, including July. We started in on the ninth day of June with a frost that killed everything in sight except a few cottonwood trees and things like that, but all of our tomatoes, which were in blossom by the way at that time because we had a favorable spring, and plums and apples went the same way. I think a few of the late blooming plums managed to survive. The frost in July did not hurt very much but the frost in August certainly finished us.

Mr. Latham: The reporter is taking all that.

Mr. Waldron: Our reputation is so good, we can own up to calamity once in a while. Of course, if our reputation was not better than others we would have to keep it dark, but inasmuch as nature favors us so continuously we can own up when we get bumped. The August frost put our corn out of business, so we are around with long fingers trying to steal seed corn.

However, a great many of the people of the state are looking forward to the matter of planting trees as never before, and our farmers and citizens are taking more interest in general tree planting and beautifying the homes than in previous years. I had this term a large class of students in landscape gardening. They will go out to the places where they live and encourage the planting of trees and landscape gardening there. In this matter of general ornamentation the frosts or other calamities have not discouraged us. I think there were more trees grown and more ornamental work done this year than in any two previous years because the men have the money and are willing to spend it. I was out on a farm last week where a man insisted on buying a thousand evergreen trees. The nurseryman tried to sell him only five hundred, but he would not have it that way. He wanted a thousand. He said he had the money and was going to pay for them; so he planted the thousand trees. We do not recommend such rashness on the part of our farmers, but it shows when a farmer insists on having a thousand trees he is taking the beautifying of his grounds seriously. This is perhaps an extreme case, but we have others working along the same line.

I certainly enjoy the privilege of being with you people here again as I have for the last quarter of a century, twenty-five years ago, when I was made an honorary member of

this society, and I do not know of any prouder moment in my whole career than when you saw fit to honor me in that manner. I certainly would never forgive myself for the balance of the year if I failed to attend these meetings. (Applause.)

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Mr. Philips: Waldron is too modest. He has not told the best thing he ever did in North Dakota, so I shall. I visited him a good many years ago, and he had some interesting boys there, especially the oldest one, and I told him that if he was going to keep ahead of that boy he would have to hustle, and now that boy at nineteen has the ability to go to one of the southern states as a professor. So he didn't tell us the greatest thing he ever did. Maybe some of the credit is due to his wife; that is the way it is at my house. (Applause.)

Mr. Waldron: I am so far behind that boy I am sort of jealous. I do not mention it.

The President: The secretary of the Wisconsin Horticultural Society is with us, Professor Cranefield. Is he in the room?

Mr. Cranefield: Mr. Graves, of Sturgeon Bay, is the duly accredited delegate to the society and probably you want to hear from him.

The President: We heard from him two or three days ago, and we will hear from him again, but just now we want you to give us a few words. This is Professor Cranefield, who has contributed on previous occasions to the success of our meetings. (Applause.) (See index.)

The President: I will now call on Professor Mackintosh, who is going to read a paper at this time.

Mr. Mackintosh: Yesterday I had to start the ball rolling as a substitute for a man from Washington, and with the assistance of Miss Bull we kept most of you here until after 12 o'clock. Today I am put ahead of the program, so you won't hear me tomorrow afternoon. The subject is, "Bringing the Producer and Consumer Together."

Mr. Mackintosh reads paper. (Applause.)

The President: I regret very much that time will not permit us to discuss this very able paper. Secretary Latham has just called my attention to the fact that there has been but very few tickets bought for the banquet this evening. You understand it takes time to prepare food, and he has to announce just how many people would be present, and I sincerely hope that those of you who intend to attend the banquet (and I trust that will be every one present) will get your tickets immediately. It is the very best part of our program. Please get your tickets so that Secretary Latham may know how to prepare for you.

At this time recess was taken until 1:30 o'clock p.m.

December 9, 1915, Afternoon Session.

Discussion on “The Topworked Orchard,” led by A. J. Philips, Wisconsin.
(See index.)

The President: The next order of business will be the election of officers for the coming year. The secretary just handed me this slip which gives you an idea of the requirements in order to be eligible to vote for officers. (Reads extracts from constitution.) The first will be the selection of a president for the coming year. Nominations are in order.

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Mr. Bradley: Mr. President, it is said that republics are ungrateful, but it is not necessary for horticultural societies to be ungrateful. It has been, I think, in the past, and I hope it may continue to be in the future, the policy of this society to recognize the services of its officers and so we, I think, are justified in recognizing the distinguished and efficient services of our present presiding officer. I take great pleasure in placing in nomination for president of this society the Honorable Thomas E. Cashman. (Applause.)

Nomination is duly seconded and there are no other nominations.

Mr. Crosby: I move that the secretary be instructed to cast the unanimous ballot of this society for Thomas E. Cashman as president of this society.

Motion is seconded and carried.

Mr. Cashman: Friends, I deeply appreciate this honor that you have conferred upon me. I am always ready to contribute my mite towards the service of the people, but I am never happy unless I am convinced that I am able to give all that the position demands. Your selection of me as your presiding officer for the sixth time convinces me that you are at least satisfied with what I have been able to do for you and this, I assure you, makes me extremely happy.

I will endeavor to show my appreciation by doing all that is within my power to further the interests of this society made up of men and women that cannot be excelled for intelligence, cleanliness of habits and honorable and right living. I know a great many horticulturists, not only of this state but of other states, and they, I assure you—and you know it yourselves—are far above the average. I therefore deem it a great honor to be known as the president of one of the best organizations, I do not care whether it is horticultural or otherwise, in this country today. I thank you. (Applause.)

The President: I find there are two members of the executive board to be elected at this time, one to succeed Professor LeRoy Cady and another Mr. R. A. Wright, whose terms of office expire at this time.

Mr. Cady and Mr. Wright are nominated to succeed themselves, nominations are seconded and upon motion the secretary cast the unanimous ballot of the society for Mr. Cady and Mr. Wright as members of the executive board for the coming three years.

The President: The next will be the selection of a treasurer.

Mr. George Strand is renominated, nomination is seconded and on motion the secretary cast the ballot of the society for Mr. George W. Strand for treasurer.

The President: The secretary places in nomination the following men, as vice presidents of this organization. I will ask him to name the list. Vice-Presidents: C. E. Snyder, 1st Cong. Dist., Preston; S. D. Richardson, 2nd Cong. Dist., Winnebago; J. K.

Andrews, 3rd Cong. Dist., Faribault; B. Wallner, Jr., 4th Cong. Dist., St. Paul; F. H. Nutter, 5th Cong. Dist., Minneapolis; Matt. Tschida, 6th Cong. Dist., St. Cloud; G. A. Anderson, 7th Cong. Dist., Renville; J. Kimball, 8th Cong. Dist., Duluth; A. L. Hanson, 9th Cong. Dist., Ada; A. W. Richardson, 10th Cong. Dist., Howard Lake.

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Secretary Latham reads names of nominees for vice presidents and places them in nomination. Nomination is seconded and upon motion the secretary is instructed to cast the ballot of the society for the persons named as vice-presidents.

The President: The next number will be a speech by Mr. S. P. Crosby, chairman of the committee that was selected by this association to go before the legislature at the last session and try to secure an appropriation sufficient to build a home for this society. (See index.)

The next gentleman on the program is our friend Clarence Wedge, who is going to tell us of his trip out to Yellowstone Park. (See index.)

Mr. Wedge: Not exactly to Yellowstone Park. We came within a day's drive of the Yellowstone, but our interest and enthusiasm went in another direction this year.

Mr. Wedge reads paper.

The President: "Peonies New and Old," by Mr. A. M. Brand, of Faribault, one of the best peony specialists in the state.

A Member: And of the world. (Applause.) (See index.)

Discussion.

The President: We have another noted horticulturist with us today from Illinois. You have all heard of the Senator Dunlap strawberry. The originator is with us today, Senator Dunlap, of Savoy, Illinois. He will be on the program tomorrow. I will be pleased to have the senator come forward and give us a word of greeting.

Mr. Dunlap: I hardly think it is necessary for me to come forward. I will be on the program a couple of times, and you will hear all that you care to from me. I am very glad to be here with you. It has been some time since I met with your society, but I remember well the very pleasant time I had at that time. I came this week from the Michigan Horticultural Society, in session at Grand Rapids, and I was very loath to leave such an interesting meeting, but I knew when I came to Minneapolis I would be in just as interesting a meeting. I wish to disabuse your minds of the statements made by your honorable chairman through an error. I am not the originator of the Senator Dunlap strawberry. The Reverend Mr. Reisenour (?) is the originator of the strawberry, and he thought it was a thrifty, strong, healthy plant and would stand the name of Dunlap, so he gave it to the strawberry. (Laughter and Applause.)

The President: I stand corrected. I have been misinformed, although I think you carry the honor. Our time is up. I have been requested to announce that the lantern talk given by Mrs. James Jennison will take place at the close of the Woman's Auxiliary meeting. Some very talented ladies are to speak this afternoon, and I hope you will all

stay and listen to them. I will now turn the meeting over to the Women's Auxiliary and request Mrs. F. M. Powers, who will preside, to take the chair.

Mrs. Powers: Just a continuation, I hope, of our good program that was begun this afternoon, and we will now listen to Mrs. Clarence Wedge, of Albert Lea, on the "Value of Horticulture to the Farm." Mrs. Wedge is not a stranger to horticulture nor to this society. (See index.)

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Mrs. Powers: Some one has said that the enemy of art is the enemy of nature, and art is nothing more than the highest sagacity and attainment of human nature. We have with us Mrs. Cyrus W. Wells, who has had considerable experience in this line and will give us the practical side.

Mrs. Wells spoke on “Art Made Practical.”

Mrs. Powers: “The Day’s Work,” by Mrs. John B. Irwin.

Mrs. Powers: According to our program we were to have one speaker tomorrow morning because we thought she could not be here at this time, but Mrs. Dunlap is here and will favor us now, if you please.

Talk by Mrs. A. M. Dunlap on “Better Methods in the Home.”

Mrs. Powers: The last number on our program will be “The Highway Beautiful,” by Mrs. Jennison.

Mrs. Jennison gave a lantern talk.

President Cashman: We have a very important question to be considered this afternoon, and, fortunately for us, it is going to be taken care of by one of our best men —“Breeding for Hardiness”—something this gentleman has been doing all his life. He has met with a great deal of success, and we are profiting by it. That gentleman is Professor N. E. Hansen, of Brookings, South Dakota. (Applause.) (See index.)

The President: Mr. C. E. Older has some suggestions to make, and we will give him an opportunity to talk at this time.

Mr. Older: Mr. President, and Ladies and Gentlemen: In a meeting of some of the leading exhibitors of the state fair yesterday they expressed quite a bit of dissatisfaction with the present manner of awarding premiums on commercial apples, that is, boxes of apples and one-layer boxes. The point was that it would be a good thing if the state could be divided so that the sections which are more favorable for the development of the apple would be in a section by themselves, and the balance of the state compete by itself. The following resolution was formulated to bring before this society, asking for their opinion oh the subject and discussion:

Resolved, That we ask the state fair board that the state be divided into two sections for the purpose of exhibit at the State Fair, making two classes, one being the Wealthy apple and the other class comprising all other varieties of box and one layer apples, the state to be divided as follows: Beginning at the Mississippi river on the north line of Goodhue County and running west on the north line of Goodhue, Rice, Le Sueur and Nicollet Counties, thence running south on the west line of Nicollet, Blue Earth and

Faribault. All those counties lying east and south of these lines are to constitute the first district, the balance of the state being known as the second district.

We also ask the state fair board that first, second, third, fourth and fifth premiums be offered on all apples, and on all the next ten lower exhibits a certain premium be paid to all deserving exhibits.

And we ask that premiums be offered on Everbearing Strawberries showing both bearing plants and fruit of the Progressive, Superb, and any other varieties.

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We also ask the state fair board that they make some practical arrangements to get the horticultural exhibits moved to the state fair from the depots in a more satisfactory and cheaper manner than the present arrangements.

I move you that this resolution be adopted.

Motion was seconded and carried unanimously.

Meeting adjourned.

December 10, 1915, Morning Session.

The President: We are to have a talk on “Spraying the Orchard,” by Senator Dunlap, of Illinois, this morning. (See index.)

Discussion.

Mr. Crosby: We thank Senator Dunlap for his able talk. I think that is the way to progress. If we do not do things right up-to-date we can learn how to do better from a competent man.

The President: We all enjoyed the able talk of Senator Dunlap. He is president of the Orchard Association of Illinois. He is considered one of the most practical men down there, and we are very fortunate in having him with us and to listen to his valuable talk and experience. (Applause.)

We will now listen to Professor Richard Wellington, who will tell us about “Orcharding in Minnesota.” (Applause.) (See index.)

Discussion.

The President: I am going to suggest a little matter at this time which I am sure you will all approve of. It has been said by hundreds of men and women attending these meetings who have had an opportunity of enjoying the talks and papers and splendid program given here that we had the greatest horticultural society in the world. It is true that we have the largest membership of any horticultural society in the United States and, I presume, of the world.

You will all agree with me that is due to the efforts of one man to a large extent. That man has been in our service and looked after our interests for twenty-five years. He is at his best all the time, cordial, kind, using good judgment, prevents friction among us, always working for the best interests of everybody belonging to the society and the interests of the state.

As I said before, he has served us twenty-five years, and I think it only fitting at this time that we should show our appreciation in a way that will appeal better than words. It has been suggested that we purchase some little token and present it this afternoon. It is up to you as to how much you want to give or whether you want to give anything or not, but Mr. Crosby and Mr. Brackett will be at the door as you pass out this noon, and they will probably have a hat there and you can drop in what you want to, and we will buy something for him and present it this afternoon. (Great applause.)

The President: Now we will turn the meeting over to the Plant Breeders' Auxiliary. I regret very much to have to announce that our good friend, Clarence Wedge, president of this auxiliary, is ill this afternoon and unable to occupy the chair. I understand there is no vice-president of the auxiliary, and I have been requested to continue as chairman during this meeting.

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We have a very important program, one of the very best we have had. Some of our best men are on this program and I hope you will all stay and attend the balance of this meeting. I am going to call on our good friend, Charles Haralson, superintendent of the Zumbra Heights farm, to tell us about “New Fruits Originated at the State Fruit-Breeding Farm.” (Applause.) (See index.)

The President: Professor C. B. Waldron, of North Dakota, finds it necessary to leave in a very short time, and he will therefore address you at this time instead of this afternoon. He will tell us about “Running Out of Varieties.” (See index.)

We will now listen to the report of the committee on examination of the Minnesota State Fruit-Breeding Farm, Dr. O. M. Huestis, Chairman. (See index.)

The President: The next speaker needs no introduction to a Minnesota audience, as the word “Hansen” is a household word and particularly in every agricultural community within the state, and the Hansen hybrids are eagerly sought for by practically everybody who plants trees. Professor Hansen has done a good work and is still accomplishing things. He will tell us what he has done during 1915. I regret the time is so short, but we will get Mr. Hansen to tell us more about his work.

“Newer Fruits,” Prof. N. E. Hansen, Brookings, S. D.

Afternoon Session, at 1:30.

Half-hour exercise, questions and answers on “Increasing the Fertility of the Land,” led by Dr. F. J. Alway. (See index.)

The President: Mr. Crosby has a word for us, and before continuing with the regular program I will ask him to come forward at this time.

Mr. Crosby: Gentlemen of the Horticultural Society: Mr. Latham, please come this way. I have the honor, in behalf of the society, to inform you, as you probably know, that this is your silver wedding, but we are going it one better and make it a golden wedding for you today. We have come to the conclusion, you have been with this society for twenty-five years, and we think it is best that you be watched and chained. I have the honor of presenting to you, in behalf of the society, a gold watch and chain. That is all I have to say. (Applause.)

Mr. Philips: Now for a speech.

Mr. Latham: Wait a moment, I will see if it is worth it. (Laughter.) I hate to part with this old turnip. I have carried it forty-five years now, never broke a crystal on it, even. It is a good faithful companion. I do not know what I will do with this now unless I put it away in a safety vault somewhere.

I do not think the Horticultural Society expects me to make a speech; they know I am not a talker. I could say something if the room were smaller, but my voice does not seem to carry very well. I am a good deal in the fix of the steamboat that carried passengers on the river up and down to the camp meeting there. They had a whistle on that boat that made a tremendous noise but when they blew it the boat had to stop. (Laughter.) If I talk loud enough to be heard here, my thinking works do not operate. (Laughter.)

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I hardly know how to express my appreciation of this gift, as showing the sentiment of the society towards me. Of course, I have tried to do what I could for the society. Sometimes, perhaps, I have gone a little too far, something like the man who was appointed in charge of a flag station. He had never done any such service as that, but he understood the business of a flagman was to stop trains. The first train that came along was a heavy express train, eight or ten or a dozen coaches, and he rushed out and flagged the train. The conductor got off, all in a hurry, and looked around. He did not see anybody but the flagman. He said: "Where are your passengers?" "Well," he says, "there ain't any passengers to get on, but I didn't know but somebody would like to get off." (Laughter.) Sometimes, perhaps, I have overreached myself here.

Twenty-five years is quite a while to look back, and as I look over the faces of those present I can scarcely see one that was a member of the society twenty-five years ago when I became secretary. Mr. Long in his address before you at the banquet last night spoke of the meeting that he first attended of the horticultural society, held in what is now the Metropolitan Life, on the ground floor, and he spoke of the surroundings there. No fruit on exhibition. If a man had two or three apples in his pocket, he showed them around on the sly as though it was a crime to let people know there was such a thing and that he had a few at home he could eat. Quite a remarkable thing!

That was the meeting of the horticultural society in which I was first elected secretary, and I recall well all the circumstances connected with it. So many of our members that I thought so much of in those days are gone. Of those who were present at that meeting, the only person left that I recall is Mr. Underwood. I had forgotten Mr. Long was there; I think he reported the meeting; I guess the first of our meetings that he reported, too.

I am not going to make any more of an address. President Vincent is here and will address you. I thank you very much indeed. (Applause.)

Mr. Vincent: I am very glad that I got in in time to be a witness to this delightful and gratifying little ceremony which has just taken place. I can not imagine anything more satisfying to a man who, in spite of all his modesty, knows he has done for twenty-five years good, genuine, valuable work than to have other people intimate in so pleasant a way that they are not entirely oblivious to what he has done.

It always does one good to see efficient work recognized, and, while I cannot own, I am sorry to say, to an intimate personal acquaintance with Mr. Latham, I have come into association with him often enough to be able to share a little what you feel toward him and toward what he has done.

The President: I am sure you will all be delighted to hear from the very popular president of one of the greatest universities in the United States, President George E. Vincent of Minnesota State University, who will now address you. (See index.)

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The President: I am sure we are very much indebted to President Vincent for this most scholarly and delightful speech. We hope he can continue with us during the afternoon. Owing to the fullness of our program this forenoon we are unable to discuss one of our most important subjects, and that was “The Elements of Hardiness,” by Prof. M. J. Dorsey, member of the Fruit Breeding Section, of the University Farm. He will discuss that question at this time. (Applause.) (See index.)

The President: Senator Dunlap, who so delightfully entertained us this morning and instructed us on the subject of “Spraying” will now speak to us on the subject of “Packing and Marketing Apples.” (See index.)

Discussion.

The President: I am now going to call on a gentleman that hasn’t said a word during our discussions and that is Mr. Weld, and request him to recite his favorite poem.

Mr. Weld recites “The Three Warnings.”

The President: We have had a very interesting session, had a good time, everything has gone very nicely, but somehow there has been one thing lacking. The old friends from Iowa have not been with us with one exception, Mr. Ferris, who gave us the lantern talk on Tuesday, but Friend Gardner, Patten, Sherman and several others (I believe Sherman has been in town, but we have not seen him here) have been absent. The reason for it is that the Iowa people have been holding their annual meeting. But I am very glad that Mr. Gardner is with us this afternoon, and I am now going to call upon Mr. Charles F. Gardner, of Osage, Iowa. (Applause.)

Mr. Gardner: Mr. President, ladies and gentlemen: I have attended your meetings so long that when I appear here before you I feel as though I had got home. I have attended every meeting of this society except two since this society held its annual meeting at Lake City the last time. That is when I joined the society, and since that time a great many things have taken place. Think it is seventeen or eighteen years ago, in that neighborhood. I was absent two years. I went to New Mexico, I went there to die, but luckily I escaped and came back home. I want to say this, that when I got back to this part of the country, if there was anything I thanked God for it was that I was spared to get back. I think there is no necessity of emigrating either from Minnesota or Iowa, and people that have traveled over the west and made a tour extending along the Pacific coast and finally get back into this country, this latitude, are generally pretty well satisfied and stay here. That is, providing they didn’t spend all their money and can not get back here. Some of our citizens are now stranded out there and will come home whenever they can.

In regard to the progress of horticulture in this length of time, I know you are very much interested in the work of Mr. Patten and a good many of you have trees that he

originated. I want to say that the people of our state of Iowa have not really gotten their eyes open yet in horticultural ways. They only appropriated for our use $4,000. We have five societies, the state society—and then the state is divided into four sections. In the last few years our state society has appropriated to carry on, to help Mr. Patten carry on his work, we have appropriated and used $4,600.

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Before that time our society allowed $50.00 a year for station fees for quite a little while, then before that $25.00 a year. Last year we appeared before the legislature and tried to get some help to keep up that work and informed them that our money was getting short and that unless it was done we could not carry on that work. The legislature hardly winked an eye at our request. No money was appropriated, and of all the things that I ever hated to help do last week was to discontinue the Charles City station. For fear that some one might think we had gone back on Mr. Patten and that the work he has done will be lost to the world, I will say there is nothing of that kind. There is not a member of our society but would do anything in the world for Mr. Patten, to help him. It is just simply a fact that the money of our society is so nearly exhausted we had hardly enough to pay for the expenses of our meeting last week. We had a splendid meeting and never had such an exhibit of apples before. Perhaps we may have had as many apples on exhibit but not so many perfect ones. On the first opportunity we have we are going to see that Mr. Patten does not suffer. I would say that they are in pretty good shape to take care of Mr. Patten down there for a year or two, and we will not lose the valuable work he has done.

As the meeting is drawing to a close I want to say in closing that if there is anything that does me good it is to come up here and look into your faces once a year, and I wish that I could see more of you. There is a kind of bond of brotherhood and a feeling that when I am here I am among friends and I have found that to be the case for almost twenty years. Thank you. (Applause.)

The President: I have just discovered a question here that should be answered, if there is anyone here that can do so. “In my locality the basswood and box elders are infested with a scale-like substance that looks like cotton. Most of the trees of the varieties named are infested. What is it and is there a remedy?”

Mr. Kellogg: That is no doubt the cottonwood bug that infects the soft maple. They come and work for about three years and then some insect comes in and cleans them out.

The President: What is the remedy, Mr. Kellogg?

Mr. Kellogg: You can use any spray for this bug. On forest trees it is out of reach, but arsenical spray will get them if you can reach them.

Mr. Warner: Cotton maple scale. Professor Waldron recommends to spray with crude oil when the trees are dormant. We find it best to cut it back. The cottony appearance does not show until the second year and then the scale has really done its injury. The time to cut it, you will find a lot of small scales on the young twigs, and if they are cut off and a new growth forced you get rid of it.

The President: I understand Prof. Broderick of the College of Winnipeg has been here. If he is here I wish he would come forward and give us a word. I understand he is the delegate from Winnipeg. (Applause.)

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Mr. Broderick: Mr. President, ladies and gentlemen: Before going away, I would like, as a member of the Manitoba society to express to you my great pleasure at being here and taking part in your excellent meeting. I had planned for a number of years to come down but circumstances have been such that I have been unable to be here. I might say that we in Manitoba, about 400 miles north of here, are interested in horticulture as well as you people in Minnesota. We have a fraternal interest in the work you are doing. A number of our members, I might say, are members of your society, and we are getting your excellent publication and following the work you are doing. Our problems up there are very similar to yours, and we feel that you can give us greater information than we can obtain from any other source. We appreciate the excellent work you are doing, and it has been of great interest to me to see the wide range of subjects you are covering. I was particularly interested this morning in the session of the plant breeders, as that is a line of work that we feel up in Manitoba has some possibilities for us. In a horticultural line we are confined very largely to the hardy varieties. We are working on improving the hardiness of our varieties, and the fruit growing as it is carried on with us very largely in a small way by the farmers and others interested through our province. We feel, however, that there are possibilities, and we are only too glad to get any information from you as to the work and progress that is being made in the matter of hardy fruits. We have been endeavoring to improve our native plums. I have had the station there at Winnipeg, and in connection with one of our nurserymen, Mr. Buchanan, we have been selecting hardy plums for a number of years, and we hope from that stock in crossing with the Japanese plums, as Professor Hansen suggested this morning, to prove that there are possibilities even as far north as Manitoba. I have heard Mr. Buchanan say on several occasions that he thought the possibilities of plum growing were fairly good in Manitoba. In small fruits we have possibilities. The currants and raspberries grow very well. We have not done so much in strawberries, but I know there are a number of growers in parts of the province that are making some very successful experiments in strawberries, and we hope in a few years to produce strawberries of a fairly good quality.

The President: How is your wild strawberry?

Mr. Broderick: I find that the wild strawberry does very well. We have around Winnipeg, where the college is located, a wild strawberry that does very well, and it is possible that we can do some work on improving the wild strawberry. We are looking to our hardy native fruits and the hardy importations we are making to establish varieties which are hardy and suited to our conditions. We are interested also in the work done in tree planting, and I followed with interest the discussion this morning as to windbreak

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protection. That has been a problem with us. The government of the Dominion has taken it over, and we find it is working out all right. Our Forestry Station at Indian Head sends out lots of trees free each year. These are planted, and they have a system of inspection. Certain requirements are made in regard to the preparation of the soil, methods of planting and caring for the plantation afterwards.

A Member: What are the majority of your forest trees?

Mr. Broderick: Forest trees are largely deciduous, the Manitoba maple, the ash, the elm and the willows. I was pleased to hear some one this morning mention the golden willow. That is one of the best trees we have. The Manitoba maple, of course grows all over that northern country, but we find that during recent years it has been becoming seriously infected with various kinds of pests. This year the aphis were serious. We are discouraging to a certain extent the Manitoba maple and planting other trees and are getting better results. The ash, the elm and willow are doing well. With the conifer trees, the Scotch pine, the white spruce, the balsam fir and the ridgepole pine are those which are growing.

The improving of home grounds is another question that is interesting us. I do not think there is anything in this western country that is going to do more to make homes than this. So we are interested in all the work you are carrying on, and we appreciate the opportunity of coming here and meeting with you and listening to the excellent discussions you have. I might say that our annual meeting is held in February and if any of you happen to stray up there we would be only too glad to have you join with us.

I thank you very much for the many courtesies extended to me on behalf of the Manitoba society. (Applause.)

(Time was now taken up by two minute speeches of different members, after which the meeting was declared closed.)

Records of Executive Board for 1916.

Record of meeting held in secretary's office 8:00 p.m. Tuesday, Dec. 6, 1915.

There were present Thos. E. Cashman, LeRoy Cady, Clarence Wedge, J. P. Andrews, R. A. Wright and A. W. Latham.

In the absence of the chairman of the board, Mr. J. M. Underwood, Clarence Wedge was elected chairman pro tem.

The following accounts were examined and approved and orders drawn in payment therefor.

Geo. W. Strand, treasurer, premiums annual meeting, 1914, $596.50.

Geo. W. Strand, treasurer, premiums summer meeting, 1915, $172.00.

A. W. Latham, expenses secretary's office from June 1, 1915, to Dec. 1, 1915, $1,064.30.

It was decided to present to the annual meeting of the society for action the following named persons for honorary life membership: John Bisbee, Madelia; J. R. Cummins, Minneapolis; S. H. Drum, Owatonna; F. W. Kimball, Waltham; Chas. Haralson, Excelsior.

An appropriation of fifty-three dollars and 25-100 ($53.25) was made for the benefit of the Minnesota Forestry Association.

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Adjourned sine die,
CLARENCE WEDGE,
Chairman, pro tem.

A. W. LATHAM, Secretary.

* * * * *

Record of meeting of the board held in West Hotel 12:30 p.m. Friday, Dec. 10, 1915.

There were present at this meeting Thos. E. Cashman, LeRoy Cady, Clarence Wedge, J. P. Andrews, R. A. Wright and A. W. Latham.

Thos. E. Cashman was elected chairman pro tem.

J. M. Underwood was elected chairman of the board for 1916, and A. W. Latham was elected secretary at a salary of eighteen hundred dollars ($1,800.00) per annum. The salary of the treasurer was fixed at twenty-five dollars ($25.00) per annum.

The board having under consideration the recommendation of grades of apples for use in packing for market, a committee consisting of Clarence Wedge, J. P. Andrews and R. A. Wright was appointed to take the question under consideration with authority to act for the board.

The sum of eight hundred dollars ($800.00) was appropriated as a revolving fund for the use of the secretary of the society during the year 1916.

The following resolution was presented by Clarence Wedge and unanimously adopted by the board.

“Resolved: That the board favors the exclusive distribution of new varieties of fruits of probable commercial value originating at the State Fruit-Breeding Farm to members of the society and the trial stations of the state as at present practiced.“Resolved further—-That when a variety of fruits originating at the fruit breeding farm has been sufficiently tested to establish its commercial value in the state, it shall be given a name and the State Fruit-Breeding Farm shall cease to propagate it for distribution.”

Adjourned sine die,
THOS. E. CASHMAN,
Chairman, pro tem.

A. W. LATHAM, Secretary.

* * * * *

Record of meeting held in the secretary's office June 22, 1916.

All members of the board were present except R. A. Wright.

Mr. John P. Andrews was elected by the board as its representative in connection with the assessment of damages on account of nursery stock to be destroyed in certain Minnesota nurseries to protect from injury threatened by a disease called "white pine blister rust."

Having under consideration the trial stations connected with the society it was decided to discontinue the station located at Madison, Minn., and locate a station at New Auburn, Minn., R. F. Hall, Supt., and another at Deerwood, Minn., L. P. Hall, Supt.

The following resolution pertaining to Farmers' Institutes was unanimously adopted.

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"Resolved: That in our judgment the carrying out of the spirit and purpose of the motion adopted by the Farmers' Institute Board, Sept. 4, 1913, pertaining to 'the horticultural work on each institute corps'—to quite literally—cannot be fully performed except by providing for each institute corps some one who should in whole or in part represent horticulture, and who should be interested and willing to serve the Horticultural Society as indicated in said motion; and further, that reasonable opportunity for such service should be allowed at each place where an institute corps may be working."

It was decided to appropriate $65.00 to be applied to the uses of the Minnesota State Forestry Association.

The accounts of the Secretary from Nov. 30, 1915, to June 15, 1916, amounting to $4,112.82, were examined and approved, and an order drawn for the payment of that amount from the treasury, an equal amount to be covered into the treasury from the hands of the secretary.

Adjourned sine die,
J. M. UNDERWOOD,
Chairman Executive Board.
A. W. LATHAM, Secretary.

Additions to Society Library, 1916.

(For preceding list see page 492, Report 1916).

	Case.	No.
Am. Pomological Socy., An. Rep., 1873	3	8
Am. Pomological Socy., An. Rep., 1871	3	9
Am. Pomological Socy., An. Rep., 1885	3	10
Cyclopedia of American Agri., Bailey. Vol. 1	*3*	*24*
Cyclopedia of American Agri., Bailey. Vol. 2	3	25
Cyclopedia of American Agri., Bailey. Vol. 3	*3*	*26*
Cyclopedia of American Agri., Bailey. Vol. 4	3	27
Cyclopedia of Practical Hort., Lowther, 1916. Vol. 1	*4*	*1*
Cyclopedia of Practical Hort., Lowther, 1916. Vol. 2	4	2
Cyclopedia of Practical Hort., Lowther, 1916. Vol. 3	*4*	*3*
Cyclopedia of Practical Hort., Lowther, 1916. Vol. 4	4	4
Plums of New York, Hedrick, 1915	*1*	*1*
Grapes of New York, Hedrick, 1915	1	2

FROM LIBRARY OF WYMAN ELLIOT:

Bureau of Ethnology. J. W. Powell 1 3 Minn. State Hort. Socy., An. Rep., 1915 44 13 *American Agriculturist. Vol. 10 4 8 Report of Secretary of Agriculture, 1889 4 10 Department of Agriculture. Report, 1877 4 11 Architecture of Country Houses. Downing 4 12 American Farmers Encyclopedia. Emerson 4 13 Michigan Hort. Socy., An. Rep., 1886 4 13 Department of Agriculture, Report, 1856 5 14 Yearbook of Argiculture, 1855 4 15 American*

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Forestry Association, Report, 1897 4 16 Department of Agriculture, Report, 1852-3 4 14 Food for Plants. Harris and Meyers 47 1 Western Farmer. Vol. 1 47 2 Western Farmer. Vol. 2 47 3 Western Farmer. Vol. 3 47 4 Minnesota State Horticultural Society, Report, 1869 47 5 State Entomologist, An. Rep., 1909-1910 47 6 American Pomological Society, An. Rep., 1903 47 7 American Pomological Society, An. Rep., 1869 47 8 Wisconsin State Hort. Socy., An. Rep., 1876 47 9 Wisconsin State Hort. Society, An. Rep., 1877 47 10 Wisconsin State Hort. Socy., An. Rep., 1891 47 11 State Experiment Station, Rep., Bulletins 47 12 Illinois Hort. Socy., An. Rep., 1870 47 13 State Entomologist, Report, 1905 47 14 Indiana State Hort. Socy., Report, 1853 47 15 Minnesota Farmers Institute Annual, 1895 47 16 Minnesota Farmers Institute Annual, 1907 47 17 Minnesota Farmers Institute Annual, 1908 47 18 Western N. Y. Hort. Socy., Report, 1887 47 19 Making Horticulture Pay. M. G. Kains 47 34 Young Farmers Manual. S. E. Todd 47 33 Home for All. O. S. Fowler 47 32 American Weeds and Useful Plants. Wm. Darlington 47 31 How to Grow and Show Potatoes. Jas. Pink 47 30 How to Build Hot Houses. R. B. Leucars 47 29 Field Book of Manures. D. J. Browne 47 28 Woodwards Country Homes. G. E. & F. W. Woodward 47 27 Grape Growers Guide. Wm. Charlton 47 26 Botanical Ready Reference. J. M. Nickells 47 25 Landscape Gardening. Chas. H. J. Smith 47 24 Cranberry Culture. B. Eastwood 47 35 Book of Roses. Francis Parkman 47 23 Elements of Agriculture, Chemistry and Geology.

J. F. W. Johnston 47 22

American Farm Book. R. L. Allan 47 21 Flower Garden. Jos. Beck 47 20 Handbook of Tree Planting. N. H. Egleston 47 38 Bulbs. E. S. Rand, Jr. 47 37 How to Cooperate. Herbert Myrick 47 36 Suburban Home Grounds. F. J. Scott 45 1 Trees of America. D. J. Browne 45 2 California Fruits. E. J. Wickson

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Transcriber's note: Minor, obvious typos corrected.